The intriguing effect of women board representation and women power on global supply base risk

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ABSTRACT

Purpose – Heeding to the various calls for research on the effects of gender diversity within the operations and supply chain management (OSCM) domain, we study the intriguing curvilinear effect of women board representation on global supply base risk. We also evaluate the contingent effects of women power – structural and expert – on this effect.

Design/Method/Approach – We hypothesized the proportion of women on boards to have a curvilinear (U-shaped) effect on global supply base risk. Additionally, women interlocks, and women in C-suite are conjectured to flatten this U-shaped effect. The proposed hypotheses are tested using a unique panel dataset of global US-based public firms with suppliers worldwide; this dataset was compiled using four different secondary data sources.

Findings – We found that our first hypothesis regarding the U-shaped effect of the proportion of women on boards was supported. However, while the negative moderation effect of women interlocks was significant, the moderation effect of women in C-suite was not. In effect, these results suggest that when it comes to women board representation, the presence of both merit and power is better than power alone.

Originality – Given the considerable lack of empirical research linking gender diversity and supply chain decision-making, our findings contribute significantly to the literature on gender diversity within OSCM. Our study draws on the double-edged effect of the proportion of women on boards by juxtaposing social role and social identity theories, and in doing so, shows that women board representation might not always result in lower risk. By testing the intriguing effects of women board representation, our study contributes to not theory and practice.

Keywords: Global supply base risk; women board representation; women interlocks; women in C-suite.

INTRODUCTION

There have been numerous calls for research to explore the varied effects of gender diversity on operations and supply chain management (OSCM) performance and decisions (e.g., Ma et al., 2021; Matthews et al., 2024; Ruel et al., 2020; Yang et al., 2024; Zinn et al., 2018). These calls for research gain credibility given the fact that regulations in the USA and Europe mandate the need to increase the participation of women directors on boards (Labelle et al., 2015). Apart from heeding these, more and more firms are bound to go over and beyond such mandated diversity requirements as both anecdotal and empirical evidence strongly point in the direction of the profound impact of gender diversity on performance and strategic decision-making (Hunt et al., 2020; Ruel & Fritz, 2021). Though limited, OSCM literature has focused on topics spanning not only gender disparity/inequality but also the effects of gender (i.e., women's representation) on decision-making and performance related to OSCM (Akbari et al., 2024; Kumar et al., 2020; Ma et al., 2021; Yang et al., 2024). Within the context of strategic decision-making, OSCM research has studied women's representation at different levels, including purchasing agents, managers, the top management team (TMT), and board members. When it comes to women board representation and strategic decision-making, OSCM studies have focused on aspects including sustainability and product recalls, among others (Post et al., 2021; Ruel et al., 2020; Wowak et al., 2021). However, it is quite surprising that the topic of global supply base risk has not been investigated yet from this perspective.

In fact, supply chains have emerged as a major source of risk for businesses (e.g., Garfield, 2024; Shih, 2022), especially because the global structuring adopted by several supply chains has revealed the underlying instability and fragility when facing increasing geopolitical tensions, logistics challenges, and more frequent shocks (Baldwin & Freeman, 2022; Shih, 2022). More importantly, in the current turbulent business and geo- and socio-political environment, sourcing from a globally dispersed supply base significantly increases a

firm's risk exposure (Baldwin & Freeman, 2022; Stanczyk et al., 2017), elevating the management of global supply bases as one of the most relevant concerns for firms today (Qian & Qiu, 2023). In other words, assessing supply chain risk and ensuring that appropriate measures aimed at mitigating risks and preventing disruptions are adopted has become a crucial topic in the board's agendas (Anonymous, 2025; Garfield, 2024; Lustig, 2023). On a resounding note, according to a report by the National Association of Corporate Directors, directors of companies have ranked the disruptions ensuing from global supply chain risks as the fourth most important future trend for corporate boards to consider (Anonymous, 2022).

Accordingly, no matter the board composition, understanding such supply chain risks and enacting strategies to mitigate their detrimental effects is the board's responsibility (Lustig, 2023). Along this vein, extensive research conducted on the relationship between gender diversity and corporate risks – primarily financial, capital, and investment risks (Maxfield & Wang, 2024; Teodósio et al., 2021) – points out the importance of accounting for women representation in boards and leadership positions when investigating organizational risks. This literature is built on the assumption that women and men differ in their attitude and consequent behavior toward risk, with women tending to be more risk-averse (Byrnes et al., 1999; Charness & Gneezy, 2012; Jianakoplos & Bernasek, 1998) and less overconfident (Fischhoff et al., 1977; Huang & Kisgen, 2013) than men. In other words, given their attitude towards risk, increased women board participation could have a fundamental impact on decision-making focused on mitigating global supply base risks.

Against this backdrop, we acknowledge that it is salient to link the notions of women representation on boards and women power to that of risks in the global supply base. While global supply base risk could encompass diverse aspects, including quality concerns and natural calamities, in this study, we focus on the risks that are related to the various institutions (e.g., social, political, security, and economic) in the countries within which the firm's suppliers

are located. Assessing these aspects of risk is of paramount importance given the current geopolitical and sociopolitical trends that we notice in the global supply chains of many firms (Baldwin & Freeman, 2022; Stanczyk et al., 2017). In fact, the potential disruptions caused by the prevalence of political tensions, the social structure, policy trends, as well as economic conditions around the world require firms to actively reach out for advice regarding their global supply base from former diplomats, politicians, as well as civil servants (Alim et al., 2023).

Our first research question is: How does women board representation impact the global supply base risk? We juxtapose the social role and the social identity theories to hypothesize that the proportion of women on boards will have a U-shaped effect on global supply base risk. While the tenets of the social role theory inform us that an increase in women representation on board will lower global supply base risk, as suggested by the social identity theory, women board representation, beyond a threshold, will result in a gender faultline which could lead the gender subgroups to take polarizing and inflexible positions (Triana et al., 2014; Williams & O'Reilly, 1998), thereby rather increasing the global supply base risk (Lau & Murnighan, 1998; Li & Hambrick, 2005). Additionally, acknowledging that the effect of women board representation could be contingent upon other factors, we evaluate the contingent effects of C-suite membership and interlocks of the women directors. Both women in C-suite and women interlocks signal a notion of the power of the women directors on the board; power can equip executives with the ability to influence collective behavior (Finkelstein, 1992; French & Raven, 1959). As for C-suite memberships, individuals who occupy these positions are seen as powerful. Accordingly, they have a unique ability to exert their structural power to influence the fundamental behavior of others on the board, women and men alike (Finkelstein, 1992; French & Raven, 1959; Hickman, 2023; Mizruchi, 1983; Triana et al., 2014). Alternatively, interlocks could signify the breadth of knowledge and experience that the directors possess and, in doing so, reflect the extent of expert power that they hold (Finkelstein, 1992). The extent of

this expert power held by women could directly affect the esteem and respect shown by the entire board, thereby cementing their ability to alter as well as drive strategic decision-making (French & Raven, 1959; Triana et al., 2014). Therefore, the second research question we aspire to answer is: how does the power of women executives moderate the effect of women board representation on global supply base risk? Our sample was based on 3339 firm-year observations spanning 497 US public firms. We tested our hypotheses using fixed effects models. While we find support for the U-shaped effect of women board representation on global supply base risk and the moderating effect of women interlocks, the moderating effect of C-suite membership was found to be insignificant.

Our study makes a few invaluable contributions to the OSCM literature. First, this is the first research effort to employ a large-scale and unique secondary dataset to study the effect of women board representation on decision-making at the supply chain level. This contribution is invaluable because most of the studies that have tried to explore the effect of gender diversity on supply chain decisions were predominantly based on literature reviews or interviews (Ruel et al., 2020; Ruel & Fritz, 2021). Our study also bridges supply chain risk and general management literature on board gender composition, showing how women board representation can impact a firm's exposure to global supply base risk. In doing so, our study enriches the extant literature on gender diversity and corporate risk which has traditionally focused on risk categories such as financial, capital, and investments risks (Maxfield & Wang, 2024). More importantly, our study advances research on supply chain risk by examining the impact of individual traits of the board members (i.e., gender; women's expertise, experience, and ability to exert influence) as well as the board's subgroup dynamics on the firm's inclination towards global supply base risk. Second, our conceptualization of global supply base risk is quite novel since literature has typically focused on firm-level dimensions like risk assessment and risk mitigation strategies while examining how firm's approach supply chain

risk-related decisions (Ho et al., 2015; Manuj & Mentzer, 2008). Specifically, by conceptualizing global supply base risk to go beyond the consideration of geopolitical risks alone and rather encompass other key institutions spanning social, security, and economic aspects (Ault & Spicer, 2020; Marshall & Cole, 2017), we evaluate the context of a much broader set of institutional voids that could significantly compound the risks that firms encounter in their global supply base (Kim & Song, 2017; Roth & Kostova, 2003). Third, we contribute to the line of research that alludes to the double-edged effect of gender diversity (Homberg & Bui, 2013; Jehn et al., 1999; Triana et al., 2014). Specifically, by juxtaposing social role and social identity theories to propose and test a curvilinear effect of gender diversity, we show that women board representation need not always result in lower risk. Such an inquiry is essential given that the effect of women's representation has been mixed in that it has been suggested to have a positive, a negative, or an insignificant effect on various organizational outcomes (e.g., Cannella & Monroe, 1997; Homberg & Bui, 2013; Jeong & Harrison, 2017; Rodriguez et al., 2024; Safiullah et al., 2022; Sila et al., 2016). Our results seem to align with extant research that has resoundingly indicated such a double-edged effect, specifically in the context of strategic change and innovation outcomes (Triana et al., 2014; Wu et al., 2022).

THEORETICAL DEVELOPMENT

Social role and social identity theories

In the context of social behavior, the social role theory contends that women and men are fundamentally different in that women are more communal – socially sensitive and empathetic, whereas men are more agentic – assertive and ambitious (Eagly, 2013; Eagly & Wood, 1999). While the social role theory tends to hint at the possibility that job roles could, to some extent, lead to behavior that might be different from this widely-held belief, research efforts have consistently shown that gender tends to be the primary driver of communal and agentic behavior in organizations (Eagly & Wood, 1999; Tang et al., 2021). Additionally,

regarding the propensity to take risks, women and men tend to behave differently due to various social and psychological considerations (Meier-Pesti & Penz, 2008). Broader literature and empirical evidence across multiple disciplines consistently suggest that women are more risk-averse than men (e.g., Byrnes et al., 1999; Charness & Gneezy, 2012; Jianakoplos & Bernasek, 1998). Another key difference between women and men is that men tend to believe that their knowledge about risk is more precise than it is, making them overconfident (Fischhoff et al., 1977). On the contrary, since women are comparatively less overconfident, they are less likely to make highly risky decisions similar to men (Barber & Odeon, 2001). In the general sense, the broader value-enhancing effect of women board representation could be explained by the social role theory (Eagly, 2013; Eagly & Wood, 1999).

Social identity theory is based on the notion that social context affects intergroup relationships (Tajfel & Turner, 1986). As is the case with other diversity measures, gender is also a cognitively immutable attribute that can result in social categorization and the subsequent development of a strong social identity (Fiske, 1998). Therefore, as per the tenets of the social identity theory, gender could create highly cohesive subgroups, wherein its members tend to have a strong sense of unity and identification among the ingroup members. Alternatively, on the same account, high cohesiveness could also be accompanied by a strong sense of differentiation towards the outgroup members (Dion, 1973; Tajfel & Turner, 1986). Given that group memberships are the source of satisfaction and value for individuals, the social identity theory purports that individuals are motivated to maintain a favorable group identity along with a strong desire to protect that identity, which could be the source of intergroup bias, negative attitudes, as well as conflicts towards others in the group that are dissimilar (Aberson et al., 2000; Carbonell & Rodríguez Escudero, 2019; Joshi & Roh, 2009; Tajfel & Turner, 1986; Turner & Pratkanis, 1998). Accordingly, the social identity theory could help explain the potential double-edged effect of women board representation, wherein a higher proportion of

women on the board could rather result in a gender faultline, which could eventually lead to higher global supply base risk (Lau & Murnighan, 1998; Li & Hambrick, 2005).

Global supply base risk – state fragility index

In addition to various benefits, the reliance on a complex and dispersed global supply base increases the supply base risk and makes the firm's supply base more vulnerable to disruptions (e.g., Blackhurst et al., 2005; Park et al., 2016). Supply base risk can originate from multiple diverse sources, and several categorizations exist in the literature (e.g., Ellis et al., 2011; Wagner & Bode, 2008). Wagner and Bode (2008) distinguish between "internal" and "non internal" risk sources; this approach was also followed by other later studies (e.g., Kauppi et al., 2016). Internal risk sources are specific to a supply chain and deal with supply-demand coordination mismatch; non-internal risk sources refer to various types of environmental factors whose impact goes beyond a single supply chain (Kauppi et al., 2016; Wagner & Bode, 2008). As for the latter, many are seen as "country-level risks" in that they reflect certain characteristics of the country where the suppliers are located (Graf & Mudambi, 2005; Kauppi et al., 2016; Wagner & Bode, 2008). These characteristics include, among others, political, economic, institutional, infrastructural, and social aspects (Ellis et al., 2011; Lee et al., 2020; Wagner & Bode, 2008). Since country risk is a multidimensional construct, it is assessed through synthetic indices that combine scores across a certain number of variables; each of these variables measures risk along a specific factor. Country risk indices have been developed by international organizations such as the UN and the WEF as well as other agencies (Oetzel et al., 2001), and past OSCM studies have used them to measure risk (Dube et al., 2016; Kauppi et al., 2016). In this study, we adopt the state fragility index (SFI) developed by the "Polity Project from the Center for Systemic Peace"; this index has been widely adopted in OSCM and international business research (e.g., Ault & Spicer, 2014; Dube et al., 2016; Huang et al., 2015; Kunz & Van Wassenhove, 2019).

Since SFI reflects whether the required institutional environments are present or not, it could reflect the opportunities and underlying risks that firms in the country could encounter (Ault & Spicer, 2014). SFI encompasses four key institutions – political, social development, security, and economic performance (Marshall & Cole, 2017). Political factors such as government instability, social tensions (protests, strikes), as well as uncertainty in the regulatory discipline, especially when it directly impacts the supply chain (e.g., trade, transportation, and environmental regulation) (Graf & Mudambi, 2005; Lee et al., 2020) introduce instability into firms' ordinary operations and can jeopardize the flow of supplies. Besides, supply base risk can be affected by a country's economic and institutional factors like the openness of its economic system, exchange and inflation rates (Graf & Mudambi, 2005), and effectiveness of the legal system in ensuring contract enforceability (Wagner & Bode, 2008) and in curbing corruption and bribery (Ellis et al., 2011). Security-related issues could relate to policing as well as border security, which can help to successfully curtail violence in the country (Marshall & Cole, 2017). The lack of proper security combined with a weak legal system could elevate the extent of corruption in the state, affecting the efficient functioning of businesses (Webb et al., 2014). Finally, a country's social conditions may affect the riskiness of sourcing from that location, given that situations of extensive poverty or deep-seated inequality are more likely to generate immoral and deplorable practices such as modern slavery or child labor in the supply base, which can cause severe reputational damages to the focal firms (Petersen & Lemke, 2015).

Hypothesis development

Effect of women board representation on global supply base risk

Gender diversity has been widely touted to not only result in better performance but also lower risk-taking in strategic decisions (Jeong & Harrison, 2017). Driven by regulatory and social pressure, a multitude of companies have started to include women in their TMTs and

boards. However, in some cases, such a mandate could be symbolic in nature. In other words, when gender diversity on the board is very low – like appointing a single woman to serve on the board, the presence of the women director could just signal tokenism (Kanter, 1977). Accordingly, in addition to their out-group status, women would be marginalized as they are grossly outnumbered. In such cases, the strategic decisions made by the board, including those related to the global supply base, would closely align with the risk-taking nature of the men in the group (Jeong & Harrison, 2017), thereby pursuing riskier firm strategies in the selection of their global suppliers. However, as the number of women on the board increases, it can no longer be considered tokenism and could rather have a consequential effect on not only performance but also strategic decision-making (Torchia et al., 2011). Specifically, the inclusion of women could change the underlying dynamics wherein different sources of information and divergent perspectives, along with the underlying reasoning, could be thoroughly examined and, subsequently, integrated (Joshi & Roh, 2009; Loyd et al., 2013). In effect, increasing gender diversity could cut against risk-seeking tendencies through thorough information elaboration and, in doing so, challenge the status quo of decision-making within the purview of global supply base risk (Joshi & Roh, 2009). Additionally, the presence of women executives could also cause the board, as a whole, to become more cautious in that when more women enter the group, their male counterparts would tend to perceive the group as a whole as more risk-averse than it actually is, thereby leading the group to be less open to risky strategies (Jeong & Harrison, 2017; Post et al., 2021). Overall, the tenets of the social role theory suggest that increased women board representation can help successfully circumvent the myopic views on global supply base risk by bringing to bear the different characteristics of the countries where the suppliers are located and vetting them thoroughly through healthy debates (Williams & O'Reilly, 1998), thereby reducing the overall risk in the global supply base by moving out of countries with higher institutional risk and instead

choosing suppliers in countries with less institutional risks.

While increasing women board representation could result in lower risk in the global supply base, this effect will not persist beyond a threshold as the subgroup dynamics could overshadow the positive benefits suggested by the social role theory (Carbonell & Rodríguez Escudero, 2019; Jehn et al., 1999; Richard et al., 2019). After a certain threshold of women representation, the global supply base risk would rather increase with the increase in women board representation. This reversal of effect could be sufficiently articulated by juxtaposing the social role theory with the social identity theory. Specifically, a gender-diverse board will result in two distinct psychological subgroups – one with male members and another with female members (Tajfel & Turner, 1986). Social identity theory purports that socially cohesive subgroups tend to feel higher intergroup bias if they perceive a threat to their subgroup's collective identity (Carbonell & Rodríguez Escudero, 2019; Turner & Pratkanis, 1998). Since socially cohesive groups tend to protect their self-identity (i.e., in-group), they often tend to display a strong negative bias towards the other group (i.e., out-group) (Tajfel & Turner, 1986; Turner & Pratkanis, 1998). The division of the board into gender-based subgroups could result in a faultline – a hypothetical line analogous to geological faults – that divides a group into subgroups (Lau & Murnighan, 1998). Though a single demographic variable causes a gender faultline and is not considered strong, since it is caused by attributes that are easily identifiable or class-based (i.e., gender), it is prone to increased conflicts, group politics, and out-group discrimination (Jehn et al., 1999; Lau & Murnighan, 1998; Richard et al., 2019). Therefore, closely examining the subgroup dynamics caused by a higher level of gender diversity could help in understanding the true effect of women board representation on global supply base risk.

Specifically, when women board representation is not that high on the board, the faultline could be weak in that the polarization might not be palpable as it is unlikely for the members of the weaker subgroup to sufficiently identify among themselves. In such situations,

women board representation could lead to the selection of suppliers in less institutional risks, thereby reducing the overall global supply base risk. However, as the number of women on the board reaches a critical threshold, then the subgroup structure could solidify to become more internally cohesive. The notion of social identification will intensify and legitimize the internal characteristics and traits of the gender subgroups. As women's representation gains more saliency, both subgroups will become highly cohesive internally, inducing a strong sense of identification and unity within themselves. This strong sense of unity could eventually lead both subgroups to be increasingly motivated to protect and advance their identity and beliefs, thereby behaving in a way that not only favors their own but also derogatory to the other subgroup (Carbonell & Rodríguez Escudero, 2019; Joshi & Roh, 2009). Given the considerable representation in both subgroups, the faultline, though weak as it is driven just by gender, could actually become profound in that the subgroups could take conflicting and inflexible positions that are polarizing and increasingly extreme (Triana et al., 2014; Williams & O'Reilly, 1998). In other words, the strong factional groups resulting from the gender faultline could be sufficient to increase the levels of behavioral disintegration related to strategic decision-making (Lau & Murnighan, 1998; Li & Hambrick, 2005). The subgroup dynamics driven by the tenets of the social identity theory thus inform us that the gender faultline and ensuing disintegration will put the brakes on the risk-averse nature of women board members, thereby increasing the overall global supply base risk after women representation on the board reaches a critical threshold. Accordingly, by juxtaposing the social role and the social identity theories, we propose:

H_1: Women board representation will have a U-shaped effect on global supply base risk. In other words, while an initial increase in women board representation will result in a reduction in global supply base risk, after a threshold, it will result in an increase in global supply base risk.

Contingent effect of the power of women directors

Power reflects the capacity of certain individuals to impose their ambition or will on others (Finkelstein, 1992; French & Raven, 1959). When it comes to strategic decision-making in firms, power could play a considerably important role as it can change the collective behavior of teams at any level (Finkelstein, 1992; French & Raven, 1959; Triana et al., 2014). In this study, we hypothesize and test the contingent effect of the interlocks of women directors and women in C-suite. Specifically, we conjecture the power that is inherent in women interlocks and C-suite membership will impact their level of influence in group decision-making processes, thereby flattening the U-shaped effect of women board representation on global supply base risk.

Board interlocks occur when a person serves on the board of directors in two or more firms, creating a connection or interlock between them (Mizruchi, 1996). Board interlocks provide individuals with opportunities to learn about best practices and strategies in a variety of companies (e.g., Cheng et al., 2021; Haunschild, 1993). Indeed, interlocks have been linked with the diffusion of corporate practices as directors who sit on multiple boards share their experiences in the decision-making process in those firms. Therefore, directors who sit on multiple boards are considered to have more expertise, both general and specific to the global supply footprint as well as the associated risks, than those who sit on fewer or no boards. Since interlocks signify exposure to diverse functional areas and a wide range of assignments, it signifies the presence of expert power in those executives (Finkelstein, 1992; Triana et al., 2014). Expert power refers to the ability of individuals to navigate external environmental factors and drive the organization's success by effectively managing uncertainties and contingencies related to the global supply base. Additionally, given that interlocks signify expertise and experience, in addition to power, they can also be seen as a significant source of merit (Hickman, 2023).

Women with interlocks can use their central network position to have access to more

external knowledge, thereby not only providing the platform for potential sources of learning but also understanding the efficacy of different alternatives, even related to risky endeavors (Li et al., 2023; Mizruchi, 1996; Westphal et al., 2001). Accordingly, the heterogeneous knowledge resources gained through interlocks could help women gain greater experience and expertise that will eventually increase their tendency to break away from the risk-averse tendency of women and take well-informed and calculated risks related to the global supply base. Additionally, given their expert power, these meritorious and powerful women can present their decisions tactically, thereby convincing both the men and women subgroups to side with their decisions (Finkelstein, 1992; Haunschild & Beckman, 1998) that could be much riskier than the other women in the board. In other words, when there is a higher number of women interlocks, there is an increased chance that women board representation might lead to the persistence of positioning global suppliers in countries with higher institutional risks, thereby flattening the curve up to the threshold point. Alternatively, given the expert power of women interlocks encompasses both merit and power, women with board interlocks could serve as a unifying intermediary that can facilitate better collaboration among the women and men subgroups, thereby enhancing the cohesion in the board and better strategic decision-making (Haunschild, 1993; Hillman et al., 2007; Wu, 2008). As the power derived through interlocks could serve as a marker for experience, network connections, and broader endorsement, higher women interlocks could help them avoid any outgroup biases among subgroups (Saggese et al., 2021). It could also successfully mitigate the negative effects of subgroup dynamics and help successfully silencing the subgroup of men (Triana et al., 2014). Therefore, whenever women interlocks are higher, firms will not succumb to subgroup dynamics and tend to increasingly gravitate towards the selection of suppliers that are located in countries with higher institutional risks even after the women board representation threshold has been reached. In summary:

H_2: Women interlocks will negatively moderate the effect of women board representation on global supply base risk. In other words, the U-shape will flatten as the women

interlocks increase.

As for the C-suite, the term is used to represent the executive committee or the corporate senior leadership, including the CEO and the other executives (CxOs) that report directly to the CEO (Groysberg et al., 2011; Guadalupe et al., 2014). In addition to being a major presence in the boardroom, the C-suite executives also have a dual role in making strategic decisions. At the same time, the power of the C-suite need not always also signal merit as its members could control the actions of the board of directors to their own end, given their power positions (Hickman, 2023). In other words, as opposed to women interlocks, C-suite membership reflects power and not always merit (Hickman, 2023). In this study, we envision women in C-suite to have structural power as it reflects the power of the formal titles that they hold and the associated authority (Finkelstein, 1992). Given this structural power, the executives who are part of the C-suite are likely to possess greater latitude in driving changes within the firm and its board. Since the members of the C-suite are at the top of the corporate hierarchy, they wield considerable ultimate structural power in any firm, thereby having the ability to influence and alter other's behavior, including those on the board of directors.

Women who elevate themselves to the top executive position, such as the C-suite, are generally motivated to succeed (Atkinson, 1964). Moreover, the risk-averse nature of women tends to put them at a disadvantage when it comes to leadership roles that require making risky strategic decisions (Branson, 2006). Therefore, women in C-suite might tend to break away from stereotypical social norms and rather take measured risks in the selection of their global suppliers so as to not only enhance their probability of achieving success but also prove their leadership (Glass & Cook, 2016, 2020; Ingersoll et al., 2023; Post et al., 2021). Even though the tenets of the social role theory would prevail, women executives who are part of the C-suite will still take a requisite amount of risk given the higher value that they would have historically placed on success (Atkinson, 1964; Glass & Cook, 2016, 2020). Additionally, as women in C-

suite hold greater power in comparison to other members of the board, women and men alike, they have the ability to sway the general sentiment of even the women board members when it comes to risk-taking in the selection of the global supply base (Finkelstein, 1992; French & Raven, 1959). Therefore, when there is a higher number of women in the C-suite, in spite of increased women board representation, the firm might continue with the persistence of suppliers in riskier countries, thereby not significantly decreasing the inherent global supply base risk. In other words, the initial part of the U-shape effect before the threshold point will flatten as there are more women in C-suite. Alternatively, the higher number of women in C-suite could also negate the detrimental effect of subgroup dynamics after the women board representation crosses the threshold. The male directors' perception of a threat to their subgroup's collective identity will be overshadowed by the respect and openness that they might have for powerful C-suite women (Lawrence et al., 2005; Wang & Kelan, 2013). Additionally, the male board members might choose not to showcase a strong negative bias towards the out-group (i.e., women) as they will not prefer to misalign with the preferences of the powerful women C-suite executives (Corwin et al., 2022). Therefore, whenever the number of women in C-suite is higher, the global supply base will continue to morph, ideally, in that the firm will continue to explore the possibility of selecting suppliers in countries with lower institutional risks, thereby not resulting in that high an increase in global supply base risk after the women board representation threshold. Based on the above discussion, we forward the following hypothesis for formal testing:

H_3: Women in C-suite will negatively moderate the effect of women board representation on global supply base risk. In other words, the U-shape will flatten as the number of women in C-suite increases.

METHODOLOGY

Data and variables

Our study uses data between 2003 and 2018 from US public companies whose supply

chain partners are located globally. Data was collected from 4 sources: (1) supply chain data from FactSet Revere, (2) SFI from the Center for Systemic Peace, (3) information on firms' directors from BoardEx, and (4) financial data from the Thomson Reuters World Scope Database. We combined these four datasets since each provides unique and non-overlapping information, thereby allowing us to develop variables spanning these four datasets. We have provided detailed information about the relevance and importance of the various sources of data in Appendix A.

Building the sample

We first identified U.S. public buyers and their suppliers worldwide from FactSet Revere database. For each firm, this dataset provides a list of relationships (e.g., customers, suppliers, and partners). As our ambition is to study the socio-political risk in the global supply base, we focused only on the suppliers of a US-based focal firm. We used the following three steps for each focal firm: (1) we identified suppliers using the relationship type "supplier", (2) we used the target company's identifier to record the identities of supplier firms, and (3) we used (1) and (2) to arrive at a panel data of the suppliers of each focal firm (i.e., the buyer). In this panel data, an observation shows the suppliers of a focal firm in a year and the supplier and focal firm identifiers. Next, we matched this with the SFI dataset to construct the dependent variable, resulting in a firm-year-level dataset from the buyer's perspective. The SFI index helps us capture yearly variations in institutional, political, economic, and social factors across countries. As mentioned earlier, we used the country name and year of observation to match SFI data with the data from FactSet. Since country names are string variables, we combined these datasets using text cleaning and matching approaches. SFI covers 167 independent countries whose population is above 500,000 in 2018. Each country is scored annually on legitimacy and effectiveness using four institutions: political, social, security, and economic, with a total of eight indicators. Each of these indicators is rated using a four-point scale

measuring fragility. The SFI combines scores on each indicator, representing the state's ability (1) to deliver essential services, manage conflicts, as well as implement public policy, and (2) to ensure the quality of life and effective response to crises and challenges. The SFI index could take values between 0 (no fragility) and 25 (extreme fragility). As the SFI data coverage ended in 2018, we limited our study until 2018. While using this data creates an issue about the recency of the data, it enables us to test our hypotheses before the impact of the COVID-19 pandemic on supply chains, businesses, and nations. After merging the FactSet and SFI datasets, we identified that US public companies have suppliers in 64 different countries. As mentioned above, given the importance of both datasets for computing the dependent variable used in our study, our sample greatly depended on the data available in the FactSet and SFI datasets.

Finally, we merged this resulting dataset with BoardEx and subsequently with Thomson Reuters' WorldScope using the ISIN (International Securities Identification Number) and year to construct the independent and control variables. For board-level information, we focused on directors from S&P 1500 firms. The S&P Composite 1500 combines the S&P 500, the S&P MidCap 400, and the S&P SmallCap 600, covering approximately 90% of U.S. market capitalization. It is designed for investors seeking to replicate the performance of the U.S. equity market or benchmark against a representative universe of tradable stocks. Using BoardEx, which has been widely used in various studies in management (Jung et al., 2023; Krause et al., 2019), we constructed key firm- and director-level variables. For example, BoardEx provides access to information on individual directors, including their gender. We obtained financial data and information (e.g., performance, sales, and industry) of the focal firms from Thomson Reuters' World Scope dataset. Additionally, we faced data constraints as the resulting data had to be complemented by firm-level financial and board data. While our initial sample was public firms based in the US that had global supplier relationships, data availability limited our study to 675 unique firms, resulting in 4258 firm-year observations.

Since we set the dependent variable to one year ahead of the independent and control variables, our sample was limited to 3339 firm-year observations spanning 497 unique firms. Though our sample size is reduced due to this approach, we believe that it helps us build a stronger case of a causal relationship between the variables of interest. We have included a flowchart that clearly illustrates the dataset matching process and the sample size at each stage (see Appendix B).

Dependent variable

Global Supply Base Risk: First, we calculated the number of suppliers for a focal firm using data from FactSet Revere (Agca et al., 2022; Dong et al., 2022; Geng et al., 2022; Son et al., 2021). FactSet collects data on suppliers and their locations from multiple sources, including but not limited to company websites, press releases, presentations to investors, and news reports. The dataset records the duration of a contract between a focal firm and its suppliers. For each focal firm i in country j in year t, we counted the number of suppliers having at least a contract with that firm (Dong et al., 2022). Second, the SFI data has been widely used in international business (Huang et al., 2015), political economy (Michalopoulos & Papaioannou, 2015), as well as operation management (Dube et al., 2016). Third, for a focal firm i in a financial year t, we compute global supply base risk as:

$$Global\ Supply\ Base\ Risk_{it} = \sum_{j=1}^{N} w_{ijt} * SFI_{ijt},$$

where w_i is the ratio of the number of suppliers firm *i* has in country *j* in year *t* to the total number of suppliers that firm *i* has across N countries in year *t*. This underscores the perceived risk within the company's supply base. If a firm's suppliers are based in countries with a high state fragility, the firm is more likely to encounter global supply base risks. The above is fundamentally a weighted average of the SFI of a focal firm's supply base. This approach is consistent with recent studies in OSCM (Geng et al., 2022).

Independent variables

Prop. Women: We operationalized women board representation as the proportion of women on

the board (e.g., Campbell & Mínguez-Vera, 2008; Kroes et al., 2024; Reguera-Alvarado et al., 2017; Wu et al., 2022). As mentioned above, we collect data on directors (specifically their gender) from BoardEx. Researchers frequently use this database to access board- and director-level information (Jung et al., 2023). In case BoardEx does not provide information on a director's gender, by following recent studies (Bernile et al., 2018; Jung et al., 2023), we use a machine-learning algorithm from NamSor (https://www.namsor.com/), which estimates their probable gender using their full names. First, for a focal firm *i* in financial year *t*, we computed the board size as the number of directors who served on the board in that year. Second, we similarly counted the number of directors who reported their gender as women. Third, we compute the proportion of women by taking the ratio of the total number of women directors divided by the board size. This variable ranges between 0 and 1.

Moderator variables

Women interlocks: Board interlocks, a key proxy for expertise and experience, serve as important communication channels through which important information about firm policies flows (Haunschild & Beckman, 1998; Zhan et al., 2024). By following the previous studies (Guldiken et al., 2019), each year, for a focal firm, we count the total number of interlocks for a woman director. In other words, we measure how many directorship positions a female director holds across different firms.

Women in C-Suite: C-Suite positions, such as CEO, COO, and CFO, hold significant influence in important firm decisions, providing opportunities for women to make an impact (Dezső et al., 2016). To capture the effects of women with power, for each firm, we count the number of women who occupy these positions each year (Triana et al., 2014).

Control variables

We calculate *Firm Size* as the logarithm of its market capitalization (Dang et al., 2018; Humphery-Jenner & Powell, 2014). Doing so helps us assess firms' ability to address global

supply-base risks (Geng et al., 2022). We control for the annual firm performance by including *Return on Assets*. *Return on Assets* is positively associated with profitability, providing a greater opportunity for firms to change their global supply base (Frijns et al., 2016; Jayachandran et al., 2013). We also controlled for *HHI Sales* by calculating the Herfindahl index based on sales in each industry, which can capture the industry concentration by a firm (Acar & Sankaran, 1999). This measure can control industry characteristics and a firm's bargaining power when firms select their supply base (Fagre & Wells, 1982). As age may confound the effects of gender on perceptions of risk, we controlled for board age. Specifically, since our study focuses on board-level decision-making, we consider board tenure as a proxy for board age. As previous studies suggest (Bonini et al., 2022; Elms & Pugliese, 2023; Li & Wahid, 2018), board tenure influences board effectiveness and firm performance due to the directors' expertise and experience. We also used the number of suppliers as a proxy for a firm's ability to manage its suppliers. Finally, we also accounted for fixed effects for firm and year by including two sets of dummy variables: (1) firm and (2) year. We will provide a more detailed explanation in the following section.

Analytical approach

Please refer to Table 1 (Panels A and B) for the descriptive statistics and correlation among the main variables. None of the variables correlate substantially, decreasing potential concerns regarding multicollinearity and that our regression models yield biased estimates. We used the lead-dependent variable approach to test the robustness of our results (Geng et al., 2022). Specifically, we set the dependent variable at time t+1 while the independent and control variables are at time t. The bivariate correlations in Table 1 indicate that there are no strong associations among our key variables, suggesting that multicollinearity might not be a concern. Since our model involved the testing of quadratic and interaction terms, we centered the variables before creating the squared and interaction terms with the ambition of minimizing

multicollinearity. The VIF values for the models in Column 2 (maximum = 1.33; average = 1.13), Column 3 (maximum = 4.74; average = 2.30), and Column 4 (maximum = 6.74; average = 2.33) are all below 10, suggesting that multicollinearity is not a major concern in our analysis (Li et al., 2021; Neter et al., 1990; Villena et al., 2019). While the maximum in the case of Model 4 is slightly higher (though well below the threshold of 10), extant research has suggested that the VIF scores might exhibit misleading behavior while (1) incorporating quadratic and interaction terms in our models, and (2) testing fixed effects models involving panel data (Edwards, 2001; Kalnins & Praitis Hill, 2025). Therefore, looking at the bivariate correlations as well as the VIF values, we conclude that multicollinearity need not be a serious concern in our research (Kalnins & Praitis Hill, 2025). Additionally, to account for potential heteroskedasticity, we employed robust standard errors.

We used a fixed effects model to test our hypotheses (Wooldridge, 2010). To determine whether a fixed effects model was the most suitable choice for our panel data, we conducted statistical tests to compare different estimators: pooled, fixed, and random effects. The Hausman test helps us decide whether to use the fixed effects model or the random effects model. In our case, the p-value is 0.002, indicating that the fixed effects model is appropriate. The Breusch-Pagan test helps us choose between the pooled effects model and the random effects. This test was statically significant ($p = 0.000$), suggesting that the random effects model might be preferable to the pooled effects model. The Chow-type test helps us decide between pooled effects and fixed effects models. In our case, the test was significant ($p = 0.000$), confirming that the fixed effects model is the correct choice. Overall, based on the results of the Breusch-Pagan, Hausman, and Chow tests, we found that the fixed effects model is the most appropriate model (i.e., the fixed effects model is better than the random effects model, which is better than the pooled effects model). Therefore, we used the fixed effects estimator to assess our models (Hausman, 1978).

The equation given below was used to test our baseline hypothesis H_1. In this equation, Y_{it+1} is the dependent variable (the global supply base risk of a focal firm *i* in year *t+1*) and X_{it} is the independent variable (prop. women at time *t* in focal firm *i*).

$$Y_{it+1} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it}^2 + \beta_3 A_{it} + \gamma_i + \delta_t + \epsilon_{it}$$

The equation given below was used to test our moderation hypotheses (H_2 and H_3). In this equation, Y_{it+1} is the dependent variable (the global supply base risk of a focal firm *i* in year $_{t+1}$), X_{it} is the independent variable (the prop. women at time *t* in focal firm *i*), and M_{it} is the moderator (number of interlocks and C-Suite membership), measured for each firm *i* at time *t*.

$$Y_{it+1} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it}^2 + \beta_3 M_{it} + \beta_4 M_{it} * X_{it} + \beta_5 M_{it} * X_{it}^2 + \beta_6 A_{it} + \gamma_i + \delta_t + \epsilon_{it}$$

In the above equations, the set of firm-level control variables is represented by vector A. In all models, we include fixed effects and use robust standard errors. While year-specific events or trends were represented by Year dummies (δ), time-invariant factors at the firm level were represented by firm dummies (γ).

We present the results of our main analyses in Table 2. Results specific to the firm-level controls and fixed effects for firm and year are shown in Column (1) in Table 2. The results suggest a decrease in the global supply base risk following an increase in firm performance and concentration of sales in an industry. The results for H_1 are provided in Column (2) in Table 2; these results argue for a curvilinear relationship between women board representation and the global supply base risk. The coefficient of prop. women is negative and significant (ß = - 0.713, $p < 0.01$), while that of the squared term is positive and significant (ß = 3.457, $p < 0.05$). Therefore, we find support for H_1. We also conduct a U-test (Lind & Mehlum, 2010) to assess whether the inflection point is within our data range (Yan et al., 2023). We found that the inflection point (turning point) is indeed within the range (when prop. women is 0.263) and that the U-test is statistically significant ($p < 0.05$). The confidence interval for the turning point

using the Delta method (95% CI: LL = 0.166, UL = 0.360) also falls within the range of the values of women board representation (Min = 0.00; Max = 0.56), providing support for H_1. The curvilinear impact of gender diversity is depicted in Panel A of Figure 1. Specifically, we plotted the effect of women board representation on global supply base risk at meaningful values of women board representation (i.e., $\mu - 2\sigma$, $\mu - \sigma$, μ, $\mu + \sigma$, $\mu + 2\sigma$). Figure 1 confirms the U-shaped effect of women board representation on global supply base risk.

--- Insert Tables 1, Table 2, and Figure 1 here ---

The results for H_2, relating to the negative moderation of women interlocks, are provided in Column (3) in Table 1. The coefficient of prop. women is negative and insignificant (ß = - 0.617, ns), and that of the squared term is positive and statistically significant (ß = 3.972, $p < 0.05$). While the coefficients of women interlocks and the interaction between the linear term and women interlocks are not significant, the interaction between women interlocks and the squared term is negative and significant (ß = - 1.259, $p < 0.05$). Therefore, H_2 was supported by our results. Figure 1 – Panel B illustrates the curvilinear relationship between women board representation and global supply base risk, moderated by women interlocks. As evident from the figure, the U-shape flattens, and eventually, the shape flips; more details on this effect are presented in Appendix C.

Column (4) in Table 1 presents the results for H_3, which tests the negative moderation by women in C-suite of the curvilinear relationship. The coefficient of prop. women is negative and significant (ß = -0.668, $p < 0.05$), and that of women in C-suite is not significant. The coefficient of the squared term is marginally significant (ß = 2.721, $p < 0.10$), but the interaction term involving the linear as well as squared terms was not significant. Thus, we do not find support for H_3. Though the hypothesis was not supported, please refer to Appendix C for more details pertaining to the flattening of the U-shape when considering women in C-suite.

Robustness tests

We conducted several tests to ensure the robustness of our findings. First, we used an alternate conceptualization of gender diversity; we operationalized it using the Blau Index. The main purpose of this test was to test our main models albeit with a different operationalization of the independent variable. We present the results of these models in Appendix D (Table D-1). We observed a U-shaped relationship between gender diversity and global supply base risk in Column (2). Also, we found a significant negative moderation by women interlocks of the curvilinear relationship in Column (3). Additionally, the curvilinear relationship between the number of women and global supply base risk moderated by women in the C-suite was found to be insignificant in Column (4). The findings are consistent with the main findings presented in Table 2 of the revised manuscript. Second, instead of using "Women %" to represent gender diversity, we create a variable "Women" by counting the number of women on a board as an alternative proxy for gender diversity. Since the number of women must be taken together with the size of the board, we included Board Size, which was measured as the number of individuals serving on the board (Guldiken et al., 2019; Hillman et al., 2007; Malhotra & Harrison, 2022) as an additional control in this analysis. The results of this regression analysis are presented in Table D-2 in Appendix D. Our original results were consistent with the results involving the alternative interdependent variable.

Third, we also assessed whether our results were robust against any bias caused by endogeneity. Specifically, we used the control function approach to assess whether the endogeneity resulting from the correlation between unobservable factors and predictors influences the estimates. This approach has been used in OM studies to address endogeneity concerns (Slot et al., 2020). Since our hypothesis testing involved curvilinear effects and interaction terms involving linear and curvilinear terms, the two-stage least square (2SLS) approach is not appropriate in our case as it does not provide consistent estimates in the case of such non-linear methods (Petrin & Train, 2010; Wooldridge, 2010). The control function

approach is very similar to the 2SLS approach in that the first stage involves an OLS estimation predicting women board representation using a set of instruments. Following research linking gender composition in executive teams with firm strategy, we use board size, the gender of the CEO, and the gender of the chair of the board as instruments (Wu et al., 2022). The selection of these instruments is based on instances from studies focusing on board and top management team composition (specifically for gender). Among others, a large board size could determine the gender heterogeneity of the board (Wu et al., 2022). Additionally, the gender of the CEO and the chair of the board would affect the appointment of other top management teams and board members, respectively (Lee & James, 2007). In other words, while these instruments may increase or decrease women's participation in boards, they may be less correlated to the global supply base decisions (Wu et al., 2022).

We also assessed the relevance and exclusion criteria of these instruments using statistical tests. Specifically, we found the three instruments to be strongly correlated with the proportion of women (0.18 – 0.33) and not correlated with the dependent variable (0.02 – 0.04). We also performed a first-stage regression with gender diversity as the dependent variable and the three instruments as independent variables, including firm and year-fixed effects and control variables (Return on Assets, Firm Size, HHI Sales, Average Board Tenure, Number of Suppliers (Ln) that were included in our main analysis). The relevance of the instruments was checked by examining the F-statistic of the first stage: the F-statistic is 16.03 and is greater than 10, which is the threshold to determine the relevance of instruments. We checked the Hansen J-Test to examine if the model was overidentified. This test is not statistically significant, confirming that our instruments are valid under the exclusion restriction. Next, we added the predicted residuals from the first stage as a correction term in all regression models that test our baseline and moderation-related hypotheses. The results of this analysis are reported in Table D-3 in Appendix D. As evident from Table D-3, our results were consistent

after the inclusion of the residual term, suggesting that our results may not be biased due to endogeneity concerns.

DISCUSSION AND CONCLUSION

By studying the curvilinear effect of women board representation on global supply base risk, our study provides a timely response to the numerous calls for research to explore the possible effects of gender diversity on OSCM decision-making (e.g., Ma et al., 2021; Matthews et al., 2024; Ruel et al., 2020; Yang et al., 2024; Zinn et al., 2018). In addition to extending the limited OSCM literature that has focused on the effect of gender diversity on supply chain decisions, which is still generally scant (Ruel et al., 2020; Ruel & Fritz, 2021), our study also contributes explicitly to research that investigates the relationship between gender diversity and risk, extending it beyond its traditional focus on financial, capital, and investment risks (Maxfield & Wang, 2024; Teodósio et al., 2021) by analyzing the impact of gender diversity on another fundamental and broader supply chain level risk that corporate boards are increasingly contending with (Garfield, 2024; Lustig, 2023). More specifically, our study makes an important contribution to the OSCM field by extending the analysis of global supply risk beyond the usual firm-level dimensions of risk assessment and risk mitigation strategies (Ho et al., 2015; Manuj & Mentzer, 2008), and focusing on other factors – women board representation, and the intergroup dynamics among gender subgroups at the board level – that can actually contribute to explaining a firm's posture towards global supply base risk. To the best of our knowledge, our research is the first one that employs a large-scale and unique dataset to investigate the effect of women representation on decision-making at the supply chain level by adopting a broader categorization of institutional risk factors to exhaustively characterize global supply base risk.

Additionally, by juxtaposing the tenets of social role and social identity theories, our study utilizes a novel theoretical angle for investigating the relationship between women board

representation and supply base risk, thereby shedding light on the mixed and contrasting results offered by literature (Bruna et al., 2019; Rodriguez et al., 2024). Specifically, our study aligns and, more importantly, extends general management research that tests the double-edged effect of gender diversity on performance as well as strategic decision-making at the supply chain level (Homberg & Bui, 2013; Jehn et al., 1999; Triana et al., 2014; Wu et al., 2022). It was intriguing to find that while women interlocks negatively moderate the effect of women board representation on global supply base risk, women in C-suite do not. In fact, during robustness tests, we found women in C-suite to be marginally significant, or not significant, or significant (when we introduced the number of women in both C-suite and board), suggesting that the contingent effect of women in C-suite is mixed as opposed to that of women interlocks.

Theoretical Implications

Our findings have some profound implications for the theory related to the effect of gender diversity on not only global supply base risk but also on managerial decision-making. The first theoretical implication revolves around the curvilinear effect of women board representation on global supply base risk. The contradictory findings revealed by literature on gender diversity and corporate risk – with different studies variously displaying increasing (Berger et al., 2014; Safiullah et al., 2022), decreasing (Hurley & Choudhary, 2020; Rodriguez et al., 2024) and no effects (Bruna et al., 2019; Sila et al., 2016) of women board or top management team representation on corporate risk – hint that this relationship is likely to be governed by a more complex dynamics than the mere difference in risk aversion between men and women. Along this vein, Rodriguez et al. (2024) suggest that gender diversity may affect risk through a behavioral mechanism in which the addition of women to the board enriches the "collective intelligence," leading to better decisions. Alternatively, de Luis‐Carnicer et al. (2008) recommended accounting for the social dynamics implications connected to higher degrees of board diversity in terms of lower group solidity and more intense inter-group

conflicts. Understanding the possibility that curvilinear relationships could reconcile inconclusive findings in gender diversity research (de Luis-Carnicer et al., 2008), our study articulates a comprehensive framework of how women board representation is related to global supply base risk in a curvilinear fashion.

Even though the curvilinear effect is not a perfect U-shape (please refer to Panel A of Figure 1), an increase after a threshold clearly suggests that the double-edged effect of gender diversity that is evident in other performance and strategic decisions (Homberg & Bui, 2013; Jehn et al., 1999; Triana et al., 2014) is also relevant when it comes to risk-taking at the supply chain level. As conjectured, the social role theory informs the initial decrease in the extent of global supply base risk – essentially attributable to the progressive removal of tokenism (Bruna et al., 2019; Joecks et al., 2013) and the higher consideration granted to the divergent perspective on supply risk in a given context that women can provide to the board (Joshi & Roh, 2009). Yet, beyond a threshold, the presence of two internally cohesive subgroups becomes apparent, thus increasing each subgroup's tendency to protect their own identities and beliefs (Chattopadhyay et al., 2004; Tajfel & Turner, 1986), which could eventually manifest through intergroup conflicts and negative evaluations of out-groups (Carbonell & Rodríguez Escudero, 2019; Chattopadhyay et al., 2004; Joshi & Roh, 2009; Triana et al., 2014). In this scenario, board dialectic is characterized by more rigid positions of the subgroup members with respect to their preferences on supply base configuration; as espoused by the social identity theory, the influence of the risk-averse nature of women board members is weakened, and the effect of women board representation on global supply risk reverses and rather starts to increase.

The second theoretical implication of our study revolves around the contingent effects of women power. Specifically, women interlocks seem to significantly flatten the U-shaped effect of women board representation on global supply base risk. Though women in C-suite also flattened the U-shaped effect, this was marginal. These results suggest that power alone,

reflected by structural power in C-suite membership, might not be sufficient for flattening the U-shaped effect before or after the threshold. Alternatively, women interlocks, a reflection of power stemming from merit, seem to be ideal to not only unify the sentiments of the women and men subgroups (Haunschild, 1993; Hickman, 2023; Hillman et al., 2007; Wu, 2008) but also avoid any outgroup biases among subgroups successfully (Saggese et al., 2021). On the one hand, these results seem to suggest that power and merit are both essential to be able to influence and alter the board members' behavior toward risk-taking in supply chain decisions (Hickman, 2023). On the other hand, even though women in leadership roles might be required to make risky strategic decisions to enhance their probability of success (Branson, 2006; Glass & Cook, 2016), this need not manifest as a disadvantage significantly for them as their risk-averse nature tends to prevail when it comes to global supply base risks. However, instead of concluding that women with structural power do not have the ability to sway the general sentiment of both sub-groups (Finkelstein, 1992; French & Raven, 1959), we contend that our results rather imply that women in C-suite are capable of breaking away from stereotypical power-based norms and truly assess the nature and impact of risks in their global supply base (Glass & Cook, 2016, 2020).

Managerial Implications

In a World scenario that is becoming increasingly turbulent and where events that trigger severe supply chain disruptions are occurring at a higher frequency, it is fundamental for firms to increase their awareness of not only the risk sources (and relative severity) they face but also how features of decision-makers, as well as organizational factors, influence the actual level of a firm's risk exposure. Thus, the first managerial implication of our study is that when it comes to global supplier location decisions, board gender composition affects the decision-making process. Specifically, our results hint that, given their natural inclination to be more risk-averse, a wider presence of women on the board can prove quite helpful in orienting

towards a more cautious approach when it comes to the global supply base. This can happen as a result of a board's more strict and pervasive approach to reviewing and monitoring the company's sourcing location strategy and the major risks associated with such strategy, as well as requiring the development of disruption recovery and supply continuity plans. In addition to conveying the message that the control of supply risk has to be the company's priority, actions like these could also prompt the adoption of more rigorous risk identification and assessment processes (e.g., extensive supplier audits, risk analysis at upper tiers of the supply chain) which may reveal hazards previously neglected and trigger decisions reducing global supply base risk.

However, as indicated by our results, this effect could vanish if inter-group dynamics raised by social identification motivations lead to biased, conflictual behaviors where the protection of one group's identity and beliefs prevails over a disciplined and well-informed analysis of risk. To counter this issue, firms could consider adopting formal risk management policies and practices and (try to) make them as objective as possible. However, this not only introduces excessive rigidity in the decision-making process, but it could also be hard to do in practice, given that risk management usually deals with incomplete and imprecise information that can barely replace the heuristics of the individual decision-makers. Alternatively, our study suggests that a higher number of women interlocks (and, to some extent, a higher share of women in C-suite) can work well in maintaining a reasonably low degree of risk by keeping the detrimental effects of social identification at bay.

Finally, it should be noted that although risk typically has a negative connotation in OSCM studies, there are cases in which a certain level of supply base risk is almost unavoidable. Pretending to reduce it drastically may compromise the firm's economic sustainability. For example, there are raw materials that are only accessible in certain countries, which could be prone to higher institutional risks. Similarly, the comparative advantage that some countries have on particular production inputs (e.g., labor cost) may represent an insurmountable obstacle

to the competitiveness of those firms, wherein risk management considerations might not suffice to deter them from sourcing from such locations. In situations such as these, counting on experienced women directors with high interlocks can be advantageous in that such powerful women are generally willing to accept moderate degrees of supply base risk rather than pushing too conservative approaches.

Future Research Directions

Despite our valuable contributions to OSCM literature related to gender diversity, it has some limitations that could inform future research endeavors. First, our study focuses on US-based companies as the primary context. Expanding the analysis to firms in other countries may yield different implications due to cultural, regulatory, and governance variations, which may affect the impact of gender diversity (Terjesen & Singh, 2008). Future research could explore these cross-national differences to understand how these factors shape the influence of gender diversity. Second, in developing our dependent variable, global supply chain risk, we utilized the SFI (Marshall & Cole, 2014). SFI assumes a degree of homogeneity among firms within a country. Given that the SFI is a comprehensive measure encompassing political, security, social, and economic dimensions, it is reasonable to assume that this institutional context shapes opportunities and constraints for all firms within a country. This index, measured at the country level, might not capture nuanced risks specific to industry-level or firm-specific contexts in countries. Therefore, acknowledging that firms may respond differently to these conditions based on their specific characteristics and contexts, we recommend future research to investigate how firms balance country-level risks with more specific internal or industry-related risks when pursuing supply chain resilience.

Third, this study examines women interlocks and women in C-suite as moderators of the effect of women board representation because we believe that these moderators can signify the merit and/or power of women directors. However, other contextual factors, such as the

political connections of a firm or the specific characteristics of individual directors, such as directors' reputations within a firm, could also play a critical role in shaping this relationship (Sojli & Tham, 2017). Future research should consider these additional factors to provide a more comprehensive analysis. Finally, while this study emphasizes women board representation as a key factor influencing global supply chain risk, it is essential to acknowledge that diversity encompasses more than just gender. Diversity in the boardroom can encompass dimensions such as ethnicity, age, professional background, tenure, and cognitive diversity (Finkelstein, 1992; Jung et al., 2023). As a point in case, since younger generational directors, such as millennials, were raised with different social influences than older generations (Koenig & Eagly, 2014), they might have differences in opinions. Hence, future research should also consider a broader operationalization of diversity.

Table 1. Descriptive Statistics and Correlations

Panel A: Descriptive Statistics

Variable	Mean	SD	Min	Max
Global supply base risk (t+1)	2.27	1.22	0.00	7.00
Prop. Women	0.16	0.11	0.00	0.56
Interlocks	1.69	1.92	0.00	8.00
Women in C-Suite	0.11	0.33	0.00	3.00
Return on Assets	7.01	6.77	-16.56	30.15
Firm Size	22.61	1.74	18.83	28.41
HHI Sales	0.21	0.16	0.06	1.00
Average Board Tenure	8.48	3.21	0.33	22.75
Number of Suppliers (ln)	1.11	0.95	0.00	5.03
N=3339				

Panel B: Correlation Matrix

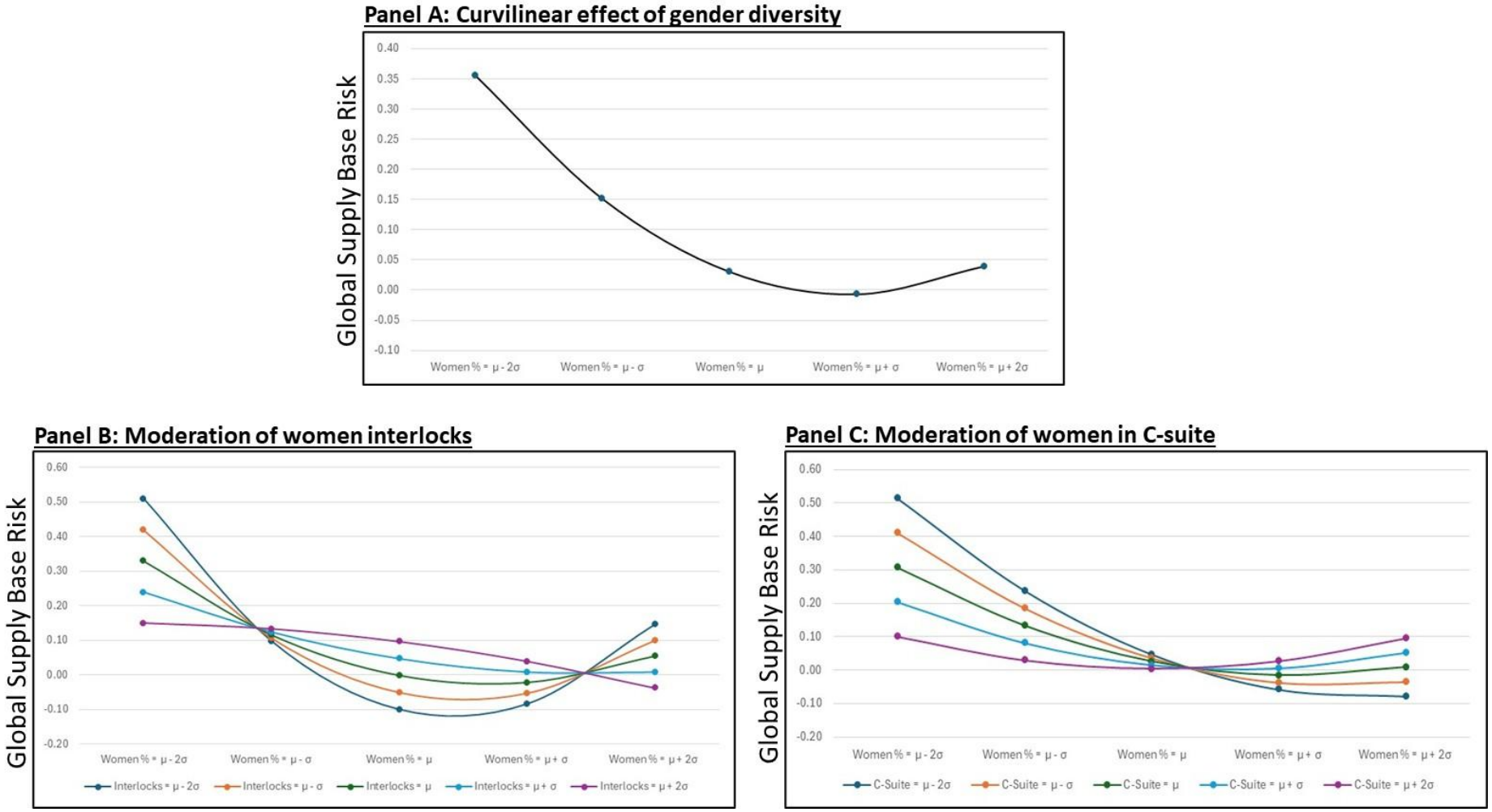
	Variable	1	2	3	4	5	6	7	8	9
1	Global supply base risk (t+1)	1.00								
2	Prop. Women	0.13	1.00							
3	Interlocks	0.07	0.59	1.00						
4	Women in C-Suite	0.05	0.26	0.15	1.00					
5	Return on Assets	0.02	0.01	0.03	0.01	1.00				
6	Firm Size	0.03	0.38	0.49	0.13	-0.09	1.00			
7	HHI Sales	-0.09	-0.13	-0.04	0.06	0.07	-0.03	1.00		
8	Average Board Tenure	-0.03	-0.18	-0.13	-0.10	0.06	-0.17	0.03	1.00	
9	Number of Suppliers (ln)	-0.14	0.03	0.08	0.05	0.04	0.14	-0.06	0.01	1.00
N=3339										

Table 2. Fixed effects Regression Models

DV: Global supply base risk (t+1)	(1)	(2)	(3)	(4)	(5)
Return on Assets	-0.004	-0.004	-0.004	-0.004	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Firm Size	0.089*	0.104**	0.104**	0.104**	0.106**
	(0.050)	(0.050)	(0.051)	(0.050)	(0.051)
HHI Sales	-0.351*	-0.381**	-0.390**	-0.404**	-0.416**
	(0.183)	(0.184)	(0.184)	(0.180)	(0.179)
Average Board Tenure	0.001	-0.001	-0.000	-0.001	-0.000
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Number of Suppliers (ln)	-0.016	-0.022	-0.021	-0.025	-0.024
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Prop. Women (C)		-0.713**	-0.617	-0.668**	-0.551
		(0.294)	(0.383)	(0.326)	(0.401)
Prop.Women^2 (C)		3.457**	3.972**	2.721*	2.749
		(1.350)	(1.722)	(1.447)	(1.915)
Interlocks (C)			0.026		0.026
			(0.019)		(0.019)
Prop. Women x Interlocks (C)			0.050		0.114
			(0.177)		(0.189)
Prop. Women^2 x Interlocks (C)			-1.259**		-1.634**
			(0.637)		(0.747)
Women in C-Suite (C)				-0.032	-0.042
				(0.077)	(0.077)
Prop. Women x Women in C-Suite (C)				1.008	0.489
				(1.149)	(1.169)
Prop. Women^2 x Women in C-Suite (C)				-1.198	2.224
				(4.204)	(4.486)
Constant	0.370	0.029	-0.002	0.025	-0.028
	(1.106)	(1.107)	(1.129)	(1.104)	(1.131)
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	3339	3339	3339	3339	3339
P-value of U-test		0.024			
Adjusted R^2	68.14%	68.25%	68.29%	68.25%	68.30%

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 1: Effect of gender diversity on global supply base risk



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