TESIS DOCTORAL

Understanding the links between firms' international and business strategies:
Studies on innovation and sustainability

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1 INTRODUCCIÓN

1.1. MARCO GENERAL E INTERÉS DE LA TESIS DOCTORAL

Las empresas multinacionales se encuentran en una posición privilegiada, debido a sus recursos y alcance global, para abordar el reto del desarrollo sostenible en los países donde desarrollan sus actividades. La sociedad espera cada vez más que estas empresas contribuyan a alcanzar los Objetivos de Desarrollo Sostenible (ODS) en 2030 a través de sus decisiones de carácter estratégico, tales como sus planteamientos medioambientales, o sus inversiones en investigación y desarrollo (I+D), entre otras (Harvard Business Review, 2022). El Objetivo 12 de la Agenda 2030 de Naciones Unidas relacionado con la producción y el consumo sostenible destaca la importancia de "alentar a las empresas, en especial las grandes empresas y las empresas transnacionales, a que adopten prácticas sostenibles e incorporen información sobre la sostenibilidad en su ciclo de presentación de informes" (Pacto Mundial Red Española, 2023). Por otro lado, el Objetivo 9 de la Agenda, vinculado a industria, innovación e infraestructura, subraya que la innovación es esencial para la consecución de los ODS (Pacto Mundial Red Española, 2023). Ambos factores son pilares fundamentales del llamamiento de António Guterres, Secretario General de Naciones Unidas, para intensificar la contribución a los ODS en la denominada "década de la acción" (Pacto Mundial Red Española, 2022: 7). Esta tesis doctoral se centra en el análisis de distintas preguntas de investigación que combinan estos elementos relacionados con la innovación, la sostenibilidad y las empresas multinacionales. El objetivo último es aportar evidencia empírica y reflexiones teóricas que impulsen cambios en las empresas multinacionales que propicien organizaciones competitivas y simultáneamente más sostenibles.

En este contexto, el rol de las empresas multinacionales está evolucionando cada vez más hacia la consideración de las tres 'Ps' – las personas, el planeta y la prosperidad (Elkington, 2013). Esto implica que sus decisiones estratégicas estén orientadas a crear valor no sólo para sí mismas, sino también para sus "stakeholders" (Gande, John, Nair, & Senbet, 2020). Por ello, la sostenibilidad y la innovación constituyen estrategias esenciales para que estas empresas asuman un compromiso empresarial en el desarrollo de sus actividades en los mercados internacionales (Harvard Business Review, 2022). Con respecto a las innovaciones en general, y las medioambientales en particular, las empresas multinacionales tienen acceso a recursos y fuentes de información más diversos que las empresas nacionales y pueden establecer relaciones con empresas e instituciones de investigación locales para desarrollar mejor las innovaciones y así aumentar su rentabilidad (Castellani, Montresor, Schubert, & Vezzani, 2017; Kafouros, Buckley, Sharp, & Wang, 2008; Villar, Pla-Barber, & Ghauri, 2020). La internacionalización permite que las empresas obtengan acceso a conocimientos y tecnologías que no están disponibles en el país de origen y este nuevo aprendizaje les permite mejorar sus productos y procesos (p. ej., Hitt, Tihanyi, Miller, & Connelly, 2006; Magomedova, Achcaoucaou, & Miravitlles, 2022; Salomon & Shaver, 2005). Santos, Doz y

Williamson (2004) mostraron que los países extranjeros también presentan oportunidades para la creación de redes y la cooperación con universidades e instalaciones de investigación locales.

No obstante, las empresas multinacionales también se enfrentan a importantes desafíos para desarrollar avances en estos ámbitos más complejos en los que desarrollan sus actividades (Cadestin, Backer, Desnoyers-James, Miroudot, Ye, & Rigo, 2018). Por un lado, tienen un reto importante relacionado con alcanzar y mantener su legitimidad en los múltiples entornos institucionales donde desarrollan sus actividades, a veces muy diversos y con requerimientos incluso antagónicos (Fortwengel, Gutierrez Huerter, & Kostova, 2023; Kostova & Zaheer, 1999; Kang, 2013). Por otro lado, las multinacionales se enfrentan a una gran visibilidad y a un número amplio de stakeholders, lo que a su vez significa que tienen que soportar un mayor escrutinio y son objeto de la máxima atención frente a cualquier comportamiento (Marano, Tashman, & Kostova, 2017). Además, su internacionalización aumenta la exposición de estas empresas a las normas globales y a los actores globales legitimadores, tales como las organizaciones no gubernamentales multilaterales o internacionales (Marano & Kostova, 2016). Adicionalmente, las multinacionales deben de ser capaces de coordinar y gestionar actividades desarrolladas en diferentes entornos institucionales donde se pueden enfrentar a cambios legislativos (Ahmed, Ahmad, Rjoub, Kalugina, & Hussain, 2022; Hitt, Hoskisson, & Kim, 1997; Okhmatovskiy & Shin, 2019). La literatura institucional ha destacado cómo la supervivencia a largo plazo de las empresas internacionales requiere que obtengan legitimidad en los diferentes mercados extranjeros donde desarrollan su actividad (Kostova & Zaheer, 1999; Scherer, Palazzo, & Seidl, 2013).

Finalmente, en el listado de retos que las multinacionales tienen que abordar, estas empresas tendrán que ser capaces de superar en los mercados exteriores la desventaja de ser extranjero, “liability of foreignness” (Cuervo-Cazurra, Ciravegna, Melgarejo, & López, 2018; Golovko & Valentini, 2011). Además, las empresas multinacionales de los mercados emergentes tienen la desventaja adicional del país de origen, “liability of origin” (Ramachandran & Pant, 2010). Esto implica percepciones y actitudes negativas en los países anfitriones hacia las empresas de países con un menor grado de desarrollo institucional en cuanto a la voluntad de estas empresas de realizar negocios legítimos (debido a la limitada credibilidad institucional y la reputación medioambiental y social de sus países de origen) (Dunning & Lundan, 2008; Kang & Yang, 2010). En resumen, los vacíos institucionales del país de origen pueden comprometer las percepciones de legitimidad en el país anfitrión (Fiaschi, Giuliani, & Nieri, 2017; Marano et al., 2017). Mientras tanto, las empresas de los países más desarrollados disfrutan de una legitimación “a priori” porque los stakeholders tienden a vincular la empresa con las características de su país de origen. Esto se puede traducir en que las empresas de países menos desarrollados deban realizar mayores esfuerzos corporativos para legitimarse cuando operan globalmente (Fiaschi et al., 2017; Marano et al., 2017; Tashman, Marano, & Kostova, 2019). En este contexto, responder a las preocupaciones institucionales sobre el entorno natural o asumir un mayor compromiso con la innovación pueden ser formas eficaces de aumentar la legitimidad de una empresa multinacional en un contexto internacional (Babiak & Trendafilova, 2011; Bansal & Roth, 2000).

En este panorama de dificultades, la literatura que ha analizado la estrategia de las multinacionales ha destacado, además, un grado creciente de escepticismo con respecto a sus progresos reales en dichos planteamientos. Aunque algunos estudios han demostrado que un desempeño medioambiental superior puede proporcionar la legitimidad necesaria para superar las desventajas de ser extranjero (Babiak & Trendafilova, 2011; Bansal & Clelland, 2004; Christmann, 2004; Sun, Doh, Rajwani & Siegel, 2021), resultados empíricos más recientes sugieren que, ya sea intencionalmente o no, las empresas internacionales encuentran medios para atenuar las oportunidades de cualquier control externo efectivo de sus operaciones y operan en contextos con monitoreo limitado (Aragón-Correa, Marcus, & Hurtado-Torres, 2016; Sheffi & Blanco, 2018). Por lo tanto, la probabilidad de fracasar después de realizar grandes inversiones aumenta en mayor medida que los beneficios potenciales de un planteamiento medioambiental más avanzado, por lo que mejorar el desempeño medioambiental o innovar pueden no ser fáciles para reforzar la legitimidad de una empresa.

Además, las estrategias de sostenibilidad dependen en última instancia no sólo de los ejecutivos sino también de los propietarios de las empresas. Un informe reciente de la OCDE afirma que casi el 70% de los propietarios institucionales dicen tener en cuenta los aspectos medioambientales en su toma de decisiones, porcentaje que es aún mayor si se incluye a aquéllos que manifiestan su intención de hacerlo (OECD, 2020a). Sin embargo, aunque los inversores institucionales han emitido múltiples declaraciones públicas sobre las preocupaciones medioambientales de sus empresas, muchos analistas y ejecutivos consideran que estas iniciativas son meras campañas de relaciones públicas con una influencia muy limitada en las estrategias medioambientales de las empresas en que invierten (The Economist, 2021). Por ejemplo, el ex-director de inversiones sostenibles de BlackRock ha criticado enérgicamente la reciente proliferación de declaraciones de inversores institucionales sobre intenciones medioambientales al afirmar que es más barato y más fácil promocionarse como ecológico que hacer el trabajo de mejorar realmente el perfil de sostenibilidad (Fancy, 2021). Esta crítica destaca la diferencia entre buscar evitar riesgos reputacionales y legales y promover las innovaciones que son relevantes para la sostenibilidad futura, pero financieramente más arriesgadas.

Por lo tanto, existen muchas oportunidades pero también desafíos relacionados con los planteamientos medioambientales de las empresas multinacionales y su compromiso con la innovación. En este sentido, esta tesis doctoral contribuye a mejorar el conocimiento con respecto a los factores internos y externos que condicionan tanto los planteamientos medioambientales de las empresas multinacionales como sus inversiones en investigación y desarrollo (I+D). De esta forma los resultados obtenidos permiten incrementar el conocimiento sobre sus decisiones de carácter estratégico para favorecer la legitimización de las empresas multinacionales frente a sus stakeholders en países extranjeros y garantizar su contribución a alcanzar los ODS planteados en la Agenda 2030.

1.2. OBJETIVOS DE INVESTIGACIÓN

El objetivo general de la presente tesis doctoral es profundizar y examinar las relaciones entre 1) la internacionalización de las empresas multinacionales y los niveles de desarrollo institucional de sus países de origen y 2) los desarrollos en sus planteamientos de sostenibilidad y de innovación. Este objetivo general se concreta en los siguientes objetivos específicos de la tesis doctoral:

Analizar la relación entre los propietarios institucionales extranjeros y los planteamientos medioambientales de las empresas multinacionales en las que invierten distinguiendo entre desempeño medioambiental (planteamiento orientado a corto plazo) e innovación medioambiental (planteamiento orientado a largo plazo)
Examinar cómo el grado de diversificación internacional de las empresas multinacionales modera la relación entre la presencia de propietarios institucionales extranjeros y los planteamientos medioambientales de las empresas multinacionales (desempeño medioambiental e innovación medioambiental)
Entender en qué medida el nivel de internacionalización de las empresas multinacionales fuera de su región (diversificación internacional inter-regional), influye en los planteamientos medioambientales de las empresas multinacionales (divulgación de sus planteamientos medioambientales y desempeño medioambiental)
Analizar en qué medida el país de origen de las empresas multinacionales, y específicamente su nivel de desarrollo institucional, modera las relaciones entre la diversificación internacional inter-regional y los planteamientos medioambientales de las empresas multinacionales (divulgación de sus planteamientos medioambientales o el desempeño medioambiental)
Comprender cómo el nivel de desarrollo institucional de 1) el país de origen de las empresas multinacionales y 2) los países hacia los que orientan su internacionalización influyen en los niveles de investigación y desarrollo (I+D) de las empresas multinacionales

1.3. ESTRUCTURA DEL TRABAJO DE INVESTIGACIÓN

Esta tesis doctoral se presenta en formato de compendio de artículos dado que los tres trabajos de investigación que conforman su núcleo se encuentran ya publicados en revistas de impacto. La tesis está formada por cinco capítulos que se agrupan en tres bloques: la introducción (Capítulo 1), el cuerpo central de la tesis con tres trabajos de investigación publicados (Capítulos 2, 3 y 4) y las conclusiones (Capítulo 5). En este primer capítulo se introducen los conceptos clave, se justifica el interés de la investigación y se establecen sus objetivos generales.

En el Capítulo 2 titulado "*The link between foreign institutional owners and multinational enterprises' environmental outcomes in the chemical industry*" se plantea el estudio del impacto de los propietarios institucionales extranjeros en los planteamientos medioambientales de las empresas multinacionales, en términos de desempeño e innovación medioambiental. Hoy en día, son numerosos los inversores institucionales que manifiestan su compromiso de sostenibilidad; no obstante, los resultados de trabajos previos no eran concluyentes en cuanto al impacto real de la existencia de esos inversores. Este trabajo se centra en el estudio de los propietarios institucionales extranjeros. El objetivo es analizar la relación entre los propietarios institucionales extranjeros y los planteamientos medioambientales de las empresas multinacionales en las que se invierten: desempeño medioambiental (planteamiento orientado a corto plazo) e innovación medioambiental (planteamiento orientado a largo plazo). Los propietarios institucionales extranjeros buscan mitigar sus riesgos en los mercados internacionales alentando a las empresas multinacionales en las que invierten hacia un buen desempeño medioambiental (planteamiento orientado a corto plazo). Sin embargo, tienden a evitar la exposición a inversiones a largo plazo derivadas de las innovaciones medioambientales. Además, en este trabajo se estudia cómo el grado de diversificación internacional de las empresas multinacionales juega un papel moderador en la relación entre la presencia de propietarios institucionales extranjeros y los planteamientos medioambientales de las empresas multinacionales (desempeño medioambiental e innovación medioambiental).

Para alcanzar los objetivos planteados se realiza un análisis longitudinal (2010-19) con una muestra de 1.200 observaciones pertenecientes a 197 empresas multinacionales de la industria química de 33 países. Son varios los motivos que justifican la importancia de centrar el estudio en la industria química. En primer lugar, es la segunda industria manufacturera más grande del mundo, con ingresos de más de 4 billones de dólares (International Finance Corporation, 2021). En segundo lugar, los procesos de producción de la industria generan cantidades considerables de emisiones de gases de efecto invernadero, desechos y liberaciones químicas al aire, el agua y el suelo (U.N. Environment Programme, 2019). Tal y como destaca la Agencia Europea de Medio Ambiente, la industria química es responsable del 18,6% de las partículas PM10 en el aire (European Environment Agency, 2019). En tercer lugar, hay que destacar que la industria química tiene un alto nivel de globalización y depende en un alto grado de cadenas de suministro globales complejas (U.N. Environment Programme, 2019).

Los resultados de este trabajo muestran que los propietarios institucionales extranjeros tienen un efecto positivo en el desempeño medioambiental de las empresas en las que invierten, pero no influyen en el desarrollo de sus innovaciones medioambientales. Además, este trabajo muestra que la influencia de los propietarios institucionales extranjeros en el desempeño medioambiental se ve fortalecido para las empresas multinacionales con un bajo nivel de diversificación internacional y es marginal para aquéllas con un mayor nivel de internacionalización. Al mismo tiempo, los propietarios institucionales nacionales están mucho más comprometidos con el avance tanto del desempeño medioambiental como de la innovación medioambiental en las empresas multinacionales en las que invierten. Este artículo fue aceptado en 2022 y publicado en formato digital en enero 2023 en la revista *Journal of International Business Studies*.

En el Capítulo 3 titulado "*Do global firms increase their environmental disclosure and performance? Symbolic versus effective operations and the moderating role of liability of origin. Legitimation implications*", se analiza en qué medida el nivel de internacionalización de las empresas multinacionales fuera de su región (diversificación internacional inter-regional) influye en los planteamientos medioambientales de las empresas multinacionales (divulgación de sus planteamientos medioambientales y desempeño medioambiental). Además, se estudia si el país de origen de las empresas multinacionales y, específicamente su nivel de desarrollo institucional, modera las relaciones entre la diversificación internacional inter-regional y los planteamientos medioambientales de las empresas multinacionales (divulgación de sus planteamientos medioambientales o el desempeño medioambiental).

El estudio se lleva a cabo utilizando datos de panel de 1.484 observaciones de 292 empresas del sector energético en el período de 2011 a 2018. El sector energético proporciona un contexto ideal para el análisis de las relaciones entre la internacionalización de las empresas, el desarrollo institucional del país de origen y sus comportamientos medioambientales por varias razones. En primer lugar, se sabe que la producción, el transporte y la venta de productos energéticos son responsables de la mayoría de las emisiones mundiales de gases de efecto invernadero, principalmente debido a la quema de combustibles fósiles (Moorhead & Nixon, 2015). Según la Agencia Internacional de la Energía (una organización de la OCDE), el sector global de energía produjo 36,8 Gt de emisiones de CO_2 en 2022, un incremento ligero comparado con el año anterior (IEA, 2023). En segundo lugar, el elevado nivel de internacionalización de las empresas de esta industria y la tendencia mundial hacia la producción de energía más limpia están permitiendo avances importantes en los planteamientos medioambientales de las empresas de este sector, y en particular de las multinacionales. El análisis de esta industria nos brinda la oportunidad de identificar en qué medida la internacionalización de las multinacionales del sector energético fuera de su región de origen, influye en la divulgación que las empresas multinacionales hacen de sus planteamientos medioambientales o en el desempeño medioambiental de las mismas. Además, dada la creciente importancia de las multinacionales energéticas de los países con menor nivel de desarrollo (Cumming, Hou & Lee, 2016), los resultados de este trabajo permiten conocer cómo el

desarrollo institucional de los países de origen de las empresas multinacionales energéticas juega un papel destacado en el desarrollo de los planteamientos medioambientales de las mismas.

Los resultados muestran que la internacionalización de las multinacionales fuera de su región (diversificación inter-regional) influye positivamente en el nivel de divulgación de sus planteamientos medioambientales, pero no afecta a su desempeño medioambiental. Los resultados alcanzados ponen de manifiesto que las empresas multinacionales cuyo país de origen tiene un nivel de desarrollo institucional más bajo, es decir en el país existen más vacíos institucionales, muestran mayores niveles de divulgación de sus planteamientos medioambientales y desempeño medioambiental a medida que incrementan su nivel de diversificación inter-regional. Por tanto, los vacíos institucionales del país de origen de la multinacional refuerzan el interés de la empresa por obtener legitimidad en los mercados extranjeros a través de la mejora en sus planteamientos medioambientales. Sin embargo, un contexto de instituciones más fuertes en el país de origen reduce el interés de la empresa multinacional en el desarrollo de planteamientos medioambientales en la que apoyar su legitimación. Estos resultados contribuyen a la literatura previa sobre cómo las empresas globales pueden ganar legitimidad medioambiental utilizando diversas estrategias. Este artículo fue aceptado en 2019 y publicado en 2021 en la revista *International Marketing Management*.

El Capítulo 4, titulado "*The impact of home and host country institutional development on multinationals' R&D intensity*", se centra en estudiar cómo el desarrollo institucional del país de origen y los países anfitriones en los que operan las empresas multinacionales influye en el nivel de investigación y desarrollo (I+D) de las empresas multinacionales. Para ello se analiza la influencia de la internacionalización de las empresas multinacionales hacia países desarrollados y el papel moderador que juega el nivel de desarrollo institucional del país de origen de las empresas multinacionales.

Los análisis empíricos de carácter longitudinal se llevan a cabo con una muestra de 967 observaciones de 234 empresas farmacéuticas de 30 países en el período de 2010 a 2017. El sector farmacéutico proporciona un contexto ideal para el análisis de las relaciones planteadas por varias razones. En primer lugar, hay que destacar la importancia del sector a nivel mundial, considerando que las ventas totales globales de la industria farmacéutica alcanzan los 1,2 billones de dólares y la industria emplea a más de 1,2 millones de personas en los países de la OCDE (OECD, 2020b). En segundo lugar, este sector es apropiado para el estudio porque se sabe que las empresas farmacéuticas son muy intensivas en investigación y desarrollo, puesto que dichas inversiones constituyen la base se su ventaja competitiva (Buciuni & Pisano, 2021). En tercer lugar, la OCDE también ha destacado que la internacionalización es uno de los desafíos más importantes de la industria farmacéutica, puesto que puede ser un factor clave para fomentar el desarrollo de innovaciones (Kiriyama, 2011).

Los resultados de este trabajo de investigación muestran que la internacionalización de las empresas multinacionales hacia los países desarrollados tiene un efecto positivo en la intensidad del I+D en estas empresas farmacéuticas. Además, esta influencia se ve fortalecida para las empresas multinacionales de países de origen menos desarrollados institucionalmente. Los resultados pueden ayudar a los gerentes, investigadores y formuladores de políticas a comprender mejor el proceso de innovación en las industrias intensivas en I+D como la industria farmacéutica. Este último artículo fue publicado en formato digital a principios de 2022 en la revista *Business Research Quarterly*.

Table 1.1 Artículos publicados que forman parte de la tesis.

Título del artículo	**Año**	**Revista**	**JCR**	**Cuartil**
The link between foreign institutional owners and multinational enterprises' environmental outcomes in the chemical industry	2023	Journal of International Business Studies	11.103	Q1 (Business) Posición 14/154 Q1 (Management) Posición 14/228
Do global firms increase their environmental disclosure and performance? Symbolic versus effective operations and the moderating role of liability of origin. Legitimation implications	2021	Industrial Marketing Management	8.890	Q1 (Business) Posición: 29/154 Q1 (Management) Posición: 32/228
The impact of home and host country institutional development on multinationals' R&D intensity	2022	Business Research Quarterly	4.204	Q3 (Business) Posición 95/154 Q3 (Management) Posición 124/228

Finalmente, en el último capítulo (Capítulo 5) se recogen las principales conclusiones e implicaciones tanto teóricas como prácticas de los tres trabajos de investigación introducidos en los capítulos anteriores. También se presentan las principales limitaciones de los trabajos y se plantean futuras líneas de investigación.

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1. INTRODUCCIÓN

2. The link between foreign institutional owners and multinational enterprises' environmental outcomes in the chemical industry

2 THE LINK BETWEEN FOREIGN INSTITUTIONAL OWNERS AND MULTINATIONAL ENTERPRISES' ENVIRONMENTAL OUTCOMES IN THE CHEMICAL INDUSTRY

2.1. 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.

2.2. INTRODUCTION

"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 BlackRock[1], 2020).

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;

[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.

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). 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 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 patters 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; Eesley & 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, 2019). 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.

2.3. 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.

2.3.1 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.

2.3.2 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 legitimation 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.

2.3.3 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., 2019).

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.

2.4. METHODS

2.4.1 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 (U.N. 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 Appendix 2A.

2.4.2 Measures

Dependent variables. Similar to recent studies on MNEs' environmental strategies (e.g., Maksimov et al., 2019), 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, p. 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 CO_2 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 Appendix 2B 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 Eikon ESG Environmental Innovation Score (Refinitiv, 2020, p. 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 Appendix 2B 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

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

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 2C.

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.

2.5. RESULTS

Table 2.1 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 rigeur* 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).

Table 2.1. 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 $p < .05$.

Tables 2.2 and 2.3 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.

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 2.2 shows a significant moderating effect of international diversification on the relationship between FIOs and EP (b = -0.187, p = 0.068). Figure 2.1 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 2.1 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.

Table 2.2. Environmental performance: Results.

Variable	Environmental performance				
	Model 1	Model 2	Model 3	Model 4	Model 5
Independent variables					
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]
Control variables					
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 2.3. Environmental innovation: Results.

Variable	Environmental innovation				
	Model 6	Model 7	Model 8	Model 9	Model 10
Independent variables					
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]
Control variables					
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.

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 2.2 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.

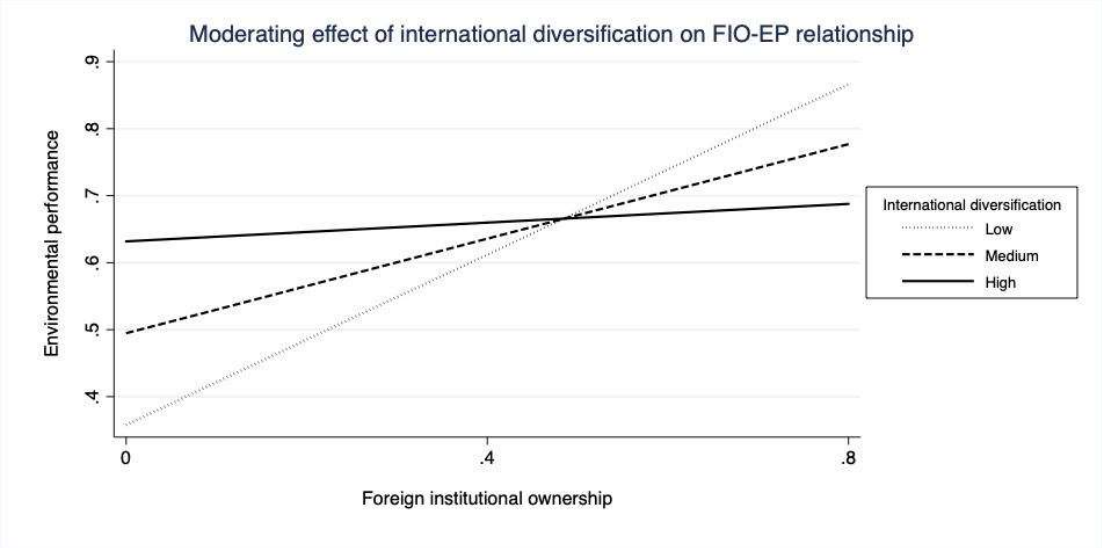


Figure 2.1. Moderating effect of international diversification on the relationship between FIOs and EP.

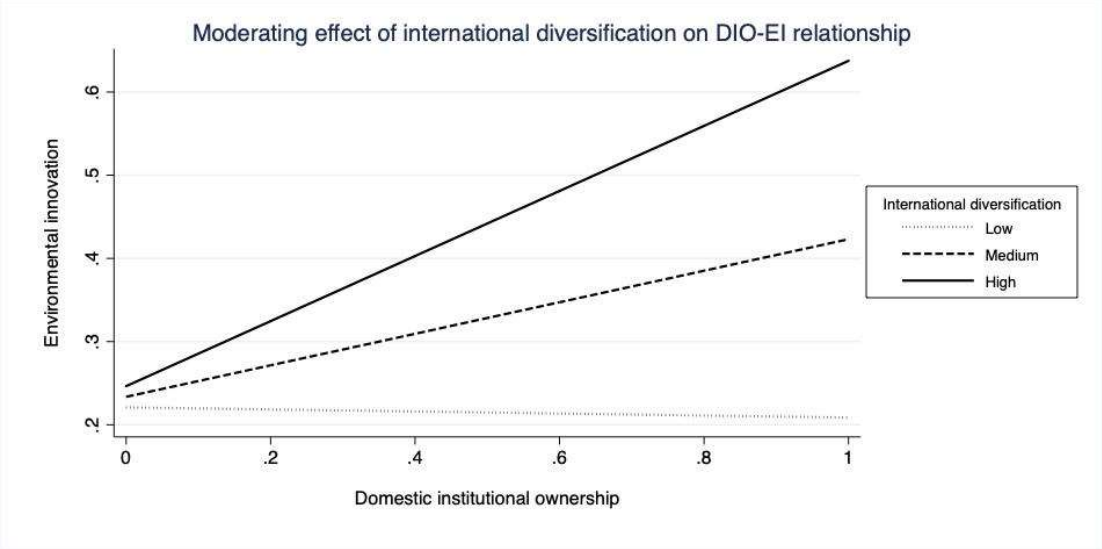
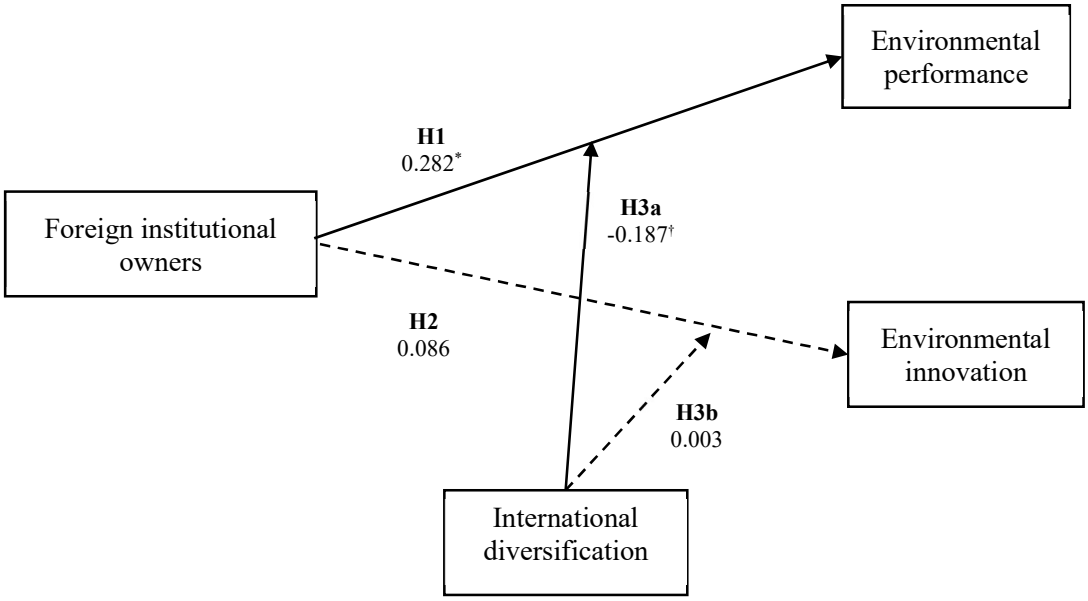


Figure 2.2. Moderating effect of international diversification on the relationship between DIOs and EI.

Figure 2.3 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.



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

Figure 2.3. Diagram of direct and interaction effects.

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. Our results reported in Appendix 2D 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.

2.6. 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., 2019; 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 settings 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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APPENDIX 2A. Additional information about sample

Table 2A.1. Geographic distribution of sampled MNEs and their subsidiaries

Country / economic area	Number of MNEs with headquarters	Number of subsidiaries	Average % of shares held by foreign institutions	Average % of shares held by domestic institutions	International diversification
Australia	5	941	56.1%	26.0%	2.46
Belgium	3	613	71.9%	4.0%	3.04
China	8	236	35.1%	6.5%	0.95
Denmark	4	328	54.8%	31.4%	3.37
Finland	3	195	47.6%	18.4%	2.83
France	7	2,551	44.0%	10.8%	2.53
Germany	9	3,780	62.2%	14.2%	2.83
India	6	766	33.7%	14.7%	2.37
Italy	3	112	25.8%	3.3%	2.77
Japan	47	6,009	30.6%	39.5%	2.32
Netherlands	4	1,816	87.2%	11.2%	2.79
Russia	3	166	6.1%	0.0%	0.95
South Africa	4	301	20.7%	48.8%	2.27
South Korea	7	149	21.9%	16.1%	1.63
Switzerland	7	2,356	60.3%	13.7%	2.96
Taiwan	10	1,210	19.5%	12.7%	0.90
Thailand	3	629	4.8%	7.5%	2.10
United Kingdom	13	4,094	47.7%	43.5%	2.81
United States	33	9,411	13.6%	82.9%	2.94
Others	18 (14 countries)	1,295	-	-	-
Total	197	**36,958**	**35.6%**	**35.7%**	**2.47**

Notes: The information is only given for countries where three or more MNEs in our sample are headquartered.

Table 2A.1 provides additional details about the geographic distribution of the 197 sampled MNEs and their 36,985 subsidiaries. The Netherlands presents the highest average percentage of shares held by foreign institutions (87.2%) while Thailand has the lowest at 4.8 % of shares held by foreign institutions. The United States, on the other hand, has the highest average percentage of shares held by domestic institutions at 82.9%. Regarding international diversification, Denmark and Belgium have the highest average levels (3.37 and 3.04).

Table 2A.2. Descriptive statistics of main variables for MNEs grouped by main location of international operations

	International diversification							
	Group 1: Developed country focus				Group 2: Emerging country focus			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Environmental performance	0.726	0.165	0.059	0.932	0.722	0.151	0.252	0.927
Environmental innovation	0.343	0.231	0	1	0.332	0.229	0	1
Foreign institutional owners	0.372	0.263	0.022	0.967	0.346	0.271	0.005	1
Domestic institutional owners	0.358	0.271	0	0.967	0.357	0.306	0	0.949

We split our sample into two mutually exclusive groups: first group with MNEs that have more than 50% of their international diversification in developed countries and the second group with MNEs more focused on emerging countries (Table 2A.2). We then compared the mean values of our key variables of interest in these two groups. These values are very similar: environmental performance (0.726 vs 0.722), environmental innovation (0.343 vs 0.332), share of foreign institutional investors (0.372 vs 0.346) and share of domestic institutional investors (0.358 vs 0.357). The differences between the two groups analyzed were not statistically significant, indicating that the effect of international diversification is not dependent on the developed or emerging nature of host countries.

APPENDIX 2B. Additional information about the dependent variables

Table 2B.1. Items used to construct our environmental performance index

Item	Description	Values after transformation
CO2 to revenue	Total estimated amount of CO2 and CO2 equivalent emissions in tonnes divided by net sales or revenue in US dollars, reverse scored so that higher values indicate lower CO2 to revenue ratios	Min = 0.000 Max = 0.967 Mean = 0.447
Waste to revenue	Total amount of waste produced in tonnes divided by net sales or revenue in US dollars, reverse scored so that higher values indicate lower waste to revenue ratios	Min = 0.000 Max = 0.998 Mean = 0.758
Emission policy	A binary item indicating whether the company has a policy to improve emission reduction	Min = 0 Max = 1 Mean = 0.878
Emission target	A binary item indicating whether the company has set targets or objectives to be achieved on emission reduction	Min = 0 Max = 1 Mean = 0.653

Table 2B.2. Items used to construct our environmental innovation index

Item	Description	Values after transformation
Eco-design products	A binary item indicating whether the company reports on specific products which are designed for reuse, recycling or the reduction of environmental impacts	Min = 0 Max = 1 Mean = 0.172
Take-back and recycling initiatives	A binary item indicating whether the company reports about take-back procedures and recycling programs to reduce the potential risks of products entering the environment	Min = 0 Max = 1 Mean = 0.131
Product environmental responsible use	A binary item indicating whether the company reports about product features and applications or services that will promote responsible, efficient, cost-effective and environmentally preferable use	Min = 0 Max = 1 Mean = 0.524
Animal testing reduction	A binary item indicating whether the company has established a program or an initiative to reduce, phase out or substitute for animal testing	Min = 0 Max = 1 Mean = 0.264
Renewable/clean energy products	A binary item indicating whether the company develops products or technologies for use in the clean, renewable energy (such as wind, solar, hydro and geo-thermal and biomass power)	Min = 0 Max = 1 Mean = 0.158
Water technologies	A binary item indicating whether the company develops products or technologies that are used for water treatment, purification or that improve water use efficiency	Min = 0 Max = 1 Mean = 0.166

APPENDIX 2C. 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 el al. (1997) to compute international diversification:

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

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

APPENDIX 2D. Additional information about robustness checks

For our robustness test on the environmental dependent variables, we used two composite scores from Refinitiv Eikon: Emissions Reduction Score as the alternative measure for environmental performance and Environmental Innovation Score for environmental innovation.

The Emissions Reduction Score is calculated using 28 metrics while the Environmental Innovation Score consists of a total of 20 metrics. As described in the article, we constructed our dependent variables using a carefully selected subset of the most representative metrics and only considering items that are available for all MNEs in our sample. However, we wanted to confirm whether the use of these composite scores, which are readily available from Refinitiv and have been used extensively by other international business scholars, yields the same results. The process that Refinitiv follows to construct the scores is based on a percentile ranking comparing firms to each other within an industry sector looking at each individual data point separately. These item-specific percentile scores are then summed up at the firm-level and these total scores are ranked against peer firms to arrive at the final scores for Emissions Reductions and Environmental Innovation (Refinitiv, 2020), resulting in values that range from 0 to 100.

The Emissions Reduction Score includes items measured in a collection of different scales such as the amount of CO_2, NOx, and SOx emissions, the existence of emission reduction policies or environmental restoration initiatives, and the amounts of hazardous, non-hazardous, and recycled waste, among others (see Table 2D.1 for a detailed list of items). The values of this score range from 0 to 100, with a higher score of environmental performance indicating more effectiveness toward reducing the firm's (negative) environmental impacts in comparison with peers in the same industry group, while a low level of environmental performance means a limited effectiveness in reducing the firm's impact in relative terms. For example, Taiwanese Nan Ya Plastics Corp (with a score of 6.25) is one of the worst performers in the industry; it was founded by and is closely related to its major shareholder Formosa Plastics Corp, which has been in the public eye due to chemical leaks and dumping toxic waste in different countries and co-owned by several foreign institutional owners ranging from Singapore to Switzerland.

The Environmental Innovation Score includes the amount of firms' environmental research and development costs, the existence of take-back and recycling initiatives to reduce the potential risks of products entering the environment, and firms' analysis of environmental and biodiversity risks, among others (see Table 2D.2 for the full list of items). Similar to the Emissions Reduction Score calculation method described above, firms within an industry sector are compared to each other and given percentile rank scores for environmental innovation. A high score on environmental innovation strategy means that a firm is more active than its peers in developing and implementing new environmental technologies, processes, and products to create market opportunities. For instance, Huntsman Corp, a U.S.-based and primarily U.S.-owned chemical manufacturer, has one of the highest scores (99.22) due to its development of innovative, water and energy saving

products and proactive environmental policies, while Swiss multinational Clariant AG has a much lower score (5.00) due to its low comparative score in most of the analyzed items.

Table 2D.1. Items of the Refinitiv Eikon ESG Emissions Reduction Score.

Item	Description
Ozone-Depleting Substances	Total amount of ozone depleting (CFC-11 equivalents) substances emitted in tonnes
Self-Reported Environmental Fines	Environmental fines as reported by the company
Estimated CO2 Equivalents Emission Total	The estimated total CO2 and CO2 equivalents emission in tonnes
Total Waste	Total amount of waste produced in tonnes divided by net sales or revenue in US dollars
Hazardous Waste	Total amount of hazardous waste produced in tonnes divided by net sales or revenue in US dollars
Discharge into Water System	Total weight of water pollutant emissions in tonnes divided by net sales or revenue in US dollars
Policy Emissions	Does the company have a policy to improve emission reduction?
Targets Emissions	Has the company set targets or objectives to be achieved on emission reduction?
Biodiversity Impact Reduction	Does the company report on its impact on biodiversity or on activities to reduce its impact on the native ecosystems and species, as well as the biodiversity of protected and sensitive areas?
NOx and SOx Emissions Reduction	Does the company report on initiatives to reduce, reuse, recycle, substitute, or phase out SOx (sulfur oxides) or NOx (nitrogen oxides) emissions?
e-Waste Reduction	Does the company report on initiatives to recycle, reduce, reuse, substitute, treat or phase out e-waste?
Emissions Trading	Does the company report on its participation in any emissions trading initiative?
Environmental Partnerships	Does the company report on partnerships or initiatives with specialized NGOs, industry organizations, governmental or supra-governmental organizations, which are focused on improving environmental issues?
EMS Certified Percent	The percentage of company sites or subsidiaries that are certified with any environmental management system
Environmental Restoration Initiatives	Does the company report or provide information on company-generated initiatives to restore the environment?
Staff Transportation Impact Reduction	Does the company report on initiatives to reduce the environmental impact of transportation used for its staff?
Climate Change Commercial Risks Opportunities	Is the company aware that climate change can represent commercial risks and/or opportunities?

VOC or Particulate Matter Emissions Reduction	Does the company report on initiatives to reduce, substitute, or phase out volatile organic compounds (VOC) or particulate matter less than ten microns in diameter (PM10)?
Waste Recycling Ratio	Total recycled and reused waste produced in tonnes divided by total waste produced in tonnes
Environmental Expenditures Investments	Does the company report on its environmental expenditures or does the company report to make proactive environmental investments to reduce future risks or increase future opportunities?

Table 2D.2. Items of the Refinitiv Eikon Environmental Innovation Score.

Item	Description
Eco-Design Products	Does the company report on specific products which are designed for reuse, recycling or the reduction of environmental impacts?
Env R&D Expenditures To Revenues USD	Total amount of environmental R&D costs (without clean up and remediation costs) divided by net sales or revenue in US dollars.
Environmental R&D Expenditures	Total amount of environmental R&D costs (without clean up and remediation costs).
Noise Reduction	Does the company develop new products that are marketed as reducing noise emissions?
Fleet Fuel Consumption	Total fleet's average fuel consumption in l/100km.
Hybrid Vehicles	Is the company developing hybrid vehicles?
Fleet CO2 Emissions	Total fleet's average CO2 and CO2 equivalent emissions in g/km.
Environmental Assets Under Mgt	Does the company report on assets under management which employ environmental screening criteria or environmental factors in the investment selection process?
Equator Principles	Is the company a signatory of the Equator Principles (commitment to manage environmental issues in project financing)?
Equator Principles or Env Project Financing	Is the company a signatory of the Equator Principles (commitment to manage environmental issues in project financing) or does it claim to evaluate projects on the basis of environmental or biodiversity risks as well?
Environmental Project Financing	Does the company claim to evaluate projects on the basis of environmental or biodiversity risks as well?
Nuclear	Does the company construct nuclear reactors, produce nuclear energy or is active in another way in the nuclear energy industry?
Nuclear Production	Percentage of total energy production from nuclear energy.
Labeled Wood Percentage	The percentage of labeled wood or forest products (e.g., Forest Stewardship Council (FSC)) from total wood or forest products.
Labeled Wood	Does the company claim to produce, source or distribute wood or forest products that are labeled (e.g., Forest Stewardship Council (FSC))?
Organic Products Initiatives	Does the company report or show initiatives to produce or promote organic food or other products?

Product Impact Minimization	Does the company reports about take-back procedures and recycling programmes to reduce the potential risks of products entering the environment or does the company report about product features or services that will promote responsible and environmentally preferable use?
Take-back and Recycling Initiatives	Does the company reports about take-back procedures and recycling programs to reduce the potential risks of products entering the environment?
Product Environmental Responsible Use	Does the company report about product features and applications or services that will promote responsible, efficient, cost-effective and environmentally preferable use?
GMO Products	Does the company produce or distribute genetically modified organisms (GMO) or seeds?
Agrochemical Products	Does the company produce or distribute agrochemicals like pesticides, fungicides or herbicides?
Agrochemical 5 % Revenue	Are the revenues generated by the company from agrochemicals like pesticides, fungicides, or herbicides 5% or more of company sales?
Animal Testing	Is the company directly or indirectly involved in animal testing?
Animal Testing Cosmetics	Is the company directly or indirectly involved in animal testing for cosmetics?
Animal Testing Reduction	Has the company established a program or an initiative to reduce, phase out or substitute for animal testing?
Renewable/Clean Energy Products	Does the company develop products or technologies for use in the clean, renewable energy (such as wind, solar, hydro and geo-thermal and biomass power)?
Water Technologies	Does the company develop products or technologies that are used for water treatment, purification or that improve water use efficiency?
Sustainable Building Products	Does the company develop products and services that improve the energy efficiency of buildings?
Real Estate Sustainability Certifications	Does the company claim to lease, rent or market buildings that are certified by BREEAM, LEED or any other nationally recognized real estate certification?

Table 2D.3. Robustness results using the Refinitiv Eikon ESG scores.

Variable	**Environmental performance**	**Environmental innovation**
Independent variables		
FIOs	38.021 (6.904) [0.000]	7.302 (8.893) [0.412]
DIOs	45.127 (7.881) [0.000]	13.613 (10.144) [0.180]
Control variables		
Firm size	3.603 (2.100) [0.087]	0.269 (2.703) [0.921]
Profitability	-0.010 (0.079) [0.903]	-0.165 (0.101) [0.106]
Organizational slack	-0.908 (0.784) [0.243]	1.204 (1.009) [0.233]
Internationalization in developed countries	7.766 (23.38) [0.740]	5.225 (30.09) [0.862]
Board tenure	1.161 (0.340) [0.000]	0.101 (0.438) [0.153]
Home country rule of law	6.323 (4.409) [0.152]	5.950 (5.675) [0.295]
Home country market size	-0.132 (0.581) [0.820]	-1.868 (0.748) [0.013]
Home country innovation capability	0.381 (0.121) [0.002]	0.233 (0.155) [0.135]

Notes: N = 1,200. Values are standardized coefficients. Standard errors in parentheses. p-values in brackets. All models include a constant.

2. FOREIGN INSTITUTIONAL OWNERS AND MNES' ENVIRONMENTAL OUTCOMES

Do global firms increase their environmental disclosure and performance?

Symbolic versus effective operations and the moderating role of liability of origin.

3. Legitimation implications

3 DO GLOBAL FIRMS INCREASE THEIR ENVIRONMENTAL DISCLOSURE AND PERFORMANCE? SYMBOLIC VERSUS EFFECTIVE OPERATIONS AND THE MODERATING ROLE OF LIABILITY OF ORIGIN

3.1. ABSTRACT

This paper analyzes the debate regarding the implications of international firms' strategies for their environmental approaches across multiple regions by distinguishing between symbolic and effective environmental operations. Furthermore, we extend previous literature by considering the relevant moderating role of a firm's liability of origin on these relationships. Using panel data of 292 firms in the period from 2011 to 2018 in the energy and utility sectors, our results show that a firm's progressive globalization increases its environmental disclosure but does not affect its environmental performance. Interestingly, our results demonstrate that a weak institutional home context reinforces a global firm's interest in gaining legitimation through both its environmental disclosure and performance; however, a strong institutional home context reduces its interest in environmental sources of legitimation. Our results contribute to previous literature on how global firms may gain environmental legitimacy using diverse strategies.

3.2. INTRODUCTION

Global firms have exponentially gained importance in the last decade as a consequence of improved communications increasing their opportunities to access multiple international regions simultaneously (Cadestin, Backer, Desnoyers-James, Miroudot, Ye & Rigo, 2018). However, the liability of foreignness – referring to the disadvantages borne in the host country by international firms as a consequence of operating outside of their institutional context – is one of the most important challenges that firms operating in different regions face (Czinkota, Kaufmann & Basile, 2014; Hitt, 2016; Ramachandran & Pant, 2010). The institutional literature has highlighted how the long-term survival of international firms requires that they gain legitimacy from local agents (Kostova & Zaheer, 1999; Scherer, Palazzo, & Seidl, 2013). Responding to institutional concerns regarding the natural environment has been deemed an effective way of increasing a firm's legitimation in an international context (Bansal & Roth, 2000; Babiak & Trendafilova, 2011), hence the debate pertains to how international firms act to ameliorate their environmental legitimacy. Whereas early literature on environmental issues highlighted how international firms reinforce their environmental operations (e.g., Christmann, 2004; Delmas & Montes-Sancho, 2011), more recent research has highlighted the risks of a purely pragmatic environmental legitimation (e.g., Aragon-Correa, Marcus, & Hurtado-Torres, 2016; Lyon & Maxwell, 2011). This paper seeks to clarify this debate by examining the different effects of a firm's interregional

internationalization on environmental disclosure and performance respectively, and analyzing the moderating role of a firm's home country on these relationships.

The doubts regarding the consequences of a firm's internationalization process are particularly relevant when the host country and home country present a higher institutional distance, in political, legal or sociocultural terms. In general, countries in the same region are relatively similar to each other (for instance, two countries in Africa are usually more similar than one country in Africa and another in Europe), and the liability of foreignness increases when a firm's internationalization is focused beyond its international home region (Asmussen, 2009; Asmussen & Goerzen, 2013; Rugman & Oh, 2013; Rugman & Verbeke, 2004, 2008). In this paper, an international firm's global strategy is defined as the process by which a firm extends its international operations beyond its home region (interregional internationalization). We propose that a firm's global strategy generates different approaches to signaling environmental interest by using a symbolic support (i.e., environmental disclosure), and it seeks a real reduction in impact through the use of internal practices (i.e., environmental performance).

Recent studies have suggested that international firms voluntarily disclose non-financial information (such as environmental information) in order to improve external perceptions of their transparency and to ensure their legitimacy in a global context (e.g., Aragón-Correa et al., 2016; Hassan & Ibrahim, 2012; Kolk & Fortanier, 2013). A recent descriptive analysis of the top 100 companies by market capitalization listed on The National Stock Exchange of India (NSE) concluded that "transparency in disclosure on non-financial parameters has been a proven tool which attracts more investors' attention and brings the businesses closer to the growing expectations of the stakeholders" (KPMG, 2019, p. 9). Therefore, we propose that a firm's global internationalization will engender greater interest in environmental disclosure in order to obtain additional legitimation from society and reduce some of the liabilities of foreignness.

The literature has also highlighted a growing degree of skepticism regarding international firms' real progress in environmental performance. Although some studies have demonstrated that superior environmental performance can provide the legitimacy required to overcome the liability of foreignness (e.g., Babiak & Trendafilova, 2011; Bansal & Clelland, 2004; Christmann, 2004), recent empirical findings suggest that whether intentionally or not, international firms find means of attenuating opportunities for any effective external control of their operations, and operate in contexts with limited monitoring (Aragón-Correa et al., 2016). We propose that a global firm operating in multiple regions will progressively reduce its global environmental performance.

Moreover, we propose in this paper that liabilities of origin play a relevant moderating role regarding the relationship between a firm's global internationalization and environmental approaches. While any firm operating in the international market faces disadvantages due to the liability of foreignness, firms from developing and emerging markets bear the additional disadvantage of liabilities of origin (Ramachandran & Pant, 2010). This implies negative

perceptions in the host countries as to these firms' willingness to conduct legitimate business (due to the limited institutional credibility of their home countries), as well as the importance of further corporate efforts to become legitimized when operating globally (Fiaschi, Giuliani, & Nieri, 2017; Marano, Tashman, & Kostova, 2017; Tashman, Marano, & Kostova, 2019). We propose that whereas a weak institutional home context reinforces a global firm's interest in reinforcing its legitimacy by increasing both its environmental disclosure and performance, a strong institutional home context reduces its interest in such sources of legitimation.

In this study we contribute to the institutional literature by offering a novel approach that will clarify the debate regarding the implications of international firms' strategies through multiple regions on their environmental approaches. We do so by distinguishing between the different implications of a firm's globalization on its symbolic and effective environmental operations and considering the relevant moderating role of a firm's liability of origin on these relationships. Moreover, whereas most previous literature has analyzed the environmental implications of internationalization based on firms from developed countries (e.g., Aragon-Correa et al., 2016; Babiak & Trendafilova, 2011; Christmann, 2004; Delmas & Montes-Sancho, 2011), and more recently the corporate social responsibility of firms from emerging countries (e.g., Fiaschi et al., 2017 Marano et al.,, 2017; Tashman et al., 2019), this paper offers a unique analysis of firms from multiple home countries operating at different levels of globalization. Our results build upon previous literature concerning how global firms can gain environmental legitimacy by using diverse strategies.

The paper begins with a theoretical background alongside our hypotheses regarding both the effects of a firm's globalization on environmental disclosure and performance and the relevant role of liabilities of origin. Having discussed the methodology, we present the results supporting our hypotheses. We conclude the paper with a discussion and suggestions for future research.

3.3. THEORETICAL BACKGROUND AND HYPOTHESES

3.3.1 Interregional internationalization and environmental approach

Firms expanding internationally face the challenge of maintaining and increasing their legitimacy in multiple institutional environments across the diverse countries and regions in which they operate (Kostova & Zaheer, 1999). Higher levels of internationalization increase the range of stakeholders involved, in turn reinforcing the risks of them engaging in adverse institutional attribution when assessing the firms (Kostova & Zaheer, 1999; Marano et al., 2017). Moreover, internationalization through different regions increases firms' exposure to global norms and legitimizing actors (Marano & Tashman, 2012), such as multilateral or international non-governmental organizations (NGOs) (Marano & Kostova, 2015). Therefore, international firms encounter very relevant, diverse, and strong interest groups in both their home and host countries,

which have the power to grant them legitimacy (Kang, 2013). Importantly, the pressures presented by the home and host countries can in cases be divergent or inconsistent (Kostova, Roth, & Dacin, 2008; Meyer, Mudambi, & Narula, 2011).

The literature has highlighted how the difficulties encountered in managing international pressure increase with the degree of institutional distance between the diverse countries or regions in which a firm operates (Van Hoorn & Maselad, 2016; Xu & Shenkar, 2002). Operating outside of its home region escalates a firm's institutional distance from its home country, reduces information transfer, and increases information asymmetries, thereby increasing the liabilities of foreignness (Asmussen, 2009; Asmussen & Goerzen, 2013; Rugman & Oh, 2013; Rugman & Verbeke, 2004, 2008). Legitimacy problems in one country may spill over to other contexts when firms are more visible to larger and widely dispersed stakeholders (Sharfman et al., 2004). Environmental approaches are accepted corporate tools to influence a global firm's legitimation.

Although disclosing information has some risks, including legal liability and exposure to potentially angry activists and stakeholders (Lyon & Maxwell, 2011), recent literature suggests that international firms have started to voluntarily disclose environmental information in order to ensure their legitimacy (Aragón-Correa et al., 2016; Delgado, Pedauga, & Cordón, 2017; Hassan & Ibrahim, 2012; Kolk & Fortanier, 2013). In a study conducted on UK firms in the FTSE 100, Hassan and Ibrahim (2012) highlighted how disclosing environmental information enhances an international firm's reputation and legitimacy with stakeholders. Their findings show that receiving environmental awards is positively related to disclosure (but not to performance). Furthermore, Kolk and Fortanier (2013) examined a sample from the Fortune Global 250 and found the existence of a statistically significant positive relationship between the level of internationalization and environmental disclosure for firms in high-sensitivity sectors from high-standard countries. In contrast, in low-sensitivity sectors the authors found a negative relationship between internationalization and environmental disclosure. Aragón-Correa, Marcus, and Hurtado-Torres (2016) showed that the top international firms have a much better record of environmental disclosure than average firms within the same industries. Finally, Delgado, Pedauga, and Cordón (2017) noted that more visible firms with a prominent position in international markets disclose more environmental information and make clear efforts at achieving environmental transparency.

To summarize, even though environmental disclosure requires some effort from firms, it tends to be an area of focus for international firms. We propose that the greater the degree of a firm's globalization (interregional internationalization), the greater its incentive to increase its legitimacy via environmental disclosure. A higher liability of foreignness and exposure to a wider range of stakeholders, global norms and global legitimizing actors will reinforce a global firm's external interest in monitoring its environmental impacts. Increasing its voluntary environmental disclosure may prove a visible, easy, and effective way to manage and maintain an international firm's legitimacy in host countries that are more institutionally distant, and can help avoid any negative spillover to one country as a consequence of legitimacy problems in another. Thus, we propose:

H1a: A firm's higher level of interregional internationalization is positively related to its environmental disclosure.

The literature on international business has yielded very mixed results regarding the relationship between a firm's internationalization and its environmental performance. Numerous studies have shown that firms operating in foreign markets may exhibit a refined environmental performance. These studies provide empirical evidence from a variety of industry and geographic contexts, such as Belgian chemical, food and textile sectors (Buysse & Verbeke, 2003), Chinese multinationals from various industries (Christmann & Taylor, 2001), and the US manufacturing sector (Kennelly & Lewis, 2002). These works argue that international firms have internal incentives to maintain similar environmental standards across different countries and improve operational efficiencies (Christmann & Taylor, 2001), as well as external incentives to mitigate litigation risks through accidentally breaking the law (Sharfman, Sharf & Tihanyi, 2004).

However, a growing body of research shows that searching for locations where lax requirements permit companies to operate as they desire – especially where it may reduce their operating costs – is also a relevant force for internationalization (Aigbedo, 2019). Aragón-Correa et al. (2016) found that top international firms across different sectors exhibited inferior environmental performance than other, less international firms in their respective industries. Similarly, in their study on publicly traded US firms from various sectors, Strike, Gao, and Bansal (2006) noted that international firms can simultaneously act responsibly and irresponsibly depending on their preferences and the benefits they may derive.

Our interest in global firms encourages us to pay particular attention to the potential influence on performance of operating in diverse regional contexts. Surroca, Tribó, and Zhara (2013) have suggested that multinational enterprises operate in a context of strong compliance with the institutional environment in the home country and weak compliance in the host country. In so doing, the authors highlight the global firm's role in the performance of institutional arbitrage through the relocation of irresponsible practices worldwide in order to reduce its own loss of reputation.

Although a firm's interregional internationalization may increase its exposure to public scrutiny (Kostova & Zahher, 1999; Marano et al., 2017), the reinforcement of its environmental performance in a globalized context may prove difficult for at least two reasons. On the one hand, the complexity of firms' interregional internationalization precludes coordination, integration, and exchange of knowledge and resources among geographically dispersed markets (Kostova & Roth, 2003). The challenges associated with the transfer, deployment and exploitation of a firm's competitive strengths may reduce corporate capacity, which is necessary to maintaining a high standard of performance outside of the home region (Mohr, Fastoso, Wang, & Shirodkar, 2014). Even when firms have opportunities to preserve their standards, the prerequisite investments and

risks increase substantially due to the adjustments that must be made to operate outside of the home region (Quian, 2010; Verbeke & Kano, 2016).

On the other hand, the potential legitimation benefits of reducing environmental performance outside of a firm's home region are constrained. The reputational risks of poor environmental performance are limited because monitoring systems are not always adequate across multiple regions (Strike et al., 2006), and global firms are difficult to track due to the complexity of their operations. Consequently, external agents can encounter difficulties in distinguishing different levels of environmental performance in global markets and thus they will be unable to reward firms' improved environmental performance with additional legitimation.

Therefore, the likelihood of failing after making huge investments increases to a greater extent than the potential benefits of a more advanced environmental record, and so improving environmental performance may be neither easy nor efficient in reinforcing a firm's legitimacy. As such, opportunities to gain legitimacy through alternative avenues requiring less investment are critical. We propose that a global firm may find it more efficient to make a small amount of environmental effort (i.e., close to the standards in each region) and seek alternative and more cost-effective means of increasing environmental legitimacy. Our hypothesis is:

H1b: A firm's higher level of interregional internationalization is negatively related to its environmental performance.

3.3.2 The moderating role of the home country's institutional development

Although all international firms face disadvantages brought on by the liability of foreignness, firms from developing and emerging markets bear the additional disadvantage of liabilities of origin, that is "a credibility and legitimacy deficit in the eyes of host country stakeholders who [are] even more circumspect due to inefficient or missing knowledge of foreign emerging market multinational firms, their quality and safety standards" (Madhok & Kayhani, 2012, p. 31; see also Kostova et al., 2008). That is, international stakeholders may exhibit unfavorable attitudes toward firms from emerging countries given their environmental and social reputation (Dunning & Lundan, 2008; Kang & Yang, 2010). In short, home country institutional voids may compromise perceptions of legitimacy in the host country (Fiaschi et al., 2017; Marano et al., 2017; Moore, Bell, Filatotchev, & Rasheed, 2012). Meanwhile, firms from developed countries enjoy an 'a priori' legitimation because stakeholders tend to link the firm to the characteristics of its home country.

Previous literature on international firms has analyzed the role of the home country via two methodological approaches. Traditionally, analyses of international firms from developed countries have highlighted the influence of strong home country institutional pressure to reinforce the environmental approaches of an international firm (Buysse & Verbeke, 2003; Chrismann, 2004;

Kolk & Fortanier, 2013). More recently, a growing number of works have shown that firms from emerging countries require an extra effort to enter developed countries (Cuervo-Cazurra, Inkpen, Musacchio, & Ramaswamy, 2014; Luo & Tung, 2007; Wang, Luo, Lu, Sun, & Maksimov, 2013). In this paper, our interest is in how the home country can moderate (i.e., reinforce or weaken) the effects of a firm's globalization on its environmental approach. Such an analysis will help distinguish between the effect of a firm's liability of foreignness and liability of origin in a context of growing globalization. It will be achieved by simultaneously analyzing firms from multiple home countries and focusing on their levels of internationalization in different regions. We will first analyze the moderating effects of a home country on the relationship between a firm's globalization and environmental disclosure, before later examining environmental performance.

Our analysis of the relationship between a firm's globalization (interregional internationalization) and environmental disclosure concluded that disclosure is a consequence of a global firm's interest in reinforcing its legitimacy (see hypothesis 1a). We now extend this analysis by proposing that we might expect differences in that relationship depending on the level of institutional development of the home country. A firm from a home country with a poor level of institutional development must reinforce its legitimacy to a greater extent than a counterpart from a country with a strong degree of institutional development when operating in an international context. Stakeholders in developed countries consider environmental matters essential, while tending to perceive that local agents in less developed economies view such questions as less significant (Becker & Henderson, 2000). Nevertheless, although stakeholders in less developed regions may be generally less interested in environmental issues, they are likely to pay extra attention to the environmental credibility of international firms operating in their countries. In particular, they will probably be more worried about environmental issues where the firm comes from a traditionally less reliable and more relaxed context (Browne & Nuttle, 2013).

Therefore, when international operations outside of their home regions increase, firms from emerging and developing countries will become more attentive to transparency regarding their social and environmental operations in order to alleviate the growing scrutiny of foreign stakeholders, who have negative perceptions derived from liabilities of origin (Meyskens & Paul, 2010; Tashman et al., 2019). Although firms from developed countries will increase their environmental disclosure with greater globalization, the pace of improvement will be less intense relative to firms from emerging countries.

In conclusion, firms from home countries with institutional voids must attenuate their legitimacy deficit owing to the negative perceptions of foreign stakeholders from more developed economies. For these reasons, we expect interregional internationalization and environmental disclosure to be more positively associated in firms from home countries with weaker institutions than firms from home countries with stronger institutions, because these firms are generally more exposed to attributions of irresponsibility. Thus, we propose the following hypothesis:

H2a. A lower level of institutional development in a firm's home country reinforces the positive relationship between the firm's level of interregional internationalization and environmental disclosure. A higher level of institutional development in a firm's home country reduces this relationship.

We will now analyze how a firm's home country may affect the negative relationship between a firm's globalization and environmental performance. It is important to highlight that "trade-offs between symbolic environmental commitment and real environmental compliance" exist among firms (Martín-de Castro, Amores-Salvadó, Navas-López, & Balarezo-Nuñez, 2017, p. 665). We expect different interests among global firms in making progress in terms of environmental performance contingent on their home countries' institutional development.
On the one hand, given that a firm from an emerging market faces greater scrutiny when operating globally than a firm from a developed country (Fiaschi et al., 2017), it faces additional pressures and incentives to improve its operations and reduce the risks of a negative situation by ensuring that its actions align with what it reports. In other words, for less developed countries' firms to gain legitimacy abroad, it is not sufficient to be transparent and to voluntarily disclose environmental information: good environmental performance must follow.

It is also necessary to recognize that learning opportunities for firms from countries with varied levels of institutional development differ when operating in a global context. Emerging and developing countries' firms must develop the capacity to survive and thrive in their less developed home markets, which can "turn into an advantage for those firms that can deploy the knowledge accumulated when internationalizing" (Cuervo-Cazurra, Ciravegna, Melgarejo, & Lopez, 2018, p. 212). These mechanisms developed by emerging and developing countries' firms at home can help them improve their capacity to compete with firms from more institutionally developed countries when facing more complex contexts with higher standards. Thus, developing and emerging countries' firms may enhance their reputation and achieve legitimacy by increasing their social or environmental performance to demonstrate compliance with accepted global standards (Marano & Kostova, 2015; Zyglidopoulos, Williamson, & Symeou, 2016).

On the other hand, firms from more developed home countries most likely operate with good environmental standards even without operating internationally, and may have fewer technical opportunities to improve their environmental performance when expanding to less developed regions. Furthermore, they may have fewer incentives to keep improving their environmental performance in less advanced markets, and possibly even enjoy the protection of their home country's reputation, enabling them to hide their environmental issues under less stringent monitoring schemes rather than learning how to improve their environmental performance when going global.

In general, less institutionally developed economies demand less from firms in terms of environmental performance. More pervasive institutional voids at home are associated with weaker

environmental protection and feeble enforcement against environmentally irresponsible behavior (Tashman et al., 2019). As firms expand beyond their national borders and the number of regulators and other stakeholders increase, they must adhere to new rules and expectations.
Hence, in order to overcome liabilities of foreignness and origin, firms from less developed countries may decide to reinforce their environmental performance as a consequence of operating internationally. They have strong incentives to keep boosting their environmental legitimacy as their global operations develop, and face considerable hazards in not doing so. At the same time, firms from more advanced countries may actually reduce their environmental performance through operating in contexts with less stringent monitoring, while enjoying the partial protection of the legitimacy accorded by their home market. It is interesting that global firms from emerging countries may have incentives to operate beyond regulations in advanced economies. Simply complying with the host country's legislation regarding environmental performance may be insufficient to free firms from their liabilities of origin, as negative perceptions and stereotypes follow firms wherever they go. Our hypothesis is:

H2b. A higher level of institutional development of a firm's home country increases the negative relationship between the firm's level of interregional internationalization and environmental performance. A lower level of institutional development of a firm's home country reduces this negative relationship.

3.4. METHODOLOGY

3.4.1 Data and sample

The sample used for the analysis comprises a number of publicly traded firms in the energy and utility sectors. Using the Thomson Reuters Eikon database, which collects comprehensive information on firms' operating behavior, environmental management and financial performance, we built a longitudinal data set with data for 292 firms in the period from 2011 to 2018. The energy sector provides an ideal context for our analysis of the relationships between firms' internationalization, home country institutional development and their environmental behavior for the following reasons. First, the production, transportation and sale of energy products is known to be responsible for the majority of global greenhouse gas emissions, primarily due to the burning of fossil fuels (Moorhead & Nixon, 2015). According to the International Energy Agency (an OECD organization), in 2016 the energy sector produced 46.4% of the global CO2 emissions derived from fuel combustion (IEA, 2018). Second, the very international nature of the firms in this industry and the global trend toward cleaner energy production are being accompanied by growing improvements in some firms' environmental performance when they expand their operations out of their home region, while others seek new business opportunities abroad in order to escape this trend and the concomitant regulatory pressure. Analyzing this industry provides us with the opportunity to examine the implications of these heterogenous approaches. Third, given the shift

in the focus of global growth and pollution towards emerging countries and the increased importance of small developing countries in the international energy sector (Cumming, Hou & Lee, 2016), it is interesting to study how the institutional development of the energy firms' home countries and the host countries in which they operate can play an increasingly determinant role in their environmental behavior.

The final sample was determined via the following steps. First, we compiled a set of 4,112 firms in the energy and energy-related utilities sectors according to the Thomson Reuters Business Classification. Second, we excluded those firms that did not present environmental or financial information for any of the years considered in this study. We then proceeded to analyze the firms in the sample individually in order to remove those firms without the information required to build the internationalization variables. After lagging all explanatory variables by one year, we obtained a final longitudinal data set of 1,484 firm-year observations.

Table 3.1 provides a breakdown of the sample by sub-industry and home region. The sub-industries with the highest representation include oil & gas exploration and production (18.84%), oil related services and equipment (17.47%), and oil & gas refining and marketing (14.04%). The majority of the firms are originally from North America (36.30%) or Eastern Asia (11.99%), while Northern and Southern Europe represent 15.41% of the sample.

Table 3.1. Sample firms by sub-industry and home region.

		Firm home region													**Total**
		AAs	CAs	EAs	EE	LAm	Mel	NAm	NE	SEA	SAf	SAs	SE	WAs	WE	
Firm sub-industry	Coal	5	0	5	2	0	0	5	0	6	2	0	0	0	1	26
	Electric utilities	4	0	5	4	4	0	8	3	0	0	1	6	0	2	37
	Independent power producers	0	0	2	0	2	0	5	0	2	0	0	1	0	0	12
	Integrated oil & gas	1	0	1	7	3	0	2	1	0	0	0	1	0	2	18
	Multiline utilities	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3
	Natural gas utilities	0	0	4	0	1	0	3	0	0	0	0	1	0	0	9
	Oil & gas drilling	0	0	1	0	0	0	8	2	0	0	0	0	0	1	12
	Oil & gas exploration and production	13	1	3	1	2	1	23	8	1	0	1	0	0	1	55
	Oil & gas refining and marketing	0	0	10	2	4	0	13	3	2	0	1	3	1	2	41
	Oil & gas transportation services	0	0	0	1	0	0	7	0	0	0	0	1	0	0	9
	Oil related services and equipment	3	0	1	0	0	0	25	7	4	0	0	3	0	8	51
	Renewable energy equipment & services	1	0	3	0	0	0	1	4	0	0	1	1	0	2	13
	Renewable fuels	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
	Uranium	2	0	0	0	0	0	2	0	0	0	0	0	0	0	4
Total		29	1	35	17	16	1	106	28	16	2	4	17	1	19	292

AAs: Australasia, **CAs**: Central Asia, **EAs**: Eastern Asia, **EE**: Eastern Europe, **LAm**: Latin America, **Mel**: Melanesia, **NAm**: Northern America, **NE**: Northern Europe, **SEA**: Southeastern Asia, **SAf**: Southern Africa, **SAs**: Southern Asia, **SE:** Southern Europe, **WAs**: Western Asia, **WE**: Western Europe

3.4.2 Measures

Dependent variables. Our first dependent variable, *environmental disclosure,* was operationalized using a set of 23 environmental issues on which firms may or may not report. Based on data

provided by the Thomson Reuters Eikon database, we constructed a measure of environmental disclosure by computing the ratio of items reported to the total number of environmental matters considered. We measured whether a firm reported on each of the 23 environmental issues with binary items ('0' if the firm did not report on a specific environmental issue, '1' if it did). Our approach followed the method used by previous literature to measure corporate social responsibility disclosure (e.g., Hwan and Ioannou, 2016; Marano et al., 2017). Appendix 3A presents the 23 environmental issues considered in order to build this variable.

Our second dependent variable, *environmental performance,* can be defined as "the environmental impact that the enterprise's activity has on the natural milieu" (Claver, López, Molina & Tari, 2007: p. 606). We measured it using the Thomson Reuters Environmental Social and Governance Emissions Score (TRESG emission score) as a proxy. This comprehensive measure developed by Thomson Reuters evaluates how firms fare in comparison with their peers in terms of their commitment to addressing key global corporate environmental issues. According to Thomson Reuters, their proprietary emission score "measures a company's commitment and effectiveness towards reducing environmental emissions in the production and operational processes" (Thomson Reuters ESG Score Methodology, 2019, p. 16). The measure is calculated using percentile rank scoring and therefore ranges from 0 to 100 depending on how firms compare to their peers when measuring a number of environmental metrics that cover the spectrum of key environmental concerns, including estimated equivalent CO_2 emissions, environmental management certifications, and environmental investment initiatives. The variables developed by Thomson Reuters on environmental issues are widely accepted and have been used in prior studies (e.g., Duque-Grisales & Aguilera-Caracuel, 2019; Gómez-Bolaños et al., 2019; Semenova & Hassel, 2015).

Independent variable. *Interregional internationalization* represents the percentage of sales of firms outside their home regions. We considered five regions (Africa, Americas, Asia, Europe, and Oceania) to determine the out-of-region sales due to limitations in the available data, as firms group their sales in different regions that do not enable them to be broken down further into smaller sub-regions. Given that many studies in international business have used the ratio of foreign sales to total sales as a measure of internationalization (e.g., Tashman et al., 2019), and with a regional classification in line with Qian, Khoury, Peng, and Qian (2010) and Wiersema and Bowen (2008), we measured interregional internationalization as the percentage of total sales from outside the home region.

Moderating variable. As a moderating variable, we considered *home country institutional development,* which we anticipated would moderate the relationship between firms' interregional internationalization and their environmental disclosure and performance. We used publicly available data from the World Bank to construct a measure for this variable. The Worldwide Governance Indicators (WGI) evaluate six aggregated indicators of control of corruption, government effectiveness, political stability, rule of law, regulatory quality, and voice and

accountability on a scale of -2.5 (indicating poor governance) to 2.5 (indicating good governance). Following the work of other authors (e.g., Globerman & Shapiro, 2003; Marano et al., 2017; Tashman et al., 2019), we used principal component analysis in order to build a construct that would allow us to measure countries' levels of institutional development with a single value.

Control variables. We included *firm size* as a control variable, as previous studies have found it to be related to a firm's environmental behavior (e.g., Aragón-Correa, 1998). We measured firm size using the natural logarithm of total annual sales. *Profitability* was also included in the model because better financial performance has been previously linked to environmental matters (e.g., Gallego-Alvarez et al., 2017). We used return on assets (ROA) as a proxy for profitability. To control for possible sub-industry effects, we included the *industry* variable, computed as 13 dummy variables for the 14 sub-industries presented in Table 3.2. We controlled for firms' *home regions* while also considering the 14 sub-regions presented in the table. We operationalized this variable using 13 dummy variables to represent the different regions.

Table 3.2. Components of the sub-industry and home region variables.

Sub-industries	Regions
Coal	Australasia
Electric Utilities	Central Asia
Independent Power Producers	Eastern Asia
Integrated Oil & Gas	Eastern Europe
Multiline Utilities	Latin America
Natural Gas Utilities	Melanesia
Oil & Gas Drilling	Northern America
Oil & Gas Exploration and Production	Northern Europe
Oil & Gas Refining and Marketing	Southeastern Asia
Oil & Gas Transportation Services	Southern Africa
Oil Related Services and Equipment	Southern Asia
Renewable Energy Equipment & Services	Southern Europe
Renewable Fuels	Western Asia
Uranium	Western Europe

3.5. RESULTS

We selected random-effects GLS regression with clustered robust standard errors to analyze our data. This technique was suited to our purposes because it has frequently been used to analyze longitudinal data with many cross sections and few time periods (Tashman et al., 2019). We chose random effects over fixed effects because the latter do not work well with variables that have limited variance over time (Cameron & Trivedi, 2010). One of the key variables in our analysis, home country institutional development, did not change much during the period under analysis. Robust standard errors were used to avoid serial correlation and heteroskedasticity. We opted for robust standard errors clustered at the firm level because they offer more reliable results than non-clustered robust standard errors (Petersen, 2009). The results presented were obtained by analyzing

models in which all of the explanatory variables were lagged by one year in order to avoid reverse causality. The descriptive statistics of our variables are shown in Table 3.3.

Table 3.3. Descriptive statistics and correlations.

		1	2	3	4	5	6	7	8
1	Environmental disclosure	1							
2	Environmental performance	0.743***	1						
3	Interregional internationalization	-0.137***	-0.092***	1					
4	Home country institutional development	-0.126***	-0.125***	0.185***	1				
5	Firm size	0.523***	0.532***	-0.194***	-0.287***	1			
6	Profitability	0.144***	0.170***	-0.115***	-0.185***	0.408***	1		
7	Industry	-0.211***	-0.024	0.210***	0.276***	-0.101***	-0.049*	1	
8	Region	0.152***	0.228***	0.119***	0.058**	0.224***	0.137***	0.125***	1
Mean		0.214	56.035	0.343	1.146	21.613	0.006	7.054	6.667
Standard deviation		0.206	28.364	0.339	0.801	2.405	0.147	3.675	3.403
Min		0.000	0.200	0.000	-0.980	11.070	-1.640	1.000	1.000
Max		0.830	99.830	1.000	2.080	26.890	0.810	14.000	14.000

$^{\dagger}p<0.10$. $*p<0.05$. $**p<0.01$. $***p<0.001$.

We used six models to test our hypotheses. Model 0a tested the relationship between the control variables and environmental disclosure, while model 0b did the same with environmental performance.

Model 1 tested the influence of our independent variable (interregional internationalization) on the environmental disclosure of firms. Model 2 tested the influence of interregional sales on the environmental performance of firms. In Models 3 and 4, we tested for a moderating effect of firms' home country institutional development on the relationship between interregional internationalization and environmental disclosure (Model 3) and/or environmental performance (Model 4).

The regression results of our models are depicted in Table 3.4. Model 0a confirmed statistically significant relationships of the control variables of firm size (b=0.035, p=0.000) and profitability (b=-0.072, p=0.013) with environmental disclosure. Although firm size had the expected, positive effect, profitability was found to have a negative effect on environmental disclosure. In a similar way, firm size (b=3.790, p=0.000) and profitability (b=-9.003, p=0.024) were found to have a significant effect on our second dependent variable, environmental performance.

Table 3.4. Regression results.

	Model 0a		Model 0b		Model I		Model II		Model III		Model IV	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Interregional internationalization					0.090***	0.019	0.277	2.716	0.181***	0.036	6.590	4.603
Firm size	0.035***	0.003	3.790***	0.550	0.041***	0.004	2.905***	0.553	0.042***	0.004	2.933***	0.555
Profitability	-0.072*	0.029	-9.003*	3.983	-0.053†	0.029	-9.447**	3.234	-0.052†	0.030	-8.990**	3.248
Industry effects	Included		Included		Included		Included		Included		Included	
Region effects	Included		Included		Included		Included		Included		Included	
Home country institutional development									0.071***	0.016	3.230	2.602
Interregional internationalization x home country institutional development									-0.070**	0.023	-5.177†	3.043
Constant	-0.540***	0.069	-30.076**	-2.67	-0.715†	0.076	-12.936	11.768	-0.831***		-16.693	12.595
R^2	0.363		0.303		0.435		0.347		0.457		0.357	

†p<0.10. *p<0.05. **p<0.01. ***p<0.001. S.E. (Standard Error)

Hypothesis 1a predicted a direct, positive relationship between a firm's level of sales outside its home region and its environmental disclosure. Model 1 revealed a positive, statistically significant relationship between interregional internationalization and the environmental disclosure of firms (p=0.000), thus confirming Hypothesis 1a. Firms with a higher level of sales outside their home region were found to disclose more environmental information than firms with a lower level of interregional sales. Firm size and profitability were found to have a statistically significant effect on firms' environmental disclosure (b=0.041, p<0.001 and b=-0.053, p<0.100, respectively).

Hypothesis 1b predicted a direct, negative relationship between a firm's interregional internationalization and its environmental performance. The coefficient of interregional internationalization was not significant in Model 2, and so Hypothesis 1b was not confirmed. We suspect that this might owe to differences in the home countries, which is why we tested the moderating effect of home country institutional development in Model 4. The control variables were statistically significant at the p<0.001 (firm size, b=2.905) and p<0.01 (profitability, b=-9.447) levels.

Model 3 provided statistical evidence (p=0.002) to confirm Hypothesis 2a, which predicted that firms' home country institutional development would have a negative moderating effect on the relationship between interregional internationalization and environmental disclosure.

Hypothesis 2b predicted that firms' home country institutional development would have a negative moderating effect on the relationship between interregional internationalization and environmental

performance. Although the direct relationship between out-of-region internationalization and environmental performance was not significant, Model 4 revealed that home country institutional development had a negative, statistically significant (p=0.089) moderating effect on the relationship.

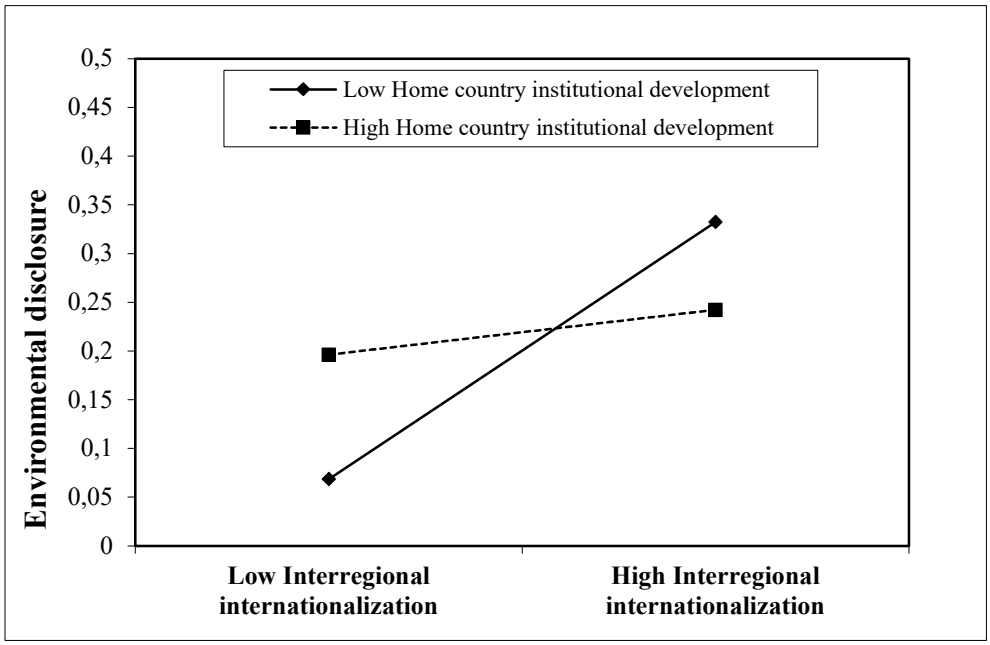

Figure 3.1. Interaction of home country institutional development on the relationship between interregional internationalization and environmental disclosure.

These results provide interesting insights concerning how firms from developed and developing countries can achieve legitimacy in their international operating environments. Firms from countries with a lower level of institutional development were found to increase their environmental disclosure when expanding their operations outside their home region to a greater extent than firms from countries with a higher degree of institutional development. In fact, at higher levels of interregional internationalization, firms from less developed countries were found to exceed the disclosure levels of developed country firms (see Figure 3.1).

In line with previous work, the confirmation of Hypothesis 2a may indicate that firms from emerging and developing countries endeavor to overcome the negative perceptions that liabilities of origin create in the eyes of stakeholders from outside their home region by increasing their transparency in environmental matters (Tashman et al., 2019).

The analysis of the results of the negative, significant moderation presented in Hypothesis 2b points to interesting conclusions. The interaction graph is presented in Figure 3.2. The environmental performance of firms with poor home country institutional development increased considerably with interregional internationalization. As firms from developing and emerging countries expand

their operations outside their region, they are likely to face stronger regulatory frameworks and stakeholder pressures that compel them to increase their environmental performance.

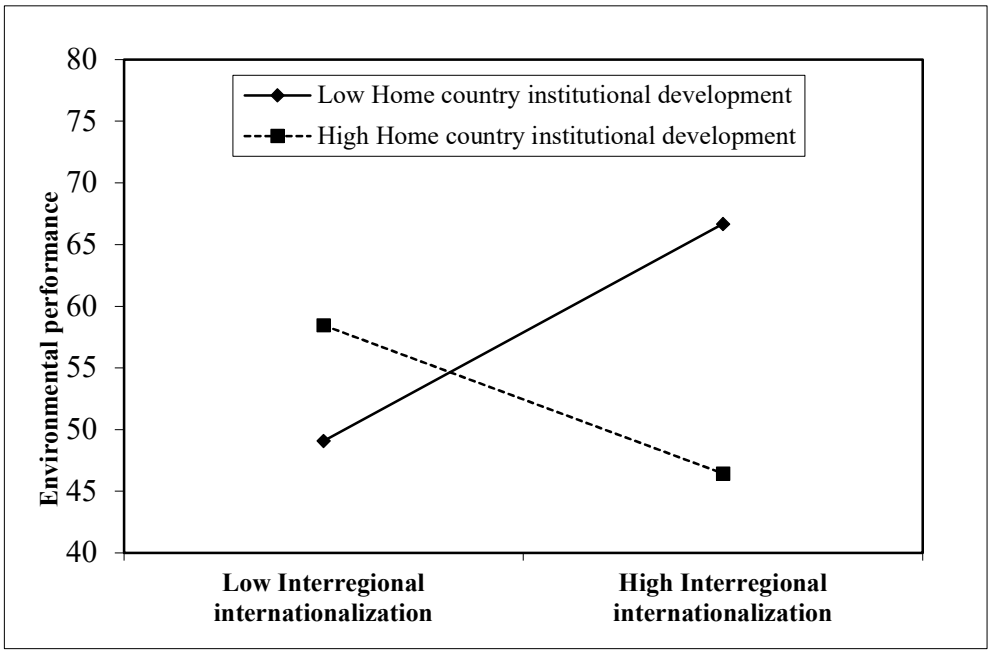

Figure 3.2. Interaction of home country institutional development on the relationship between interregional internationalization and environmental performance.

On the other hand, the environmental performance of firms from developed countries decreases as they grow their business outside their region. This finding would, at first sight, support the pollution haven hypothesis. However, when the host country or region has a poor level of development, it simply may not be possible to implement the environmental standards that firms from developed regions have in place in their headquarters, as the prerequisite resources are not available.

3.6. DISCUSSION

Based on the premise of the relevance of legitimation for obtaining a 'license to operate' in international contexts, this study has examined how global firms respond to institutional concerns regarding the natural environment as an effective means of increasing their legitimacy in an international context (Babiak & Trendafilova, 2011; Bansal & Roth, 2000). Our interest in global firms encouraged us to pay special attention to the potential influence on the environmental approach of operating in very different regional contexts, because the liability of foreignness increases when a firm's internationalization is focused outside of its international home region (Asmussen & Goerzen, 2013; Rugman & Oh, 2013).

Our findings provide evidence that a firm's greater globalization (interregional internationalization) will generate a strong incentive for it to increase its legitimacy by reinforcing

its environmental disclosure. A stronger liability of foreignness and exposure to a wider range of stakeholders, global norms and global legitimating actors will reinforce the incentives associated with using this visible, easy, and effective way of demonstrating interest in environmental matters. In general, increasing voluntary environmental disclosure may be an effective way to manage and maintain legitimacy in institutionally distant host countries, and to avoid any negative spillover to another country as a consequence of legitimacy problems elsewhere.

We did not find support for our second hypothesis: that a higher degree of interregional internationalization would be negatively related to environmental performance. Early studies in the US manufacturing sector (Kennelly & Lewis, 2002), a mix of the chemical, food and textile industries in Belgium (Buysse & Verbeke, 2003) and Chinese firms form various sectors (Christmann & Taylor, 2001) have found a positive link between a firm's level of internationalization and its environmental performance. Other, more recent studies looking at global firms from multiple industries have found that international firms may act more irresponsibly in terms of their environmental behavior (Aragón-Correa et al., 2016) or may act responsibly and irresponsibly at the same time (Strike et al., 2006). Our analysis of the moderating effect of home country institutional development confirms the importance of a more fine-grained analysis on the nature of this relationship.

The results regarding the moderating influence of the liabilities of the home country help us understand the limited significance of the direct effect. The moderating regression analysis revealed that the sign of the relationship between globalization and environmental performance would change based on the home country's institutional situation. In this context, a statistically limited value on the direct relationship highlights the importance of separating the analysis.

Importantly, our paper notes the strong and significant relevance of the liabilities of home to the influence of globalization on environmental approaches. Specifically, a global firm from an institutionally weak home country must reinforce its legitimacy by disclosing its environmental information and improving its environmental performance to a greater extent than an international firm from a country with a strong institutional basis. Thus, firms from less developed countries must make additional efforts to attenuate their legitimacy deficit due to the liability of origin. Indeed, our results suggest that global firms originally from emerging countries may seek legitimacy by increasing their environmental disclosure and environmental performance in order to demonstrate their compliance with accepted stringent standards as their global operations grow. It is particularly interesting to learn that the global firms from developed countries sampled presented a diminishing level of environmental performance (i.e., more pollution and environmental impacts) with increased globalization. However, global firms from emerging countries improved their environmental performance in similar situations. For instance, a firm from Canada that has operations primarily in North America (its home region) displayed better environmental performance in comparison with a firm that has a more global footprint (a higher level of interregional internationalization). When comparing two energy firms from Russia (an

emerging country), we observed that the firm with a more home region focused internationalization strategy showed lower levels of environmental performance than the second firm, a multinational with a higher level of its operations outside the home region.

Our study contributes to research on the country-of-origin and global strategy effects on legitimation strategies in terms of the global context and environmental approaches. First, it contributes to the research on environmental approaches as legitimation strategies in an international context by offering a novel approach to clarify the debate regarding the implications of firms adopting a global strategy. Our findings build on the growing body of research concerning the practical implications of environmental progress among international firms (e.g., Aragon-Correa et al., 2016; Babiak & Trendafilova, 2011; Christmann, 2004; Delmas & Montes-Sancho, 2011). Second, our work extends previous research by showing that the level of a home country's institutional development can influence the relationship between international firms' global strategy and environmental disclosure and performance. While some previous literature has analyzed the implications of internationalization on the social and environmental issues of firms from developing or emerging countries (e.g., Fiaschi et al., 2017; Marano et al., 2017; Tashman et al., 2019), this paper offers a unique analysis of firms from developed and developing home countries in relation to the environmental approach. Third, our work also addresses recent calls to study why firms engage in corporate social responsibility decoupling and greenwashing, including advanced economy firms (e.g., Tashman et al., 2019).

For managers, these findings point to the importance of using environmental issues to achieve legitimacy in international contexts. Managers of global firms face significant challenges of legitimacy when entering other regions. They must ensure that their firms exhibit an embedded approach and earn the trust of local agents. Although the debate has traditionally focused on the real implications of processes to gain legitimacy when entering international markets, our results demonstrate that the urgency of and interest in increasing environmental performance and disclosure after going global are rather dependent on the previous status of the firm. It is particularly clear in our results that the executives of firms from developed countries enjoy an extra degree of credibility when making their environmental approaches, and their environmental impacts can remain under the radar, whereas those from emerging countries are required to make an extra effort, not only providing additional environmental information but also improving environmental performance.

Despite its contributions, our analysis is subject to some limitations. In particular, we analyzed a single industry, and so although our conclusions may offer interesting contributions to the literature and provide us with opportunities to compare similar firms, the results may not be generalizable to other sectors. Furthermore, the use of the Thomson Reuters Emission Score as a proxy for environmental performance presents some limitations, because even though it "measures a company's commitment and effectiveness towards reducing environmental emissions in the production and operational processes" (Thomson Reuters, 2019, p. 16) and is therefore appropriate

for our analyses, it is not possible to customize its components. Hence, different proxies of environmental performance might provide a different perspective of the situation in certain firms.

Future studies could analyze different industries and identify various measures for a firm's progress in terms of environmental performance. It is also necessary to attend to how micro-institutional factors may generate effects in terms of firms' environmental approaches. A micro-institutional perspective may complement our general approach by analyzing how regional institutional contexts can affect firms differently depending on company-specific factors, such as managers' background or the structure of the board. We believe that future research concerning the intersections between the reactions of different governance agents to the globalization process will also help develop a greater understanding of the environmental reactions of international firms.

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APPENDIX 3A. Details of environmental disclosure variable

Table 3A.1. Breakdown of items used for measuring the variable "Environmental disclosure"

Title	Description
Biodiversity Impact Reduction	Does the company report on its impact on biodiversity or on activities to reduce its impact on the native ecosystems and species, as well as the biodiversity of protected and sensitive areas?
Emissions Trading	Does the company report on its participation in any emissions trading initiative?
NOx and Sox Emissions Reduction	Does the company report on initiatives to reduce, reuse, recycle, substitute, or phase out SOx (sulfur oxides) or NOx (nitrogen oxides) emissions?
VOC or Particulate Matter Emissions Reduction	Does the company report on initiatives to reduce, substitute, or phase out volatile organic compounds (VOC) or particulate matter less than ten microns in diameter (PM10)?
VOC Emissions Reduction	Does the company report on initiatives to reduce, substitute, or phase out volatile organic compounds (VOC)?
Particulate Matter Emissions Reduction	Does the company report on initiatives to reduce, substitute, or phase out particulate matter less than ten microns in diameter (PM10)?
Waste Reduction Initiatives	Does the company report on initiatives to recycle, reduce, reuse, substitute, treat or phase out total waste?
e-Waste Reduction	Does the company report on initiatives to recycle, reduce, reuse, substitute, treat or phase out e-waste?
Environmental Restoration Initiatives	Does the company report or provide information on company-generated initiatives to restore the environment?
Staff Transportation Impact Reduction	Does the company report on initiatives to reduce the environmental impact of transportation used for its staff?
Environmental Expenditures Investments	Does the company report on its environmental expenditures or does the company report to make proactive environmental investments to reduce future risks or increase future opportunities?
Environmental Partnerships	Does the company report on partnerships or initiatives with specialized NGOs, industry organizations, governmental or supra-governmental organizations, which are focused on improving environmental issues?
Toxic Chemicals Reduction	Does the company report on initiatives to reduce, reuse, substitute or phase out toxic chemicals or substances?

Green Buildings	Does the company report about environmentally friendly or green sites or offices?
Environmental Supply Chain Partnership Termination	Does the company report or show to be ready to end a partnership with a sourcing partner, if environmental criteria are not met?
Land Environmental Impact Reduction	Does the company report on initiatives to reduce the environmental impact on land owned, leased or managed for production activities or extractive use?
Environmental Products	Does the company report on at least one product line or service that is designed to have positive effects on the environment or which is environmentally labeled and marketed?
Eco-Design Products	Does the company report on specific products which are designed for reuse, recycling or the reduction of environmental impacts?
Environmental Assets Under Management	Does the company report on assets under management which employ environmental screening criteria or environmental factors in the investment selection process?
Organic Products Initiatives	Does the company report or show initiatives to produce or promote organic food or other products?
Product Impact Minimization	Does the company reports about take-back procedures and recycling programmes to reduce the potential risks of products entering the environment or does the company report about product features or services that will promote responsible and environmentally preferable use?
Take-back and Recycling Initiatives	Does the company reports about take-back procedures and recycling programs to reduce the potential risks of products entering the environment?
Product Environmental Responsible Use	Does the company report about product features and applications or services that will promote responsible, efficient, cost-effective and environmentally preferable use?

3. GLOBAL FIRMS AND THEIR SYMBOLIC VERSUS EFFECTIVE OPERATIONS

4. The impact of home and host country institutional development on multinationals' R&D intensity

4 THE IMPACT OF HOME AND HOST COUNTRY INSTITUTIONAL DEVELOPMENT ON MULTINATIONALS' R&D INTENSITY

4.1. ABSTRACT

This empirical article examines how the institutional development of the home country and host countries in which multinational enterprises (MNEs) are embedded can drive MNEs' research and development (R&D) intensity. In doing so, this study analyzes 967 firm-year observations of 234 pharmaceutical firms from 30 developed and less developed countries in the period from 2010 to 2017. We find empirical support for internationalization toward developed countries as a driver of R&D intensity at the firm level. Furthermore, we find that this positive effect is stronger for MNEs from less institutionally developed home countries. The results can help managers, researchers, and policymakers to better understand the innovation process in R&D-intensive industries.

4.2. INTRODUCTION

Globalization has transformed multinational enterprises (MNEs) into stateless actors disconnected from specific countries in a world without borders (Amankwah-Amoah & Debrah, 2017). While negative attitudes toward globalization have increased in the past years, globalization has brought about "global learning, and the rapid spread of ideas across borders from the transfer of individuals and technologies" (Cuervo-Cazurra et al., 2020, p. 4). As such, today's MNEs conduct a large portion of their research and development (R&D) activities outside their home country. Foreign activities enable firms to access knowledge resources that would be more difficult to obtain if a firm developed its activity exclusively in its domestic market (Almeida & Kogut, 1999; Bartlett & Ghoshal, 1989; Nachum & Zaheer, 2005). The international business literature recognizes that firms' internationalization enables the reinforcement of their existing core competences, access to substantial growth opportunities in foreign countries, and the gain of unique knowledge (e.g., Hitt et al., 1997, 2006; Salomon & Shaver, 2005), which, in turn, fosters the international firms' innovativeness (e.g., Castellani et al., 2017; Zahra et al., 2000). For example, in the context of multinational pharma companies, McKinsey and Company (2017) highlighted how MNEs with global operations across emerging countries can benefit from the interchange of ideas across mature and emerging markets. However, the international business literature has suggested that MNEs are deeply embedded in the national configurations of institutions because individual countries remain distinctive despite pressures to converge (Dodgson, 2018). In this vein, there is an ongoing debate about the extent to which the innovation of MNEs is a reflection of the characteristics of the institutional environments in which they are embedded (e.g., Hernandez & Guillén, 2018; Zhou & Guillén, 2015).

Hence, considering that countries differ one from another on their institutional profile, in this study we provide advances to understand how the institutional development of home and host countries affects the R&D intensity of MNEs. We propose that MNEs with a higher internationalization toward developed countries show higher levels of R&D intensity due to the stricter market requirements and increased learning opportunities. Developed countries offer access to more sophisticated knowledge and technologies, as well as networking and cooperation opportunities with local knowledge-intensive firms, universities and research facilities (Yoo, & Reimann, 2017). Furthermore, developed countries generally present better intellectual property rights protection systems, legal systems and environmental protection systems (Wu & Park, 2019), which allow MNEs to protect their self-developed and acquired knowledge-based assets. Additionally, we suggest that this relationship is strengthened for MNEs from less institutionally developed countries. Specifically, we argue that MNEs from institutionally weak countries respond to the institutional characteristics of host developed countries through a higher level of R&D intensity. MNEs from less developed countries have an uncertainty management capability that allows them to be more flexible, adapt better to different political systems and conditions of foreign countries, and recognize more easily new opportunities, thus making it more likely for them to achieve the full potential of ambidexterity in international expansion (Luo & Rui, 2009). When these firms expand their international operations in developed countries, they recognize that they are operating in more efficient and transparent institutional environments where they can generate new knowledge and improve their competitive advantages (Wu & Wu, 2014; Witt & Lewin, 2007). Furthermore, MNEs from less developed countries may seek to align themselves with the international context because global stakeholders promote "guidelines and expectations for MNE behavior on a worldwide basis" (Kostova, Roth & Dacin, 2008: 998).

We conduct our analysis in the context of the pharmaceutical industry. Drawing on the institutional perspective, our hypotheses are tested on a longitudinal dataset of 967 firm-year observations of 234 MNEs from 30 countries in the period from 2010 to 2017. Some works have stressed the role of internationalization in the current innovation challenges of R&D-intensive sectors, such as the pharmaceutical industry (e.g., Gassmann, Schuhmacher, von Zedtwitz & Reepmeyer, 2018; Kiriyama, 2011; Thakur-Wernz & Samant, 2019). The OECD study by Kiriyama (2011: 5) noted that "revenues from global sales have provided incentives and funds for R&D investment for future innovation. Global sales of pharmaceutical products, in turn, mean global diffusion of advanced medical technology and … improved health, an essential basis for future growth and innovative capacity". Thus, given that the pharmaceutical industry is R&D-intensive and increasingly global, our sample provides an excellent context in which to assess the goals of this study. Our focus on the pharmaceutical industry makes our results especially relevant, since it is a global strategic sector with the highest R&D intensity, investing up to 40% of its gross value added in R&D in Japan and the United States (OECD, 2018). In the global pharmaceutical value chain, leading firms directly devise their innovation development plans and rarely delegate this important activity to independent global suppliers (Buciuni & Pisano, 2021). On the other hand, the importance of some emerging countries, such as India and China, is becoming more relevant in the pharmaceutical

context. For instance, Chinese pharmaceutical firms have gradually increased their R&D intensity over the past decade. However, in these emerging countries, R&D investments are still quite low compared to developed country firms (X. Chen et al., 2019).

In this article, we advance the stream of internationalization-innovation research by testing a model to explain how the institutional development of home and host countries affects the R&D intensity of MNEs. We contribute to the literature in several ways. First, based on the institutional perspective, we show that MNEs with a higher internationalization toward developed countries increase their levels of R&D intensity. Compared to existing research on the internationalization-innovation relationship (e.g., Castellani et al., 2017; Golovko & Valentini, 2011; Salomon & Shaver, 2005), this paper focuses on the level of development of host countries in which MNEs are internationalizing. Our article allows us to analyze whether internationalization toward developed countries influences R&D intensity, which is important considering the increasing importance of less developed markets as host countries for pharmaceutical MNEs. In this way, we highlight that when studying the relationship between internationalization and R&D intensity, it is important to consider not only the level of internationalization but also its orientation toward countries with certain characteristics. Second, we add a more integrative view of how the home country institutional development moderates the relationship between internationalization toward developed countries and R&D intensity, such that this relationship is more positive with lower levels of home country institutional development. This insight contributes to recent theorizing that regards MNEs from less developed countries as having strong incentives to improve their capabilities when they expand to more developed countries by providing empirical evidence of how the logic of these arguments also extends to innovation activities. So, MNEs' R&D intensity reflects the characteristics of all the countries in which they operate. Third, we also contribute empirically by analyzing a panel dataset (8 years) of 234 pharmaceutical MNEs from 30 developed and emerging countries and with 16,479 subsidiaries in 107 countries. Our sample of MNEs in the pharmaceutical industry from developed and less developed countries offers an interesting framework, because this industry has experienced a process of profound transformation. While OECD countries lead the statistics of health and medicine related clinical trials (with over 75% of the total) across the globe (OECD, 2018), some developing countries have emerged as pioneers in innovation and as testing sites for new business models and technologies. For instance, certain countries, such as China and India, might drive pipeline innovation, as witnessed in recent trials of oncology, hepatitis C, and diabetes (McKinsey & Company, 2017). Furthermore, the fact that our sample includes MNEs from both developed and less developed home countries is of special relevance because it allows us to analyze the influence of home country institutional development and to draw a wider generalization of our conclusions.

The rest of this paper is organized as follows. First, the related theoretical background and hypotheses are discussed. Second, the sample, measures and methods are presented. Third, the results are analyzed. Finally, the paper consolidates the findings and ends with the main conclusions, implications and avenues for future research.

4.3. THEORETICAL BACKGROUND

Institutional theory describes how each country is the sum of its institutions and how these institutions form the basis of societal structure, and guide behavior within the society (North, 1990). The legal, political, administrative and economic frameworks of the country are formal institutions, while societal norms, beliefs, traditions and codes of conduct are informal institutions (North, 1990; Scott, 1995). Wan and Hoskisson (2003) combine North's (1990) institutional view with a more traditional economic perspective on production factors in their concept of country institutional profile, which encompasses labor quality, infrastructure and natural resources. Countries have differing levels of institutional development, which can lead to specific advantages for firms and different challenges and opportunities for those companies that decide to internationalize toward these markets (e.g., Dunning & Lundan, 2008; Garrido, Gomez, Maicas, & Orcos, 2014; Meyer, Estrin, Bhaumik, & Peng, 2009).

On the other hand, according to institutional theory, there are differences in the way MNEs from different countries behave and make strategic decisions because the home institutional environment affects the options available to firms operating within them for formulating and implementing strategies, their behavior and performance (Meyer & Peng, 2016; Peng, 2002). Firms develop "particular resources at home to deal with characteristic conditions of the environment there and these resources are then used by the firm in its international expansion" (Cuervo-Cazurra, 2011: 384). Recent literature, focused on the particular case of emerging and developing country MNEs, has shown how the institutional voids of their home countries can be a comparative disadvantage but can also foster these firms' internationalization (e.g., Cuervo-Cazurra & Ramamurti, 2017; Luo & Tung, 2018; Wang & Ma, 2018). Firms from emerging countries may venture into more developed markets to escape the underdeveloped institutions at home (Cuervo-Cazurra & Ramamurti, 2017; Wang & Ma, 2018) and use international expansion to acquire critical capabilities available in more developed countries and to reduce their vulnerability to institutional voids at home (Luo & Tung, 2018). In addition, the home country's comparative disadvantages can also have a positive effect on creating new capabilities that can be leveraged internationally (Cuervo-Cazurra & Ramamurti, 2017).

Additionally, specifically in relation to innovation, Porter's (1990) seminal work on national competitiveness sees the innovativeness of firms and their consequent competitive success as a function of the characteristics of their home country. Developed countries often offer more sophisticated knowledge-based assets, better intellectual property rights and greater market requirements (e.g., Yoo, & Reimann, 2017; Wu & Park, 2019). The availability of financial and labor quality factors, the sophistication of knowledge and technology, the requirements of local buyers and the networking and cooperation with local universities and research facilities influences the innovativeness of a firm (e.g., Cuervo-Cazurra & Ramamurti, 2017; Rosenbusch, Gusenbauer, Hatak, Fink & Meyer, 2019; Wu & Park, 2019). Thus, opportunities and challenges in less developed home and host countries are systematically different from those in developed countries.

In the next section we discuss how the institutional development of the host countries in which MNEs operate may have an impact on these MNE's R&D intensity. Moreover, since MNEs' behavior and strategies can be conditioned by the home country, we analyze to what extent the relationship between internationalization toward developed countries and R&D intensity is moderated by the home country's level of institutional development.

4.3.1 Internationalization toward developed countries

MNEs through operating in foreign countries access more diverse resources and information sources, and can establish relationships with local businesses and research institutions, in order to better develop innovations and thus increase their profitability (e.g., Castellani et al., 2017; Kafouros, Buckley, Sharp & Wang, 2008; Villar, Pla-Barber, & Ghauri, 2020). Internationalization allows firms to gain access to knowledge and technologies that are not available in the home country, and this new learning enables firms to improve their products and processes (e.g., Hitt et al., 2006; Salomon & Shaver, 2005). For example, the internationalizing firm may learn from customer feedback and competing products and technologies used by foreign competitors, buyers and suppliers (Salomon & Shaver, 2005). Santos, Doz and Williamson (2004) showed that foreign countries also present opportunities for networking and cooperation with local universities and research facilities. The newly acquired knowledge can help a firm improve its products and processes to gain competitive advantages, and thus enhance its performance in both domestic and foreign markets. As the competitive global landscape requires firms to innovate in order to achieve and maintain competitive advantage (Hitt et al., 1997; Lu & Beamish, 2004), the greater market size attained through internationalization provides more resources for doing so (Tsao & Lien, 2013). Golovko and Valentini (2011) found that operating in foreign countries will generally expand the revenue base of a firm, and increased sales are likely to provide the firm with more resources to invest in innovation. Additionally, internationalization reduces the dependence on the home country for revenues and profits and increases demand from a foreign market, thus allowing the firm to commercialize its innovations to a broader audience and increase the returns on innovation (Alvarez & Robertson, 2004).

Thus, the literature agrees that the extent to which a firm's operations are conducted in foreign countries drives its level of innovation (e.g., Castellani et al., 2017; Cassiman & Golovko, 2011; Chittoor, Aulakh & Ray, 2015; Kafouros et al., 2008; Zahra et al., 2000). Internationalization serves as a "springboard" for acquiring innovative capabilities (Luo & Tung, 2007). However, since host countries have different institutional profiles, the influence of internationalization on R&D intensity can be different depending on the institutional development of countries in which these international operations take place. It is important to highlight that countries differ in per capita income, in their ability to produce knowledge, and in the extent to which they can leverage that knowledge by being connected to other countries (Furman, Porter & Stern, 2002). Operating in a certain country implies that firms are embedded in, and face the distinct challenges and

opportunities that derive from the country's institutional development (Dunning & Lundan, 2008; Meyer et al., 2009). Cuervo-Cazurra (2011: 383) argued that "the particular norms and institutions prevailing in the country" induce the internationalizing firm to develop specific resources to be able to interact with other players in the marketplace. The literature based on institutional theory has highlighted how innovation activities are influenced by regulations and laws, by more or less effective institutions which influence the agency problems among the decision makers and the financial resources available to firms (Choi, Yoshikawa, Zahra, & Han, 2014; Cuervo-Cazurra & Ramamurti, 2017) and, specifically, by the national innovation systems that condition knowledge spillovers in a country (Wu & Park, 2019). Thus, general institutional characteristics in the host country, such as government effectiveness, rule of law, regulatory quality, corruption, political stability and characteristics of innovation systems, such as university and research institutes and financial support for innovation, impact firms' innovation activities (Rosenbusch et al., 2019).

In general, developed countries, characterized by a higher level of institutional development, present stricter market requirements, which oblige firms that wish to operate in these markets to be more innovative to meet these higher demands. These countries also offer better access to knowledge and technologies and provide superior opportunities for networking and cooperation with local universities and research facilities (e.g., Yoo, & Reimann, 2017). Developed countries normally present more advanced intellectual property rights protection systems, legal systems and environmental protection systems than emerging countries (Wu & Park, 2019). In this regard, Piperopoulos, Wu, and Wang (2018) show that the host countries' level of institutional development positively moderates the relationship between internationalization and innovation activities. Developed countries provide non-native companies with more sophisticated knowledge and technologies, and offer more opportunities to foster network ties with knowledge-intensive firms and local universities and research facilities. When MNEs operate internationally in more developed institutional environments, they can concentrate on generating new knowledge and improving their competitive advantages (Li, Wei & Liu, 2010; Witt & Lewin 2007; Wu, Wang, Hong, Piperopoulos & Zhuo, 2016).

On the other hand, less developed countries offer "fewer opportunities for sourcing advanced knowledge and technologies because of their overall lower levels of economics and technological development" (Piperopoulos et al., 2018: 234). Although in developed countries MNEs may need to rethink their business models in order to succeed, these adaptations for less developed countries often do not require higher levels of R&D investment. For instance, price reductions or adding new functionalities may be necessary for success in less developed countries because the conditions under which products are used in less developed countries differ with respect to their use in developed countries (Ramamurti & Singh, 2009).

In conclusion, we propose that having a higher level of international operations in more institutionally developed countries may positively impact MNEs' R&D intensity. We argue that the greater market requirements in developed countries compel MNEs to be more innovative, thus

driving them to increase R&D intensity. Furthermore, a higher internationalization toward developed countries drives firms to foster investments in R&D with the objective of taking advantage of the opportunities that these markets offer in relation to better access to advanced knowledge and technologies and increased opportunities for networking and cooperating with local firms, high-quality universities and research facilities. We thus hypothesize that:

Hypothesis 1. A firm's internationalization toward developed countries is positively associated with its R&D intensity.

4.3.2 Institutional development of the home country

Building on the institutional perspective, various researchers have concluded that differences in firms' home country institutional environments have a significant impact on firm strategies (e.g., Cuervo-Cazurra, Ciravegna, Melgarejo & Lopez, 2018; Yan, Zhu, Fan & Kalfadellis, 2018; Wan & Hoskisson, 2003). MNEs from more institutionally developed countries are seen as more competitive due to the availability in their home country of specialized resources and skilled labor, the existence of related industries and the exchange of market and strategic information, external pressures from more demanding buyers, advanced management practices and increased competition among domestic firms (Cuervo-Cazurra & Ramamurti, 2017). Some researchers have noted that the existence of physical infrastructure, financial and capital resources, labor quality and political, legal and societal institutions, facilitates the development of innovations in countries with high institutional development (Rosenbusch et al., 2019). MNEs from countries with high institutional development face tougher competition, which requires continuous innovation and specialized expertise for them to remain successful. For instance, Furman et al. (2001) found that countries that encouraged competition and investments in technical universities increased their innovative capacity. Furthermore, in more institutionally developed economies, governments often promote R&D investments and innovation by granting subsidies or tax incentives, enforcing standards, and by promoting competition, antitrust laws and open trade (e.g., Carney, Estrin, Liang, & Shapiro, 2019). In particular, government financial support provides firms with resources to innovate and helps mitigate the risk of unsuccessful projects.

In contrast, less developed market firms often face challenges and increased transaction costs due to institutional voids, such as the lack of or improper functioning of institutions in the product, capital and labor markets (Cuervo-Cazurra & Ramamurti, 2017). They also often lack high-quality market intermediaries, such as brokers and accounting firms (Xie & Li, 2018). Furthermore, their competitiveness is weakened by political problems, such as instability and unpredictability, corruption and bureaucracy (Luo & Tung, 2007). In less developed countries, the lack of institutional support, such as shallow capital markets, shortages of skilled labor, weak legal enforcement, and a lack of independent financial intermediaries, seriously hinders a firm's innovation (Zhou, Gao & Zhao, 2017). As firms in less developed countries have to invest time

and resources in dealing with unpredictable and unstable governments, they are left with fewer resources for developing innovations (Wu, 2013). The innovations of less developed market firms are often fundamentally different from those of developed market firms. It has been argued that the institutional voids present in less developed countries and the lower per capita income of citizens drive innovations for inexpensive, portable and easy-to-use products (Govindarajan & Ramamurti, 2011). These products focus on solving some of the inherent problems of less developed countries, such as poor road infrastructure or the unreliable supply of electricity (Cuervo-Cazurra & Ramamurti, 2017). However, exposure to political risk and corruption in the home country drives less developed market firms to promote routines and strategic solutions that deal with their uncertain, unpredictable environments (Cuervo-Cazurra et al., 2018).

Some research based on less developed country MNEs has analyzed the internationalization and home country institutions as drivers as innovation (Chittoor, Aulakh & Ray, 2015; Wu et al.; 2016; Xie & Li ,2018). For instance, Chittoor et al. (2015) showed that the impact of internationalization on Indian firms' investment in innovation became stronger as the level of Indian institutional development increased as a consequence of the linkages with the global economy as well as the improvements of the free market mechanisms in the country. Xie and Li (2018) found that R&D and better-developed market intermediaries at home enhanced the positive effect of exporting on Chinese manufacturers' innovation, while market openness in the home region tended to diminish it. Wu and Park (2019) demonstrated for Chinese firms that internationalization provides learning opportunities for innovation performance but also incurs higher management costs to handle the information overload from extensive internationalization. As the springboard view posits, MNEs from emerging countries have strong incentives to learn and improve their capabilities and innovation when they expand to international markets but they also face challenges for growth in highly complex international environments as their internationalization grows greater. Wu et al. (2016) analyzed Chinese MNEs and showed that although host-country institutional development on average enhances innovation performance, such effects are more pronounced for firms with strong absorptive capacity and for those diversifying into a larger number of countries. In the same line, other research has noted that MNEs from weak institutional home countries may generate more innovation benefits than MNEs from developed countries when expanding their international operations into more institutionally developed countries (Cuervo-Cazurra, 2012; Rosenbusch et al., 2019). As emerging country firms often lack competitive internal R&D capabilities, they have been expanding rapidly to internationally and institutionally diverse markets to seek external ideas and upgrade their capabilities (Zhao, Liu, Andersson & Shenkar, 2021).

Hence, we propose that when MNEs from less developed home countries expand to the international markets they are more motivated than MNEs from developed home countries to increase their R&D intensity for several reasons. First, they perceive the institutional environment to be more efficient and transparent and one in which they can generate new knowledge and improve their competitive advantages (Wu & Wu, 2014; Witt & Lewin, 2007). Firms from less developed countries expand into more developed countries in order to benefit from their

institutional advantages and technological knowledge (Wu, 2013). They can "more easily recognize new opportunities in international markets that lead to successful expansion, growth, and performance advantages. Hence, they are more likely to achieve the full potential of ambidexterity in international expansion" (Luo & Rui, 2009: 52). Second, the uncertainty management capability developed by less developed country MNEs (e.g., Cuervo-Cazurra et al., 2018) allows them flexibility and better adaptation to different political systems and conditions of foreign countries, which can influence their decision to increase R&D intensity. Third, increasing R&D intensity may help these MNEs from less developed countries to distance themselves from their home country institutional voids. Developing country MNEs may seek to align themselves with the international context because global stakeholders promote "guidelines and expectations for MNE behavior on a worldwide basis" (Kostova et al., 2008: 998). Thus, we propose that the institutional development of the home country negatively moderates the positive relationship between the firm's internationalization toward developed countries and its R&D intensity, such that this relationship is more positive with lower levels of home country institutional development. We thus hypothesize that:

Hypothesis 2. The level of institutional development in a firm's home country weakens the positive relationship between the firm's internationalization toward developed countries and its level of R&D intensity.

4.4. METHODS

4.4.1 Data collection

Our hypotheses were tested with a panel data set of 234 pharmaceutical MNEs from 30 countries in the period from 2010 to 2017. The pharmaceutical industry plays an important role in economies across the globe. The industry's global aggregate sales reach $1.2 trillion (OECD, 2020) and it employs over 1.2 million people in OECD countries (OECD, 2018). This sector is appropriate for our study because pharmaceutical firms are known to be highly research-intensive and because most of the time these firms directly oversee the way innovations are developed (Buciuni & Pisano, 2021), making them suitable for examining R&D intensity. Furthermore, the OECD has also stressed that internationalization is one of the most important challenges of this industry and can be important in fostering innovation (Kiriyama, 2011).

The research-intensive pharmaceutical industry was in the spotlight recently as it led the battle against COVID-19 from the very beginning, by investigating and discovering diagnostics, treatments and vaccines to help the world return to normality. While the events of 2020 and 2021 may have made the public think that drug development is quick and easy, the reality is that the pharmaceutical industry is risky when it comes to R&D and most of the risk and associated costs are borne by the firms themselves, as opposed to governments and the public sector in general (European Commission, 2020). It takes on average 10-15 years to develop a new medicine from

initial discovery to marketing approval (OECD, 2018). However, only a small percentage of medicines entering clinical trials continue to gain approval. Of those that do make it to the market, a minority results in commercial success. This and the lack of new ideas has resulted in a declining productivity of pharmaceutical firms' R&D activities, measured as the total cost per approved drug (OECD, 2018).

In a supranational context, as emerging countries have become parties to the Trade Related Intellectual Property Rights (TRIPS) Agreement upon joining the World Trade Organisation (WTO), firms in these countries face a different institutional environment governed by a tight appropriability regime. This regime puts pressure on laggard firms from emerging countries to shift from being followers to producers and innovators (Ray & Ray, 2021). For instance, in India from 2005 onwards, with the implementation of TRIPS, there has been a profound change as, on the one hand, pharmaceutical firms have had to discontinue all reverse engineering of patented drugs and, on the other hand, TRIPS have incentivized pharmaceutical firms to innovate and discover new drugs as the new environment has enabled earning profits from these innovations (Ray & Ray, 2021). In turn, the European Union has recently published an 'EU Pharmaceutical Strategy', which includes new proposals aimed at helping Europe remain competitive and regain its position as a leading force in medical innovation (European Commission, 2020).

We relied on several data sources for the study. The data was collected from Thomson Reuters Eikon and Bureau van Dijk's Orbis databases and the World Economic Forum's Global Competitiveness Index. The reliability of Thomson Reuters Eikon and Bureau van Dijk's Orbis databases has been supported in the academic community and among users of corporate information. These databases include a number of financial (e.g., income statement, balance sheet, statement of cash flows) and non-financial parameters (e.g., business and geographic segments, subsidiaries, major customers). These databases offer a comprehensive platform for establishing customizable benchmarks (e.g., sector and country) for the assessment of corporate performance. The Global Competitiveness Index assesses the economic situation in 141 economies and is "the product of an aggregation of 103 individual indicators, derived from a combination of data from international organizations as well as from the World Economic Forum's Executive Opinion Survey" (World Economic Forum, 2019: 7).

Our initial sample included all pharmaceutical firms with publicly available data on their internationalization and financial accounting details in the Thomson Reuters Eikon data base. Thus, the original sample size was 1,875 firms. Due to our interest in multinational firms, we then discarded those firms that only operated in one country, resulting in the final sample size of 234 firms. To deal with the issue of sample selection bias, we performed tests to compare our sample (N=234) to the total population (N=1,875) 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 and regional distribution between our sample and the population. The average firm size in our sample was higher than that of the full population of

pharmaceutical firms because we only included MNEs in our sample and these tend to be larger than purely domestic firms. Our sample firms represent 89% of the total revenues of the full population of pharmaceutical firms available in Thomson Reuters Eikon.

Table 4.1. Geographic distribution of sample firms and their subsidiaries.

Country / economic area	**Sample firm geographic distribution by headquarters**		**Subsidiary geographic distribution by location**	
	Count	**Percentage**	**Count**	**Percentage**
Australia	6	2.6%	292	1.8%
Austria	-	-	161	1.0%
Belgium	1	0.4%	232	1.4%
Brazil	1	0.4%	193	1.2%
Canada	10	4.3%	340	2.1%
Cayman Islands	1	0.4%	12	0.1%
China	21	9.0%	1,163	7.1%
Denmark	2	0.9%	115	0.7%
Finland	1	0.4%	67	0.4%
France	5	2.1%	427	2.6%
Germany	3	1.3%	822	5.0%
Hong Kong	4	1.7%	211	1.3%
Hungary	1	0.4%	106	0.6%
India	10	4.3%	309	1.9%
Indonesia	1	0.4%	42	0.3%
Ireland	6	2.6%	583	3.5%
Israel	2	0.9%	162	1.0%
Italy	2	0.9%	239	1.5%
Japan	16	6.8%	381	2.3%
Korea. Rep.	9	3.8%	97	0.6%
Luxembourg	-	-	135	0.8%
Mexico	1	0.4%	154	0.9%
Netherlands	1	0.4%	529	3.2%
Poland	-	-	148	0.9%
Portugal	-	-	219	1.3%
Russia	-	-	114	0.7%
Singapore	1	0.4%	204	1.2%
Slovenia	1	0.4%	40	0.2%
South Africa	1	0.4%	175	1.1%
Spain	3	1.3%	274	1.7%
Sweden	2	0.9%	192	1.2%
Switzerland	6	2.6%	473	2.9%
Taiwan	1	0.4%	57	0.3%
United Kingdom	13	5.5%	1,267	7.7%
United States	102	43.6%	4,767	28.9%
Others (72)	-	-	1,767	10.7%
Total	**234**	**100.0%**	**16,469**	**100%**

Table 4.1 shows our final sample and their subsidiaries distributed among countries, as follows. The sample includes firms from all five continents, although most are from North America (48.3%), followed by Asia (26.9%) and Europe (20.1%). United States has the highest number of firms in our sample (102), amounting to 43.6% of the total. Other well-represented countries in the sample include the China with 21 firms and Japan with 16 firms. As noted in Table 1, the sample represents both developed and developing countries. When focusing on the 16,469 subsidiaries,

we can observe that 73.2% of them are located in developed countries. Developed country MNEs in our sample have 12,051 subsidiaries in developed countries and 2,622 in developing countries, while developing / emerging country MNEs have 656 subsidiaries in developed countries and 1,140 in developing countries. This means that 17.9% of developed and 63.5% of developing country MNEs' subsidiaries are located in emerging or developing markets. Overall, our sample firms have on average 64 subsidiaries in 11 countries.

4.4.2 Measures

Dependent variable. This study aims to explain the variable *R&D intensity*. Innovation can be measured in terms of input or output. Input measures include expenditure in R&D and the number of R&D full-time employees, while output measures range from patents to new products and processes (Filippetti, Frenz & Ietto-Gillies, 2017). An input measure was chosen as it represents the efforts of a firm to innovate (Dziallas & Blind, 2019), as opposed to output measures, which quantify the success of the innovative efforts of a firm. The number of patents, for instance, has been criticized as a measure because not all inventions can be patented (Kafouros et al., 2008). As the sample consists of firms operating in the pharmaceutical industry, which are characterized by long development cycles and low success rates, the use of input measures better quantifies the innovative efforts. It is estimated that an average R&D project takes 10-15 years to complete and that only 1 out of every 5,000 projects is successful (Hong, Feng, Wu & Wang, 2016). We thus operationalized a firm's R&D intensity as the ratio of total R&D expenses to total revenue (e.g., Sambharya & Lee, 2014), so as to be able to compare firms of different sizes in a non-biased manner (Tyagi, Nauriyal & Gulati, 2018). These investments "involve the commitment of financial resources in the short run on the expectation of future positive returns" (Golovko & Valentini, 2011: 366).

Independent and moderator variable. We have drawn data from 16,479 subsidiaries of the 234 MNEs in our sample to measure our first independent variable, *internationalization toward developed countries*. This variable reflects the extent to which MNEs have oriented their internationalization toward developed countries or less developed countries, and for that reason it is measured as the proportion of foreign subsidiaries in developed countries over total foreign subsidiaries. The data was collected from Bureau van Dijk's Orbis database and for each subsidiary, we recorded the country location and establishment date, which allowed us to create time-varying variable. We split the countries in which our sample firms have subsidiaries into two mutually exclusive groups (developed countries and less developed countries). To create this grouping, similar to previous studies (Yoo, & Reimann, 2017), we followed the United Nations Conference on Trade and Development (UNCTAD) classification, which is based on a broad assessment of the respective countries' economic conditions. We then computed the proportion of foreign subsidiaries in developed countries over total foreign subsidiaries.

To measure *home country institutional development* – the variable used as a moderator in our second hypothesis – we used the home country innovation profile, in line with previous studies (e.g., Berry, Guillén & Zhou, 2010). The data is taken from the Global Competitiveness Index of the WEF. We used the composite measure of the 12th pillar referring to countries' innovative competitiveness ("Pillar 12: Innovation capability"). This pillar consists of six factors: "Diversity of workforce", "State of clusters development", "International co-inventions", "Multi-stakeholder collaboration", "Scientific publications", and "Total number of patent family applications per million population".

Control variables. We used various firm-level control variables to take into consideration the effects of firm size, firm age, firm profitability, organizational slack and firm ownership. First, studies have acknowledged that firm size impacts the level of innovation but disagrees on how (Xie & Li, 2018). We therefore controlled for *firm size* and measured it with the natural logarithm of the number of employees (Hitt et al., 1997). Second, *firm age* was measured as the number of years since the firm was established. Third, *organizational slack*, defined as the surplus capacity of a firm (Cyert & March, 1963), was proxied by the ratio of current assets to current liabilities. It might either encourage investments in long-term research projects or reduce the incentives to invest (Nohria & Gulati, 1997). Fourth, we included a variable for *domestic ownership* to account for any ownership effects on the level of R&D intensity. Domestic owners, compared with foreign owners, often have more knowledge about their investees and stronger interests in long-term growth (David, Yoshikawa, Chari, & Rasheed, 2006), which means they may be more likely to encourage R&D investments for their investee firms. The variable was measured as the percentage of total outstanding shares held by investors in the firm's home country. Fifth, to account for the positive effect that *profitability* may have on firm's R&D intensity, we added return on assets (ROA) as a control variable in our analyses. Lastly, we included the firms' overall *level of internationalization* as a control variable. Our independent variable measures the distribution of international operations between developed and developing countries and does not take into account the total extent of international operations. In this way, we attempted to single out the effect of overall level of internationalization to focus purely on the effect that internationalization toward developed countries (versus developing) might have on our dependent variable. In other words, two firms may have the same percentage of their international operations in developed countries but their overall levels of international operations may be very different. We measured internationalization with the internationalization index developed by Pisani, Garcia-Bernardo and Heemskerk (2020):

$$Internationalization_i = \frac{1}{2} * \left(\frac{Number\ of\ countries_i}{Max\ (number\ of\ countries)} + \frac{Number\ of\ subsidiaries_i}{Max\ (number\ of\ subsidiaries)}\right)$$

4.4.3 Analysis

All statistical analyses were carried out using version 16 of Stata statistical package (StataCorp, 2019). By having a panel dataset we first needed to select the appropriate estimation technique for

our model. Given a panel data, we can define several models derived from the most general linear representation (Baum, 2006):

$$y_{it} = \sum_{k=1}^{k} X_{kit}\,\beta_{it} + \epsilon_{it},\ \text{i =1,….,N, t = 1,…….,T}$$

where N is the number of individuals and T is the number of periods.

On the other hand, Baum (2006) points out that for a given observation, an intercept varying over units results in the following structure:

$$y_{it} = X_{it}\beta_{it} + z_i\,\delta + u_i + \epsilon_{it}$$

where u_i is the individual-level effect and ε_{it} is the disturbance term. For the correct estimation of the model, we must make assumptions about the relationship between u_i and the regressors. In this way, we can assume that u_i is both correlated or uncorrelated with the regressors, giving rise to what is known, respectively, as the fixed effects model (FE) and the random effects model (RE). Starting from different assumptions, both estimation methods are not perfectly substitute. There are statistical tests that allow us to determine if it is preferable to estimate a model using the fixed effects or the random effects approach. Although we could use the Hausman test to determine this (Baum 2006; Wooldridge, 2013), this test should not be used with models where the RE estimator is not fully efficient due to heteroskedasticity or serial correlation. Therefore, we first checked for the presence of heteroskedasticity, serial correlation and cross-sectional dependence using the appropriate commands available in Stata. First, the results of the *xttest3* command, which performs the modified Wald test for groupwise heteroskedasticity in fixed effect regression models, indicated the presence of heteroscedastic errors (χ^2 = 0.00, 193 df, p =0.000). Secondly, the Pesaran test for weak cross-sectional dependence showed the presence of cross-sectional dependence (CD=15.164, p=0.000). Finally, the Wooldridge test for autocorrelation in panel data showed that no first-order autocorrelation was present [F (1,166)=0.007, P=0.9338]. Given the results obtained in the previously described tests, the choice between a fixed-effects or random-effects model was carried out using a test of overidentifying restrictions (orthogonality conditions) with the *xtoverid* command with the robust option (Schaffer and Stillman, 2006). Based on the results of this test (Sargan-Hansen statistic χ^2 = 20.666. Chi-sq 7 df, p-value=0.0043), the use of a fixed effects model was preferable to a random effects model.

Due to the conditions under which the models were estimated (presence of heteroscedasticity and cross-sectional dependence), we used the *xtscc* command (Hoechle, 2007) that produces Driscoll and Kraay (1998) standard errors for coefficients estimated by fixed-effects (within) regression. Driscoll and Kraay (1998) propose a nonparametric covariance matrix estimator that produces heteroskedasticity and autocorrelation consistent standard errors that are robust to general form of spatial and temporal dependence.

4.4.4 Results

The descriptive statistics and correlations among the variables included in this study are presented in Table 4.2. On average the R&D intensity ratio, defined as the expenditures by a firm on its research and development activities divided by the firm's sales, amounted to 7.24%. However, the standard deviation of this variable was 58.563, indicating a high dispersion of its values among the companies in the sample. The correlation between R&D intensity and organizational slack was statistically significant. This is consistent with previous research that has highlighted that organizational slack is one of the potential sources for funding R&D activities (Herold, Jayaraman & Narayanaswamy, 2006; Chen and Miller, 2007). It is also interesting to note that our results showed a significant and negative correlation between R&D intensity and firm profitability, measured with ROA. Previous investigations (Huang and Liu, 2005) have shown that a non-linear relationship can exist between these two variables.

Table 4.2. Descriptive statistics and correlations.

	1	2	3	4	5	6	7	8	9
1. R&D intensity	1								
2. Firm size	-0.114***	1							
3. Firm age	-0.050	0.207***	1						
4. Organizational slack	0.070*	-0.007	-0.017	1					
5. Domestic ownership	-0.041	-0.057	-0.100**	-0.017	1				
6. Firm profitability	-0.191***	0.558***	0.091**	0.035	-0.022	1			
7. Level of internationalization	-0.062	0.709***	0.205***	-0.059	-0.073*	0.264***	1		
8. Internationalization in developed countries	0.072*	-0.189***	-0.091**	0.005	0.094**	-0.155***	-0.024	1	
9. Home country institutional development	0.035	-0.129***	0.006	0.113***	-0.152***	-0.118***	-0.056	0.177***	1
Mean	7.239	3.071	31.022	5.036	0.356	-3.745	0.108	0.500	5.046
Standard deviation	58.563	1.065	39.506	7.733	0.327	27.671	0.188	0.347	0.718

As previously indicated, we tested the hypotheses using regression models that were estimated with the xtscc command (Hoechle, 2007), available in Stata, and using a fixed effects model. In Table 4.3 we present the results obtained after estimating the three models. The first model (Model I) included only the control variables. Firm size (β=39.69, $p<0.1$) had a positive significant effect on the R&D intensity of MNEs, while firm age (β=-1.203, $p<0.05$) and domestic ownership (β=-26.75, $p<0.1$) both exhibited negative significant effects on the dependent variable (in the case of domestic ownership statistically significant at the 10% level). This indicates that larger and younger MNEs

and MNEs with higher levels of foreign ownership are more innovative. Organizational slack, profitability and the level of internationalization did not affect R&D intensity in our analysis. Considering the focus of this paper on the level of development of the host countries in which MNEs are internationalizing, it is especially interesting to note that the level of internationalization is not significant in the empirical context of this study.

Our second model (Model II) allowed us to test Hypothesis 1. For this purpose, we started from Model I to which we incorporated the variables that measure internationalization toward developed countries and home country institutional development. Our results indicated that while the estimated coefficient for the variable related to internationalization toward developed countries is positive and statistically significant (β=138.9, $p<0.01$), the coefficient for home country institutional development reached a statistical significance at the 10% level. Thus, the results confirmed Hypothesis 1, i.e. that MNEs with a higher internationalization toward developed countries exhibited higher R&D intensity.

In the third model (Model III), we performed a moderated regression by adding a multiplicative term calculated from the variables incorporated in Model II. On this occasion, we followed the recommendations of Aiken and West (1991), and variables in the moderated regression were centered by subtracting their mean value. While centering the variables before constructing the interaction term might not help to alleviate possible multicollinearity problems (e.g., Echambadi and Hess, 2007), mean centering does not affect the detection of interaction and is a strategy that can help interpret estimated coefficients (Shieh, 2011; Darlington & Hayes, 2017). After estimating this model, we calculated the variance inflation factor (VIF) values obtaining a maximum value of 1.48 which shows that there were no multicollinearity problems despite the incorporation of the multiplicative term in the third model. In this way, Model III was linked to Hypothesis 2 where internationalization toward developed countries is the core independent variable and home country institutional development acts as the moderating variable. Since the variables considered in the interaction term were centered, their estimated coefficients in Model III indicate the impact of these variables on R&D intensity for the mean of the other variable (Darlington & Hayes, 2017). On the other hand, the coefficient calculated for the centered interaction term was negative and statistically significant (β=-69.05, $p<0.05$).

Table 4.3. Regression results.

	Models		
	I	II	III
Firm size	39.69*	31.87**	33.29
	(19.95)	(13.04)	(20.55)
Firm age	-1.203**	-0.508	-0.634
	(0.429)	(1.341)	(0.604)
Organizational slack	0.652	0.606	0.613
	(0.524)	(0.457)	(0.515)
Domestic ownership	-26.75*	-26.18	-26.87*
	(13.76)	(22.44)	(12.68)
Firm profitability	-0.471	-0.540***	-0.546*
	(0.249)	(0.154)	(0.259)
Level of internationalization	-32.68	-95.77	-101.7
	(70.59)	(184.0)	(58.46)
Internationalization toward developed countries		138.9***	
		(36.97)	
Home country institutional development		-30.28*	
		(15.64)	
Internationalization toward developed countries (centered)			133.9
			(91.58)
Home country institutional development (centered)			-28.27***
			(8.037)
Internationalization toward developed countries x Home country institutional development (centered)			-69.05**
			(25.51)
Constant	-71.82	21.23	-58.30
	(59.03)	(84.12)	(53.29)
Observations	967	967	967
R-squared	0.0306	0.0520	0.0565

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

To obtain a clearer view of the nature of the interaction, we plotted the interaction terms obtaining the representation shown in Figure 4.1 (representation is based on centered data). First, the figure shows that, overall, as the MNEs' internationalization toward developed countries increases, so too does their R&D intensity, in line with that predicted in Hypothesis 1. Second, home country institutional development has a clear moderating effect on the relationship, as seen when comparing the fitted lines for high, medium and low home country institutional development. MNEs with low home country institutional development show higher levels of R&D intensity as their

internationalization toward developed countries increases than MNEs from highly institutionally developed countries. Thus, Hypothesis 2 was confirmed.

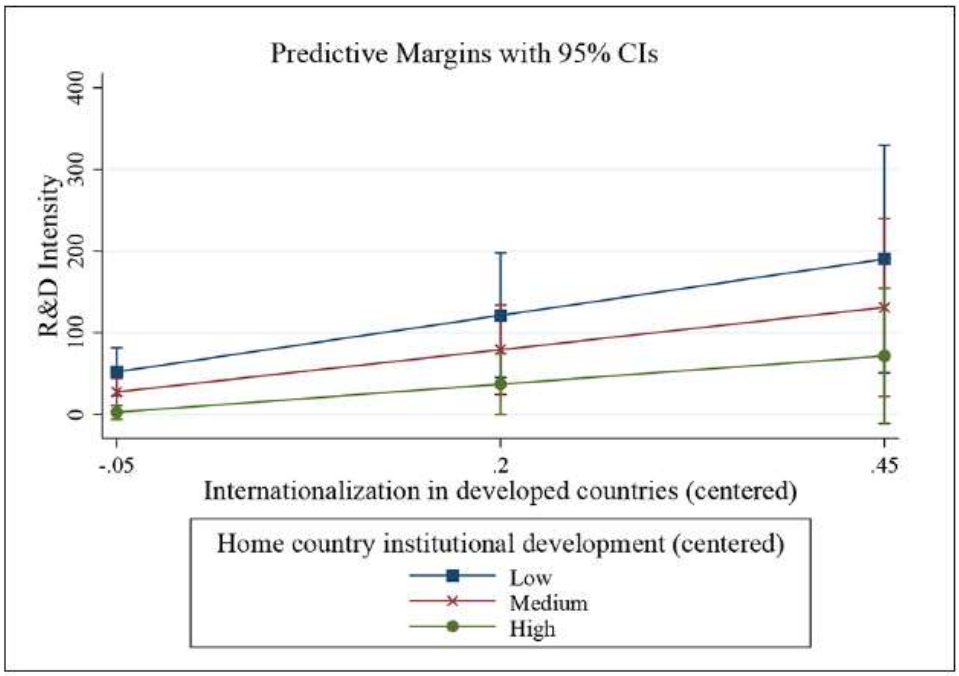

Figure 4.1. Adjusted means plot for the moderating effect with 95% confidence interval (based on centered data).

4.4.5 Robustness checks

To test the robustness of our models, we followed recommendations of Neumayer and Plümpler (2017) and applied a sensitivity analysis to the explanatory variables. To implement this analysis, we used checkrob module (Barslund, 2007) that estimates a set of regressions where the dependent variable is regressed on core variables (which are included in all regressions), and all possible combinations of other "non-core" or secondary variables. This test was carried out both for Model II, which allowed us to test the first hypothesis, and for Model III, linked to the second one. In the case of Model II, as the core variables we selected internationalization toward developed countries and home country institutional development. The rest of the variables were considered "non-core", except level of internationalization, which is a control variable that is considered in all regressions. For Model III the variable of interest is the interaction term, so in addition to the two above the multiplicative term between the previous core variables is included (these variables were centered prior to the calculation of the interaction term). In this case, all other independent variables were considered secondary.

These analyses allowed us to investigate how the results are affected when one or more of the variables that are identified as potential determinants of R&D intensity are omitted. In other words,

this approach allowed us to test whether our results on the relationship between R&D intensity and our core variables are robust to changes in the model specification. Tables 4.4 and 4.5 present the results obtained after the sensitivity analysis, both for the core variables (Table 4.4) and for secondary variables (Table 4.5). The first three columns show the maximum, minimum, and average of the point estimate over all possible regressions performed. Column (4) shows the average standard deviation of the point estimates. Columns (5)– (7) contain the main results from the analysis. They reflect, respectively, the share of regressions where the point estimate is significant at the 5% level, the share with a positive point estimate (not necessarily significant), and finally the share of regressions with a negative point estimate. Column (8) gives the average t-value over all regressions and Column (9) reports the total number of estimated models.

Table 4.4. Summary statistics for core variable sensitivity analysis.

Model II:

Core variable	(1) Max	(2) Min	(3) Mean	(4) AvgSTD	(5) PercSig	(6) Perc+	(7) Perc-	(8) AvgT	(9) Obs
Internationalization toward developed countries	179.616	99.140	135.809	30.446	1	1	0	4.479	32
Home country institutional development	-17.124	-35.445	-26.745	13.310	0.593	0	1	2.025	32

Model III:

Core variable	(1) Max	(2) Min	(3) Mean	(4) AvgSTD	(5) PercSig	(6) Perc+	(7) Perc-	(8) AvgT	(9) Obs
Internationalization toward developed countries (centered)	178.905	111.024	139.772	73.474	0.531	1	0	1.926	512
Home country institutional development (centered)	-14.687	-33.679	-24.246	6.587	1	0	1	4.128	512
Interaction (centered)	-35.882	-98.254	-66.874	27.711	0.75	0	1	2.481	512

The data in Table 4.4 shows that the core variables were remarkably robust in both of the analyzed models: none of the variables showed sign changes in any combination with the secondary variables. Focusing on Model II, the variable for home country institutional development was significant at the 5% level in 59.3% of cases, while the internationalization toward developed countries variable, linked to the first hypothesis, reached this statistical significance in 100% of the cases, and was on average significant at the 1% level (AvgT=4.479). Regarding the secondary variables we found mixed results. As seen in Table 4.5, except in the case of the age variable, these variables did not show sign changes either. Firm profitability and firm size were always significant at the 5% level, while firm age, organizational slack and domestic ownership did not reach

statistical significance for any of the possible combinations of secondary variables analyzed. Taken together, our analyses indicated that Model II is robust.

Regarding Model III, the interaction term is the most relevant core variable for testing the second hypothesis. In this case the multiplicative term was statistically significant at the 5% level in 75% of the cases analyzed; and no change in sign was detected regardless of the combination of secondary variables considered. This result again confirms that Model III is robust in testing and confirming the second hypothesis.

Table 4.5. Summary statistics for secondary variable sensitivity analysis.

Model II:

Secondary variable	(1) Max	(2) Min	(3) Mean	(4) AvgSTD	(5) PercSig	(6) Perc+	(7) Perc-	(8) AvgT	(9) Obs
Firm size	47.665	24.336	35.877	11.036	1	1	0	3.266	16
Firm age	1.333	-0.693	0.252	1.080	0	0.625	0.375	0.577	16
Organizational slack	0.793	0.408	0.566	0.407	0	1	0	1.383	16
Domestic ownership	-12.589	-32.667	-23.086	20.418	0	0	1	1.155	16
Firm profitability	-0.422	-0.542	-0.483	0.129	1	0	1	3.771	16

Model III:

Secondary variable	(1) Max	(2) Min	(3) Mean	(4) AvgSTD	(5) PercSig	(6) Perc+	(7) Perc-	(8) AvgT	(9) Obs
Firm size	47.841	24.795	35.798	12.991	0.562	1	0	3.235	256
Firm age	1.237	-1.153	0.053	0.465	0.281	0.5	0.5	1.502	256
Organizational slack	0.806	0.418	0.582	0.445	0	1	0	1.308	256
Domestic ownership	-8.247	-32.348	-22.395	11.555	0.562	0	1	1.923	256
Firm profitability	-0.437	-0.549	-0.491	0.220	1	0	1	2.253	256
Level of internationalization	40.747	-180.91	-68.602	44.900	0.312	0.1875	0.8125	1.673	256

4.5. DISCUSSION

Innovation has been recognized as one of the key aspects of MNEs to respond to opportunities and challenges they face at home and in host countries (e.g., Govindarajan & Ramamurti, 2011). This article answers to the question of how MNEs' domestic and foreign institutional environments influence their R&D intensity, by integrating the institutional development of home and host countries as a possible R&D intensity driver.

Our results show that MNEs with higher internationalization toward developed countries exhibit higher levels of R&D intensity. Our research complements prior research by incorporating the

institutional development of foreign countries in which firms are embedded, as a consequence of their internationalization processes. Previous research has shown, on the one hand, that firms that engage in international activities gain access to technological and market information in international markets and can use this new knowledge to facilitate innovation (e.g., Hitt et al., 2006; Salomon & Shaver, 2005; Santos et al., 2004). MNEs increasingly carry out their R&D activities outside of the home country, as this allows them to gain access to knowledge that would often not be available to firms operating only in their domestic markets (Almeida & Kogut, 1999; Bartlett & Ghoshal, 1989; Nachum & Zaheer, 2005). On the other hand, previous literature has noted that internationalization helps firms increase their sales and thereby incentivizes firms to innovate in the hopes of gaining profit (e.g., Golovko & Valentini, 2011; Tsao & Lien, 2013). Our study, in the context of pharmaceutical MNEs, adds new evidence to prior work by emphasizing that the level of institutional development of the host countries determines the greater or lesser effect that the internationalization of the MNEs has on their R&D intensity. In fact, our results show that the firms' level of internationalization alone does not impact their R&D intensity; however, when the location of international activities is considered, results are significant and point to the fact that having higher internationalization toward developed countries has a positive effect on firms' R&D intensity.

In addition, our results show that MNEs from institutionally weak countries increase their level of R&D intensity when they expand to developed countries to a higher extent than MNEs from institutionally developed countries. Increasing their R&D investments helps these MNEs from less developed countries dissociate themselves from the institutional voids of their home countries. On the other hand, since our analysis is based on MNEs from both developed and less developed countries, we complement previous studies that have been primarily conducted with samples of Chinese, Indian, and Latin American firms. These previous studies have highlighted that institutional voids drive firms from less developed countries to expand into more developed countries in order to benefit from their institutional advantages and technological knowledge (Li et al., 2010; Piperopoulos et al., 2018; Witt & Lewin 2007; Wu, 2013; Wu et al., 2016; Yoo, & Reimann, 2017). However, our findings add to these studies by providing empirical evidence from 234 firms from 30 countries in four continents.

Overall, our findings have some important implications for researchers and practitioners. First, while the international business literature has recognized home country institutional development and internationalization as antecedents of innovation, few studies have integrated both aspects (see the meta-analysis of Hitt et al., 2006). Notable exceptions include the studies of Chittoor et al. (2015), Xie and Li (2018), and Wu et al. (2016) who analyzed the internationalization of firms from a single country (China or India). We offer an adequate approach to the study of firm-level innovation because our analysis of MNEs from 30 developed and less developed countries allows for greater generalizability of the findings. Furthermore, we explore the effects that a higher internationalization toward developed countries can have on the level of R&D intensity and analyze to what extent the level of institutional development in the home country may moderate this

relationship. Our work contributes to the existing literature on internationalization and innovation by highlighting the importance of considering the characteristics of all countries in which MNEs operate as determinants of their R&D intensity. In this way, our findings support the idea that MNEs are not "first and foremost, creatures of their home countries" (Stopford, 1998: 13) and, thus, do not make decisions based purely on the characteristics of the home country (Perlmutter, 1969; Vernon, 1979). Acknowledging that MNEs' R&D intensity reflects characteristics of all countries in which they operate supports the importance of considering the "home base" as opposed to the "home country" (Zhou & Guillén, 2015) as a determinant of firm-level innovation.

Second, this study adds new findings to existing research on how operating in more developed countries can help developing and emerging country MNEs align with global markets and expectations (Kostova et al., 2008). Extensive recent literature has studied MNEs from less developed countries and has focused principally on how they can escape home country institutional voids and use internationalization to access more efficient foreign countries (e.g., Cuervo-Cazurra & Ramamurti, 2017; Thakur-Wernz & Samant, 2019). Although the internationalization of emerging market firms has stimulated a great deal of attention recently, "there is still paucity of research on the phenomenon of R&D-driven internationalization" (Purkayastha, Manolova, & Edelman, 2018: 104). Our findings extend previous literature and fill this gap by showing that MNEs from less institutionally developed countries are more flexible and adapt better to different political systems and conditions of foreign countries and recognize more easily new opportunities (Luo & Rui, 2009). When they expand their international operations in developed countries, MNEs from less institutionally developed countries have the perception that they operate in a more efficient and transparent institutional environment where they can generate new knowledge and improve their competitive advantages (Wu & Wu, 2014; Witt & Lewin, 2007). This is an important contribution to our understanding of how the home country can influence the relationship between internationalization and R&D intensity.

Third, this research responds to the requests of recent research for a focus on R&D-intensive industries in the study of innovation (e.g., Chittoor et al., 2015). Our longitudinal analysis of 234 MNEs in the pharmaceutical industry offers an interesting context because this industry has undergone a process of intense transformation. The pharmaceutical sector is growing at a much faster pace in less developed countries, such as China and India, than in developed countries (Rezaie, McGahan, Frew, Daar & Singer, 2012), and it is therefore of interest to test whether the growing number of MNEs from less developed countries matches the R&D investments of their developed country rivals. After all, staying innovative is vital to achieving and maintaining a competitive advantage, in both the domestic and the global arena (Porter, 1990).

Despite its contributions, this study has a number of limitations. First, the average firm size in our sample was large, thus our conclusions should be carefully extrapolated to small and medium-sized firms (SMEs). Due to limitations in the availability of data (i.e., as our sample consists of large MNEs that publish their financial information), it was not possible to include smaller firms. It could

be interesting to re-estimate the results with a sample including SMEs. Second, our study analyzes R&D intensity, however, it would be also valuable for future research to extend the investigation to innovation performance which could in turn lead to a deeper understanding of the internationalization-innovation relationship. Despite this limitation, we take a significant step toward better understanding the internationalization-innovation relationship by studying the role of institutional development in the home and host countries in which MNEs are embedded as drivers of MNEs' R&D intensity. Third, our variable for internationalization toward developed countries is measured using subsidiary data only and does not consider other aspects of firms' international operations, such as revenue. Neither Thomson Reuters Eikon nor Bureau Van Dijk's Orbis provide a country-level breakdown of revenue. The geographic breakdowns of revenue that are available in Thomson Reuters Eikon are heterogeneous among different firms as they are based on how each firm reports their revenue (e.g., one firm may split their revenue in four regions, while another might provide details only for domestic and international revenue). For this reason, we were not able to compute the proportion of sales in developed countries over total sales. Fourth, our study was conducted in the context of the pharmaceutical industry, a global strategic sector with the highest R&D-intensity. We acknowledge that although studying a single industry has its advantages when it comes to controlling for industry effects, the results might not be applicable to other contexts. Thus, it would be interesting for future studies to apply the theoretical framework developed in this study to other highly research-intensive industries in order to confirm and generalize the findings.

For practitioners, this study shows that the managers of MNEs could consider internationalization activities in order to acquire new knowledge from the international markets and improve their products and processes based on such information. Our empirical findings offer a route for pharmaceutical MNEs to guide their internationalization strategy. Our results show that MNEs with more international operations in developed countries exhibit higher R&D intensity, which we believe is motivated by enhanced access to new, diverse sources of knowledge and increased global collaboration between innovation networks to jointly develop and exploit new knowledge and technologies. On the other hand, the need to respond to specific institutional characteristics of host countries can also help explain why the international activities of MNEs from less developed countries have "spillover" effects in their home countries and other less developed countries in which they operate. Through pro-innovation policies, governments could enhance the attractiveness of less developed countries in the worldwide R&D market to attract more foreign investments in R&D.

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4. HOME AND HOST COUNTRY DEVELOPMENT AND MNES' R&D INTENSITY

5. Conclusiones e implicaciones

5 CONCLUSIONES E IMPLICACIONES

Este último capítulo recoge las principales conclusiones de los tres artículos ya publicados, sus implicaciones tanto teóricas como prácticas, sus limitaciones y las posibles futuras líneas de investigación. El objetivo de esta tesis doctoral ha sido avanzar en el conocimiento de la influencia de la internacionalización y de las características del país de origen de las empresas multinacionales en sus planteamientos medioambientales y en los esfuerzos realizados en I+D por parte de las mismas.

5.1. CONCLUSIONES E IMPLICACIONES TEÓRICAS DEL TRABAJO DE INVESTIGACIÓN

En esta sección se describen las principales conclusiones e implicaciones de los tres trabajos de investigación. A continuación, se resumen las principales aportaciones e implicaciones de cada trabajo por separado, lo que nos permite identificar los avances que implican para la literatura cada uno de los estudios realizados.

Los resultados del Capítulo 2 respaldan la influencia positiva de los propietarios institucionales extranjeros en el desempeño medioambiental de las empresas multinacionales, mientras que los propietarios institucionales nacionales influyen positivamente tanto en el desempeño medioambiental como en la innovación medioambiental. Además, la influencia de los propietarios institucionales extranjeros en el desempeño medioambiental se ve fortalecida cuando las empresas multinacionales están menos diversificadas internacionalmente, y este desempeño medioambiental se ve debilitado cuando las empresas multinacionales están más diversificadas internacionalmente. Además, la diversificación internacional refuerza la influencia positiva de los propietarios institucionales nacionales en la innovación medioambiental de las empresas multinacionales.

Estos resultados implican unos avances importantes en varias líneas de investigación. En primer lugar, en lo que respecta a la investigación existente sobre el papel de los propietarios institucionales extranjeros (Aguilera, Marano, & Haxhi, 2019; Shi, Gao, & Aguilera, 2021), este trabajo supone un avance en el conocimiento sobre la influencia de los propietarios institucionales extranjeros en los planteamientos medioambientales de las empresas multinacionales (Durand, Paugam, & Stolowy, 2019; Flammer, 2013; Hawn, Chatterji, & Mitchell, 2018). El trabajo se suma a la investigación emergente sobre el análisis de la influencia de los inversionistas extranjeros en los planteamientos medioambientales de las empresas multinacionales (DesJardine & Durand, 2020; Dyck, Lins, Roth, & Wagner, 2019; Flammer, Toffel, & Viswanathan, 2021) confirmando el efecto positivo con respecto a los resultados medioambientales. La escasa literatura previa en la que se analiza el papel de los propietarios institucionales extranjeros planteaba dudas relevantes sobre cómo los propietarios institucionales extranjeros podrían conciliar su aversión a las pérdidas financieras y los compromisos inciertos a largo plazo con sus preocupaciones sobre los riesgos

potenciales del cambio climático (The Economist, 2021). Los resultados de este trabajo confirman que los propietarios institucionales extranjeros impulsan a las empresas multinacionales a mejorar su desempeño medioambiental para reducir los riesgos reputacionales en un contexto de asimetrías de información. Dado que los propietarios institucionales extranjeros están más interesados en las ganancias a corto plazo que en el valor a largo plazo (Aguilera, Desender, Lamy, & Lee, 2017; David, O'Brien, Yoshikawa, & Delios, 2010; Geng, Yoshikawa, & Colpan, 2016), los resultados de este trabajo de investigación muestran que una mayor presencia de los propietarios institucionales extranjeros en una empresa puede mejorar su desempeño medioambiental pero no necesariamente su innovación medioambiental. Estos resultados se relacionan con el hecho de que las innovaciones medioambientales requieren inversiones financieras más costosas, más arriesgadas y a más largo plazo que las mejoras en el desempeño medioambiental. Este estudio de la relación entre los propietarios institucionales extranjeros y los planteamientos medioambientales de sus empresas también permite avanzar en el conocimiento del gobierno corporativo (Aguilera et al., 2019; Marano & Kostova, 2016; Shi et al., 2021).

En segundo lugar, este trabajo responde a las llamadas de la literatura sobre gobierno corporativo en las empresas multinacionales (Aguilera et al., 2019; Castañer, Goranova, Kavadis, & Zattoni, 2020). En particular, permite avanzar en el conocimiento de cómo la internacionalización de los propietarios institucionales de una empresa, así como el nivel de diversificación internacional de la empresa influyen en la relación entre las decisiones tomadas por los propietarios (los principales) y los ejecutivos (agentes) en la empresa multinacional. En ese sentido, los resultados alcanzados respaldan el argumento de que la diversificación internacional de una empresa multinacional podría proporcionar discrecionalidad, incentivos y oportunidades adicionales para que los ejecutivos reaccionen ante la complejidad institucional internacional aumentando la atención que prestan a los problemas medioambientales (Maksimov, Wang, & Yan, 2019; Montiel, Husted, & Christmann, 2012; Wang & Li , 2019). Por lo tanto, los resultados muestran la importancia de considerar el nivel de diversificación internacional en los estudios que analizan las características de la propiedad de las empresas multinacionales y su influencia en los planteamientos medioambientales.

El Capítulo 3 proporciona evidencia de que la mayor internacionalización de las empresas multinacionales fuera de su región (internacionalización inter-regional) generará un fuerte incentivo para que éstas desarrollen planteamientos medioambientales más avanzados que les permita ganar legitimidad en el contexto internacional. Los mayores niveles de internacionalización fuera de su región conllevan una exposición a un mayor número de diversos stakeholders y a un mayor impacto de normas globales y actores legitimadores globales (Marano, Tashman, & Kostova, 2017). Estas circunstancias reforzarán los incentivos de la empresa multinacional con respecto a visibilizar sus avances en sus planteamientos medioambientales. Por ello, la empresa multinacional opta por incrementar la divulgación de sus planteamientos medioambientales. Esta divulgación puede ser una forma eficaz de gestionar y mantener la legitimidad en países anfitriones institucionalmente distantes y de evitar cualquier efecto indirecto

negativo en un país como consecuencia de problemas de legitimidad en otros lugares (Aragón-Correa, Marcus, & Hurtado-Torres, 2016; Delgado-Márquez, Pedauga, & Cordón, 2017; Kolk & Fortanier, 2013). Es particularmente interesante ver que las empresas multinacionales de los países desarrollados presentaron un nivel decreciente de desempeño medioambiental (es decir, más contaminación e impactos ambientales) a medida que se incrementaba su nivel de diversificación inter-regional. Por el contrario, las empresas multinacionales de los países emergentes mejoraron su desempeño medioambiental en situaciones similares.

Los resultados alcanzados en este Capítulo 3 tienen importantes implicaciones teóricas. En primer lugar, este trabajo señala una fuerte y significativa relevancia del país de origen en la influencia de la globalización en los planteamientos medioambientales. Específicamente, una empresa multinacional más global, es decir, con una mayor diversificación inter-regional, de un país de origen institucionalmente débil debe reforzar la divulgación de sus planteamientos medioambientales y mejorar su desempeño medioambiental en mayor medida que una empresa multinacional de un país con un contexto institucional más desarrollado. Así, las empresas de los países menos desarrollados deben realizar esfuerzos adicionales para atenuar su déficit de legitimidad, como consecuencia de su "liability of origin" y demostrar unos planteamientos medioambientales más avanzados a medida que crecen sus operaciones globales.

En segundo lugar, el trabajo ofrece un enfoque novedoso y contribuye al debate académico que ha analizado cómo los planteamientos medioambientales constituyen estrategias de legitimación para las empresas multinacionales en un contexto internacional. Los resultados aportan una evidencia novedosa en la línea actual de investigación que versa sobre las importantes implicaciones para las empresas multinacionales derivadas de adoptar planteamientos medioambientales más avanzados (Aragon-Correa et al., 2016; Babiak & Trendafilova, 2011; Christmann, 2004; Delmas & Montes-Sancho, 2011).

En tercer lugar, este trabajo contribuye a la literatura sobre "greenwashing" y la posible existencia de "decoupling" en los planteamientos medioambientales de las empresas (Graafland & Smid, 2019; Lee & Raschke, 2023; Tashman, Marano & Kostova, 2019). El análisis realizado considerando el nivel de desarrollo institucional de los países origen de las multinacionales constituye un planteamiento novedoso y relevante para avanzar en el conocimiento de las diferentes estrategias seguidas por las empresas multinacionales de países con diferentes niveles de desarrollo institucional.

El trabajo de investigación descrito en el Capítulo 4 está centrado en el estudio de la internacionalización y las características del país origen de las empresas multinacionales y su influencia en el compromiso de las multinacionales con el I+D, una cuestión clave para garantizar la sostenibilidad de las empresas multinacionales. Además, este trabajo constituye una aportación novedosa puesto que proporciona nueva evidencia respecto a la importancia que tiene el nivel de desarrollo institucional de los países anfitriones como determinante del mayor o menor efecto que

la internacionalización de las empresas multinacionales tiene sobre su intensidad de I+D. De hecho, los resultados muestran que el nivel de internacionalización de las empresas multinacionales por sí solo no afecta su intensidad de I+D; sin embargo, cuando se considera si las actividades internacionales se desarrollan en mayor o menor medida en países desarrollados, los resultados son significativos y apuntan a que tener una mayor internacionalización hacia los países desarrollados tiene un efecto positivo en la intensidad de I+D de las empresas multinacionales.

Las conclusiones de este trabajo presentan implicaciones teóricas. En primer lugar, aunque la literatura de negocios internacionales había reconocido el desarrollo institucional del país de origen y la internacionalización como antecedentes de la innovación, pocos estudios habían integrado ambos aspectos (ver el metaanálisis de Hitt, Tihanyi, Miller, & Connelly, 2006). Este trabajo adicionalmente muestra la importancia de considerar las características de todos los países en los que operan las empresas multinacionales como determinantes de su intensidad de I+D. Reconocer que la intensidad de I+D de las empresas está condicionada por las características de todos los países en los que operan pone de relieve la importancia de analizar la "base de operaciones de la empresa multinacional" en contraposición a sólo el "país de origen" (Zhou & Guillén, 2015) como un factor determinante de la innovación a nivel de empresa.

En segundo lugar, esta investigación responde a las llamadas realizadas en trabajos recientes con respecto a desarrollar investigaciones en industrias intensivas en I+D en el estudio de la innovación (Chittoor, Aulakh, & Ray, 2015). El análisis longitudinal realizado en empresas multinacionales de la industria farmacéutica ofrece un contexto interesante porque esta industria intensiva en I+D ha experimentado un proceso de intensa transformación en las últimas décadas. El sector farmacéutico está creciendo a un ritmo mucho más rápido en los países menos desarrollados, como China e India, que en los países desarrollados (Rezaie, McGahan, Frew, Daar & Singer, 2012), por lo que es interesante comprobar si el creciente número de empresas multinacionales de países menos desarrollados tiene un compromiso en inversiones en I+D similar a sus competidores de países desarrollados.

En tercer lugar, este estudio añade nuevos hallazgos a la investigación existente sobre cómo operar en países más desarrollados puede ayudar a las empresas de países emergentes a alinearse con los mercados y expectativas globales (Kostova, Roth, & Dacin, 2008). Aunque la internacionalización de las empresas de mercados emergentes ha despertado una gran atención en los últimos años, todavía hay poca investigación sobre el fenómeno de la internacionalización y la I+D (Purkayastha, Manolova & Edelman, 2018). Este trabajo muestra que las empresas multinacionales de países menos desarrollados son más flexibles y se adaptan mejor a diferentes entornos institucionales de países extranjeros y reconocen más fácilmente nuevas oportunidades (Luo & Rui, 2009). Esta es una contribución importante a la comprensión de cómo el país de origen puede influir en la relación entre la internacionalización y la intensidad de I+D.

Esta tesis doctoral ha contribuido a la literatura al verificar cómo diferentes aspectos del entorno de las empresas multinacionales, tanto a nivel micro (las características de sus propietarios y sus estrategias de internacionalización) como macro (las características de los países en que opera, país origen y mercados internacionales) juegan un rol en el desarrollo de sus estrategias de sostenibilidad e innovación. Es importante destacar que existen diferentes dimensiones que se pueden analizar de la "internacionalización". Es decir, podemos estudiar internacionalización en términos generales, pero también podemos hablar de internacionalización inter-regional o intrarregional y de internacionalización hacia países más desarrollados o menos desarrollados. Con respecto a los planteamientos medioambientales de las empresas también existen diferencias puesto que podemos hablar de aquéllos orientados a divulgar sus avances, los que ponen de manifiesto su desempeño medioambiental actual y los que implican un compromiso a largo plazo, tales como los relacionados con la innovación medioambiental. Por esta razón, esta tesis ha analizado varias dimensiones relacionadas con los planteamientos medioambientales de las empresas multinacionales: la divulgación de información sobre cómo las empresas cuidan (o no) el medioambiente, los impactos reales de las empresas en el medioambiente (emisiones, residuos) y las innovaciones que las empresas desarrollan para disminuir su impacto en el medioambiente. En general, esta tesis ha resaltado la importancia para las empresas multinacionales de planificar bien sus estrategias de sostenibilidad e innovación teniendo en cuenta de donde viene la empresa multinacional (países origen con un entorno institucional más o menos desarrollado) y hacia donde orienta su internacionalización (nivel más regional o más global o hacia países con entornos institucionales más o menos desarrollados).

5.2. IMPLICACIONES PARA LA PRÁCTICA EMPRESARIAL

Esta tesis posee varias implicaciones prácticas para empresas multinacionales y sus ejecutivos, pero también para gobiernos y políticos. En primer lugar, se resalta la necesidad de que los gerentes de las empresas multinacionales comprendan mejor las preocupaciones específicas de sus propietarios institucionales extranjeros para que puedan desarrollar enfoques que se alineen con los intereses de estos propietarios. Con frecuencia, los gerentes creen erróneamente que el colectivo de los propietarios institucionales extranjeros no estará interesado en iniciativas medioambientales. Nuestros resultados muestran claramente que los propietarios institucionales extranjeros están interesados en garantizar que las prácticas medioambientales de las empresas en las que invierten sean suficientes para evitar cualquier riesgo legal y social. Sin embargo, los propietarios institucionales extranjeros pueden ser reacios a aceptar enfoques relacionados con inversiones innovadoras más arriesgadas y de largo plazo.

En segundo lugar, para los ejecutivos de las empresas, los resultados apuntan a la importancia de los planteamientos medioambientales en las multinacionales para lograr legitimidad en contextos internacionales. Los gerentes de empresas globales enfrentan importantes desafíos de legitimidad cuando ingresan en otras regiones. Deben asegurarse de que sus empresas muestren un enfoque

integrado y se ganen la confianza de los agentes locales. Si bien el debate se ha centrado tradicionalmente en las implicaciones reales de los procesos para ganar legitimidad al ingresar en los mercados internacionales, los resultados de esta tesis demuestran que la urgencia y el interés en aumentar el desempeño y divulgación medioambiental después de globalizarse dependen bastante del estado anterior de la empresa. Es particularmente claro en los resultados que los ejecutivos de empresas de países desarrollados disfrutan de un grado adicional de credibilidad en sus planteamientos medioambientales, y sus impactos medioambientales pueden pasar desapercibidos, mientras que las empresas de países emergentes deben hacer un esfuerzo adicional no solo proporcionando más información medioambiental, sino también mejorando su desempeño medioambiental.

En tercer lugar, para los gobiernos y otras organizaciones implicadas en ámbitos regulatorios, los resultados sugieren que ayudar a los procesos de diversificación internacional en las empresas locales no solo es bueno para la economía nacional, sino que también puede ser bueno para el medioambiente. A medida que las empresas multinacionales avanzan en su internacionalización y se vuelven más diversificadas internacionalmente, aumenta la presión para que los ejecutivos refuercen el desempeño medioambiental de sus empresas y reduce la importancia de la presencia de los propietarios institucionales extranjeros. No obstante, la influencia de los propietarios institucionales extranjeros en el desempeño medioambiental es particularmente fuerte cuando la diversificación internacional es baja.

Por último, esta tesis sugiere a los gobiernos de los distintos países la importancia de incentivar a sus empresas multinacionales a que se expandan a países desarrollados, ya que de esta manera se pueden producir efectos de “spillover” en el país de origen. Los resultados muestran que las empresas multinacionales con más operaciones internacionales en países desarrollados exhiben una mayor intensidad de I+D, causada por un mayor acceso a nuevas y diversas fuentes de conocimiento y una mayor colaboración global entre redes de innovación para desarrollar y explotar conjuntamente nuevos conocimientos y tecnologías. Este efecto es aún más positivo para empresas de países emergentes.

5.3. LIMITACIONES Y FUTURAS LÍNEAS DE INVESTIGACIÓN

En esta sección, se presentarán las limitaciones y futuras líneas de investigación relacionadas con la tesis doctoral. Las limitaciones son aquellos aspectos que pudieron haber influido en los resultados de la investigación y que deben ser considerados al interpretar los resultados. Por otro lado, las futuras líneas de investigación son aquellas áreas que aún no han sido abordadas y que representan una oportunidad para seguir profundizando en el tema. La investigación futura puede abordar dimensiones complementarias a nuestros análisis, resultados y recomendaciones. En los siguientes párrafos se describen las principales limitaciones y algunas sugerencias de cómo futuros trabajos podrían extender y validar las conclusiones de esta tesis.

Primero, los tres trabajos de investigación que forman parte de esta tesis tienen cada uno una muestra diferente en cuanto al sector industrial y el perfil internacional. Esto conlleva ventajas importantes por las implicaciones directas y relevantes que nuestros resultados tienen para las empresas multinacionales de la industria química, energética y farmacéutica. Sin embargo, se reconoce que, aunque estudiar una sola industria tiene sus ventajas cuando se trata de controlar los efectos de la industria, los resultados podrían no ser generalizables para otro tipo de industrias. Cada industria tiene sus características y es difícil extrapolar los resultados a otros contextos. También hace desafiante realizar comparaciones entre estudios anteriores que tienen otro contexto industrial o incluso investigaciones con muestras de varias industrias (por ejemplo, estudios que incluyen empresas de distintos índices como S&P, Dow Jones o Fortune). La investigación futura en diferentes contextos industriales podría ayudar a comprender mejor si la elección de la industria puede haber jugado un papel en los resultados.

Segundo, los tres trabajos de investigación están basados en análisis con muestras que incluyen principalmente empresas que cotizan en bolsa y, por lo tanto, es posible que los resultados no puedan ser generalizados a empresas que no cotizan en bolsa. Por la misma razón, las empresas multinacionales de las tres muestras tienen un tamaño medio elevado. Por tanto, si bien las empresas de la muestra representan una gran parte del sector en todo el mundo, las empresas más pequeñas están sub-representadas debido a las limitaciones en la disponibilidad de datos. Las muestras constan de grandes empresas multinacionales que publican su información financiera y medioambiental mientras que no ha sido posible incluir multinacionales más pequeñas ya que no suelen publicar sus datos financieros ni tampoco información sobre sus iniciativas medioambientales. Es por esta razón que las conclusiones deben extrapolarse cuidadosamente a las empresas de menor tamaño. Los estudios futuros podrían recopilar datos primarios de las multinacionales que no cotizan en bolsa y tienen un tamaño más reducido para realizar nuevos análisis con una muestra más inclusiva de empresas de diferentes tamaños.

Tercero, existen algunas limitaciones en cuanto a las medidas de internacionalización utilizadas en los tres trabajos de investigación. Las bases de datos que se han utilizado, Refinitiv (Thomson Reuters) Eikon y Orbis de Bureau Van Dijk, no proporcionan un desglose de los ingresos de las empresas a nivel de país. Los desgloses geográficos de los ingresos que están disponibles en Eikon son heterogéneos entre las diferentes empresas, ya que se basan en cómo cada empresa informa sus ingresos (por ejemplo, una empresa puede dividir sus ventas en cuatro regiones, mientras que otra puede proporcionar detalles solo para las ventas nacionales e internacionales). Por el otro lado, Orbis desglosa información sobre la ubicación de las subsidiarias de las empresas. Esto facilita el cálculo del número de países en que operan las empresas, pero no es posible identificar el peso que tiene cada subsidiaria. En definitiva, aunque se han realizado esfuerzos por obtener información de varias bases de datos, se es consciente de la limitación de las medidas y de la necesidad de avanzar en este sentido en futuras investigaciones.

Cuarto, en relación al Capítulo 2, los análisis y resultados no toman en cuenta cuáles son los países de origen de los propietarios o de las empresas multinacionales; sin embargo, los análisis de aspectos geográficos particulares podrían dejar ver la importancia de ciertas dimensiones regulatorias adicionales. Además, otras investigaciones han demostrado la importancia de la subcontratación en el extranjero de actividades contaminantes (e.g., Berry, Kaul & Lee, 2021; Li & Zhou, 2017). En futuros trabajos se podría buscar datos adicionales para analizar si las mejoras de desempeño medioambiental en las empresas con presencia de inversores institucionales podrían provenir de la deslocalización de parte de la contaminación en lugar de reducirla.

Quinto, futuros estudios podrían considerar una perspectiva micro-institucional para analizar cómo los contextos institucionales regionales y nacionales pueden afectar a los directivos de las empresas de manera diferente según características específicas de la empresa, tales como las características personales de los miembros del equipo directivo o del consejo de administración o las características de la composición del consejo de administración. Además, una investigación futura en la que se analicen las relaciones con otros agentes o instituciones con intereses medioambientales también favorecería profundizar en el conocimiento de los factores que determinan los planteamientos medioambientales de las empresas multinacionales.

En conclusión, este estudio ha explorado el impacto de la internacionalización de las empresas multinacionales en sus planteamientos de sostenibilidad e innovación. A través de una extensa revisión de la literatura y análisis empíricos, ha quedado claro que las empresas multinacionales están reconociendo cada vez más la importancia de la sostenibilidad y la innovación en sus estrategias, y que la internacionalización desempeña un papel fundamental en la configuración de estas estrategias. Aunque aún existen desafíos por abordar, como la necesidad de una mejor regulación y una mayor transparencia, está claro que las empresas multinacionales tienen el potencial de ser poderosos impulsores de un cambio positivo tanto en el ámbito medioambiental como en el de la innovación. Como tal, este estudio proporciona información valiosa tanto para académicos como para profesionales que buscan comprender y mejorar la influencia de las empresas multinacionales en un futuro más sostenible.

5.4. BIBLIOGRAFÍA UTILIZADA EN ESTE CAPÍTULO

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