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The Link between Foreign Institutional Owners and Multinational Enterprises' Environmental Outcomes

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ABSTRACT:

Many institutional investors claim to be leaders in their commitment to sustainability, yet their real impact is undetermined. We look at the relationship between the presence of foreign institutional owners and the firm's environmental outcomes in terms of performance and innovation. We argue that foreign institutional owners seek to mitigate their exposure to reputational risks by encouraging their investee firms to move towards better environmental performance. However, these owners are less likely to engage in long-term investments derived from environmental innovations. We examine these paradoxical motivations in the context of multinational enterprises (MNEs) in the chemical industry across 33 countries in emerging and developed markets and further explore how these investee firms' international diversification affects these relationships. Our findings contribute to international corporate governance and sustainability research by uncovering that, contrary to institutional owners' popular claims, foreign institutional owners have a positive effect on their investees' environmental performance, but their influence is not statistically significant on environmental innovation. Specifically, the influence of foreign institutional owners on environmental performance is strong for MNEs with a low level of international diversification and marginal for those with a higher level of internationalization; meanwhile, domestic institutional owners are committed to advancing both environmental performance and innovation in their MNE investees. In sum, we show that environmental concerns are still quite localized.

Key words: Environmental performance, environmental innovation, institutional owners, foreign investors, internationalization, international corporate governance.

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“From Europe to Australia, South America to China, Florida to Oregon, investors are asking how they should modify their portfolios. (...). Given the groundwork we have already laid engaging on disclosure, and the growing investment risks surrounding sustainability, we will be increasingly disposed to vote against management and board directors when companies are not making sufficient progress on sustainability-related disclosures and the business practices and plans underlying them” (Larry Fink, CEO and Chairman of BlackRock¹, 2020).

INTRODUCTION

Institutional owners, also called institutional investors, hold the majority of firm equity across the globe and this share has been growing in the last decade (De La Cruz, Medina, & Tang, 2019; OECD, 2021). A recent OECD report finds that almost 70% of institutional owners state that they consider environmental aspects in their decision-making, and more are planning to do so (OECD, 2020). However, while institutional investors have issued multiple public statements about their firms’ environmental concerns, many analysts and executives consider that these initiatives are mere public relations campaigns with very limited bearing on their investees’ environmental strategies (Fancy, 2021; The Economist, 2021a). The business globalization and the climate emergency make understanding these investments’ environmental impact critical. Hence, we seek to unpack and analyze the relationship between foreign institutional owners (FIOs) and the two most relevant environmental outcomes of investee firms: short-term-oriented environmental performance and long-term-oriented environmental innovation. Moreover, we explore the effect of the firms’ degree of internationalization on these relationships.

Institutional owners seek to obtain value for their customers (Shi, Gao, & Aguilera, 2021), however there are differences between the strategic approaches of foreign and domestic institutional owners when it comes to accessing and interpreting information about investee firms because foreign investors typically experience higher information asymmetries: less familiarity with local values, economic environments, and regulatory evolution (Kim, Pevzner, & Xin, 2019; Shi et al., 2021). Consequently, FIOs take on increased costs to limit risks from their investments’ information asymmetries, including due diligence in

¹ BlackRock is a multinational investment firm and the world's largest asset manager, with \$8.67 trillion in assets under management as of January 2021.

monitoring executives to ensure they focus more on performance and less on opportunistic behavior (Boyd & Solarino, 2016). In addition, FIOs are highly sensitive to poor performance signals and react quickly to protect their investments, including an immediate willingness to exit the organization to avoid risks (David, O'Brien, Yoshikawa, & Delios, 2010). In this study, we analyze whether FIOs' participation in an MNE is associated with distinct patterns of environmental performance and environmental innovation.

Environmental performance (EP) and environmental innovation (EI) entail two core dimensions of a firm's environmental approach. On the one hand, a firm's EP considers the organizational effectiveness in limiting the firm's negative impacts on the planet, deriving mostly from air emissions, waste generation, and water discharges (e.g., El Ghoul, Guedhami, & Kim, 2017; Kassinis & Vafeas, 2006). On the other hand, a firm's EI entails the funding, development, and implementation of "new designs and novel products and processes to reduce or eliminate the use and generation of hazardous substances" (Berrone, Fosfuri, Gelabert, & Gomez-Mejia, 2013: 891). While an ambitious firm's EI strategy usually reflects a long-term commitment that might influence employees and business partners along the firm's global supply chain, a firm's EP is related to the firm's current impacts through its production and processes (Delmas & Toffel, 2008).

Risks arising from a poor EP include operational and reputational costs, such as legal fees, fines, and the inability to satisfy key stakeholders (Diestre & Rajagopalan, 2014; Easley & Lenox, 2006); however, supporting EI to prevent future environmental damages may also call for additional, substantial internal and external commitments (Hawn & Ioannou, 2016) and financial risks (DesJardine, Marti, & Durand, 2021; The Economist, 2021b). In general, improvements to a firm's EP may be achieved with limited investments in market initiatives, such as the acquisition of commercial end-of-pipe technologies or the outsourcing of polluting activities. Meanwhile, EIs usually require long-term-oriented investments and multiple internal and external commitments to prevent the sources of pollution (Bansal & Song, 2017; Hawn & Ioannou, 2016). Thus, given FIOs' well-known aversion to risk (Kim et al., 2019), we argue that

a higher presence of FIOs is positively associated with the investee firms' EP in order to mitigate short-term legal and reputational risks but hinders EI strategies that require longer term, riskier financial commitments and favorable local conditions.

Furthermore, MNEs have operations and stakeholders located across multiple countries (Marano & Kostova, 2016) and deal with unexpected cultural and normative environmental changes (Okhmatovskiy & Shin, 2019). In this context, demands made on more internationalized investees by certain groups, such as environmental activists and community advocates, may also be deemed more aggressive due to the added visibility (Eesley & Lenox, 2006). One of the consequences of this internationalization is that MNE executives gain discretion, incentives, and opportunities to prioritize environmental concerns (Maksimov, Wang, & Yan, 2022). Thus, we will examine how the MNEs' degree of internationalization moderates the relationship between the presence of FIOs and the MNEs' environmental outputs.

Our predictions are tested on an unbalanced panel dataset of 1,200 firm-year observations from 197 MNEs in the chemical manufacturing sector for the period 2010–19. Our study makes two central contributions to the growing literature on the relationship between FIOs and MNE strategies (e.g., Aguilera, Marano, & Haxhi, 2019; Marano & Kostova, 2016; Shi et al., 2021). First, we shed light on the debate on how foreign owners impact firms' environmental strategies (DesJardine & Durand, 2020; Dyck, Lins, Roth, & Wagner, 2019; Flammer, Toffel, & Viswanathan, 2021) by showing that FIOs demand enhanced EP, but not necessarily EI, from their investee firms. Second, we respond to calls for further research looking at the institutional challenges of international corporate governance mechanisms (Aguilera et al., 2019, Aragon-Correa, Marcus, & Vogel, 2020; Castañer, Goranova, Kavadis, & Zattoni, 2020) by discussing how low levels of investee firms' international diversification reinforce FIOs' positive influence on EP, while high levels of investee internationalization reduce the relevance of foreign institutional ownership on advanced EP. These results contrast with our complementary findings regarding the positive relationship between domestic institutional owners (DIOs) and EP (for any level of international diversification) and the positive relationship between DIOs and their investees' EI

(especially for highly internationally diversified firms). Our results are highly consequential for the design of MNEs' global environmental strategies.

FOREIGN INSTITUTIONAL OWNERSHIP AND ENVIRONMENTAL OUTCOMES

The relationship between institutional ownership and firms' environmental sustainability has received a growing amount of attention in recent years (e.g., see Gillan, Koch, & Starks, 2021). While other investors may find it difficult to impact the way in which their investees conduct business, institutional owners' volume and legitimation allow them to not only react to MNEs' strategies but also potentially influence their investees' environmental initiatives (Nofsinger et al., 2019). Specifically, institutional investors usually share a preference for investing in "lower-risk and better-governed foreign markets with more informative disclosure and less opaque accounting practices" (Kim et al., 2019: 87). The recent and growing attention being paid to the influence of institutional owners on their investees' environmental strategies has revealed some mixed evidence. Flammer et al. (2021) find that institutional investors' proposals were highly effective in increasing the voluntary disclosure of climate change risk. However, others show that institutional investors only support social and environmental actions that yield short-term returns (Desender & Epure, 2021).

Recent literature uncovers how different types of institutional investors can have different objectives which will affect a variety of firms' strategic outcomes (Boyd & Solarino, 2016). In this line, FIOs face higher levels of information asymmetry than domestic ones due to limited familiarity with local institutional requirements, such as cultural implications, regulatory evolution, or disclosure expectations (e.g., Aguilera, Desender, Lamy, & Lee, 2017; Kim et al., 2019; Okhmatovskiy & Shin, 2019). Bena, Ferreira, Matos and Pires (2017) are an exception to the popular view that foreign investors lead firms to adopt a short-term orientation and find a positive relationship with investees' long-term investments in a sample of publicly listed firms. From a positive agency perspective (Eisenhardt, 1989), FIOs' concern with the heightened risks linked to the ad hoc information asymmetries in their investments may have at

least three consequences in relation to environmental strategies. First, the effects of increased information asymmetries lead to an amplified aversion to risks and reinforce FIOs' interest in short-term profits versus long-term value (e.g., David, Yoshikawa, Chari, & Rasheed, 2006; Geng, Yoshikawa, & Colpan, 2016). Second, FIOs also place more emphasis on agency monitoring to reduce their information asymmetries (Aguilera et al, 2017; Kim et al., 2019). Recent evidence has shown that activist institutional investors influence voluntary environmental disclosure in firms (Flammer et al., 2021). Third, FIOs are highly sensitive to poor performance signals and react quickly to protect their investments, including an immediate willingness to exit the organization to avoid risks. In fact, FIOs trade shares more frequently (e.g., David, O'Brien, Yoshikawa, & Delios, 2010), and firms with a higher proportion of FIOs react more strongly to negative media reports by replacing executive and board members (Okhmatovskiy & Shin, 2019). For example, BlackRock – the largest private equity firm in the world with a broad portfolio of assets under management in multiple countries – has attracted considerable attention by announcing its intentions to hold management and board directors accountable if their firms are not making progress in sustainability (see quote in our intro). Similar to BlackRock, Norges Bank Investment Management highlights in its document “Climate Change Expectations of Companies” how they expect their investees to address the climate emergency in a manner meaningful to their business models (Norges Bank Investment Management, 2021). As a consequence, executives need to pay closer attention to FIOs' interests due to the intensity and credibility of their reactions to any perceived risk (Okhmatovskiy & Shin, 2019). Based on these characteristics, in the following sections, we develop arguments on how FIOs may have different interests on MNEs' EP and EI.

Foreign institutional owners and environmental performance

FIOs are not usually involved in the day-to-day management of their investee firms, however their influence is relevant because they have been shown to quickly withhold their investments in response to different types of trust-damaging information (Okhmatovskiy & Shin, 2019). For instance, Nordea Asset

Management removed JBS from its €230 billion portfolio after the Brazilian company was linked to deforestation in the Amazon rainforest (Philips, 2020). Environmental risks for investors include any harmful environmental damage caused or penalties accrued by the firm that can generate a rapid negative impact on the firm's reputation, financial performance, or stock price (Diestre & Rajagopalan, 2014). For example, Flammer (2013) studied news coverage of U.S. public companies over a period of two decades and found that environmentally responsible initiatives led to stock price increases, and environmentally irresponsible actions were followed by stock price decreases. Interestingly, over the last decades, the positive stock market reaction to environmentally friendly actions has generally declined while the negative stock market reaction to environmentally harmful events has been magnified (Flammer, 2013; Durand, Paugam, & Stolowy, 2019b; Hawn, Chatterji, & Mitchell, 2018). Information asymmetries from investing abroad will particularly encourage FIOs to limit their reputational and legal environmental risks by influencing their investees to improve their environmental performance (EP). Although objective economic data may be available for any professional institutional investor, information about normative and cultural values, regulatory changes, or unexpected political developments may be more difficult to access and interpret from abroad (e.g., Aguilera et al., 2017; Kim et al., 2019; Shi et al., 2021). Consequently, FIOs may be particularly keen on highly visible environmental outputs and the related short-term initiatives to react to the demands of stakeholders, such as end-of-pipe filters, recycling initiatives, outsourcing pollution, or green certifications (Desender & Epure, 2021; Nofsinger et al., 2019). Hence, as FIOs are highly sensitive to reputational harm signals, they will try to reduce their information asymmetries by demanding that the MNEs in which they invest reinforce their EP, because failure to do so can quickly lead to negative repercussions on firm reputation and subsequent fall in share prices. Thus, we propose:

Hypothesis 1. The percentage of an MNE's shares held by FIOs is positively related to its EP.

Foreign institutional owners and environmental innovation

Due to FIOs' traditional emphasis on short-term returns (e.g., David et al., 2010; Geng et al., 2016), it is reasonable to assume that MNEs with high percentages of FIO will be less interested in devoting their investments to long-term sources of potential benefits, such as improving their environmental innovation (EI) strategies. For example, the former Chief Investment Officer for sustainable investing at BlackRock has strongly criticized the recent proliferation of declarations by institutional investors of environmental intentions by stating that "it's cheaper and easier to market yourself as green rather than do the long tail work of actually improving your sustainability profile" (Fancy, 2021: 1). This criticism highlights the difference between looking to avoid reputational and legal risks (as discussed in the previous section) and promoting EIs that are relevant for future sustainability but financially risky.

EI is based on investments that enable technical, commercial, or administrative changes to prevent polluting impacts and may be a source of competitive advantage in the long term (e.g., Bansal & Roth, 2000; Berrone et al., 2013). EIs demands both internal and external commitments (Diestre & Rajagopalan, 2014; Hawn & Ioannou, 2016) and may generate negative reactions from short-term-oriented institutional investors because they are also a source of immediate financial concern for them (DesJardine et al., 2021). Furthermore, while the reputational and legal costs of poor EP are immediate and certain, the consequences of limited EI strategies are uncertain and depend on the evolution of legal, commercial, and technical factors (Barnett & Salomon, 2012). Hence, FIOs' short-term financial preferences are inconsistent with MNEs' efforts to prevent future environmental risks by investing in uncertain EI. The reasons for FIOs' skepticism about long-term EIs may include their relevant financial costs and the multiple external factors affecting the returns from these investments.

FIOs' heightened effort to minimize the information asymmetries of their investments (Kim et al., 2019; Shi et al., 2021) further increases their interest in reducing the exposure to investments in EI. In fact, MNEs may gain more legitimization benefits from providing standardized information about their environmental impacts (i.e., environmental disclosure) than they do from realizing potential rewards from EIs that are highly dependent on local normative, political, and cultural conditions (Aragón-Correa,

Marcus, & Hurtado-Torres, 2016). FIOs' limited interest in long-term commitments and their focus on managerial monitoring (Kim et al., 2019) influences boards and CEOs' on where they invest as regards to investments in EIs. For instance, the shareholders (via the board of directors) of Danone, one of the largest multinational food products companies, have recently fired its CEO, Emmanuel Faber, who had long championed the benefits of sustainability, because they were unhappy with the MNE's languishing share price (Financial Times, 2021). Interestingly, almost 80% of Danone's shares are held by institutional investors and 81% of those are international. Consistent with this example, Geng et al. (2016) show that in general, foreign owners place incentives and pressure on firms' management to prioritize actions that increase stock prices and profitability.

Thus, managers in MNEs with a high proportion of FIOs may hold back from long-term strategic investments and direct their efforts towards meeting short-term performance goals to retain these owners (David et al., 2006), and executives have strong incentives to align their firms' priorities with key investors (Geng et al., 2016). Hence, we expect FIOs are not attracted to, and discourage investee firms from engaging in, EI initiatives due to their longer-term investment horizons and the risky, uncertain outcomes. Consequently, we propose:

Hypothesis 2. The percentage of an MNE's shares held by FIOs is negatively related to its EI.

The moderating role of international diversification

A firm's international diversification defines its global supply chain, that is, the degree to which the firm expands its customer base, factors of production, and the capacity to create value across regional and national borders (Hitt, Hoskisson, & Kim, 1997; Lu & Beamish, 2004). A higher level of internationalization increases the multiple institutional logics that a firm must tackle with in the social and environmental arena (Kang, 2013; Marano & Kostova, 2016). Institutions determine the acceptable and approved way of conducting business functions in a particular society, not only in terms of regulations, but also the cultural, cognitive, and normative elements (Powell & DiMaggio, 1991; Scott, 1995).

When operating in complex international settings, executives might need additional capabilities and frequently wider managerial discretion to make decisions. In fact, previous findings have confirmed that international diversification strengthens managerial entrenchment because institutional complexity relies heavily on executives' idiosyncratic capabilities and experience to deal with changing and potentially conflictive situations (Kim, Pathak, & Werner, 2015). When it comes to environmental approaches, highly internationally diversified MNEs also tend to be highly idiosyncratic adjusting to the complex and often conflicting country expectations, i.e., multiple regulatory and normative pressures generate risks of incompatible expectations (Kang, 2013; Marano & Kostova, 2016). An advanced and forward-looking firm-level standard of environmental performance offers reinforced legitimation to deal with the risks of multiple and changing levels of international stringency (Christmann, 2004). Hence, internationally diversified MNEs tend to strengthen their firms' environmental performance to mitigate future reputational and legal environmental risks which are exacerbated by the multi country institutional complexity (Christmann, 2004; Wang & Li, 2019).

Under conditions of high international diversification, FIOs' monitoring of environmental risks has a more limited influence on their investees' environmental performance because the implicit international pressure towards environmental issues is already driving MNEs' attention towards environmental performance. Consequently, we propose:

Hypothesis 3a. A higher level of international diversification of an MNE weakens the positive relationship between FIOs and EP.

Regarding environmental innovation (EI), MNEs with greater global connectedness in terms of international diversification enjoy extra resources to increase their EI with a more limited risk than firms operating in domestic environments. On the one hand, a higher level of international diversification offers more diverse resources and information sources (Wan, Hoskisson, Short, & Yiu, 2011) and has a positive effect on innovation intensity and, indirectly, on productivity (Castellani, Montresor, Schubert, & Vezzani, 2017). For example, MNEs can obtain knowledge from around the world allowing for the

development of more dynamic innovative green capabilities (Maksimov et al., 2022).

On the other hand, operating in more countries creates opportunities for achieving economies of scale and scope and may drive down the costs of investment in critical long-term innovative activities (Hitt, Li, & Xu, 2016). Additionally, at higher levels of international diversification, MNEs often gain greater visibility in stakeholders' eyes which in turn bring corporate attention to external expectations (Eesley & Lenox, 2006). In fact, environmental demands made on MNEs by certain stakeholders, such as activists and community advocates, can be more strategic and effective because they can converge their actions on a single target and, through the process of contagion, reach and affect other organizations associated with that said target (Daudigeos, Roulet, & Valiorgue, 2020; Eesley & Lenox, 2006). Hence, an MNE's reinforced effort in environmental innovation may alleviate some of the executives' concerns about being targeted by stakeholders in unfamiliar contexts and, indirectly, it also opens the FIOs' acceptance of the investment risks of being environmentally innovative.

In conclusion, internationally diversified MNEs will have more opportunities to implement environmental innovations because they enjoy greater knowledge inputs and there are fewer risks involved in acting on them. Due to more limited risks and reinforced short term reputational rewards, FIOs will also increase their willingness to accept that their investees in a context of high international diversification will increase their EIs versus those investees operating with low levels of international diversification. Hence, we expect that a high level of international diversification will reduce the negative effect of FIOs on firms' EI strategies. Thus, our hypothesis is:

Hypothesis 3b. A higher level of international diversification of an MNE weakens the negative relationship between FIOs and EI.

METHODS

Sample and data

We test our hypotheses on an unbalanced panel dataset of chemical sector MNEs between 2010 and 2019.

We chose the chemical manufacturing sector as the context for our study because of its vast impact on the environment and human health. The chemical industry is the second largest manufacturing industry in the world, amounting to over US\$ 4 trillion in revenue (International Council of Chemical Associations, 2019). The industry's production processes generate considerable amounts of greenhouse gas emissions, waste and chemical releases to air, water, and soil (United Nations Environment Programme, 2019); for instance, it is responsible for 18.6% of the particulate matter (PM10) in the air (European Environment Agency, 2019). The chemical industry is also becoming more global and reliant on complex global supply chains (U.N. Environment Programme, 2019).

We selected all firms belonging to the chemical manufacturing sector, NAICS code 325, as available in the Refinitiv Eikon database, which includes information on the largest firms in the world for each industry. The initial sample size was 3,785 firms. Because of our interest in analyzing firms with international operations (MNEs), we collected data using Bureau van Dijk's Orbis database on the subsidiaries of the firms in our sample and included only those firms that were parent companies of at least one foreign subsidiary. We collected information for each year and sampled MNE from 2010 to 2019. In addition, we collected country-level control variables from the World Economic Forum and the World Bank. Due to the lack of availability of key data points for some firms, our final sample consisted of 197 chemical MNEs headquartered in 33 countries. This led to an unbalanced dataset of 1,200 firm-year observations.

To address the issue of sample selection bias, we performed tests to compare our final sample to the original population in terms of average firm size, average profitability, and the distribution of firms across countries and regions. We did not find any statistically significant differences for average profitability or regional profile. The average firm size in our sample was somewhat higher than that of the full population of chemical firms as a consequence of larger firms being more likely to report on their environmental actions. Our sampled MNEs account for 61% of the industry's total revenues and 65% of its total market capitalization, which means that our findings regarding the environmental approaches of

MNEs in the chemical sector capture well the strategies in the industry. We provide additional details about our sample in the Online Appendix.

Measures

Dependent variables. Similar to recent studies on MNEs' environmental strategies (e.g., Maksimov et al., 2022), we obtained data for the dependent environmental variables from the Refinitiv Eikon ESG database. We chose two dimensions of firms' environmental approaches for our study: EP and EI – the relatively low correlation (0.315) indicates that they capture distinctive internal strategic initiatives.

Environmental performance (EP) was measured using four items of the Refinitiv Eikon ESG Emissions Reduction Score (Refinitiv, 2020: 22). Our selection sought to avoid the extensive use of metrics that do not explicitly capture EP (e.g., the Emissions Reduction Score includes 9 items regarding the disclosure of various initiatives) and to ensure comparability across MNEs of different sizes.² Thus, the four items included are: the amount of CO₂ emissions as a percentage of revenue, the amount of total waste as a percentage of revenue, the existence of emission reduction policies and the existence of emission targets (see the Online Appendix for a detailed description of items). The two continuous variables were transformed to a scale from 0.00 to 1.00 and then reverse scored by deducting each value from 1 so that higher values reflect lower emission and waste ratios; we also calculated the natural logarithm before transforming the values. At the same time, the two binary items were coded 0 (false) or 1 (true). The four values were then aggregated and divided by the number of items (4). Thus, the values of our index range from 0.00 to 1.00, with a higher score of EP indicating more effectiveness toward reducing the MNE's (negative) environmental impacts.

We built an index measure for *environmental innovation (EI)* using six items of the Refinitiv

² We are grateful to two of our reviewers for this suggestion.

Eikon ESG Environmental Innovation Score (Refinitiv, 2020: 22). Our selection of items uses two key selection criteria: relevance as a measure of EI and availability of data for the sample firms. Our index includes the existence of initiatives to reduce the potential risks of products entering the environment and policies regarding the environmentally responsible use of products (see the Online Appendix for more details about the selected 6 items). Each item was first coded 0 (false) or 1 (true) and the aggregate value for each firm was then divided by the total number of items (6) to arrive at a new variable with values ranging from 0.00 to 1.00. A high score on EI means that an MNE is more active than its peers in developing and implementing new environmental technologies, processes, and products.

Independent variables. Our independent variable, *foreign institutional owners* (FIOs), reflects the percentage of an MNE's shares held by non-domestic institutional investors. In the same way, *domestic institutional owners* (DIOs) reflects the percentage of shares held by institutional investors located in the MNE's home country. To calculate the percentages, we collected detailed shareholder portfolios from the Refinitiv Eikon database for each sampled firm at each calendar year-end date from 2010 to 2019. For our classification of institutional investors, we excluded those shareholders that were regarded as strategic investors by Refinitiv Eikon, i.e., corporations, holding companies, government agencies, and individuals. We then followed Aguilera et al. (2017) and, for each firm and year, we computed the percentage of total outstanding shares that were held by institutional investors domiciled in a country that is different from (FIOs) or equal to (DIOs) the country in which the MNE is headquartered. The average percentage of total shares held by FIOs was 35.58%.

Moderating variable. We measured *international diversification* using an entropy measure that considers both the extent and geographic distribution of MNEs' international presence based on the number of subsidiaries each firm has in foreign countries (see Hitt et al., 1997; Hitt, Tihanyi, Miller, & Connelly, 2006). For more details, please see Appendix I.

Control variables. We included multiple control variables to account for firm-level and country-level characteristics that have a potential influence on a firm's environmental strategies (Berrone et al.,

2013; Duanmu, Bu, & Pittman, 2018; Lin, Moon, & Yin, 2014). At the firm level, we used five control variables. First, *firm size* was measured by computing the natural logarithm of total annual sales. Second, *firm profitability* was measured with return on assets (ROA). Third, because of the potential influence of resource availability on firms' opportunities to develop advanced environmental approaches, we controlled for *organizational slack*, calculated by dividing a firm's total current assets with its total current liabilities. Fourth, considering that MNEs may follow different internationalization paths, we controlled for the effect that firms' focus on developed countries (*developed country focus*) has on their environmental approaches. This was measured as the percentage of foreign subsidiaries located in developed countries divided by the total number of foreign subsidiaries. Fifth, in an effort to take into account corporate governance, we included a control variable for *board tenure*, indicating the average number of years that directors have served.

Furthermore, we included three country-level control variables to account for the impact that larger, better governed or more innovative home countries might have on our findings. We used two pillars from the World Economic Forum's Global Competitiveness Report: Pillar 10 for market size and Pillar 12 for innovation capability and an item from the World Bank's Worldwide Governance Indicators, rule of law (The World Bank, 2021).

RESULTS

Table 1 presents the descriptive statistics for the sampled MNEs. Given that our dependent and independent variables are continuous, and our data is longitudinal in nature, we opted for generalized least squares (GLS) regressions. In order to identify potential omitted-variable bias in our data, we designed sequential models in which each regression adds variables to the previous one (Nichols, 2007). Based on the result of the Hausman test (Hausman, 1978), we used fixed-effects estimators in all our statistical models. As fixed-effects estimators do not exploit cross-sectional differences across groups (in our case, firms), they allow us to control for any time-invariant omitted variables. In addition, we employed robust

standard errors clustered at the firm-level which can be considered “*de rigueur* in panel models to allow for errors that may be correlated within group and not identically distributed across groups” (Nichols, 2007: 514). In this way, we also controlled for heteroscedasticity and autocorrelation (Cameron & Miller, 2015).

Tables 2 and 3 present our results. Models 1 and 6 show the effects of all control variables on the two dependent variables – EP and EI. In Models 2 and 7, we included FIOs and DIOs into the regression models with control variables and the two dependent variables. In Model 2, we uncover a positive significant effect ($b = 0.282, p = 0.027$) of FIOs on EP as predicted in Hypothesis 1, while in Model 7 we did not find a significant influence of FIOs on EI ($b = 0.086, p = 0.394$), hence we could not support Hypothesis 2.

---- INSERT TABLES 1, 2 and 3 ABOUT HERE ----

Although our hypotheses focus on the effects of FIOs, we also explored the overall effect of institutional investors by including DIOs as a separate variable in our models, to unpack the relative relevance of FIOs in our findings. Model 2 shows a positive significant effect ($b = 0.309, p = 0.030$) of DIOs on EP and Model 7 shows a positive significant effect ($b = 0.273, p = 0.003$) of DIOs on EI. These results confirm the distinct role of foreign and domestic institutional investors. FIOs effectively may influence their investees to mitigate the short-term reputational and legal risks of a poor EP, but their influence is not statistically significant on EI for the sampled firms. Meanwhile, the prevalence of DIOs is important for both EP and EI.

We analyze whether a higher level of MNEs’ international diversification influences the relationship between FIOs and environmental outcomes. Model 4 in Table 2 shows a significant moderating effect of international diversification on the relationship between FIOs and EP ($b = -0.187, p = 0.068$). Figure 1 confirms an overall tendency of firms with higher levels of FIOs to be associated with higher values of EP, in line with Hypothesis 1. However, it is revealing that Figure 1 uncovers that the effect of FIOs on EP is stronger for MNEs with a low level of international diversification and weaker for MNEs with higher levels of internationalization. As shown in Model 5, the influence of DIOs on EP is

always positive and significant and it does not depend on the international diversification of the investees.

---- INSERT FIGURE 1 ABOUT HERE ----

When looking at EI (Model 9), we did not find any significant moderating influence of international diversification on the relationship between FIOs and EI ($b = 0.003, p = 0.964$). On the other hand, Model 10 shows a significant effect ($b = 0.133, p = 0.061$) of international diversification on the relationship between DIOs and EI. Figure 2 confirms an overall tendency of MNEs with higher levels of DIOs to be associated with higher values of EI. Interestingly, at the same time, it shows that the positive effect of DIOs on EI is more pronounced for MNEs with higher levels of international diversification. In other words, while we could not find a significant influence of FIOs on EI in the sampled MNEs, DIOs make a positive and significant influence on EI, especially for the most internationally diversified investees.

---- INSERT FIGURE 2 ABOUT HERE ----

Figure 3 provides an overview of our findings and shows that institutional ownership plays an important role in EP and EI. However, while FIOs are highly relevant for EP, DIOs are important for both EP and EI. In addition, we can conclude that the effect of FIOs on EP depends on the level of international diversification, and we advance a trade-off between international diversification and the relevance of FIOs on environmental changes. However, DIOs' critical influence on MNEs' EI is even stronger when these MNEs are more internationally diverse.

---- INSERT FIGURE 3 ABOUT HERE ----

In order to exemplify our results, we selected from our sample two pairs of matched firms from two different geographical contexts and were able to confirm changes in environmental outputs following the increase of foreign institutional investors' shares in these MNEs. Specifically, we began by identifying a U.S. MNE and a European MNE that have seen a significant increase in shares held by FIOs in the period analyzed in this study. After that, we compared them with other MNEs in the same subsector and region where shares held by FIOs have remained stable. These examples show that a progressive increase

in shares held by FIOs has been accompanied by improvements in the environmental outcomes of the selected firms but remain relatively stable in the matched firms in which FIOs have not increased their shares.

The U.S. company in our example is Church & Dwight Co. Inc., a leading U.S. producer of sodium bicarbonate and cleaning products. In 2010, FIOs held 7.62% of the Church & Dwight Co. Inc 's shares, while by 2018 this percentage more than doubled to 17.19%. This progressive increase was accompanied by substantial improvements in environmental performance (EP). Specifically, the firm's EP was 0.56 in 2010, while it increased by more than 56% to reach a value of 0.83 in 2019. We also see a similar evolution in Sika AG, a leading Swiss chemical company that processes materials to protect and reinforce load-bearing structures. At Sika AG, the percentage of shares held by FIOs increased from 29.87% in 2010 to 69.26% in 2018. Similarly, its EP more than doubled, reaching 0.84 in 2019 compared to 0.33 in 2010.

In contrast to these two MNEs, we can point out the cases of Ecolab Inc., an American company in the soap and other detergent manufacturing industry (NAICS 325611) – same as that of Church & Dwight Co. Inc. – and German Henkel AG & Co KgaA, which operates in the same industry (adhesive manufacturing, NAICS 325520) and region as Sika AG. In both cases the percentage of shares held by FIOs has remained fairly stable between 2010 and 2018. In 2010, FIOs held 13.95% of Ecolab 's shares, while in 2018, this percentage was 19.42%. During this period, its EP remained almost the same (0.86 in 2010 and 0.84 in 2019). At Henkel AG & Co KgaA, the percentage of shares held by FIOs increased only slightly from 2010 to 2018, and its EP remained unchanged in the value of 0.50 in both 2010 and 2019. Although we cannot exclude the possibility of FIOs simply selecting the MNEs showing an improvement in environmental performance, these examples illustrate that FIOs' increased participation in their investees' capital is positively related to and may be a strong positive influence on the improvements in their environmental performance.

Robustness checks

As a robustness test of our main results, we re-ran Models 2 and 7 using composite scores from Refinitiv Eikon: Emissions Reduction Score for EP and Environmental Innovation Score for EI (see details in the Online Appendix). Our results remain broadly unchanged. When running Model 2 using an alternative measure of EP, the direct relationship between FIO and EP is positive and significant. Thus, we confirm that our findings remain unchanged with respect to higher levels of FIOs being associated with better EP, providing further support for Hypothesis 1. In the same way, the relationship between FIO and EI is not significant when using an alternative measure of EI.

Given the various countries in our sample, some concerns could be raised about their influence on the results. While we included various control variables for this purpose, we also ran additional robustness tests. Our main results remain similar when excluding U.S. firms in our sample or when excluding countries with only one or two firms in our sample (translating to the elimination of 18 firms). This means that neither firms from the largest country nor firms from the outlier countries drive our results.

DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

This study seeks to understand the relationships between foreign institutional owners (FIOs) in MNEs and the two most relevant dimensions of a firm's environmental approach: environmental performance (EP) and environmental innovation (EI). Our results provide support for the positive influence of FIOs on MNEs' EP whereas domestic institutional owners (DIOs) are important for both EP and EI. Furthermore, interestingly, the influence of FIOs on EP is strong when MNEs are less internationally diverse and weak when MNEs are more internationally diverse. Meanwhile, international diversification reinforces the positive influence of DIOs on MNEs' EIs. We believe that our findings contribute to several streams of research.

First, we join existing research on the role of FIOs (e.g., Aguilera et al., 2019; Shi et al., 2021). Specifically, we extend the analyses of investors' reactions to firms' environmental and social initiatives

(Durand et al., 2019b; Flammer, 2013; Hawn et al., 2018) by adding to the emergent research in analyzing foreign investors' influence on their investees' environmental strategies (DesJardine & Durand, 2020; Dyck et al., 2019; Flammer et al., 2021). Previous anecdotal evidence has raised questions about how FIOs might reconcile their aversion to financial losses and long-term uncertain commitments with their concerns about the potential risks from climate change (e.g., *The Economist*, 2021a). Our findings confirm that FIOs drive their investee firms to improve their EP in order to reduce reputational and legal risks in a context of information asymmetries. As FIOs are more interested in short-term profits than long-term value (e.g., Aguilera et al., 2017; David et al., 2010; Geng et al., 2016), a larger presence of FIOs in a firm may enhance its EP but not necessarily improve the firm's EI, which necessitates longer-term, riskier and costlier financial investments. Furthermore, executives' increased attention to EP in the sampled chemical industry confirms the importance of issue salience in organizational responses to normative pressures (Durand, Hawn, & Ioannou, 2019a). Our detailed attention to the relationship between FIOs and their investees' environmental outputs has also confirmed the explanatory power of an institutional view of corporate governance (e.g., Aguilera et al., 2019; Marano & Kostova, 2016; Shi et al., 2021).

Second, we respond to calls in the international corporate governance literature (Aguilera et al., 2019; Castañer et al., 2020) to analyze how a firm's institutional context influences the relationship between principals' and agents' decisions in the firm. In that regard, our supplementary analyses lend support to the argument that a firm's international diversification might provide extra discretion, incentives, and opportunities for executives to react to the international institutional complexity by increasing the attention they pay to environmental issues (e.g. Montiel, Husted, & Christmann, 2012). Hence, MNEs are exposed to a dynamic and wide-ranging set of environmental demands from stakeholders around the globe (e.g., Maksimov et al., 2022; Marano & Kostova, 2016), and are under constant scrutiny by multiple governments (Wang & Li, 2019). Thus, our findings show the importance of exploring the level of international diversification in ownership studies in MNEs.

Our findings highlight the need for managers to better understand the specific concerns of their

firm's FIOs so they can develop approaches that align with these investors' interests. Frequently, practitioners mistakenly believe that FIOs will not be interested in environmental initiatives. Our results clearly show that FIOs *are* interested in ensuring that the environmental practices of the firms in which they invest are sufficient to avoid any legal and social risks. However, FIOs might be reluctant to accept approaches related to more risky and long-term innovative investments. Furthermore, as firms advance in their internationalization and become more internationally diversified, this increases the pressure for executives to reinforce their firms' EP and reduces the importance of the FIOs' presence; however, we uncover that FIOs' influence on EP is particularly strong when international diversification is low. For governments and policy makers, our findings suggest that helping the processes of international diversification in local firms is not only good for the local economy but can also be good for the environment.

Although we did not find statistical support to confirm a relationship between FIOs and EI strategy, we uncovered that DIOs are supportive of long-term EIs. This finding highlights the different interests of FIOs and DIOs regarding EIs. The lack of statistical significance to confirm a negative relationship between FIOs and EI strategy might be explained by the industry context of our sample where it is difficult to achieve improved environmental results without undertaking at least certain innovative initiatives. In other words, while in other industry sectors it may be easier to guarantee a good EP with only a limited level of investment in EIs, this approach may prove difficult in the chemical sector. Future research in a different industry setting could help us to better understand whether the choice of industry may have played a role in our results.

We recognize that future research may address complementary dimensions of our findings. First, our sample includes mostly publicly listed chemical sector firms, and hence our results may not apply to privately-owned firms or firms in different sectors. Second, while our sample firms account for a large share of the chemical manufacturing industry worldwide, smaller firms are underrepresented due to the limited availability of environmental data for these firms. Future studies could collect primary data from

SMEs to analyze the impact that FIOs may have on local firms' environmental approaches. Third, our results reveal a limited relevance of the investees' home countries and the owners' countries of origin; however, analyses of particular regulatory dimensions might uncover the importance of certain additional geographical dimensions. Fourth, and finally, recent research has shown the significance of offshore outsourcing of polluting activities (e.g., Berry, Kaul, & Lee, 2021; Li & Zhou, 2017). We would need additional data to analyze whether EP improvements in the firms with presence of institutional investors might come from offshoring some of the pollution instead of reducing it. In any case, our results show the strong interest of institutional investors in avoiding the risks of investees with bad pollution records and the limited interest of FIOs in being involved with firms with significant investments in EI.

In sum, our study confirms that the presence of institutional investors has implications for the environmental outputs of their investees. However, the improvements linked to FIOs are much more limited than the public statements made by executives of global institutional owners.

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Table 1. Descriptive statistics and correlation matrix

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1. EP	0.7242	0.1604	1											
2. EI	0.3361	0.2303	0.2645	1										
3. FIOs	0.3558	0.2679	0.1320	0.2155	1									
4. DIOs	0.3573	0.2927	0.0307	0.0564	-0.4016	1								
5. International diversification	2.4760	0.7877	0.3314	0.2814	0.2486	0.2538	1							
6. Firm size	8.7014	1.2244	0.3594	0.5143	0.2368	0.1031	0.4414	1						
7. Profitability	9.0780	7.3535	0.1030	-0.0361	0.0444	-0.0207	0.2027	0.0625	1					
8. Organizational slack	1.9556	1.0780	-0.0677	-0.2751	-0.1441	-0.0817	-0.2852	-0.3266	0.0425	1				
9. Internationalization in developed countries	0.4288	0.2245	0.1051	0.0623	0.1247	0.1145	0.2942	0.0416	-0.0322	0.1103	1			
10. Board tenure	6.6806	2.8455	0.0247	-0.0477	-0.0615	0.0495	0.0432	-0.0117	0.1025	-0.0610	-0.1480	1		
11. Home country rule of law	1.3839	0.5638	0.2599	0.2720	0.3256	0.2426	0.4331	0.1786	0.0551	-0.0330	0.3350	-0.0197	1	
12. Home country market size	82.788	11.156	0.0115	0.0970	-0.3833	0.5866	0.0343	0.1837	-0.0625	0.0790	0.1262	0.0452	-0.0078	1
13. Home country innovation capability	74.177	9.7476	0.1962	0.2070	0.0639	0.3490	0.2336	0.1507	-0.0369	0.0950	0.2915	0.0033	0.7431	0.3290

Notes: $N = 1,200$. $|r| > 0.06$ implies significance at $p < .05$.

Table 2. Environmental performance: Results

Variable	Environmental performance				
	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Independent variables</i>					
FIOs		0.282 (0.126) [0.027]	0.269 (0.131) [0.043]	0.727 (0.297) [0.015]	0.271 (0.135) [0.047]
DIOs		0.309 (0.141) [0.030]	0.299 (0.143) [0.039]	0.288 (0.131) [0.030]	0.377 (0.468) [0.422]
International diversification			-0.050 (0.062) [0.423]	0.095 (0.073) [0.199]	0.054 (0.065) [0.405]
FIOs x international diversification				-0.187 (0.102) [0.068]	
DIOs x international diversification					-0.030 (0.151) [0.841]
<i>Control variables</i>					
Firm size	0.003 (0.022) [0.876]	-0.003 (0.023) [0.883]	-0.003 (0.023) [0.880]	-0.006 (0.023) [0.803]	-0.003 (0.023) [0.901]
Profitability	-0.003 (0.001) [0.752]	-0.000 (0.000) [0.830]	-0.000 (0.001) [0.829]	0.000 (0.001) [0.990]	-0.000 (0.001) [0.830]
Organizational slack	-0.009 (0.008) [0.246]	-0.008 (0.008) [0.275]	-0.006 (0.001) [0.415]	-0.009 (0.008) [0.274]	-0.006 (0.008) [0.439]
Internationalization in developed countries	-0.034 (0.204) [0.868]	-0.119 (0.210) [0.571]	-0.163 (0.208) [0.435]	-0.126 (0.213) [0.554]	-0.167 (0.209) [0.426]
Board tenure	0.005 (0.003) [0.144]	0.004 (0.003) [0.196]	0.004 (0.003) [0.189]	0.004 (0.003) [0.176]	0.004 (0.003) [0.202]
Home country rule of law	0.037 (0.038) [0.341]	0.004 (0.038) [0.912]	0.005 (0.037) [0.895]	0.002 (0.037) [0.967]	-0.005 (0.038) [0.904]
Home country market size	0.002 (0.005) [0.692]	0.004 (0.005) [0.444]	0.004 (0.005) [0.457]	0.003 (0.001) [0.545]	0.004 (0.005) [0.455]
Home country innovation capability	0.003 (0.001) [0.012]	0.003 (0.001) [0.014]	0.002 (0.001) [0.022]	0.003 (0.001) [0.009]	0.002 (0.001) [0.022]

Notes: $N = 1,200$. Robust standard errors in parentheses. p -values in brackets. All models include a constant.

Table 3. Environmental innovation: Results

Variable	Environmental innovation				
	Model 6	Model 7	Model 8	Model 9	Model 10
<i>Independent variables</i>					
FIOs		0.086 (0.100) [0.394]	0.078 (0.103) [0.452]	0.070 (0.125) [0.577]	0.069 (0.102) [0.501]
DIOs		0.273 (0.090) [0.003]	0.267 (0.092) [0.004]	0.267 (0.094) [0.005]	-0.076 (0.192) [0.694]
International diversification			0.314 (0.037) [0.001]	0.031 (0.041) [0.456]	0.010 (0.034) [0.761]
FIOs x international diversification				0.003 (0.071) [0.964]	
DIOs x international diversification					0.133 (0.071) [0.061]
<i>Control variables</i>					
Firm size	0.048 (0.027) [0.072]	0.044 (0.026) [0.096]	0.435 (0.026) [0.096]	0.044 (0.026) [0.097]	0.0408 (0.026) [0.116]
Profitability	-0.001 (0.001) [0.221]	-0.001 (0.001) [0.132]	-0.001 (0.001) [0.132]	-0.001 (0.001) [0.128]	-0.001 (0.001) [0.128]
Organizational slack	-0.004 (0.007) [0.562]	-0.003 (0.007) [0.666]	-0.002 (0.007) [0.813]	-0.002 (0.007) [0.820]	-0.003 (0.007) [0.673]
Internationalization in developed countries	-0.003 (0.197) [0.989]	-0.047 (0.194) [0.809]	-0.075 (0.202) [0.711]	-0.075 (0.203) [0.711]	-0.057 (0.202) [0.779]
Board tenure	0.002 (0.004) [0.668]	0.001 (0.004) [0.822]	0.001 (0.004) [0.822]	0.001 (0.004) [0.822]	0.001 (0.004) [0.775]
Home country rule of law	0.027 (0.040) [0.502]	0.033 (0.040) [0.405]	0.027 (0.040) [0.498]	0.027 (0.041) [0.505]	0.026 (0.040) [0.521]
Home country market size	0.002 (0.005) [0.774]	0.002 (0.005) [0.704]	0.002 (0.005) [0.712]	0.002 (0.005) [0.714]	0.002 (0.005) [0.671]
Home country innovation capability	0.001 (0.002) [0.549]	0.014 (0.002) [0.362]	0.001 (0.002) [0.412]	0.001 (0.002) [0.422]	0.001 (0.002) [0.395]

Notes: $N = 1,200$. Robust standard errors in parentheses. p -values in brackets. All models include a constant.

Figure 1. Moderating effect of international diversification on the relationship between FIOs and EP

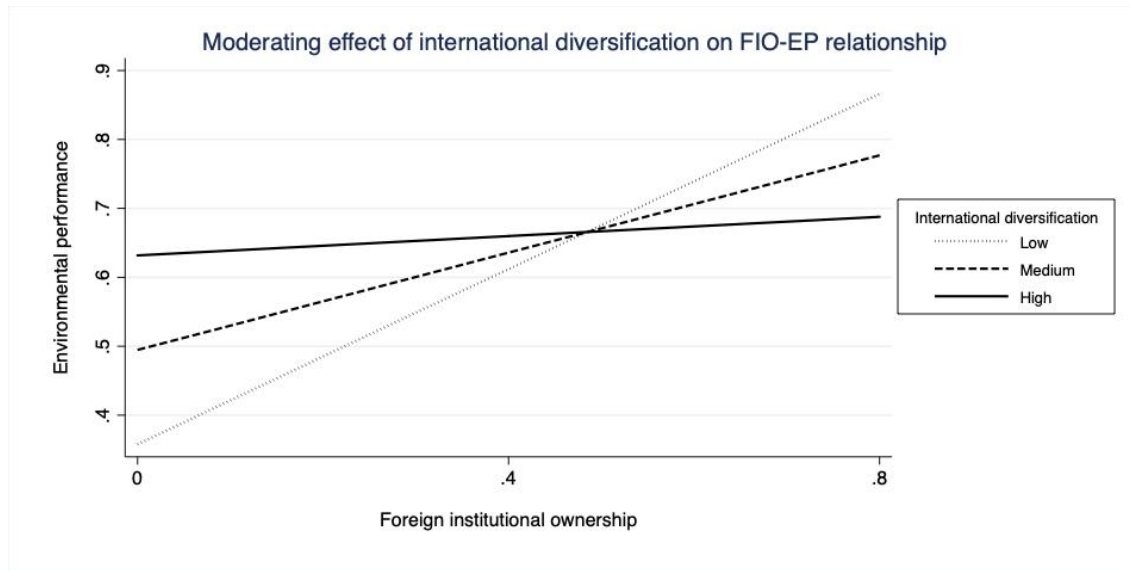


Figure 2. Moderating effect of international diversification on the relationship between DIOs and EI

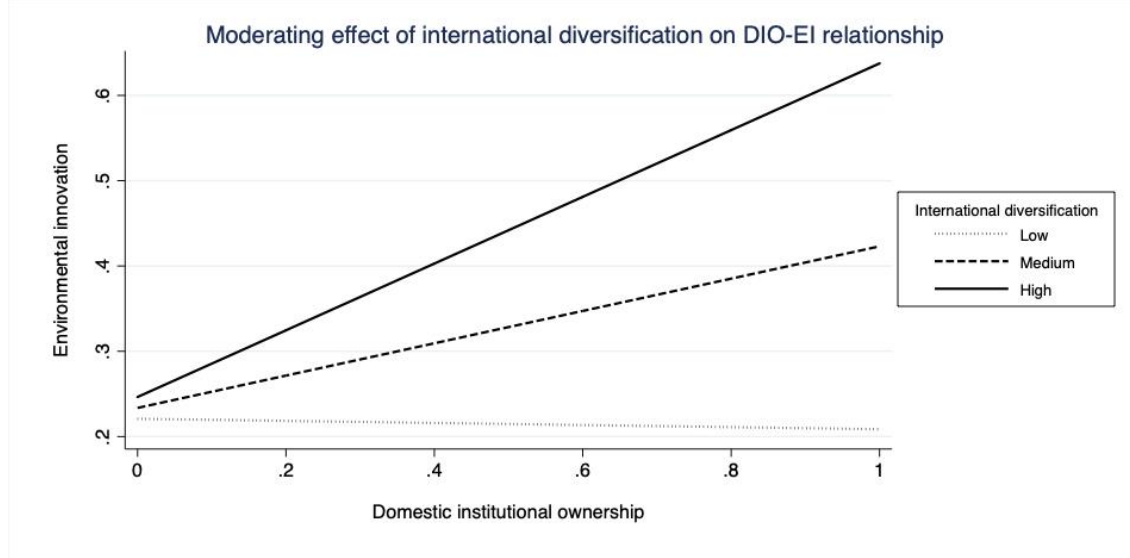
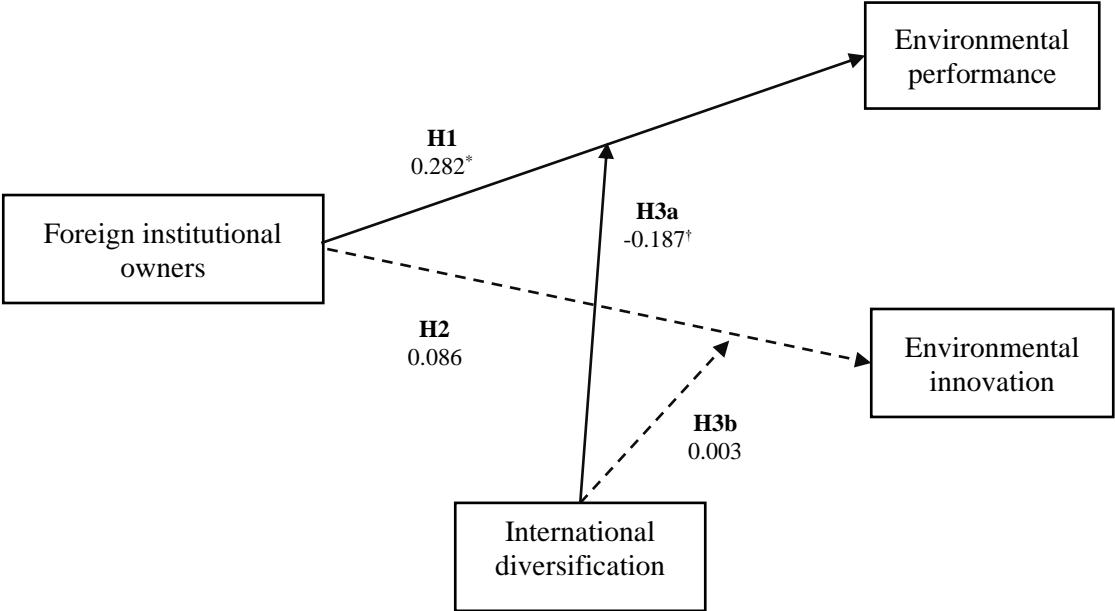


Figure 3. Diagram of direct and interaction effects



Notes: N = 1,200. p-values: † p<0.10, * p<0.05.

APPENDIX I. Measure of international diversification

We measured *international diversification* using an entropy measure that considers both the extent and geographic distribution of MNEs' international presence based on the number of subsidiaries each firm has in foreign countries (see Hitt et al., 1997; Hitt, Tihanyi, Miller, & Connelly, 2006). We began by using Bureau van Dijk's Orbis database to collect information on the country locations of each of the 36,985 subsidiaries of the 197 MNEs in our sample. Prior studies have also used this database to measure firms' international orientation (e.g., Pisani, Garcia-Bernardo, & Heemskerk, 2020). We included those subsidiaries in which one of our sample firms was the global ultimate parent company, owning at least 50% of the entity either directly or indirectly, and, for each subsidiary, recorded the country location and establishment date. We then applied the following formula from Hitt et al. (1997) to compute international diversification:

$$\text{International diversification} = \sum_i \left[P_i * \ln \left(\frac{1}{P_i} \right) \right],$$

where P_i is the percentage of foreign subsidiaries a firm has in country i , and $\ln(1/P_i)$ is the weight given to each country. We considered a total of 138 countries, including all countries in which at least one of the sampled MNEs had a subsidiary. For each firm, we excluded domestic subsidiaries from the equation, based on the firm's home country.