Shifting landscapes: Impact of climate risk on MNEs' OFDI location decisions & the moderating role of network effects

A rising number of extreme weather events and associated disruption has led researchers to study and quantify the impact of climate change on the tangible assets and facilities of multinational enterprises (MNEs) (Li and Gallagher, 2022; Olcott and Oliver, 2014). Studies predominantly find that increasing climate risk is associated with economic loss, decreased financial performance, and/or loss of competitiveness for MNEs (Carleton and Hsiang, 2016; Kolk and Pinkse, 2008; Romilly, 2007; Waldinger, 2022). This implies that the negative effects of climate change should deter MNEs from locating their outward foreign direct investments (OFDI) in high climate-risk environments to reduce economic losses. Despite this evidence, current literature examining MNE's strategic behavior in the context of climate change assumes MNE passivity and complacency in responding to the risks of climate change (Christmann, 2004; Christmann and G. Taylor, 2001, 2006; Copeland and M. S. Taylor, 2004; Delmas and Toffel, 2008; Geels et al., 2017). Scholars argue that climate risks do not affect the OFDI location decisions of MNEs either because MNEs do not prepare for climate risks or seek to compensate for climate risks through experiential learning (Oetzel and Oh, 2014; Oh and Oetzel, 2011, 2017; Oh, Shin, and Oetzel, 2021; Zarsky, 1999). These findings offer a puzzling account of MNEs' strategic decision-making and behavior when juxtaposed against each other.

We highlight that prior studies have examined MNE behavior in limited contexts and conceptualized climate risks as rare or local events for which MNEs cannot prepare because they are "unpredictable and unpreventable" (Oh, Shin, and Oetzel, 2021). However, we argue that this characterization is becoming increasingly obsolete as we recognize as a society that any climate change event(s) is not an '*Act of God* ' divorced from human activity and beyond human control. Instead, climate change is an urgent, persistent, and global concern caused/exacerbated by human activities (McKibben, 2006). As a result, climate risk has metamorphosed into a continuous and unrelenting concern that systematically affects and influences MNEs' strategic decisions, such as FDI (Li and Gallagher, 2022; Pachauri et al., 2014). We also note that studies examining the impact of climate risk on the strategic decision-making of the MNEs do not acknowledge the fact that MNEs are border-crossing multi-location multi-business entities that operate across heterogeneous social contexts and can rarely make independent decisions (Heidenreich, 2012; Rugman and Verbeke, 2004). Consequently, MNEs' strategic decisions are subject to different relational constraints that arise from their membership in different networks. We must account for these network contingencies for a holistic theoretical understanding of MNEs' strategic decision-making and behavior. Lastly, in an increasingly interconnected global ecosystem, the economic effects of climate change are no longer local (Jackson, 2021). Thus, lacking a global context with multiple reference points, studies are bound to report discordant findings (van Hoorn and Maseland, 2016).

Based on the evidence that increasing climate risk leads to economic losses, we hypothesize that MNEs seek to redress or avoid the negative externalities of climate change by actively orchestrating their OFDI location decisions. We further hypothesize that increasing connectedness of the country-of-origin of the MNEs' in the global OFDI network increases their informational advantage (Jha et al., 2023) that facilitates their strategic decision-making by reducing the adverse effects of information asymmetry that arise in the context of investing in foreign locations. Lastly, we posit that the increasing embeddedness of MNEs in the global collocation network of their focal industry increases isomorphic and mimetic pressures and impedes their decision-making. We acknowledge that information exchanges also occur in the interfirm network of a given industry. However, we assume that interfirm information exchanges are more plausible between MNEs that share a country of origin than when they share the same industry. In support of our assumption, prior studies have shown that country-of-origin agglomeration effects are stronger than the industry agglomeration effects (Chang and Park, 2005; Stallkamp et al., 2018).

To test our hypotheses, we use a unique hand-collected dataset of the OFDI decisions made by MNEs in the global automobile industry between 2003 and 2019, triangulated from multiple sources. To disambiguate the effect of different network contingencies, we employ recent social network analysis advances that allow us to decompose multipartite networks into one-dimensional networks, which we then use to calculate weighted centrality measures that help us quantify the network contingencies that we posit impact the strategic decision-making of the MNEs. Using a semi-parametric approach, we estimate that a 1% increase in the host location's climate risk reduces the likelihood of MNEs locating their FDI in that location by 0.06% and reduces the magnitude of FDI in the location by 0.31%. Next, we find that a 1 unit increase in the connectedness of the country of origin of the focal MNE in the global OFDI network increases the negative effect of increasing climate risk on their OFDI location decisions by 0.0022%. Lastly, our results show that a 1 unit increase in the embeddedness of MNEs in the global FDI collocation network reduces the negative effect of increasing climate risk by 0.14%.

In conclusion, we show that MNEs are not passive or unresponsive towards the negative externalities of climate change but instead actively orchestrate their OFDI decisions to hedge against the uncertainty and economic losses induced by climate risk. We also show that MNE's OFDI location decisions are strongly influenced by their membership and embeddedness in different networks. While MNEs are able to leverage the informational advantages that accrue to them on account of the increasing connectedness of their country of origin to make better OFDI location choices and are less likely to locate their FDI in locations with worse climate conditions, they succumb to mimetic pressures imposed by their embeddedness in their industry-wide FDI collocation network and become more likely to locate their OFDI in high-climate-risk locations. Our study has significant implications for policymakers by showing that locations increasingly more prone to climate risk must take affirmative steps to mitigate the adverse effects of climate change if they want to continue to be attractive destinations for FDI.

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