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# Differentiated effects of formal and informal institutional distance between countries on the environmental performance of multinational enterprises<sup>☆</sup>

Javier Aguilera-Caracuel<sup>a,\*</sup>, Nuria Esther Hurtado-Torres<sup>b</sup>, Juan Alberto Aragón-Correa<sup>c</sup>, Alan M. Rugman<sup>d</sup>

<sup>a</sup> Pablo de Olavide University, Department of Management, School of Economics and Business, Carretera de Utrera, Km. 1, 41013, Seville, Spain

<sup>b</sup> University of Granada, Spain

<sup>c</sup> University of Surrey, United Kingdom

<sup>d</sup> University of Reading (Henley Business School), United Kingdom

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## ABSTRACT

This research examines the influence of environmental institutional distance between home and host countries on the standardization of environmental performance among multinational enterprises using ordinary least-squares (OLS) regression techniques and a sample of 128 multinationals from high-polluting industries. The paper examines the environmental institutional distance of countries using the concepts of formal and informal institutional distances. The results show that whereas a high formal environmental distance between home and host countries leads multinational enterprises to achieve a different level of environmental performance according to each country's legal requirements, a high informal environmental distance encourages these firms to unify their environmental performance independently of the countries in which their units are based. The study also discusses the implications for academia, managers, and policy makers.

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## 1. Introduction

Institutional theory establishes that organizations are embedded within broader social structures, comprising different types of institutions that exert significant influence on the decision-making of corporations (e.g., Campbell, 2007; Campbell, Hollingsworth, & Lindberg, 1991). Because multinational enterprises (MNEs) operate in different countries, they face challenges in strategically deciding whether their approaches should be similar given the diversity of the countries and regions in which they operate (Kostova & Roth, 2002). In the environmental arena, previous works have generated broad debate, and while some works have proposed that environmental differences between countries may generate incentives for maintaining differentiated approaches to reduce costs where possible (e.g., Chang & Rosenzweig, 2001; King & Shaver, 2001; Stewart, 1993; Vernon, 1992), other works have claimed that firms may prefer a standardized approach to reinforce credibility (e.g., Christmann, 2004; Delmas & Montes-Sancho, 2011; Orlitzky, Siegel, & Waldman, 2011; Rivera & deLeon, 2008).

International business researchers have mostly used institutional theory (e.g., DiMaggio & Powell, 1983; North, 1990; Scott, 1995) to study the impact of institutional distance on the different strategies of MNEs. The extent of similarity or dissimilarity between the institutional environments of home and host countries may influence multiple strategic decisions of international firms, such as location choice (Holburn & Zelner, 2010; Xu & Shenkar, 2002), ownership (Eden & Miller, 2004), or entry strategies (Arslan & Larimo, 2010; Estrin, Baghdasaryan, & Meyer, 2009; Xu & Shenkar, 2002). In general, Kostova (1999) and Kostova and Zaheer (1999) suggested that the greater the institutional distance between home and host countries, the more difficult it will be for the MNE to transfer organizational practices from the parent firm to the foreign subsidiary.

The institutional literature in the international field has given much attention to the influence of national and international regulations (e.g., Gunningham & Kagan, 2005; Hoffmann, Trautman, & Hamprecht, 2009; Kostova, Roth, & Dacin, 2008). Within the green context, the body of literature connecting international business and corporate environmental strategies has also widely analyzed the impact of environmental regulations (e.g., Bansal, 2005; Christmann, 2004; Darnall, 2006; King & Shaver, 2001; Rugman & Verbeke, 1998a, 1998b), but recent work has recognized that the results are still inconclusive (e.g., Christmann & Taylor, 2006; Darnall, 2006; Darnall, Henriques, & Sadorsky, 2008; Delmas & Montes-Sancho, 2011). This work concerning regulations is directly related to the formal dimension in North's proposal to delimitate the national environment (North, 1990), but research has not considered the informal dimension in North's proposal (which is more related to values and culture in the country) so far.

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\* Corresponding author. Tel.: +34 954 977322; fax: +34 954 348353.

E-mail addresses: jagucar@upo.es (J. Aguilera-Caracuel), nhurtado@ugr.es (N.E. Hurtado-Torres), jaragon99@gmail.com (J.A. Aragón-Correa), a.rugman@henley.reading.ac.uk (A.M. Rugman).

Previous contradictory findings regarding the relation between institutional distance and the level of homogeneity in the MNEs' environmental approaches may be due to their focus on formal institutions, with little regard for informal ones. For example, similar national environmental regulations do not necessarily imply a similar degree of environmental development in the two countries because they may place different levels of social priority on the enforcement of environmental regulations (Christmann & Taylor, 2001; Dasgupta, Hettige, & Wheeler, 2000). Little effort has been made to take into account informal institutional elements at the country-level as they relate to environmental issues (e.g., Darnall, 2006, 2009; Delmas & Montes-Sancho, 2011, Hoffmann, 1999).

The study here makes at least two contributions. First, this study extends previous literature on the influence of institutional distance by showing that different institutional dimensions should be taken into consideration to explain the strategies of MNEs and that each one may have a specific impact on the firms' approaches. Explicit attention will not only be given to the formal aspects of institutional distance but also to the most informal features.

Second, this research answers the call to analyze the influence of institutional dimensions on specific domains. Previous literature emphasizes that institutional distance must be measured with reference to the related institutional context (e.g., Busenitz, Gomez, & Spencer, 2000). The study here focuses on the green context; the study extends recent attention in this field (Aguilera-Caracuel, Aragón-Correa, Hurtado-Torres, & Rugman, 2012) by offering a general framework that includes differentiated analysis of the effects of the formal and informal environmental distances between home and host countries. In addition, we incorporate the term, "environmental performance standardization," to refer to a scenario in which the MNEs' facilities operating in different countries reach similar levels of environmental impact.

Based on a sample of 128 MNEs in three different industries with headquarters and subsidiaries based in the USA, Canada, France, and Spain, the results show that not all the dimensions of environmental distance have the same influence on the standardization of environmental performance within an MNE. A high informal environmental distance between home and host countries encourages the MNEs to standardize their environmental performance, whereas a high formal environmental distance drives the MNEs to adapt their environmental performance according to each country's institutional requirements.

This paper proceeds with a theoretical review in Section 2. Section 3 proposes the hypotheses. The fourth and fifth sections report on the methodology and describe the empirical results, respectively. Section 6 offers a discussion and conclusions.

## 2. Conceptual framework

Managers of MNEs make strategic decisions that take into account both firm-specific advantages (FSAs) and country-specific advantages (CSAs) (Rugman & Verbeke, 2003). As a result, MNEs need to consider the specific conditions of their home and host countries and take into account their internal resources and capabilities in developing their management policies and practices (Kolk & Pinkse, 2008).

In addressing environmental issues, MNE managers must decide whether they wish to implement advanced environmental approaches using the dynamic capacity of their firms to design or alter their operations, processes, and products to voluntarily prevent the negative environmental impacts the firms would otherwise generate (Aragón-Correa & Sharma, 2003; Hart, 1995). Toward this end, MNE managers must consider whether the generation of specific green advantages associated with advanced environmental performance levels can only be developed and used within individual countries (location-bound) or if they can be used globally through environmental standards (non-location-bound) (Rugman & Verbeke, 1998a, 1998b, 2001). MNEs that decide to

generate non-location-bound green initiatives are able to transfer advanced environmental management practices to the rest of their units. As a result, the MNE self-regulates its environmental conduct worldwide due to a commitment that extends beyond what the law requires (King & Lenox, 2000; Rivera & deLeon, 2008) through voluntary environmental initiatives (Christmann & Taylor, 2006; Delmas & Montes-Sancho, 2011). Several studies have shown that pressures by various stakeholders (governments, industry, and customers) contribute to the global standardization of different dimensions of MNEs' environmental policies (e.g., Christmann, 2004; Orlitzky et al., 2011).

MNEs do not only face different national institutional dimensions in the various contexts in which they operate, they also create their own internal profile. Because these firms face complex institutional pressures and act on a large scale, they need to reinforce their own internal institutional profiles (DiMaggio & Powell, 1983; Kostova et al., 2008), which include internal procedures, principles, and organizational cultures that make certain practices and structures more acceptable and desirable than others (Kostova & Zaheer, 1999). An MNE's internal institutional profile can reduce ambiguity within organizational units, increase trust, and transfer a set of capacities and competences within the firm (Bartlett & Ghoshal, 1989). Consequently, MNEs are able to promote their own legitimacy in each country and increase their transparency (Christmann, 2004).

The literature on international management has used different dimensions to analyze the institutional characteristics of specific countries (e.g., Arslan & Larimo, 2010; Bae & Salomon, 2010; Estrin et al., 2009; Gaur & Lu, 2007; Salomon & Wu, 2012; Xu, Pan, & Beamish, 2004). North (1990) proposed a classification of formal and informal institutional distances. Formal institutional distance refers to the differences between the legal institutions, laws, and regulations of the home and host countries of the MNE (Salomon & Wu, 2012). Informal institutional distance results from the differences in values, beliefs, customs, traditions, and codes of conduct of the home and host countries of MNEs (Arslan & Larimo, 2010; Salomon & Wu, 2012).

North's framework offers three advantages for the analysis of how the differences between international contexts influence the management approaches of MNEs. The boundaries of institutional distance are clearly defined and avoid any confusing overlap (Arslan & Larimo, 2010). North's framework focuses on national institutions and thus lends itself to country-level analysis (Gelbuda, Meyer, & Delios, 2008; Kostova & Roth, 2002). The approach is suitable for international business studies and allows for consistency and clarity in analyzing differences within the national and international contexts (Estrin et al., 2009; Peng & Khoury, 2009).

Consequently, this research follows the call of Peng (2002, 2003) and Peng, Wang, and Jiang (2008) to use North's framework to the classification of institutional dimensions. The next section will examine the different impacts of the formal and informal institutional distance dimensions on environmental performance standardization for MNEs.

## 3. Hypotheses

Environmental initiatives of MNEs may be highly conditioned by the institutional profiles of the different countries where these firms operate. High environmental institutional distance between home and host countries may lead MNEs to achieve a different level of environmental performance and, hence, to develop opportunistic behavior with regard to the natural environment (Aguilera-Caracuel et al., 2012). Alternatively, the MNE may create its own environmental performance standards by reinforcing its internal institutional profile independent of those of the countries in question. Thus, the formal and informal dimensions of environmental institutional distance may have differing impacts on the generation of location- and non-location-bound green firm-specific advantages within the MNE.

### 3.1. Formal environmental distance and environmental performance standardization within MNEs

Formal institutional distance refers to the differences between the legal institutions and regulations of the home and host countries (North, 1990; Salomon & Wu, 2012). The formal dimension in North's (1990) classification corresponds to the regulatory dimension in Scott's (1995) classification. Regulatory elements include rules, sanctions, and legal requirements that tend to codify socially accepted corporate behavior (Muthuri & Gilbert, 2010). Such tools are coercive and are tied to asymmetric power relationships. Previous literature has widely studied home and host environmental regulations and their influence on the adoption of corporate environmental strategies by MNEs (Rugman & Verbeke, 1998a, 1998b). The results are inconclusive. Some authors argued that MNEs tend to locate their most polluting activities in countries with lax environmental regulations (Vernon, 1992; Stewart, 1993). The transfer of green FSAs to countries that are relatively distant in terms of their environmental regulations usually results in higher adaptation costs (compared to location-specific "linking" investments) accrued to align the firm with the specific advantages of these particular host countries (King & Shaver, 2001; Rugman & Verbeke, 2003). Chang and Rosenzweig (2001) argue that when MNEs enter an unfamiliar or different legal context, they have to adapt their business practices, including their contracts with employees, agents, and distributors.

On the other hand, some studies show that MNEs create their own internal rules by generating environmental standards that are independent of countries' environmental regulations (Christmann & Taylor, 2001, 2006; Delmas & Montes-Sancho, 2011). Government policies can also provide support for firms, can structure competition within industries (Barnett & Carroll, 1995) or may favor and provide incentives to entrepreneurs (Rondinelli & Kasarda, 1992).

Considering environmental regulations as coercive, a high level of formal environmental distance between home and host countries leads MNEs to exhibit different levels of environmental performance that correspond to each country's legal requirements. If the host country has lax environmental regulations, firms may find it easier and more practical to lower their level of environmental performance in that country, ignoring the potential to develop a proactive and a standardized environmental approach. If the employees at a subsidiary perceive a practice of their company in other countries to be in conflict with the regulatory institutions in their country, they are unlikely to transfer and implement this practice (Kostova & Roth, 2002) due to the sanctions that would result from violating national regulations. Finally, foreign firms that decide to locate some of their operations in other countries usually face more environmental legal requirements determined by different stakeholders than do locally operating firms (Arslan & Larimo, 2010; King & Shaver, 2001). Consequently, foreign firms tend to adapt their levels of environmental performance according to each country's legal requirements.

With a high formal environmental distance between home and host countries, MNEs need to avoid penalties, sanctions, and the cost of litigation in each country where they operate. MNEs may limit their action to compliance with environmental regulations and fail to strengthen their internal institutional profile.

**H1. The greater the formal environmental distance between home and host countries, the lower the environmental performance standardization within the MNE.**

### 3.2. Informal environmental distance and environmental performance standardization within MNEs

Informal institutional distance results from the differences in values, beliefs, customs, traditions, and codes of conduct of home and host countries (Arslan & Larimo, 2010; North, 1990; Salomon & Wu, 2012). These informal aspects can influence the management

decisions of MNEs, such as the transfer and management of organizational routines or the degree of adaptation to the local environment (e.g., Kostova, 1999; Xu & Shenkar, 2002).

Many scholars refer to informal institutions, broadly, as cultural institutions (Salomon & Wu, 2012). Other scholars explicitly account for differences between normative and cognitive institutions (e.g., Kostova & Roth, 2002; Xu & Shenkar, 2002; Yiu & Makino, 2002). These approaches are consistent with the prevailing international business literature, as summarized by Jensen and Szulanski (2004: 513), "Cultural distance adequately captures cognitive and normative institutions." According to House, Hanges, Javidan, Dorfman, and Gupta (2004), informal institutions have to be analyzed while taking into consideration the way things are currently performed at the nation-level and are required to be assessed using "what are" and "what should be" common behaviors and institutional practices in society. Therefore, this informal dimension clearly captures the attributes of national culture (Hanges & Dickson, 2006). The collective behaviors and knowledge form a culturally supported and conceptually correct basis that becomes unquestioned (Hoffman, 1999). Compared with the formal institutional dimension, this dimension is more tacit and more engrained in the deep-seated structures of a country (Gersick, 1991); it is more difficult for an outsider to sense and interpret this dimension (Estrin et al., 2009; North, 1990).

The beliefs, customs, and codes of conduct regarding the natural environment that are socially shared and carried by individuals in a country are determined by a variety of social actors, including the media, institutional investors, non-governmental organizations (NGOs), educational and professional associations, and social movement organizations. These actors set standards for legitimate organizational practices (Bansal, 2003).

Cross-country differences in the informal institutional dimension are of great importance to the environmental performance standardization within MNEs. Corporations that conform to all informal aspects are acting under the 'rules of the game' (Marquis, Glynn, & Davis, 2007: 934). Such firms exhibit behavior that is culturally acceptable in the institutional environments in which they operate (Kostova & Zaheer, 1999). The neo-institutional approach has traditionally emphasized that MNEs that want to gain legitimacy in the informal institutional dimension must attain isomorphism in each country where they operate (e.g., Kostova, 1999; Kostova et al., 2008; Scott, 1995). According to this approach, MNEs' subsidiaries act and behave as local firms rather than patterning their practices after those of the parent company or some other global standard (DiMaggio & Powell, 1983).

However, legitimacy in the informal dimension, as opposed to the formal, may be difficult for MNEs to attain (Kostova & Zaheer, 1999). Indeed, MNEs may find it more efficient to achieve legitimacy in an international and local context by using a standardized approach than to attempt to understand and satisfy a complex set of tacit expectations and subsequently risk being misunderstood. Because MNEs bring something distinctive to their host countries that is valued and appreciated by local constituents, they are less likely to adopt locally established practices. In addition, local environments do not necessarily provide all of the scarce resources that MNEs need; rather, MNEs may have alternative sources (Kostova et al., 2008).

In the green context, as long as MNEs act within the boundaries of the law, they can choose their level of responsiveness to the local informal institutional environment. MNEs are able to create their own internal business model throughout the organization regarding the implementation and transfer of informal elements (Kostova et al., 2008). Hence, MNEs tend to strengthen their internal institutional profiles if there is a large informal environmental distance between home and host countries. They will decide to unify their environmental impact in the different areas in which they operate, gaining internal coherence (Christmann & Taylor, 2006), transparency, reputation (Christmann, 2004; Dowell, Hart, & Yeung, 2000), and international legitimacy in the eyes of external agents (Bansal, 2005; Kostova et al., 2008).

Therefore, we hypothesize the following finding.



**H2. The greater the informal environmental distance between home and host countries, the greater the environmental performance standardization within the MNE.**

#### 4. Method

##### 4.1. Sample

The study tests these hypotheses using a sample of MNEs with headquarters based in the USA, Canada, or France and subsidiaries in four countries: the USA, Canada, France, and Spain. The four selected countries feature good data availability (with data measured in a similar way to allow comparisons), economic connections (including a good range of international firms with headquarters and subsidiaries in the four countries), and environmental institutional differences, which provide the opportunity to analyze how environmental similarities and differences influence the environmental performance of MNEs.

The country pairs USA–Canada and France–Spain have similar geographical and legal conditions. The USA and Canada are part of the North American Free Trade Agreement (NAFTA), which created the Commission for Environmental Cooperation (CEC) in North America. France and Spain belong to the European Union (EU) and are members of the European Environmental Agency (EEA). However, although these two groups of countries show similar values for some indicators – for instance, for per capita income, health investment, or investment in education and research and development during the period 2000–2005 (World Bank, 2005) – significant differences in terms of the formal and informal environmental dimensions were found for each of the four countries, regardless of whether they belong to NAFTA or the EU (specific data are available from the authors upon request).

This research uses public data available from the different national environmental registries and private information from Standard & Poor's Capital IQ (2009). The USA publishes the Toxic Release Inventory (TRI), Canada publishes the National Pollution Release Inventory (NPRI), and Spain and France publish the European Pollutant Emission Register (EPER).

Due to the significant impact on the natural environment (King & Lenox, 2002), the study focuses on three different industries: chemical (SIC Code 28), industrial machinery (SIC Code 37), and energy and petroleum (SIC Code 29) industries. The selection of MNEs followed three criteria. First, MNEs had at least one subsidiary based in one of the four countries analyzed. Second, those subsidiaries belonged to the same industry and conducted the same activities as the headquarters. Third, all facilities of the headquarters and subsidiaries (identified by using each national environmental registry) not focused on the core industrial activity (i.e., local sales, distribution centers, or centers with diverse activities) were excluded.

The initial sample contained 210 cases. Because of missing data, the final sample had to be reduced to 170 cases, including 128 different MNEs and 1790 facilities. 73 headquarters are based in the USA, 35 in France, and 20 in Canada. The sample includes 18 subsidiaries based in the USA, 69 in Canada, 66 in France, and 17 in Spain. 82 cases are from the chemical industry, 58 from the industrial machinery industry, and 30 from the energy and petroleum industry.

##### 4.2. Variable measurement

###### 4.2.1. Environmental institutional distance between home and host countries

The previous institutional literature has highlighted the importance of considering different dimensions of institutions to fully characterize a firm's institutional background (e.g., Gammeltoft, Filatochev, & Hobdari, 2012; Kostova & Roth, 2002; Salomon & Wu, 2012; Scott, 1995; Xu & Shenkar, 2002). In addition, different studies have insisted on the importance of adapting the dimensions for the analyzed situations (e.g.,

Busenitz et al., 2000; Descotes, Walliser, Holzmüller, & Guo, 2011; Hoffmann, 1999; Kostova & Roth, 2002). For this study, we used two environmental constructs (formal and informal) to reflect the countries' environmental institutional profiles and the two different types of environmental institutional distance between home and host countries.

*4.2.1.1. Formal environmental distance between home and host countries.* The World Economic Forum Survey on Environmental Governance (World Economic Forum, 2004) offers an aggregated dimension to reflect the environmental regulatory situation in different countries. Specifically, we use the 'rule of law' variable, which has also been used in previous literature (Abdi & Aulakh, 2012). This variable captures information that addresses detailed aspects of environmental regulation: air pollution regulations, chemical waste regulations, the clarity and stability of regulations, the flexibility of regulations, environmental regulatory innovation, leadership in environmental policy, the consistency of regulation enforcement, environmental regulatory stringency, toxic waste disposal regulations, and water pollution regulations.

Using principal components of all of the survey questions included in the analysis, this dimension aggregates all the aspects of environmental regulation mentioned above. The formal environmental distance between the countries in which the headquarters and the subsidiaries are located was calculated based on the absolute value of the differences between the scores of the two countries. Scores close to zero show that environmental regulatory features have similar importance in the countries in question, and therefore, the environmental formal institutions are similar in both countries.

*4.2.1.2. Informal environmental distance between home and host countries.* We use a multi-item indicator including secondary data for a selection of four different environmental domestic variables: waste recycling (Organization for Economic Cooperation and Development, 2004; United Nations Human Settlements Programme, 2004); practices related to the reduction of ecological footprint per capita (Ecological Footprint of Nations, 2004); private sector environmental innovation; and the use of energy subsidies (World Economic Forum, 2004). These practices together capture the national informal dimension in the environmental field because they represent environmentally devised constraints that are not formalized but embedded in customs, traditions, and codes of conduct or social norms.

Specifically, these practices are a good proxy of the informal environmental situation in the country because they emerge from the collective assumptions and behaviors regarding different key fields of the environmental problems in the country. In addition, the selected practices are internationally well accepted, and homogeneous data are available for them.

The information was captured from different international secondary databases. Appendix A includes a detailed description of each item and how each one relates to the environmental profile of the country. A subsequent confirmatory analysis tested the robustness of the measure. The informal environmental distance between the countries was calculated based on the absolute value of the differences between the final score of this dimension in each country.

###### 4.2.2. Environmental performance standardization within the MNE

To create this variable, the study takes into account the degree of similarity between headquarters' and subsidiaries' environmental performance (air releases). Air releases were considered because some national environmental registries (the EPER in particular) have multiple missing data for land, water releases, or waste-recycling processes. For this reason, a proxy of the headquarters' and subsidiaries' impact on the natural environment was needed. Several studies have used air releases as a proxy of environmental performance, especially in highly polluting industries (e.g., King & Lenox, 2000; King & Shaver, 2001), and international treaties and regulations usually pay more attention

to air pollution because of its impact on key environmental issues (i.e., climate change).

The 50 most polluting substances included in the European Pollutant Emission Register (EPER) were included in the analysis, and each substance was weighted according to its degree of toxicity (EPA, 1997; King & Lenox, 2000, 2002; King & Shaver, 2001). The next step involved aggregating the data at the facility level to obtain the headquarters' and subsidiaries' air releases for 2005.

Similar to other studies, which assessed the environmental performance of facilities and firms (e.g., King & Lenox, 2000, 2002; King & Shaver, 2001) this research used the coefficient between the headquarters' and subsidiaries' air releases and their total revenues in 2005 (Capital IQ, 2009) to obtain a value that shows the environmental impact of each of the MNE's organizational units (headquarters and subsidiaries), taking into account sales during that year and the environmental impact associated with those sales. The environmental performance standardization within MNEs was calculated by subtracting the headquarter ratios from the subsidiary ratios.

4.2.3. Control variables

4.2.3.1. *Headquarters and subsidiary size.* Organizational size has significant repercussions on an organization's environmental conduct (Aragón-Correa, 1998). We controlled for headquarters and subsidiary size using the Neperian logarithm of the number of employees in 2005 as a proxy for firm size (King & Shaver, 2001).

4.2.3.2. *Industry.* To consider the possible effects of the three different industries in the sample, we created two dummy variables (chemical industry and energy and petroleum industries) (Christmann & Taylor, 2001).

4.2.3.3. *Headquarters' financial performance.* Firms with superior performance may be more likely to pursue environmental self-regulation (Christmann & Taylor, 2001). Headquarters' financial performance was measured using the ratio of return on equity in 2005 (Bansal, 2005).

4.2.3.4. *NAFTA.* The study includes a dichotomous variable to control for whether the country in which the headquarters are based belongs to NAFTA. Hence, we were able to distinguish between the European and American groups of countries in our sample.

5. Results

5.1. Confirmatory analysis

To assess the reliability and validity of the informal dimension, a confirmatory analysis of all four items was conducted using LISREL 8.0 and the weighted least squares (WLS) method. To perform this analysis, we considered the values of the construct for the 146 countries included in the Environmental Sustainability Index 2005 (Esty, Levy, Srebotnjak,

& Sherbinin, 2005). All the items were standardized in advance to unify the scales. Finally, to establish comparisons among all the constructs, the scales of the "practices related to the reduction of ecological footprint per capita" and the "the use of energy subsidies" indicators were inverted.

Table 1 shows a good fit of the final model. The standardized factor loadings are statistically significant and at least 0.7 with individual reliabilities (R<sup>2</sup>) above 0.5, which indicates the convergent validity of the measurement scales. A composite reliability (CR) above 0.7 and average extracted variance (AVE) exceeding 0.5, together with a high Cronbach's alpha value, provide evidence for the scale's reliability (Hair, Black, Babin, & Anderson, 2009).

The final score of the informal dimension for each country was obtained using the average sum for the values of the items in each construct. In calculating the average sum, we considered each indicator's standardized factor loading.

5.2. Regression analysis

The hypotheses have been verified using ordinary and hierarchical least-squares (OLS) regression techniques. Precautionary and post-hoc analyses indicate that multivariate outliers are not present in the dataset and, therefore, do not exert a significant impact on the results. All the variables were normalized to avoid the detrimental effects of dispersed values. An analysis of the condition indices and variance inflation factors (VIFs) shows that multi-collinearity does not seem to threaten the estimates (Hair et al., 2009). The VIF values are all adequate, with values less than 5. Table 2 presents the descriptive statistics and correlations for all variables. No high correlations among the variables were observed.

Table 3 shows the regression results. Model 1 includes the control variables. Model 2 incorporates the formal environmental distance between home and host countries. Finally, Model 3 adds the informal environmental distance between home and host countries. The three models exhibit good fit, with adjusted R<sup>2</sup> values that range from 0.32 to 0.36. Thus, Model 3 very accurately explains the environmental standardization within the MNEs.

The formal environmental distance between the countries in which headquarters and subsidiaries are located has a negative and significant impact on environmental performance standardization within MNEs (Model 3: β = 0.68, p < 0.01). The greater the formal environmental distance between home and host countries, the lower the degree of environmental performance standardization within the MNE. Therefore, the findings support H1.

The informal environmental distance between home and host countries has a positive and significant effect on environmental performance standardization within the MNE (Model 3: β = -0.82, p < 0.055). The greater the informal environmental distance between the countries the greater the environmental performance standardization within the MNE. Thus, H2 receives support.

A location in NAFTA, the headquarters' financial performance, and the subsidiary size are positively related to environmental performance

Table 1  
Confirmatory factor analysis and Cronbach's alpha.

Constructs	Standardized loadings	R <sup>2</sup>	Composite reliability (CR)	Average extracted variance (AVE)	Cronbach's alpha
Informal environmental dimension:			0.97	0.87	0.89
Waste recycling	0.97	0.94			
Practices related to the reduction of ecological footprint per capita (inverted scale)	0.88	0.77			
Private sector environmental innovation	0.98	0.95			
Use of energy subsidies (inverted scale)	0.91	0.83			

Goodness-of-fit measures: χ<sup>2</sup>(13) = 82.53; CFI = 0.98; GFI = 0.98; AGFI = 0.96; RMSEA = 0.07.

**Table 2**  
Descriptive statistics and correlations.

	Mean	Standard deviation	Environmental performance standardization	Headquarters' size	Subsidiary size	Chemical industry	Energy and petroleum industry	Headquarters' financial performance	NAFTA	Formal environmental distance between home and host countries
Environmental performance standardization	0.55	1.62								
Headquarters size	10.42	1.22	−0.13*							
Subsidiary size	6.25	1.58	−0.18**	0.43***						
Chemical industry	0.46	0.50	0.16*	−0.49***	−0.30***					
Energy and petroleum industry	0.18	0.39	−0.08	−0.12†	0.20**	−0.44***				
Headquarters' financial performance	0.02	0.54	−0.42***	0.18*	0.15*	0.03	0.07			
NAFTA	0.83	0.37	−0.37	−0.10***	−0.12*	0.11†	−0.11†	0.12†		
Formal environmental distance between home and host countries	−0.44	0.43	0.30***	0.01	−0.04	0.05	−0.05	−0.14*	−0.29***	
Informal environmental distance between home and host countries	0.24	0.23	0.11†	0.04	−0.12	0.07	−0.15*	−0.13*	−0.24***	0.31**

N = 170.

† p < 0.10.

\* p < 0.055.

\*\* p < 0.01.

\*\*\* p < 0.001.

standardization within the MNE. The firms belonging to the chemical industry show less environmental performance standardization. These results are consistent with the previous literature.

**6. Discussion and conclusions**

The international business literature recognizes that countries' institutional dimensions may have a direct impact on MNEs' strategic approaches (Kostova & Roth, 2002). Considering the simultaneous influence of countries' institutional dimensions and firms' potential to generate advantages through own initiatives (Rugman, 1981; Rugman & Verbeke, 1998a, 1998b, 2001), this study helps explain how the different dimensions of environmental institutional distance between home and host countries influence MNEs' decisions regarding environmental performance standardization. The results are particularly useful because

they show that high institutional distance may have different implications depending on the specific institutional dimension.

The results demonstrate that a high formal environmental distance between home and host countries leads the sampled MNEs to exhibit high variance in environmental performance based on the legal requirements for each local context. These results suggest that when the formal environmental distance is high, the MNEs comply with environmental regulations to avoid penalties, sanctions, and legal costs. The organizations analyzed appear to find it more efficient to improve their environmental performance as necessary within the local context than to standardize their approach to environmental issues based on the most stringent regulations in the different countries in which they operate.

Large informal differences between home and host countries result in lower differences between the headquarters' and subsidiaries' environmental performance in the different countries in which these

**Table 3**  
Results of the hierarchical regression analyses<sup>a</sup>.

	Model 1	VIF	Model 2	VIF	Model 3	VIF
Intercept	1.60 (1.19)		1.77 (1.18)		1.99 (1.18)	
Headquarters size	0.08 (0.11)	1.61	0.06 (0.11)	1.62	0.08 (0.11)	1.64
Subsidiary size	−0.13† (0.07)	1.28	−0.12† (0.07)	1.29	−0.14* (0.07)	1.31
Chemical industry	0.69** (0.27)	1.70	0.64** (0.27)	1.71	0.66** (0.27)	1.71
Energy and petroleum industry	0.05 (0.30)	1.30	0.07 (0.30)	1.31	0.01 (0.30)	1.32
Headquarters' financial performance	−1.12*** (0.20)	1.10	−1.08*** (0.2)	1.12	−1.11*** (0.20)	1.12
NAFTA	−1.58*** (0.28)	1.05	−1.4*** (0.29)	1.15	−1.48*** (0.29)	1.18
Formal environmental distance between home and host countries			0.55** (0.25)	1.12	0.68** (0.26)	1.22
Informal environmental distance between home and host countries					−0.82* (0.48)	1.24
R <sup>2</sup>	0.34		0.36		0.39	
Adjusted R <sup>2</sup>	0.32		0.33		0.36	
Change in F	14.17***		4.86**		2.92*	

Dependent variable: Environmental performance standardization within the MNE.

N = 170.

Negative coefficients show a positive effect on the environmental performance standardization within the MNE. In contrast, positive coefficients show a negative impact on the environmental performance standardization within the MNE.

<sup>a</sup> Non-standardized regression coefficients are shown. Standard errors are in parenthesis.

† p < 0.10.

\* p < 0.055.

\*\* p < 0.01.

\*\*\* p < 0.001.



units operate. Within the green context, because the agents' perceptions regarding beliefs, cultural customs, and codes of conduct are often diverse and perhaps even contradictory, the MNEs avoid the high costs and risks of adapting their environmental performance levels to the environmental schemas of each country. Because this dimension reflects societal beliefs and schemas related to what the environmental issues are, the dimension is difficult for outsiders to discern and interpret because it is embedded in subtle social structures (Gersick, 1991). Consequently, the MNEs prefer to standardize their level of environmental performance because they are able to reinforce their reputation and legitimacy and add coherence to their business model (Bansal, 2005; Kostova et al., 2008).

The control variables (i.e., size, original location, or financial performance) have shown that some variables traditionally discussed in the environmental literature are relevant to the analysis of multinational firms. However, the inclusion of the control variables does not alter the findings concerning the importance of the dimensions of institutional distance between countries.

The presented research makes two important contributions to the international business and environmental strategy literature. First, the research advances institutional theory in terms of the specific influence of formal and informal dimensions of the institutional distance between countries. Previous international management studies concerning the effect of institutional distance between home and host countries have been ambiguous on this distinction (Gammeltoft et al., 2012).

Second, this work extends the previous literature analyzing the environmental strategies of MNEs by emphasizing the joint importance of firm-specific assets and institutional dimensions in the environmental field. The study facilitates an understanding of how the institutional distance between home and host countries affects whether the firm-specific advantages connected with optimum levels of environmental performance are useful in all the locations in which the MNEs operate or only some of them (non-location-bound and location-bound green FSAs). Hence, this work helps to reinforce the links between the institutional and strategic literature regarding international firms and the natural environment.

This research has implications for managers as well. Governmental regulations are clear and easy to follow for decision-makers. Managers must comply with environmental regulations to obtain a "license to operate" and ensure the firms' survival (Gunningham & Kagan, 2005). In the case of a high formal environmental distance between the home and host countries, adaptation according to the legal requirements in each country where MNEs have operations may be the most efficient way. At the same time, there are relevant informal institutional elements that may lead managers to create environmental performance standards within the MNEs' internal network. Managers might attempt to cultivate similar environmental approaches in all the MNEs' units (headquarters and subsidiaries) if there is a large informal environmental distance between home and host countries. In this case, MNE managers may want to avoid the risk of misunderstanding the locally embedded conditions and to transfer legitimacy from the country of the headquarters by promoting and transferring their MNE's own internal environmental practices, codes of conduct, and cultural traditions across the organization.

For policy makers, this research provides new insight into the importance of considering informal institutions as well as formal ones when creating incentives to protect the natural environment. To improve the environmental performance of international firms, governments must specifically take into consideration the influence of other institutional conditions in addition to making appropriate regulations. To include these influences, governments are required to design proper policies and incentives beyond environmental regulations that encourage organizations to develop advanced environmental management initiatives. Because MNEs are key operators in terms of economic and environmental development (Kolk & Pinkse, 2008; Kolk & van Tulder, 2010), policy

makers and public and private agents (i.e., NGOs, green associations) need to encourage them to take the responsibility to become agents of global change.

This study has several limitations. First, the MNEs' environmental performance was measured using data on air releases. Although air releases are an important dimension of environmental performance, water and land release data and data on waste recovery and recycling processing may be of interest to complement the study if these data become internationally available in the future. Second, although the researchers verified that all the compared facilities belonged to the same industry, data limitations prevented determining whether the subsidiaries were more or less focused on specific products than the headquarters and determining the number of their revenue-generating activities. Finally, the different national environmental registries remain incomplete. This study only analyzed the period for which all the national environmental registries offer full information.

Future studies should validate the presented results using a sample that includes organizational units located in developing countries from Asia and Africa. These countries may have very different national environmental institutional profiles and may generate different effects on the level of environmental practices transferred (Peng et al., 2008). It may also be useful to complement the work by analyzing the roles of specific agents (i.e., NGOs or green activists) in limiting or expanding the influence of the environmental institutional distance between countries.

## Appendix A. Items in the informal environmental dimension

Informal environmental dimension	
Waste recycling (Organization for Economic Cooperation and Development, 2004; United Nations Human Settlements Programme, 2004)	This item has been measured using the percentage of solid waste recycled for selected cities in each country for the non-OECD countries and the percentage of glass, paper, and cardboard recycled for the OECD countries. Waste recycling reduces impacts on the natural environment by using resources more efficiently and by reducing the stream of waste to landfills and for incineration. Recycling also reflects the country's awareness of the importance of reducing its environmental impact. Hence, this item captures the degree of collective skills and knowledge regarding the preservation of the natural environment.
Practices related to the reduction of ecological footprint per capita (Ecological Footprint of Nations, 2004)	This item is a popular measure of the area of biologically productive land that is required per capita to sustain a country's population at the current consumption levels. Thus, this measure makes it possible to consider an important behaviorally oriented pattern regarding how the individuals in a country consume (or not) in a responsible way.
Private sector environmental innovation (World Economic Forum, 2004)	This item represents the principal components of survey questions addressing the importance of innovative environmental behaviors in the private organizations in the country. This item is relevant to understanding the collective framework the country uses to categorize and evaluate the importance of protecting the natural environment, to implement advanced environmental management practices, and to collaborate with the public sector.
Use of energy subsidies (World Economic Forum, 2004)	This item is an index of a survey that assesses the degree of social acceptance of the government subsidies for energy or materials usage. The original survey assumes that subsidies encourage the wasteful consumption of energy and that this variable reflects the agents' mental models about the importance of responsible environmental attitudes.

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