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Departamento de Organización de Empresas

TESIS DOCTORAL

LA ESTRATEGIA MEDIOAMBIENTAL PROACTIVA Y

PLANTEAMIENTOS INTERNOS DE LA EMPRESA

Tesis doctoral presentada por

Vera Ferrón Vilchez

Dirigida por el Profesor Doctor

Juan Alberto Aragón Correa

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*Only when the last tree has been cut down,
only when the last river has been poisoned,
only when the last fish has been caught,
only then will you find that money cannot be eaten*

(Proverbio india)

Knowledge brings fear

(Mars University Matta)

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“Cuando el discípulo está listo, el maestro aparece”.

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CAPÍTULO 1

INTRODUCCIÓN

1.1. Un acercamiento al tema objeto de estudio y su importancia

1.1.1. Introducción

La actividad empresarial afecta al medio ambiente tanto por el consumo de materiales y energías como por la generación de residuos y emisiones contaminantes. Durante las tres últimas décadas el impacto que las empresas ejercen en el medio ambiente ha cobrado una especial atención por parte de investigadores, especialistas, reguladores y la sociedad en general. La incipiente preocupación por el calentamiento global de la tierra, el consiguiente cambio climático y/o el progresivo agotamiento de los recursos naturales han convertido al reto medioambiental en un punto de referencia a nivel global para la toma de decisiones de prácticamente todas las organizaciones. No obstante, a pesar de su relevancia, el conocimiento sobre las relaciones existentes entre los comportamientos empresariales en materia medioambiental y determinados planteamientos internos de las organizaciones es aún muy limitado.

Así, este trabajo pretende dar respuesta a cómo las organizaciones afrontan dicho reto medioambiental valiéndose para ello de una recopilación de tres artículos de investigación que estudian la sinergia existente entre la implantación de determinadas prácticas de gestión interna y la implementación de estrategias medioambientales proactivas.

1.1.2. Delimitación y concepto del tema objeto de estudio.

La proactividad se define como *la tendencia de las organizaciones para iniciar cambios en sus políticas empresariales, en vez de reaccionar a los eventos* (Aragón Correa, 1998b:557). En relación con el medio ambiente, una estrategia medioambiental proactiva queda delimitada como determinados patrones sistemáticos de prácticas voluntarias que llevan a cabo las empresas y que sobrepasan a los requerimientos legales, por ejemplo, en materia de reducción de residuos o de prevención de la polución (Klassen y McLaughlin, 1996; González Benito y González Benito, 2006; Aragón Correa y Rubio López, 2007).

No obstante, una estrategia medioambiental proactiva puede ser enfocada por parte de las empresas bajo diferentes perspectivas. González Benito y González Benito (2006) ofrecen una clasificación funcional compuesta por tres tipos de estrategias que delimitan cómo las empresas implementan determinadas prácticas medioambientales proactivas. Así, existen (i) prácticas organizativas y de planificación, encargadas de la definición a nivel corporativo de las políticas, procedimientos y objetivos medioambientales a conseguir por la empresa, (ii) prácticas operativas, que implican la inserción de cambios en los sistemas productivos de las empresas con idea de hacer frente a las actuales demandas medioambientales y, (iii) prácticas de comunicación, cuyo objetivo se basa en transmitir el compromiso medioambiental de la empresa al conjunto de la sociedad (González Benito y González Benito, 2006).

El presente trabajo pretende centrar su atención en cómo las empresas implementan estrategias medioambientales proactivas bajo la segunda perspectiva previamen-

te explicada, es decir, bajo una óptica enfocada en las prácticas operativas. Más concretamente, este tipo de prácticas medioambientales se clasifican en aquellas prácticas enfocadas a la transformación del producto y/o servicio hacia perspectivas más ecológicas (diseño y desarrollo de nuevos productos “verdes”, empaquetado ecológico, reciclaje del producto, etc.) y en prácticas enfocadas a la innovación y mejora medioambiental del propio proceso productivo (González Benito y González Benito, 2006). En este sentido, éstas últimas centradas en los procesos conforman el objeto de estudio del presente trabajo. Actividades relativas a la prevención de la polución como el control y seguimiento rutinario del desempeño medioambiental de la empresa, el uso de herramientas y tecnologías que permitan alcanzar altos niveles de ecoeficiencia¹ o la orientación interna hacia la minimización de los costes medioambientales suponen claros ejemplos del enfoque usado por este trabajo para delimitar la relación existente entre una estrategia medioambiental proactiva y determinados planteamientos internos existentes en las empresas.

1.1.3. Evolución de la relación existente entre empresa y medio ambiente.

Durante las décadas de los sesenta y los setenta del pasado siglo comienza a surgir determinados movimientos sociales que defienden una mayor preocupación por los problemas medioambientales, sobretodo de aquellos que eran percibidos como de naturaleza local: contaminación de las aguas por el mal uso de desagües, polución del aire proveniente de chimeneas industriales, entre otros (Aragón Correa, 1998a). Morrison y

¹ La ecoeficiencia se define como la elaboración de bienes y servicios a precios competitivos, que satisfacen las necesidades humanas y ofrecen calidad de vida, al mismo tiempo que van reduciendo los impactos medioambientales negativos hasta un nivel al menos igual a la capacidad de regeneración de la Tierra (www.wbcsd.org)

Dunlap (1986) consideran que la década de los ochenta es el punto de partida para la expansión de dicha preocupación medioambiental a la sociedad en su conjunto. Debido a este incipiente interés general por los problemas medioambientales, será a mediados de los ochenta cuando varias empresas líderes comienzan a insertar el reto medioambiental en su toma de decisiones. La iniciativa “Responsible Care” de la industria química ejemplifica este hecho. Dicha iniciativa nace en 1985 en Canadá con la idea de que las empresas ubicadas en el sector químico, mediante sus asociaciones nacionales, trabajaran de manera conjunta para mejorar los resultados medioambientales y el desempeño en material de salud y seguridad de los miembros del sector químico de manera global (www.responsiblecare.org). De esta forma, mediante el apoyo de asociaciones sectoriales, de gobiernos e incluso de organizaciones medioambientales, el mundo empresarial comienza a afrontar paulatinamente el reto medioambiental.

En el verano de 1992 tuvo lugar la Conferencia de Naciones Unidas sobre medio ambiente y el desarrollo sostenible, también conocida como “Cumbre de la Tierra”, en Río de Janeiro. Dicha cumbre dio lugar a la elaboración del documento “Agenda 21” que supuso el punto de partida para la generalización del concepto de *desarrollo sostenible* por parte de gobiernos, empresas, organizaciones no gubernamentales y el público en general.

Diez años más tarde, en 2002, se volvió a celebrar la siguiente “Cumbre de la Tierra” en Johannesburgo con el objetivo de que todos los entes sociales continuasen avanzando en temas medioambientales que han ido adquiriendo con el paso de los años una mayor relevancia y se han ido revistiendo de una mayor alerta pública, como por ejemplo:

- La entrada en vigor en el año 2005 del Protocolo de Kioto que acuerda la reducción de emisiones de gases a la atmósfera por parte de los gobiernos para evitar el calentamiento global de la Tierra, lo cual produce el Cambio Climático.
- Una mayor aplicación en todos los ámbitos (agricultura, arquitectura, mundo empresarial, entre otros) del concepto de *desarrollo sostenible*, que se define como *la manera de satisfacer las necesidades de las generaciones presentes sin comprometer las posibilidades de las generaciones del futuro* (WCED, 1987:43).
- La fulgurante emergencia y expansión poblacional de los nuevos países industrializados, como La India o China, cuyo consumo de recursos naturales (agua, energía, tierra) crece exponencialmente, lo cual plantea la falta de saneamiento, la carencia de estrés hídrico e incluso el agotamiento de dichas fuentes.
- El progresivo agotamiento de las reservas de combustibles fósiles y, por ende, del petróleo, unido a la degradación de los ecosistemas y, con ello, la pérdida irreversible de la diversidad biológica y los recursos energéticos que contienen.

Además de lo señalado en párrafos previos, la Tabla 1 muestra varias de las reuniones internacionales más importantes que han acontecido en la última década para la defensa y protección del medio ambiente y sus principales líneas de actuación.

Tabla 1: Varios hitos internacionales de la última década sobre medio ambiente

Reunión Internacional	Principales líneas de actuación
La comunicación de la Comisión Europea al Consejo Europeo, al Parlamento Europeo, al Comité Económico y Social y al Comité de las Regiones sobre el VI Programa de Acción en Materia de Medio Ambiente de la Unión Europea, titulado <i>Medio ambiente 2010: el futuro en nuestras manos</i> . Bruselas (Bélgica), 2001.	Definir las prioridades y objetivos de la política medioambiental de la Unión Europea tomando como horizonte temporal el 2010 y detallar las medidas a adoptar para contribuir a la aplicación de la estrategia de la Unión Europea en materia de desarrollo sostenible.
Conferencia Mundial sobre Desarrollo Sostenible de Johannesburgo, también conocida como " <i>Río+10</i> " o <i>Cumbre de Johannesburgo</i> . Johannesburgo (Sudáfrica), 2002.	Reafirmar el desarrollo sostenible como el elemento central de la Agenda Internacional y dar un nuevo ímpetu a la acción global para la lucha contra la pobreza y la protección del medio ambiente.
<i>Cumbre de Bali</i> de Naciones Unidas sobre cambio climático. Bali (Indonesia), 2007.	Redefinir el Protocolo de Kioto y adecuarlo a las nuevas necesidades respecto al cambio climático.
Cumbre de Copenhague de Naciones Unidas sobre cambio climático. Copenhague (Dinamarca), 2009.	Alertar y movilizar sobre la necesidad de tomar medidas urgentes sobre el cambio climático con idea de alcanzar un acuerdo común que aporte soluciones reales al problema.

En el ámbito académico relativo a la Organización y Dirección de empresas, todas estas preocupaciones sociales y ecológicas comienzan a ponerse de manifiesto de manera más tardía. La investigación sobre la gestión medioambiental de las empresas es un tema relativamente joven en el ámbito académico en comparación con otros campos de investigación de corte medioambiental. A finales de la década de los ochenta y principios de los noventa la literatura existente ofrece multiplicidad de estudios descriptivos

y divulgativos, pero con poca base teórica en relación a los paradigmas de investigación de la disciplina (Newton y Harte, 1997). No obstante, el monográfico de octubre de 1995 de la revista científica *Academy of Management Review* sobre organizaciones ecológicamente sostenibles supuso el punto de referencia formal para la consolidación de publicaciones con una mayor rigurosidad en cuanto a metodología estadística se refiere y con fuerte arraigo en los planteamientos teóricos propiamente del ámbito científico de la Dirección y Organización de empresas. Merece una especial atención el artículo seminal de Stuart Hart (1995) en el cual se propone una *aproximación natural* a la teoría de recursos y capacidades de la organización. Hart (1995) delimita la existencia de tres estrategias organizativas interrelacionadas (la prevención de la polución, la gestión del producto y el desarrollo sostenible) que dan lugar a la generación de recursos capaces de incorporar el interés por la mejora del medio ambiente en la dirección estratégica de las empresas, y, por ende, de generar ventajas competitivas a las organizaciones que los desarrollan. Tras este punto de partida, comienzan a emerger estudios cada vez más rigurosos que relacionan determinados planteamientos organizativos medioambientalmente proactivos con enfoques teóricos del ámbito de la Dirección y Organización de empresas, como la Teoría Institucional (ej. Hoffman, 1999), la Perspectiva de Recursos y Capacidades (ej. Aragón Correa, 1998b), la Teoría de los *Stakeholders* o grupos de interés de la organización (ej. Fineman y Clarke, 1996; Henriques y Sadosky, 1996; 1999), o la influencia de la regulación medioambiental en las empresas (ej. Porter y van der Linde, 1995).

Llegado a este punto de madurez en la investigación científica sobre la influencia de una adecuada gestión medioambiental de las empresas, los investigadores comienzan a plantearse si dichas prácticas medioambientales afectan positiva o negativa-

mente al desempeño empresarial, por lo que aparecen diversos estudios que estudian la repercusión de determinados comportamientos medioambientalmente proactivos en dicho desempeño empresarial (ej. Klassen y McLaughlin, 1996; Hart y Ahuja, 1996; Russo y Fouts, 1997; Delmas, 2005). En este caldo de cultivo, en el verano de 2000 aparece el monográfico de otra de las revistas de reconocido prestigio en el ámbito científico de la Dirección y Organización de Empresas, *Academy of Management Journal*. Este hecho supone la consolidación definitiva de la gestión medioambiental como línea de investigación *per se* a nivel global, comenzando a aparecer numerosos estudios y artículos que versan sobre determinados comportamientos medioambientales proactivos de las organizaciones en publicaciones de alta calidad y con elevados índices de impacto.

En la actualidad, el campo de actuación de la investigación sobre gestión medioambiental ha aumentado exponencialmente, apareciendo nuevas temáticas para explorar como la moderación de los factores del entorno en la implantación de estrategias medioambientales proactivas (ej. Aragón Correa y Sharma, 2003), la problemática medioambiental de las empresas multinacionales (ej. Christmann, 2004), o la compensación a los directivos en función del desempeño medioambiental obtenido (ej. Berrone y Gómez Mejía, 2009).

Por tanto, nuestro trabajo toma como punto de partida las últimas propuestas de esta reciente línea de investigación, tratando de aportar nuevos enfoques y resultados empíricos a la literatura existente de tal forma que continúe el proceso de desarrollo, mejora y consolidación de la misma.

1.1.4. Interés de la investigación

El presente trabajo presenta una compilación de tres artículos de investigación que versan sobre cómo las empresas pueden beneficiarse de la sinergia existente entre determinados planteamientos internos y la implementación de una estrategia medioambiental proactiva.

La literatura sobre gestión medioambiental ha puesto de manifiesto en múltiples ocasiones los potenciales beneficios tanto tangibles como intangibles de la implantación de estrategias medioambientales proactivas. Este trabajo pretende aportar tanto evidencia empírica como un estudio cualitativo a dicha línea de investigación y para ello se utilizan dos paradigmas teóricos de la disciplina de la Dirección y Organización de empresas: la Perspectiva de Recursos y Capacidades y la Teoría de los *Stakeholders*.

En primer lugar, resulta de especial interés estudiar conjuntamente determinados planteamientos internos empresariales y las implicaciones que conllevan la implantación de prácticas medioambientales proactivas orientadas a los procesos productivos bajo la Perspectiva de Recursos y Capacidades puesto que las organizaciones que llevan a cabo simultáneamente ambos planteamientos están capacitadas para beneficiarse de las sinergias resultantes de los mismos. La literatura existente sobre recursos y capacidades explica qué condiciones debe cumplir un recurso o una capacidad para poder ser fuente de ventaja competitiva (Wernerfelt, 1984; Barney, 1991). Bajo este enfoque teórico varios estudios han demostrado cómo determinadas prácticas medioambientales que gozan del reconocimiento externo por parte del público en general suponen una ventaja para la empresa (ej. Delmas, 2001; Darnall, 2006). No obstante, con el presente

trabajo se pretende demostrar que no sólo aquellos recursos o capacidades desarrollados en el seno de estrategias medioambientalmente proactivas con una orientación externa son capaces de soportar ventajas competitivas, sino que como consecuencia de las sinergias resultantes de la combinación de dichas estrategias medioambientales y determinados planteamientos internos de las empresas se pueden obtener beneficios aún mayores. Por ejemplo, la obtención de una certificación medioambiental por parte de una empresa es un recurso fácilmente imitable por el resto de competidores y, por tanto, no entraña una fuente de ventaja competitiva. Sin embargo, la orientación hacia la eficiencia productiva unida a un comportamiento medioambiental proactivo ofrece como resultado el desarrollo de una capacidad valiosa, insustituible, rara y difícilmente imitable como es el caso de poseer altos niveles de ecoeficiencia o la disminución simultánea de los impactos medioambientales negativos y los costes soportados por la empresa. Por tanto, el estudio de la combinación de ambos planteamientos y sus implicaciones suscita un gran interés por parte de investigadores, directivos y reguladores públicos.

En segundo lugar, buena parte de la literatura en gestión medioambiental se ha encargado de estudiar la influencia de los *stakeholders* o grupos de interés de la empresa (Freeman, 1984) a la hora de implementar determinadas prácticas medioambientales proactivas (Henriques y Sadorsky, 1996; 1999; Céspedes Lorente et al., 2003; Buysse y Verbeke, 2003; Sharma y Henriques, 2005; Kassinis y Vafeas, 2006; Murillo Luna et al, 2008). No obstante, poco es sabido sobre si los directivos perciben de diferente manera esta influencia a la hora de implementar prácticas medioambientales de orientación interna o aquellas prácticas que gozan de un mayor reconocimiento externo. Nuestro trabajo pretende arrojar luz sobre dicha temática puesto que, haciendo mención a los párrafos previos, un mayor conocimiento sobre la adecuada integración de los *stakeholders*

en la toma de decisiones relativas a cuestiones medioambientales puede suponer el desarrollo de una capacidad organizativa de gran valor y difícilmente imitable (Delmas, 2001).

En tercer lugar, varios estudios han analizado la existencia de efectos moderadores relativos a variables que no son totalmente controlables por la empresa como, por ejemplo la influencia del entorno (Aragón Correa y Sharma, 2003; Rueda Manzanares et al., 2008) en la implementación de prácticas medioambientales proactivas. En este sentido, el presente trabajo intenta demostrar, por un lado, la existencia del efecto moderador del desempeño empresarial en la relación existente entre la influencia de los *stakeholders* y el uso de prácticas medioambientales proactivas y, por otro lado, la existencia del efecto moderador de la industria en la relación existente entre la orientación al bajo coste y el uso de prácticas medioambientales proactivas. Por un lado, varios estudios han estudiado la relación existente entre la mejora en el desempeño medioambiental de las empresas y su consiguiente incremento en la rentabilidad empresarial (ej. Hart y Ahuja, 1996; Russo y Fouts, 1997). En otras palabras, la literatura existente ha intentado responder a las preguntas: ¿Hasta qué punto es rentable perseguir una estrategia medioambiental proactiva? ¿La existencia de beneficios (o pérdidas) puede influir en la toma de decisiones de los directivos a la hora de implementar prácticas de gestión medioambiental? En el artículo presentado en el capítulo 2 de este trabajo dicha moderación se realiza de manera directa, es decir, insertando el resultado empresarial como variable moderadora. Por otro lado, en el artículo presentado en el capítulo 3 la variable moderadora analiza cómo es explicada la orientación al bajo coste mediante la interacción entre una variable relativa al hecho de operar en un sector “sucio” o con alto poder contaminante o hacerlo en un sector “limpio” y el uso de determinadas prácticas me-

dioambientales. Consecuentemente, el hecho de ofrecer resultados sobre la influencia de variables relativas al desempeño empresarial (medidas de manera directa o de manera indirecta mediante la orientación al coste) supone una aportación de gran interés tanto para el ámbito investigador como para el ámbito práctico.

El trabajo empírico desarrollado en este trabajo conforma el cuarto motivo que explica la importancia de la investigación realizada. La información primaria utilizada para testar empíricamente las hipótesis de investigación presentadas a lo largo del trabajo ha sido obtenida mediante un cuestionario desarrollado por el Directorio Medioambiental de la Organización para la Cooperación y el Desarrollo Económico (OCDE) y un grupo de investigadores de reconocido prestigio internacional². Dicho cuestionario contiene datos de 4.186 unidades de negocio (en inglés, *facilities*) con al menos cincuenta empleados, de diferentes sectores económicos de la industria manufacturera de Alemania, Canadá, Estados Unidos, Francia, Hungría, Japón y Noruega durante el año 2003. El cuestionario³ de la OCDE fue pre-testado en Francia, Canadá y Japón antes de ser traducido al idioma oficial de cada país. Los encuestados fueron los directivos responsables en materia medioambiental de cada unidad de negocio. La OCDE realizó 2 envíos consecutivos para garantizar la obtención de respuestas adicionales. El ratio de respuesta fue del 24,7%, el cual es consistente con tasas de respuesta de estudios similares sobre prácticas medioambientales (ej. Christmann, 2000; 2004). Por tanto, dado el alcance internacional y la rigurosidad estadística de la información primaria manejada,

² La autora del presente trabajo agradece sobremanera la colaboración de la profesora Nicole Darnall de George Mason University (Virginia, EE. UU.) por facilitar los resultados del cuestionario de la OCDE.

³ En la elaboración del cuestionario fueron evitados los cuatro sesgos específicos del proceso de recolección de datos que son: la “no respuesta”, la falta de generalizabilidad, la deseabilidad social y el método común de la varianza.

los resultados empíricos obtenidos a lo largo del presente trabajo cuenta con gran poder de generalización.

Finalmente, es interesante resaltar el hecho de que nuestro trabajo no sólo ofrece resultados empíricos sobre las materias objeto de estudio, sino que también cuenta con un capítulo teórico que aporta un análisis cualitativo a las relaciones estudiadas. En el último artículo propuesto en este trabajo se desarrolla un estudio del caso cuyos resultados son de especial interés tanto para la gestión como para las instituciones públicas responsables en materia medioambiental. En consecuencia, la riqueza resultante de la multiplicidad de metodologías usadas para testar las hipótesis de investigación presentadas a lo largo de este trabajo supone otro aspecto importante del mismo. La Tabla 2 resume estas metodologías empleadas.

Tabla 2: Metodologías empleadas a lo largo del trabajo

Título del artículo de investigación	Metodología seguida
“Percepciones de los directivos sobre la influencia de los <i>stakeholders</i> en la implantación de prácticas medioambientales de baja visibilidad y el efecto moderador del resultado empresarial”	Regresión Logística Multinomial Efectos moderadores Regresión Ordinal
“La relación entre el control y seguimiento de los impactos medioambientales negativos y la ubicación empresarial en sectores contaminantes o no contaminantes: El efecto moderador de la orientación al bajo coste”	Regresión Lineal Múltiple Efectos Moderadores
“La internalización de los costes medioambientales: Un estudio del caso en el sector del transporte de mercancías por carretera en España”	Estudio del Caso Revisión de contenido de documentos oficiales

1.2. Objetivos de la investigación

El objetivo central de este trabajo consiste en el estudio de los vínculos existentes entre determinados planteamientos internos de la empresa y la implantación de una estrategia medioambiental proactiva. A pesar de que esta relación subyace como hilo conductor de los tres artículos presentados, cada uno de los capítulos guardan su propia contribución y objetivos específicos. No obstante, a continuación se enumeran los objetivos generales a alcanzar con la elaboración del presente trabajo.

En primer lugar, revisar y sintetizar la literatura existente que relaciona los dos paradigmas teóricos utilizados, es decir, la Perspectiva de Recursos y Capacidades y la Teoría de los *Stakeholders*, y determinados comportamientos medioambientalmente proactivos de las organizaciones con la finalidad de conseguir un adecuado marco teórico que fundamente las conclusiones obtenidas.

En segundo lugar y paralelamente al objetivo previo, analizar los posibles efectos moderadores de determinadas variables que pueden influenciar la relación existente entre los planteamientos internos de la empresa y la implementación de estrategias medioambientales proactivas. De este modo, en el primer artículo de investigación se mide la potencial moderación del desempeño empresarial mientras que en el segundo artículo de investigación se mide la potencial moderación de cuál es el poder contaminante del sector en el que opera la empresa.

Finalmente, estudiar la relación existente entre determinados planteamientos internos y la implantación de estrategias medioambientales proactivas no sólo bajo diferentes ópticas teóricas sino también utilizando distintas metodologías existentes para la

comprobación de hipótesis de investigación. A este respecto, tal y como se ha mencionado en epígrafes anteriores, este trabajo permite el desarrollo de habilidades investigadoras tanto desde un punto de vista empírico como desde un punto de vista cualitativo.

1.3. Estructura del trabajo de investigación

El trabajo presentado consta, además de este capítulo introductorio, de tres artículos de investigación y un último capítulo de recapitulación. Como se ha mencionado previamente, el hilo conductor que sirve como guía para la unión de los artículos propuestos es la relación existente entre determinados planteamientos internos de la empresa y la implementación de prácticas medioambientales proactivas. A continuación realizamos una breve descripción de cada uno de los contenidos de los capítulos previamente mencionados.

El capítulo 2 de este trabajo recoge el artículo de investigación titulado “Percepciones de los directivos sobre la influencia de los *stakeholders* en la implantación de prácticas medioambientales de baja visibilidad y el efecto moderador del resultado empresarial”. Este primer estudio presenta un *continuum* de tipos de prácticas medioambientales que la empresa puede acometer, situándose en un extremo un comportamiento reactivo (“No hacer nada”) y ubicándose en el extremo opuesto un comportamiento medioambiental proactivo. No obstante, el estudio delimita y enfatiza dos opciones adicionales a las previamente explicadas: las prácticas medioambientales de alta visibilidad y las prácticas medioambientales de baja visibilidad. Las primeras se definen como aquellas que gozan de notoriedad por parte del público ya que son fácilmente identificables como comportamientos ecológicos empresariales, mientras que las segundas no disfru-

tan de esa notoriedad pública pero, si bien, tienen al menos la misma importancia que las primeras a la hora de reducir eficazmente los impactos negativos medioambientales de las organizaciones. Bajo el enfoque de la Teoría de los *Stakeholders*, el artículo intenta dar respuesta a si las percepciones que los directivos tienen sobre los diferentes grupos de interés de la empresa influyen de manera distinta a la hora de implementar prácticas medioambientales de alta/baja visibilidad. Además, se analiza la existencia de una potencial moderación del resultado empresarial en la asociación previamente planteada. En otras palabras, se intenta dar respuesta a si las empresas con cifras positivas de beneficios están más o menos influenciadas por los *stakeholders* que aquellas otras con resultados empresariales negativos cuando los directivos deciden implementar prácticas medioambientales de alta/baja visibilidad.

El capítulo 3 presenta el artículo de investigación titulado “La influencia del control y seguimiento de los impactos medioambientales negativos en la orientación al bajo coste: El efecto moderador del sector”. En la literatura existente sobre gestión medioambiental se ha estudiado cómo afecta la implantación de prácticas medioambientales proactivas en el desempeño empresarial de las organizaciones. No obstante, hasta el momento no se ha analizado en profundidad si existe una relación positiva entre determinados comportamientos medioambientalmente proactivos y la orientación al bajo coste. Este artículo pretende arrojar luz sobre dicha asociación. Además, el análisis incluye el efecto moderador relativo a cómo de contaminante es el sector en el que opera la empresa. Parece lógico pensar que aquellas empresas ubicadas en sectores “sucios” o intensivos en polución, como consecuencia de sus altos niveles de residuos y emisiones contaminantes, deben estar más interesadas en reducir dichos impactos negativos y, por tanto, llegar a ser más ecoeficientes. Este segundo artículo pretende demostrar que no

sólo las empresas que operan en sectores sucios se benefician de las sinergias resultantes de la relación entre la orientación al bajo coste y la implantación de prácticas medioambientales proactivas, sino que también las empresas ubicadas en sectores “limpios” o pocos contaminantes pueden beneficiarse de estos resultados positivos, e incluso en mayor medida que las anteriores.

El capítulo 4 presenta el artículo de investigación titulado “La internalización de los costes medioambientales: Un estudio del caso en el sector del transporte de mercancías por carretera en España”. Dada la creciente importancia de los costes medioambientales tanto en el ámbito académico como en la vida práctica empresarial, este artículo analiza si las empresas que se anticipan a la aparición de este tipo de costes persiguen estrategias medioambientales proactivas. En primer lugar, el artículo ofrece una tipología de los distintos costes medioambientales que deben soportar las empresas, la cual sintetiza de manera sencilla pero exhaustiva la complejidad de la temática expuesta y, en segundo lugar, muestra la relación existente entre el grado de atención o interés prestado por parte tanto de las instituciones públicas como de los directivos a determinados costes medioambientales y la existencia de un patrón de comportamiento empresarial de estrategia medioambiental proactiva. Tras presentar una revisión teórica sobre los distintos costes medioambientales a los que se enfrentan las organizaciones de manera genérica en la actualidad, se considera cómo afrontan tanto las instituciones públicas como las empresas dicha temática mediante un estudio del caso en el sector del transporte de mercancías por carretera en España.

Finalmente, en el capítulo 5 del presente trabajo se expone una recapitulación de los tres artículos presentados que aúna las principales conclusiones obtenidas, las impli-

caciones que dichas conclusiones conllevan tanto para el ámbito académico como para la gestión e incluso los reguladores públicos y, en último lugar, las limitaciones encontradas a la hora de realizar este trabajo.

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CAPÍTULO 2

MANAGERIAL PERCEPTIONS OF STAKEHOLDERS INFLUENCES CONCERNING THE IMPLEMENTATION OF LOW VISIBILITY ENVIRONMENTAL PRACTICES AND THE MODERATING EFFECT OF BUSINESS PERFORMANCE

**MANAGERIAL PERCEPTIONS OF STAKEHOLDER INFLUENCES
CONCERNING THE IMPLEMENTATION OF LOW VISIBILITY
ENVIRONMENTAL PRACTICES AND THE MODERATING EFFECT OF
BUSINESS PERFORMANCE**

Abstract

Although organizations implement environmentally friendly practices that are easily recognized by the general public as environmentally conscious behavior, other practices do not enjoy this same recognition, even when they have the same or more important. These low-visibility environmentally friendly practices positively contribute to the improvement of organizational environmental performance and, in some cases, they become more effective in reducing the negative environmental impacts of organizations. However, could managerial perceptions of stakeholder demands influence the implementation of these environmental practices? Moreover, could business performance moderate this prior relationship in the sense that profitable organizations are more or less conscious than unprofitable businesses? Drawing on Stakeholder Theory, this paper attempts to answer these research questions. In doing so, this study uses data for 1,373 manufacturing facilities in seven OECD countries.

Keywords: Stakeholders, environmental practices, visibility, business performance, multinomial logistic regression.

2.1. Introduction

Stakeholders are defined as “*any group or individual who can affect or is affected by the achievement of an organization’s objective*” (Freeman, 1984:46). Previous research has highlighted the importance of stakeholder interests on managerial decision-making regarding actions that affect the natural environment (Henriques and Sadorsky, 1999; Delmas 2001; Buysse and Verbeke, 2003; Sharma and Henriques, 2005; Murillo-Luna et al., 2008). However, the literature has not rigorously studied whether managers pay closer attention to stakeholder concerns when managers decide to implement environmentally friendly practices that vary in their different degrees of external visibility. We define *visibility* as the extent to which the public, as stakeholders, are capable of identifying or recognizing the environmentally proactive behavior of a company⁴. Thus, low-visibility environmentally friendly practices are usually linked to internal processes that aim to reduce a facility’s negative environmental impact. In contrast, high-visibility environmentally friendly practices are usually linked to improvements in the external recognition of the company. Related to the degree of visibility of environmentally friendly practices, the literature on stakeholder interests has shown that the implementation of high-visibility “green” practices is influenced by stakeholder pressure (Henriques and Sadorsky, 1999; Quazi et al., 2001; Darnall, 2006; Henriques and Sadorsky, 2006). For instance, a positive relationship exists between stakeholder influence and the adoption of ISO14001 certification (Quazi et al., 2001;

⁴ Despite our sample is taken at the facility level, here we use the term “company” in a general sense.

Darnall, 2006). However, despite the fact that stakeholder are increasingly interested in internal managerial decisions regarding actions that affect natural environment, the literature related to the potential of stakeholder influence on managers, when dealing with low-visibility environmentally friendly practices is much more scarce. At a first glance, it might be evident that environmentally certified facilities have the highest implementation of all types of environmental practices, and consequently they are the most concerned with reducing their negative environmental impacts. But this relationship is not trivial and it should be studied in depth. For instance, Darnall and Sides (2008) found that U.S. participants in voluntary environmental programs did not have improved environmental performance compared with non-participants and, furthermore, they found inconclusive findings that ISO14001 participants had improved environmental performance. We argue that stakeholders can positively influence managers to implement low-visibility environmentally friendly practices (to a greater extent than high visibility practices) and this influence can translate into real reductions in a given facility's negative environmental impact. In other words, this influence can transform an organization's behavior into becoming environmentally responsible. Furthermore, the literature has shown that appropriate integration of stakeholder concerns regarding environmental matters has a positive effect on corporate business performance (e.g., Hart, 1995; Sharma and Vredenburg, 1998). However, less is known about whether managers are equally interested in all stakeholder influences, when the economic situation of the organization is more or less positive. The potential implications of business performance in the attention paid by a manager on stakeholder concerns may be especially relevant in a context in which the economic health of the organization is rapidly deteriorating.

Therefore, the purpose of this study is threefold. Our first objective is to analyze whether managers perceive different degrees of stakeholder influence when they decide whether to implement low-visibility environmentally friendly practices or high-visibility environmentally practices. Our second aim is to analyze whether the organization's economic situation can moderate the relationship between stakeholder influences perceived by managers and the implementation of environmentally friendly practices. Finally, our study attempts to demonstrate that facilities that implement low-visibility environmentally friendly business practices respond in a more environmentally responsible behaviour, generally, than facilities that implement high-visibility environmentally friendly business practices.

Understanding these relationships is essential for several reasons. First, low visibility environmentally friendly practices are linked to specific pieces of information that are not easily communicated, but they provide a detailed overview of information to physically measurable units that helps in obtaining more accurate economic figures. Thus, these practices relate to stakeholder interests because they might help answer simultaneously stakeholder interests in physically measurable and economic information. Second, drawing on resource-based view, highly visible environmentally friendly practices (such as ISO14001 certification) or low visibility environmentally friendly practices (such as a facility's routine internal monitoring of environmental performance) do not exemplify a rare, valuable, scarce, and inimitable resource because most facilities could easily implement them. But the involvement of stakeholders in these practices may contribute to the development of an important organizational capability (Delmas, 2001). Finally, we argue that environmentally conscious behaviour, at all organizational levels, must be accompanied by real decreases in negative

environmental impacts, rather than being accompanied only by external recognition. For these reasons, despite the fact that standardization is increasing worldwide (www.iso.org), our study focuses on highlighting the environmental benefits that accompany high-visibility environmentally friendly practices, and compares the benefits that accompany low-visibility, but more effective, practices.

This study uses data for 1,373 manufacturing facilities in seven OECD countries. Therefore, the study offers a global perspective on the extent to which managerial perceptions of stakeholder influences relate to the implementation of low-visibility environmentally friendly practices and a perspective on the role of business performance in this relationship.

This paper proceeds in five main sections. The first section is a theoretical review on environmentally friendly practices. The second section describes the different environmental stakeholder groups used in our study. The third section discusses the development of our research hypotheses. The fourth section presents the methodology. The fifth section contains discussion, conclusions, and limitations of this study.

2.2. High-visibility or low-visibility environmentally friendly practices?

In the literature on environmental management, there is a debate as to whether environmental certification accompanies real reductions in negative environmental impacts (e.g., Chirstmann, 2004; Russo, 2009), or, conversely, whether managers only

use this practice to obtain an eco-label and improve their facility's⁵ environmental reputation, rather than understanding this process to be outcome-oriented (Tenbrunsel et al., 2000; Delmas, 2001; Darnall and Sides, 2008).

“Standard-based systems . . . produce a means versus ends focus in which conformance to a standard takes priority over improving the environment” (Tenbrunsel et al., 2000:862)

In this context of inconclusive results on the consequences of certification, less is known about what the causes of this incongruence are. Specifically, drawing on Stakeholder Theory, this study attempts to answer whether managers perceive differently stakeholder pressure when managers decide to consider environmental issues through the certification process. We conceptually separate facilities that are certified from those that are concerned with environmental issues but are not certified. In doing so, we assume that two types of environmentally friendly management practices exist: high-visibility practices and low-visibility practices.

The concept of *visibility*⁶ is often defined in finance as *“the extent to which analysts follow a firm’s stock and the amount of a firm’s new coverage”* (Baker et al., 2002:497). Similar to finance research, which assumes that visibility significantly increases when a firm cross-lists its shares on several stock exchanges, we argue that the greater number of people who are able to recognize an environmentally friendly practice

⁵ It is important to note that certification process takes place at facility level (Russo, 2009).

⁶ Further the term “visibility” is also used in the area of supply chain management as the amount of available information that can be used among nodes in order to share data and make more accurate decisions.

implemented by an organization, the greater the visibility of this practice becomes. Most investors, corporate buyers, end-consumers, ecological groups, public agencies, and society in general identify the ISO14001 label or EMAS label as environmental standards that certify proactive environmental behavior. However, it is likely that none of these potential stakeholders knows whether the organization has undertaken other, lower visibility environmentally friendly practices. Therefore, as used in this study, a high-visibility environmentally friendly practice might be an activity that the organization undertakes with the only purpose of increasing positive external recognition of the organization's position on environmental issues. For example, these could include environmental certification using widely recognized eco-labels such as ISO14001 and/or EMAS. Low-visibility environmentally friendly practices could be defined as those activities that the organization undertakes to reduce its negative environmental impacts, but are less likely to be recognized by the public. For example, these would include routine internal monitoring of a facility's negative environmental impacts, including impacts that are difficult to perceive from the outside (e.g., consumptions of raw materials, water, or energy). There are many companies that use both types of environmentally friendly practices. In fact, this is the most environmentally conscious approach. In order to comply precisely with the certification process's objectives and to pursue environmentally proactive behavior, the facility must implement low-visibility environmentally friendly practices to obtain more accurate environmental monitoring. Conversely, there are companies that do not use environmentally friendly practices in any case. Additionally, internal routine monitoring of environmental performance might be included as a task in the facility's certification process. Consequently, to avoid this overlapping problem, we clearly differentiate four profiles of implementation of environmentally friendly practices: facilities that do

nothing, facilities that only implement high-visibility practices, facilities that only implement low-visibility practices, and environmentally responsible facilities that implement both low and high visibility practices. Even though our study pays special attention to the difference between high and low visibility environmentally friendly practices, similar to Henriques and Sadosky (1999), we recognize that both environmentally *proactive* and *reactive* facilities exist, and they will be our reference in evaluating others.

Given these prior conceptualizations, our intention is not to analyze why an organization decides to implement (or not to implement) these practices. Our main objective is to determine whether and to what extent organizations that implement low-visibility environmentally friendly practices are influenced by stakeholder pressure compared with high-visibility practices.

The distinction between these concepts is essential for two reasons. First, environmental certification could require the implementation of an environmental management system (Delmas, 2001; Darnall and Sides, 2008; Russo, 2009) that encompasses an articulation of a facility's formal goal-setting, measures, assessments, and progress regarding environmental issues. While demonstrating a facility's commitment to the environment and facilitating regulatory compliance, it does not ensure complete compliance. Organizations still have to take responsibility for their environmental improvement, independent of whether such improvement would be mandated by regulators or government agencies that are charged with environmental protection, or whether the organization truly exhibits environmentally conscious

behavior. Thus, there is the possibility that organizations are interested in improving their environmental performance without any interest in external recognition.

Second, obtaining certification enables access to certain consumer segments and markets, but this does not imply an actual intention to protect the environment (Gonzalez-Benito and Gonzalez-Benito, 2008). Currently, many end-consumers may be disposed to paying higher prices for products or services that are made by *a priori* environmentally friendly organizations. Furthermore, environmental certification of suppliers is often demanded by some organizations (Darnall, Jolley and Ytterhus, 2007; Gonzalez-Benito and Gonzalez-Benito, 2008). Thus, certification might be used by organizations that are interested in increasing sales *via* positive environmental reputation and, consequently, these organizations attempt to certify environmentally their facilities as soon as possible. However, under this short-term behavior, there is not any real environmental purpose, but an environmental practice that is highly visible externally. For instance, “*non-participants improve the environment 24% more than participants in self-monitored voluntary environmental programs, whereas participants certified per International Standards Organization 14001 as a group exhibit inconclusive environmental performance improvements*” (Darnall and Sides, 2008: 95).

For these reasons, we clearly differentiate organizations that only are interested in obtaining “the label” from those that are interested in reducing their negative environmental impacts despite less social recognition. Table 1 highlights some differences and similarities between both types of environmentally friendly practices.

Several studies have analyzed how stakeholder influences explain the adoption of environmental global standards (e.g., Chirstmann, 2004) and certifications (e.g., Delmas, 2001). However, less is known about how managers perceive stakeholder influences in organizations that implement low visibility, environmentally friendly practices, without interest in obtaining the positive environmental reputation conferred by certification. This research gap is what our study attempts to answer. Understanding how stakeholders influence managers in the implementation of both types of environmentally friendly practices is essential to determining the best way to integrate stakeholder concerns in the organization’s decision-making process.

Table 1: Differences and Similarities between environmentally friendly practices with high/low visibility

	Certification as a high-visibility environmentally friendly practice	Monitoring environmental performance as a low-visibility friendly environmental practice
Similarities	Implementation at the facility level	
	Leading operational efficiencies	
	Necessary personnel support in controlling both process	
Differences	Recommended by a third-party assessment	Self-evaluated
	Not an outcome-oriented process	An outcome-oriented process
	Having an environmental management system is a recommendation	Unnecessary to have an environmental management system to practice it
	A medium/long term process, with a flexible deadline	Daily routine (or weekly, monthly)

2.3. Environmental Stakeholders

Stakeholder Theory is charged with answering the question of what benefits that interest groups derive from management (Freeman, 1984; Mitchel et al., 1997). With regards to the natural environment, previous literature has highlighted the positive relationship between the influences of different stakeholder pressures in managerial decisions on the implementation of environmentally friendly practices (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003; Christmann, 2004; Murillo-Luna et al., 2008). Some empirical studies have analyzed how different types of stakeholder pressures perceived by managers affect the implementation of “green” practices (that is, stakeholder influences as independent variables) (Christmann, 2004; Sharma and Henriques, 2005; Murillo-Luna et al., 2008). Others have studied the impact of different corporate environmental strategies on managerial perceptions about the importance to stakeholder groups, that is, stakeholder influence as a dependent variable) (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003). The results of these studies are similar to Hart’s (1995) suggestion, which stated that “*more proactive environmental strategies are associated with a stronger stakeholder orientation*” (Buysse and Verbeke, 2003:458).

Furthermore, researches have elaborated their own classifications of environmental stakeholder groups depending on their specific aims. In general terms, the environmental studies literature stresses three main groups: (1) regulatory or governmental stakeholders who are regulators and agencies charged with creating and enforcing environmental regulations (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003; Christmann, 2004; Murillo-Luna et al., 2008); (2) organizational or

primary stakeholders, who have formal relationships with the organization as employees, shareholders, customers, and suppliers (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003); and (3) secondary and community stakeholders, which include environmental organizations, community groups, and other lobbyist groups (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003).

Nevertheless, Murillo-Luna et al. (2008) argued that managers perceive only one dimension of environmental stakeholder demand. Unlike this prior study, we suspect that managers perceive more than one dimension of stakeholder demands for two main reasons. First, related to “green” management practices, empirical results have found differences in stakeholder pressure when organizations implement these practices (e.g., Christmann, 2004; Henriques and Sadorsky, 2006; Darnall, Seol and Sarkis, 2009). For instance, Christmann (2004), using a sample composed of multinational companies, showed that while industry pressures strengthen the standardization of operational environmental policies, government pressures strengthen the existence of a minimum internal global environmental performance standard. Delmas (2001) found that there is a positive impact of external stakeholder involvement in competitive advantage derived from environmental certification, but the impact of employees is less strong. These examples highlight how each stakeholder group can influence differently the implementation of green management practices.

Second, managers have to respond to stakeholder demands in different ways. Some stakeholder groups may pay more attention to environmental data in physically measurable units about an organization’s activities, while others have major concerns regarding economic effects. For instance, the corporate headquarters or shareholders

might be interested in economic results while, on the other hand, environmental protection agencies or activist groups could be more interested in waste and pollution figures, expressed in physical units, and may not really care whether these figures are internalized by the organization (Burritt et al., 2002; Savage and Jasch, 2004).

Therefore, because our interest is in analyzing the relationship between managerial attention paid to stakeholders and the implementation of environmental practices with different degrees of external visibility that require and disclose different types of organizational information, this study classifies environmental stakeholders into three groups. Each group is located in a specific context that distinguishes among internal, supply chain, or general stakeholders. First, the internal group is composed by stakeholders who are involved directly in decision-making related to the environmental and business performance of the organization, and includes shareholders and corporate headquarters and those who have a contractual labor relationship with the organization, such as employees. Second, the supply chain group is formed by stakeholders who are specially related to the specific industry conditions and include suppliers, corporate buyers, and consumers. Finally, the third group relates to the general environment in which the organization is established, and includes public regulators, environmental groups, financial institutions, and other social and community groups that could influence the organization from a more general perspective. Unlike other studies that focus on environmental stakeholder influences (e.g., Henriques and Sadosky, 1999), we do not consider the influence of the media for two reasons. On one hand, we consider that the media is merely tool through which stakeholders can exert pressure, depending on their interests, but the media is not a stakeholder *per se*. For instance, former disgruntled employees or an environmental activist group could start a boycott

against the organization (Henriques and Sadorsky, 1999) using mass media to publicize their position. Thus, though the media can influence public opinion, it only must inform facts, and does not must have a real stake in the organization. On the other hand, our empirical analysis focuses on the facility level. Managers who are in charge of a facility are less influenced by information that the mass media can disclose about the organization than CEOs who work at the corporate level and have to take care with the reputation of the organization. Therefore, we did not include the media as a salient stakeholder in our study.

In the same way that prior empirical studies focused on Stakeholder Theory (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003; Murillo-Luna et al., 2008), because our study does not attempt “*to find out which factors influence stakeholder salience perceived by managers*” (Murillo-Luna, 2008: 1226), we summarize a list of thirteen initially considered green stakeholders using principal component analysis. According to Buysse and Verbeke (2003), the purpose of this step is twofold: first, to reduce the number of explanatory variables in our study and, second, to test empirically the stakeholder classification described above.

Our sample is drawn from a survey developed by the OECD Environment Directorate and academic researchers, from which 4,186 manufacturing facilities in seven countries were surveyed. Pressures from stakeholders were assessed by asking facility managers the following question: How important do you consider each of the following influences on the environmental practices of your facility?

Facility managers considered the importance of public authorities, household consumers, commercial buyers, suppliers, shareholders, management employees, non-management employees, corporate headquarters, banks and other lenders, environmental groups, community organizations, labor unions, and industry or trade associations. Using a three-point Likert scale, respondents indicated whether these influences were “not important,” “moderately important,” and “very important.” Then these thirteen stakeholder pressures were entered into a principal component factor analysis and, as we expected, three factors emerged: internal stakeholders, supply chain stakeholders, and general stakeholders. The associated eigenvalues were 1.178, 1.003, and 5.579, respectively, and the total variance accounted for among the three emerged factors was 59.7%. These results are shown in Table 2.

Table 2: Principal Component Factor Analysis of Stakeholders Influences

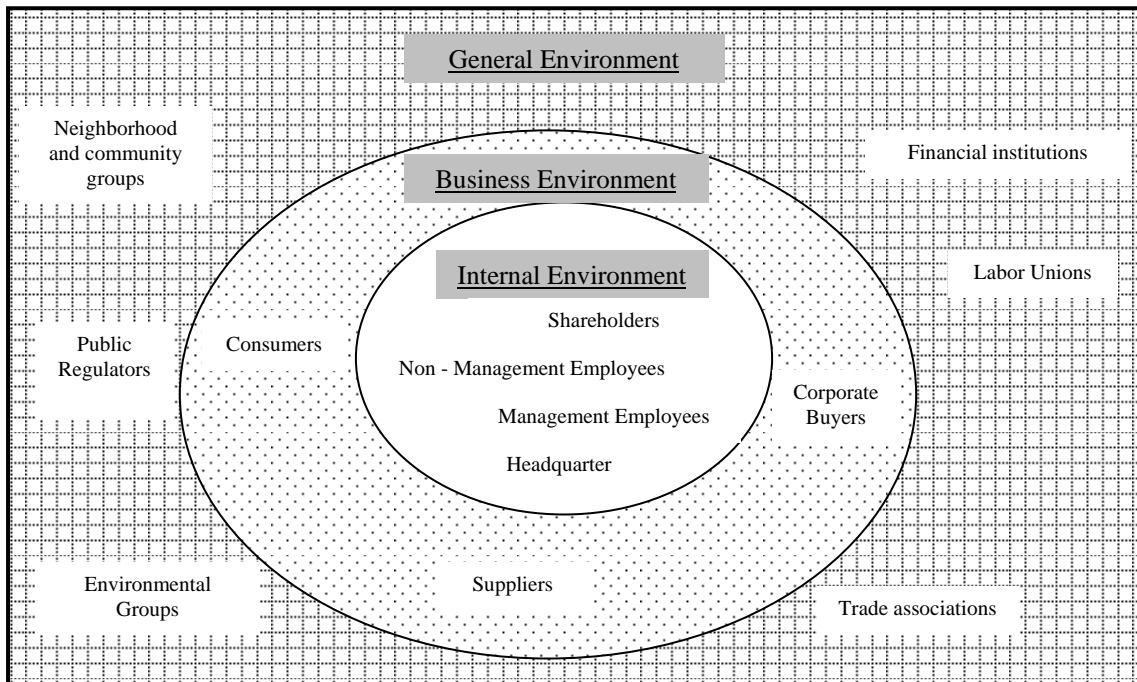
Items	General Stakeholders	Internal Stakeholders	Supply Chain Stakeholders
Influence of public authorities (government, state, local)	0.473	0.340	0.081
Influence of corporate headquarters	0.178	0.679	0.150
Influence of household consumers	0.324	0.063	0.720
Influence of commercial buyers	0.073	0.201	0.835
Influence of suppliers of goods and services	0.243	0.247	0.696
Influence of shareholders and investment funds	0.466	0.504	0.242
Influence of banks and other lenders	0.519	0.395	0.259
Influence of management employees	0.210	0.844	0.154
Influence of non-management employees	0.263	0.780	0.166
Influence of labor unions	0.611	0.398	0.119
Influence of industry or trade associations	0.711	0.245	0.168
Influence of environmental	0.797	0.132	0.175

groups or organizations			
Influence of neighborhood and community groups	0.711	0.118	0.280
Cronbach's Alpha	0.8038	0.7977	0.7293

Highest Factor Loadings are bolded

Analyzing the factor loadings, results showed that the first factor, called “general stakeholders,” was composed by respondents’ perceptions of environmental groups, community organizations, labor unions, industry or trade associations, banks and other lenders, and, finally, public authorities. Despite the factor loading of the influence of public authorities not being higher than 0.5, this influence is allocated in the general stakeholders group because it has the highest factor loading for this item. Additionally, this result is consistent because a *factor loading of 0.4 is statistically significant when the sample size is greater than two hundred observations* (Hair et al., 1999:100). The respondents’ perceptions about the head office, management employees, shareholders, and non-management employees were included in the second factor, or “internal stakeholders.” The last factor accounted for respondents’ perceptions of “supply chain stakeholders,” and included household consumers, commercial buyers, and suppliers. Reliability was assessed for the three factors using Cronbach’s alpha and, as Table 2 shows, alpha was above Nunnally’s recommended value of 0.70 for each factor, indicating sufficient internal reliability. Figure1 illustrates these three stakeholder groups.

Figure 1: The three stakeholders’ groups



Related to business performance, Hart's (1995) seminal work argued that the integration of stakeholder concerns for the natural environment is not only useful in developing environmentally friendly practices, but also in enhancing the organization's profitability. Although there is prior literature that explained the connection between profitability and environmental performance (e.g., Hart and Ahuja, 1996; Russo and Fouts, 1997), so far no previous work has analyzed empirically whether the effect of business performance can moderate the existing relationship between managerial perceptions of stakeholder pressure and the implementation of environmentally friendly practices. Our study hypothesizes that business performance could be a potential source to explain discrepancies found in the previous literature regarding stakeholder influences and the implementation of these management practices.

This study used managerial perceptions about stakeholders influence (Donaldson and Preston, 1995) because after evaluating which stakeholders are salient (Mitchell, Agle and Wood, 1997), managers establish how an organization's strategy will be

influenced by them (Donalson and Preston, 1995; Fineman and Clarke, 1996). Thus, managers' perceptions about stakeholder pressure serve as an accurate predictor of stakeholder pressures (Fineman and Clarke, 1996).

2.4. Hypotheses

Keeping in mind the previous literature, our study argues that there is a relationship between managerial perceptions of different environmental stakeholder pressures and the implementation of management practices with varying degrees of visibility regarding environmental concerns. However, we expect that the emergence of differences for different stakeholder influences will be a consequence of the moderating effects of business performance on this prior relationship. Two main reasons explain why we maintain this expectation. First, organizations may reduce a significant portion of their environmental costs by integrating stakeholder concerns in management tasks in product design and process development (Hart, 1995) or through avoiding legal liability (Sharma and Vredenburg, 1998). Therefore, profitability might be enhanced *via* cost reduction due to the integration of stakeholder demands for consideration of environmental issues. Second, when losses exist, organizations will be more interested in improving their economic results internally than in considering stakeholder influences. In these cases, organizations will attempt to avoid bankruptcy risk instead of satisfying stakeholder demands. Combining prior arguments, we hypothesize that, in order to consider accurately stakeholder demands, the implementation of environmentally friendly practices must be accompanied by improved business performance to be attractive to organizations, but this relationship may vary depending on our three specified groups of environmental stakeholders.

The internal stakeholders

Management employees, non-management employees, headquarters, and shareholders compose the internal stakeholders group. We propose that manager perception of pressure from this group will be more linked to low-visibility environmentally friendly practices than high-visibility environmentally friendly practices. Because this group may be highly affected and must be well informed of the current situation regarding the environmental progress of the facility (regardless of how the externally visible the decision-making is), the importance of their environmental concerns will be very relevant for environment-related managerial decisions.

Employees might be capable in leading advanced environmental practices in their own organizations (Hanna, Newman and Johnson, 2000; Ramus and Steger, 2000) and even in their industries (Fineman and Clarke, 1996). Because they are concerned about job security (Fineman and Clarke, 1996) management and non-management employees will attempt to avoid non-compliance with environmental requirements (Henriques and Sadorsky, 1996). Non-management employees often are pioneers for the initiation of an organization's proactive environmental practices (Hanna, Newman and Johnson, 2000; Ramus and Steger, 2000). Due to their practical knowledge about the daily manufacturing process, they may be able to eliminate inefficiencies while improving environmental protection. However, support and leadership from top-level managers is essential to ensuring environmentally conscious behavior in organizations (Zutshi and Sohal, 2004). Therefore, by using low visibility environmentally friendly practices, such as routine internal monitoring of environmental performance, management and non-

management workers will be motivated to find new polluting alternatives that lower environmental costs and enhance profitability (Graff et al., 1998, EPA, 1995). Moreover, corporate headquarters and shareholders are very interested in the objective achievement of their operational units (or facilities) because they have an economic stake in the organization (Donaldson and Preston, 1995). These stakeholders have the highest level of responsibility for the organization's health and they are in charge of controlling compliance with environmental regulations. Unlike high-visibility green practices that might be undertaken solely for the sake of improving corporate reputation, low-visibility environmentally friendly practices allow for a detailed overview of organizational information both in physical and economic units, and this allows for compliance with corporate mandates. Thus, managers might consider these practices essential to satisfying headquarters and shareholder demands.

However, we propose that business performance moderates the relationship between managerial perception of stakeholders' influences and the implementation of environmentally friendly practices with varying degrees of visibility. When profitability decreases, employees, headquarters, and shareholders become dedicated to improving economic results because their salaries and benefits depend on business performance. Hence, managers might be more inclined to adopt short-term practices (like those that are highly visible) that help improve economic performance as soon as possible, instead focusing on implementing low-visibility environmentally friendly practices. In these cases, the effect of business performance could change the sense of the relationship explained above, making high-visibility environmentally friendly practices more important than low-visibility environmentally friendly practices.

Therefore, due to their concern for the general long term survival of the organization (Henriques and Sadorsky, 2006), we hypothesize that managers' perceptions about internal stakeholders positively influence the implementation of low visibility environmentally friendly practices in a greater extent than high visibility practices. But the moderating effect of business performance can change the sense of this relationship.

H1a: There is greater perceived importance of internal stakeholder influence by managers when low-visibility environmentally friendly practices are implemented over high-visibility environmentally friendly practices.

H1b: Business performance moderates the relationship between the implementation of environmentally friendly practices with varying degrees of visibility and managers' perceptions of internal stakeholder influence.

The supply chain stakeholders

The supply chain stakeholder group is composed of commercial buyers, household consumers, and suppliers. In the context of concerns for the environment, we suggest that this stakeholder group can pressure organizations into adopting low visibility environmentally friendly practices. Corporate buyers and suppliers may want to protect their reputations regarding environmental sensitivity and consciousness (Henriques and Sadorsky, 1999; Darnall et al., 2001) by ceasing delivery of any input or output to a "dirty" organization, or by pressuring organizations to use a more environmentally friendly substitute (Darnall, Jolley and Ytterhus 2007). For instance,

“U.S. companies that operate in Western Europe are experiencing market pressures from large corporate buyers who request that they provide them with documentation of their environmental procedures” (Darnall, Jolley and Ytterhus, 2007:3). Similarly, end-consumers can manifest their environmental preferences by buying products or services that originate from organizations that implement environmentally friendly practices (Henriques and Sadorsky, 1999). Conversely, end-consumers can boycott an organization’s products or services when they think that the organization is not sufficiently environmentally conscious. Therefore, to satisfy the preference for the “greenest” providers and clients by supply chain stakeholders, it seems that managers might be especially sensitive to high-visibility environmentally friendly practices. Nevertheless, low-visibility environmentally friendly practices provide more accurate internal information that can be used to implement high-visibility environmentally friendly practices, such as, for example, public environmental reports or environmental certifications. For instance, routine internal monitoring of negative environmental impacts enables organizations to prioritize projects and offers (Graff et al., 1998; Savage and Jasch, 2004) because this practice controls the thresholds of negative impacts that organization is able to support. As a result, low-visibility environmentally friendly practices assist managers in selecting (and in being selected by) the “greenest” suppliers, corporate buyers, and end-consumers. Therefore, managerial perceptions of the implementation of low-visibility environmentally friendly practices are more positively related to the influence of supply chain participants compared to perceptions of high-visibility practices.

Nevertheless, we propose that business performance moderates the prior relationship. On the one hand, household consumers have increasingly demanded

environmentally friendly products and/or services (Darnall, 2007) but this type of stakeholder might be used to relating organizational proactive environmental behavior to high-visibility practices like obtaining ISO14001 certification, rather than to low-visibility practices. Similar to internal stakeholders, when the economic situation is worse, managers dedicate greater efforts to focusing on practices that help demonstrate its environmental concerns, in order to subsequently increase sales. On the other hand, in the context of positive business performance, managers pay more attention to satisfying external demands to address environmental concerns by supply chain participants because managers will be more interested in improving recognition for environmental consciousness or avoiding the reputational risks of not being recognized as environmentally conscious. Thus, we hypothesize that managerial perception of supply chain stakeholders positively influences the implementation of low-visibility environmentally friendly practices to a greater extent than this perception influences the implementation of high-visibility practices, but the moderating effect of business performance can change the sense of this relationship.

H2a: There is a greater perceived importance of supply chain stakeholder influence by managers when low-visibility environmentally friendly practices are implemented over high-visibility environmentally friendly practices.

H2b: Business performance moderates the relationship between the implementation of environmentally friendly practices with varying degrees of visibility and managers' perceptions of supply chain stakeholder influence.

The general stakeholders

The general stakeholder group consists of public regulators, environmental associations, financial institutions, community groups, labor unions, and trade associations. We propose that managers' perceived importance of stakeholders, in relation to the implementation of low-visibility environmentally friendly practices is greater than the perceived importance of these stakeholders in relation to high-visibility environmentally friendly practices. Several reasons explain this influence. First, managers must comply with environmental regulations, independent of the visibility that compliance offers. Porter and Van der Linde (1995) argued that high environmental regulatory pressure might create an incentive for organizations to improve their internal efficiencies. Because low-visibility environmentally friendly practices might aid in obtaining improved and more cost-effective compliance with environmental legal requirements (Burritt et al., 2002; Savage and Jasch, 2004) managers may decide to implement this type of environmental practice to comply with environmental regulations. Second, environmental and professional groups have the capacity to mobilize the general public in favor of, or in opposition to, the organization *via* public protests or campaigns, consumer boycotts, strikes, and calls for engagement (Henriques and Sadorsky, 1999). These external groups usually encompass a higher level of expertise on environmental matters and capacity to understand hidden environmental costs. For these reasons, they can positively influence managers towards using low-visibility environmental practices. For instance, professional associations are interested in reducing uncompensated health effects of negative environmental impacts. And environmental groups are interested in how organizations face the harmful effects of climate change. Regular monitoring of environmental performance can satisfy the demand for information that is required by these stakeholders because it provides

figures in physical units. Finally, financial institutions “*may be reluctant to enter into a business relationship that may transfer environmental liabilities to them in the future*” (Savage and Jasch, 2004:41). The greater amount of attention paid to environmental concerns by financial institutions might imply a growing demand for detailed information regarding internal risks.

Combining prior arguments, regulators, environmental and professional associations, and financial institutions positively influence managerial perceptions of the implementation of low-visibility environmental practices to a greater extent than their influence on perceptions of the implementation of high-visibility environmental practices.

However, unlike prior stakeholder groups, we consider that business performance does not moderate this relationship. There is no difference in the degree of influence related to general stakeholders when organizations have positive or negative business performance because of external and mandatory nature of this group. When an organization does not comply with environmental regulations, it has to face the threat of legal action, penalties, and fines (Henriques and Sadosky, 1996) independent of its financial results. Indeed, environmental regulations are created with the purpose of being applicable generally and a scarce amount of benefits is not something that permits avoidance of penalties due to negative environmental impacts of the organization. In the same way, organizations have to carry out their commitments to environmental and professional groups and financial institutions. Thus, we hypothesize that despite pressure on managers from general stakeholders to implement low-visibility

environmentally friendly practices, business performance does not affect this relationship.

H3a: There is greater perceived importance of general stakeholder influence by managers when low-visibility environmentally friendly practices are implemented over high-visibility environmentally friendly practices.

H3b: Business performance does not moderate the relationship between the implementation of environmentally friendly practices with varying degrees of visibility and managers' perceptions of general stakeholder influence.

The unit of measurement for this study is the facility, for several main reasons. First, related to Stakeholder Theory, several managerial interactions with interest groups often take place at the facility level (Freeman, 2004). Second, Darnall, Henriques and Sadorsky (2008) stated that some environmentally friendly practices, such as the implementation of an environmental management system, occur at the facility level. Hence, the analysis at the facility level offers a better opportunity to detect environmental improvements more accurately. Third, both environmental certification processes (which exemplify high-visibility practices) and routine internal monitoring of negative environmental impacts (which exemplifies low-visibility practices) happen at the facility level. Therefore, these three motivations justify testing our research hypotheses through facility level information gathering.

2.5. Research Method

2.5.1. Data

The data for this study was taken from a survey developed by the OECD Environment Directorate and academic researchers, through which 4,186 facilities with at least fifty employees from the manufacturing industries in Canada, France, Germany, Hungary, Japan, Norway, and the United States were surveyed in 2003. The manufacturing sector was selected because it is commonly accepted that these industries produce more air, land, and water pollution than service facilities (Stead and Stead, 1992). The sample included both publicly and privately owned facilities.

The OECD questionnaire was pre-tested in France, Canada, and Japan before it was translated into each country's official language and re-translated to validate the accuracy of the original translation. The respondents were responsible for the facility's environmental activities. The OECD sent two follow-up mailings to prompt additional responses. The response rate was 24.7%, which is consistent with previous studies of firm-level environmental practices (e.g., Chirstmann, 2000; 2004).

There are four specific biases that can appear in data collecting when survey techniques are used: (1) common method variance, (2) social desirability, (3) non-response, and (4) lack of generalizability. The OECD questionnaire attempted to avoid these biases. Because the data was an assessment of single respondents, common method bias could have augmented relationships among variables. However, if this was a problem, a single general factor would account for most of the covariance in the dependent and

independent variables (Podsakoff and Organ, 1986). The post-hoc Harman's single factor test indicated no general factor, what is an indicative of non-existence of common method variance bias. Social desirability bias was controlled using three methods. First, we ensured anonymity for all respondents. Second, we separated questions related to stakeholder influences from questions pertaining to environmental management. Finally, we sought statistically significant relationships (Hardin and Hilbe, 2001) because where a social desirability bias exists, researchers are less likely to obtain statistically significant results when there is less variability in survey answers. The OECD examined non-response bias by evaluating the general distribution of its survey respondents. It assessed industry representation and facility size of the survey respondents relative to the distribution of facilities in the broader population, and found no statistically significant differences (Johnstone, et al., 2007). Finally, when results are applied only to the statistical target population of a study, they are less generalizable to different populations, thus the more generalizable an estimated parameter is, the more important it is likely to be. Because the OECD survey was broadly applicable due to its targeting of large and small operations across multiple industry sectors and countries, generalizability was not a concern.

2.5.2. Measures

Both dependent and independent variables were obtained by relying on OECD questionnaires. The dependent variable was the implementation of high or low visibility environmental practices. To differentiate these terms, a facility's implementation of environmental practices with varying degrees of visibility was measured through a categorical variable that distinguished (1) facilities that do not use environmentally

friendly practices (“doing nothing”), (2) certified facilities that do not regularly monitor their environmental performance, (3) non-certified facilities that regularly monitor their environmental performance, and (4) certified facilities that regularly monitor their environmental performance. To create this categorical variable, knowing whether facilities were certified and whether negative environmental impacts were regularly monitored was necessary. First, we relied on data from the OECD questionnaire that asked managers if their facility had obtained EMAS or ISO14001 certification, given that an environmental management system was implemented. Respondents reported “Yes” or “No” Second, to measure the facility’s regular internal monitoring of environmental performance, the OECD questionnaire asked managers whether several environmental performance measures were regularly monitored in their facilities. Specifically, facility managers were asked about routine monitoring of: the use of natural resources (energy, water, etc.), solid waste generation, wastewater effluent, local or regional air pollution, and global pollutants. Respondents reported “Yes” or “No” to each item. The average implementation of these five environmental performance measures for facilities in our sample was 2.93. The median was 3. Thus, with the purpose of creating a binary variable similar to certification, we separated facilities that regularly monitored zero, one, or two of these negative environmental impacts from facilities that regularly monitored three, four, or five of these negative environmental impacts. Combining prior arguments, our dependent variable was formed by four resulting categories. Facilities that implement low-visibility environmental practices were facilities that monitor their environmental performance but were not interested in obtaining environmental certifications. Facilities that implement high-visibility environmentally practices were those that were interested in obtaining environmental certification but did not regularly monitor environmental performance. Additionally,

similar to Henriques and Sadorsky (1999), *reactive* facilities, or non-certified facilities that do not monitor their environmental performance, are included as a reference category. Additionally, *proactive* facilities are included. These are certified facilities that regularly monitor their environmental performance. Table shows our four categories.

Table 3: Dependent variable categories

CATEGORIES OF DEPENDENT VARIABLE	Frequency (n)	Percentage
“Doing nothing” / “Reactive”: not monitor + non-certified	347	25.3%
“Low-visibility”: monitor + non-certified	609	44.4%
“High-visibility”: Not monitor + certified	36	2.6%
“Environmentally Proactive”: Monitor + certified	381	27.7%

The independent variables were the stakeholder influences that were explained in section 2. The first factor, “general stakeholders”, was composed by the respondents’ perceptions of environmental groups, community organizations, labor unions, industry or trade associations, banks and other lenders, and public authorities. The respondents’ perceptions about headquarters, management employees, shareholders, and non-management employees were included in the second factor, “internal stakeholders.” The last factor accounting for respondents’ perceptions was “supply chain stakeholders,” which included household consumers, commercial buyers, and suppliers.

To address firm heterogeneity, this study included several control variables. Facility size was accounted for by the number of employees per facility. Industry and country variables were also accounted for. Unlike the country variable, which was included as a nominal variable with seven categories, the industry variable offered some statistical problems. Due to a detailed division in multiple manufacturing subsectors in

the sample, most observations were missing (coded by 0) with respect to the dependent variable in several subsectors, and appeared as unexpected singularities in the Hessian matrix.⁷ To avoid this statistical inconvenience, reducing the number of items in the industry control variable was necessary.⁸ Thus, we considered differentiating between clean and dirty sectors inside the manufacturing industry. According to Mani and Wheeler (1997) and Gallagher and Ackerman (2000), who stated how do determine whether a dirty or clean manufacturing sector depending on the obtained environmental performance, clean manufacturing sectors included textiles, leather and footwear (SIC 17-19), machinery and equipment (SIC 29-33), and transport-related equipment (34-35). Dirty manufacturing sectors included pulp, paper, publishing and printing (SIC 20-22), chemical, rubber, plastics and fuel (SIC 23-25), other non-metallic mineral products (SIC 26), and basic metal and fabricated products (SIC 27-28). The “neutral” (neither clean nor dirty) manufacturing sectors consisted of food, beverage and tobacco (15-16), furniture (36), and recycling (37). Table 4 contains descriptive statistics and Pearson’s correlations that are within the range of acceptability.

⁷ The Hessian matrix is the square matrix of second-order partial derivatives of a function. It determines the local curvature of a function of many variables

⁸ When subpopulations are based on covariates, goodness-of-fit tests generally are not useful because there will be many variables with 0 observations.

Table 4: Descriptive statistics and Pearons’s correlations

N=1,373	Visibility	Size	Country	Sector	General	Internal	Supply	Business Performance
Visibility	1							
Size	-0.132***	1						
Country	-0.067**	-0.003***	1					
Sector	-0.159***	0.062**	0.015	1				
General Stk	0.017	0.146***	0.062**	-0.116***	1			
Internal Stk	-0.064**	0.121***	-0.073***	0.037*	-0.005	1		
Supply Chain Stk	-0.076***	0.079***	-0.109***	0.022	-0.004	-0.004	1	
Business Performance	-0.028	0.065***	0.000	-0.061**	0.031	0.143***	0.003	1
Mean	2.22	406.25	3.61	1.20	-0.011	-0.006	-0.003	3.47
E.D.	0.882	1015.48	1.741	0.674	0.993	1.006	0.994	1.028

*** p<0,005; **p<0,05; *p<0,1

2.5.3. Results

Because our dependent variable is formed by four categories, we used multinomial logistic regression to estimate our empirical models. When a natural ordering of the values of the dependent variable does not exist, that is, where there is a categorical dependent variable, multinomial logistic regression is a better alternative than linear regression. The coefficients are estimated through an iterative maximum likelihood method and parameters are interpreted with reference to some base category. In our model, the reference category is “doing nothing”, that is, *reactive* facilities. Multinomial logistic regression models allow for comparison among response patterns observed in the dependent variable because coefficients on explanatory variables are estimated jointly.

Results are summarized in Table 5. Hypothesis 1a, which predicted that the perceived importance of internal stakeholder influence will be higher for the implementation of low-visibility environmentally friendly practices than for the implementation of high-visibility environmentally friendly practices, was not supported. The exponential beta (1.842) is higher in the case of facilities using high-visibility practices than facilities using low-visibility practices (1.676). Both are positive and statistically significant. That means that internal stakeholder influence for facilities that implement high-visibility practices is 84.2% higher with respect to facilities that “do nothing.” The multiplicative factor of low-visibility facilities is 67.6% higher with respect to facilities that “do nothing.”

However hypotheses 2a and 3a, which predicted that the both perceived importance of supply chain and general stakeholder influence, respectively, will be higher for the implementation of low-visibility environmentally friendly practices than those with high-visibility environmentally friendly practices, was supported. While the odds ratios (column Exp(B)) of both supply chain stakeholders and general stakeholders were found to be statistically significant and positive in the case of implementation of low-visibility practices, the odds ratios of both stakeholder groups were not found to be statistically significant in the case of implementation of high-visibility practices. Thus, there is a positive relationship between perceived managerial influences of supply chain and general stakeholders and the implementation of low-visibility environmentally friendly practices. Supply chain and general stakeholders do not influence the implementation of high visibility environmentally friendly practices, thus giving empirical support to hypotheses 2a and 3a.

Table 5: Results of multinomial logistic regression

N = 1,373 facilities	Certified facilities that regularly monitor			Non-certified facilities that regularly monitor LOW VISIBILITY			Certified facilities that not monitor HIGH VISIBILITY
	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B
Intercept	-3.277***	0.549		-1.057**	0.440		-5.268***
USA	1.867***	0.469	6.469	1.944***	0.372	6.986	1.004
Germany	2.235***	0.425	9.344	1.656***	0.325	5.236	0.975
Hungary	2.257***	0.494	9.555	1.398***	0.403	4.048	2.056*
Japan	3.001***	0.422	20.108	1.114***	0.326	3.046	2.444**
Norway	2.027***	0.439	7.588	0.765**	0.341	2.148	2.769**
France	1.064**	0.461	2.898	0.685**	0.347	1.983	1.765
Dirty sector	-0.453	0.303	0.636	0.915***	0.230	2.497	-0.647
Clean sector	0.212	0.186	1.236	0.583***	0.168	1.792	-0.741*
Size	0.003***	0.000	1.003	0.003***	0.000	1.003	0.002**
Internal stakeholders	1.017***	0.103	2.766	0.516***	0.087	1.676	0.611***
Supply Chain stakeholders	0.252**	0.092	1.287	0.136*	0.082	1.146	0.135
General stakeholders	0.419***	0.100	1.520	0.380***	0.089	1.462	0.085
Business Performance	0.106	0.094	1.112	-0.126	0.081	0.882	0.305
internal * BP	-0.100	0.093	0.905	-0.069	0.076	0.933	0.036
Supply * BP	-0.061	0.088	0.941	-0.168**	0.076	0.845	0.238
general * BP	-0.089	0.092	0.915	-0.036	0.081	0.964	-0.293
N	381			609			
Chi-square log likelihood: 550.472***							
Cox and Snell's R2: 0.330							
Nagelkerke's R2: 0.366							
McFadden's R2: 0.173							

“Doing nothing” is the reference category for the dependent variable (N=347) *** p<0,005; **p<0,05; *p<0,1

Canada is the reference category for country variable. The neutral sector is the reference category for sector variable.

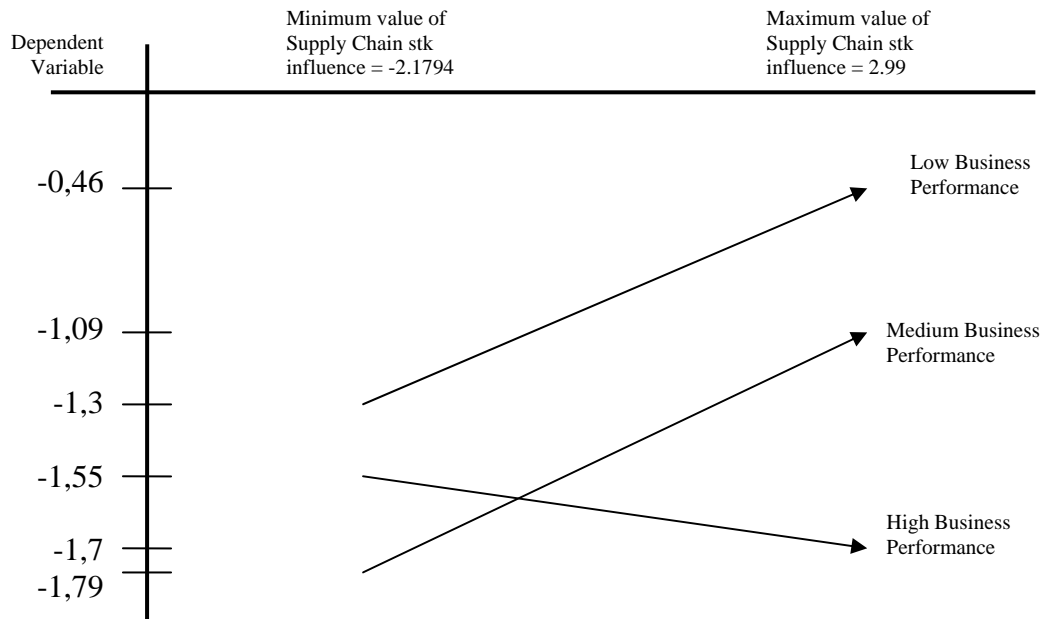
To test the second part of our research hypotheses, which is related to the moderating effect of business performance on the relationship between high/low visibility environmental practices and stakeholder influences, we relied on an item from the OECD survey that asked facility managers how they would assess their facility's overall business performance over the past three years. Using a five-point Likert scale, they could respond whether the revenue has "been so low as to produce large losses," "been insufficient to cover costs," "allowed to break even," "been sufficient to make a small profit," and "been well in excess of costs." To test hypotheses 1b, 2b, and 3b, interactions between the de-meanned⁹ business performance variable and each stakeholder's influence factor were included in the model.

Hypothesis 1b, which predicted that business performance moderates the relationship between the implementation of environmentally friendly practices with varying degrees of visibility and managerial perceptions of internal stakeholder influence, was not supported because the interaction between business performance and internal stakeholder influence was statistically insignificant in all cases. However, hypothesis 2b, which predicted that business performance moderates the relationship between the implementation of environmentally friendly practices with varying degrees of visibility and managerial perceptions of supply chain stakeholder influence, was partially supported. The interaction between business performance and supply chain stakeholder influence was not statistically significant in the case of high-visibility environmentally friendly practices, but this interaction is statistically significant in the case of low-visibility environmentally friendly practices. Further, the negative

⁹ De-meaning consists of subtracting the mean of this item (3.46) in each observation of the sample in order to avoid multicollinearity among independent variables.

coefficient of the interaction variable means that the greater the decrease in business performance, the greater the managerial perception of supply chain stakeholder influence. Graph 1 illustrates this moderating relationship.

Graph 1: The moderating effect of business performance



Our findings supported hypothesis 3b, which predicted that business performance does not moderate the relationship between the implementation of environmentally friendly practices with varying degrees of visibility and managerial perceptions of general stakeholder influence, because the interaction variable was not statistically significant in all cases. This means that, as expected, managers do not perceive different degrees of general stakeholder influence according to the facility's economic situation.

As for the control variables, in general terms, they were statistically significant. Facility size, measured by the number of employees, is a positive and statistically

significant variable in all cases. But the statistical significance of country and sector variables was inconclusive. All the countries were also positive and statistically significant in the case of environmentally proactive facilities and facilities that use low-visibility practices. However, in the case of facilities that use high-visibility practices, only Hungary, Japan, and Norway were found to be associated with positive and statistically significant effects. The variable that differentiates between clean and dirty sectors is positive and statistically significant, but only in the case of facilities that use low-visibility practices. This finding is consistent with a proactive environmental management view because being in a clean or dirty sector might not be an important concern for environmentally proactive facilities (because they are environmentally responsible in all cases). In the case of facilities that use low-visibility practices, this variable is positive and statistically significant. Furthermore, it seems logical that the variable denoting the cleanliness of a sector has greater explicative power in explaining the dependent variable.

To test model fit, several tests were presented. First, likelihood ratio statistics tests,¹⁰ which determine what predictors contribute significantly to the model, showed that all variables in the model were statistically significant, except for the interaction between business performance and the perceived influence of general stakeholders, and the interaction between business performance and the perceived influence of internal stakeholders. Second, similar to pseudo R-Squared statistics, the Nagelkerke R-squared statistic of 0.366 and McFadden R-squared statistic of 0.17 indicate reasonable model fit, which is consistent with previous studies that also applied multinomial logistic regression in the context of environmental practices (e.g., González-Benito and

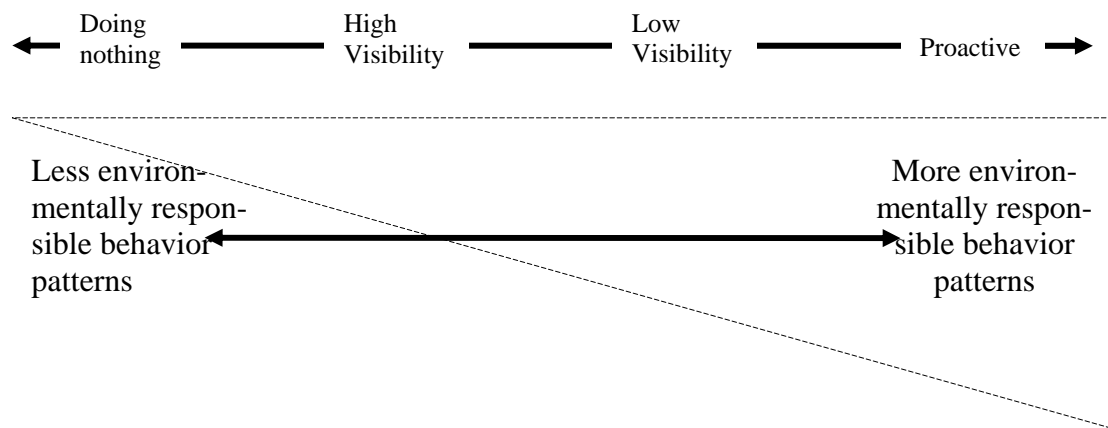
¹⁰ The chi-square statistic is the difference in $-2\log$ likelihood between the final model and the reduced model. The reduced model is formed by omitting an effect from the final model.

González-Benito, 2008). Finally, the adjustment between the observed response categories and the predicted categories of the dependent variable evaluate how well the model identifies implementation of environmentally friendly practices. This compares favorably to the intercept-only model, which classifies all cases as the modal category, that is, facilities that use low-visibility practices. Overall, 57.5% are classified correctly, indicating reasonable model fit.

Additionally, after evaluating the findings of the multinomial logistic technique, these results showed that an inherent order exists among categories of the dependent variable, which concerns the perceived degree of stakeholder pressure by managers. In the existing *continuum* from being a certified facility that regularly monitors environmental performance (*proactive* facilities) to doing nothing (*reactive* facilities), facilities that use high-visibility practices and facilities that use low-visibility practices exist. As for the managerial perception of stakeholder influence, our results show that a facility's managers who are interested in the implementation of low-visibility environmentally friendly practices have greater concern for satisfying demands of interest groups than facility managers who are interested in the implementation of high-visibility environmentally friendly practices. Thus, we considered that the implementation of low-visibility environmentally friendly practices is nearer to environmentally proactive behavior than behavior that is associated with the implementation of high visibility environmentally friendly practices. Therefore, facilities that not are certified and do not monitor environmental performance (doing nothing or *reactive*) are followed by certified facilities that do not monitor their environmental performance (facilities that use high-visibility practices). Then, there are non-certified facilities that monitor environmental performance (facilities that use low-visibility practices) and the most environmentally *proactive* group, that is, certified

facilities that regularly monitor environmental performance. Figure 2 shows this ordering classification.

Figure 2: From “Doing nothing” to “Being Environmentally Proactive”



To address this idea, our study tests the results obtained by prior multinomial logistic procedures using ordinal regression. The ordinal regression technique allows for the evaluation of the importance of several independent variables when the dependent variable is ordinal. Following prior classifications at each level, subsequent analysis *via* ordinal regression analysis permits us to distinguish the probabilities associated with less desirable and more desirable outcomes. Results of ordinal regression with a logit link function are shown in Table 3. As for findings of the dependent variable, using the first or last category as a reference category is not a concern because of its latent continuous outcome nature. In our model, the reference category is formed by certified facilities that regularly monitoring environmental performance (environmentally *proactive* facilities). Each category of the dependent variable and all stakeholder influence variables were positive and statistically significant. This supports our main insight, which states that managerial perceptions of stakeholder influence on the implementation of low-visibility environmentally friendly practices is closer to

environmentally proactive and responsible behavior than the implementation of high-visibility environmentally friendly practices.

Table 3: Results of ordinal regression analysis

Variables	Coefficients	Standard Error
Doing nothing	0.661**	0.306
High-visibility	0.818**	0.306
Low-visibility	3.102***	0.318
USA	0.984***	0.251
Germany	1.389***	0.247
Hungary	1.411***	0.283
Japan	1.874***	0.249
Norway	1.025***	0.264
France	0.677**	0.270
Dirty sector	-0.158	0.165
Clean sector	0.130	0.118
Size	0.001***	0.000
General stk	0.286***	0.058
Internal stk	0.659***	0.061
Supply chain stk	0.153***	0.055
Business Performance	0.078	0.053
General * BP	-0.030	0.052
Internal * BP	-0.075	0.052
Supply Chain* BP	-0.039	0.051
N	1,373	
Chi-square likelihood	331.298***	
Cox and Snell's R2	0.214	
Nagelkerke's R2	0.238	
McFadden's R2	0.104	

“Environmentally proactive facilities” is the reference category for the dependent variable.

*** p<0,005; **p<0,05; *p<0,1

Canada is the reference category for the country variable.

The neutral sector is the reference category for the sector variable.

Moreover, neither the business performance variable nor any interaction variables were statistically significant. Thus, as for the second part of our research hypotheses, the facility’s economic situation does not moderate the relationship between how managers perceive stakeholder influences and the implementation of different degrees of environmentally friendly practices.

2.6. Discussion, Implications and Limitations

2.6.1. Discussion and Conclusions

Drawing on Stakeholder Theory, several studies have highlighted that the implementation of some “green” practices is influenced by stakeholder pressure (Henriques and Sadorsky, 1999; Delmas 2001; Buysse and Verbeke, 2003; Christmann, 2004; Sharma and Henriques, 2005; Murillo-Luna et al., 2008). However, less work has examined whether managers pay a different amount of attention to stakeholder influences concerning different degrees of visibility of environmentally friendly practices. Moreover, in the prior literature, the moderating effect of the organization’s economic situation on managerial perceptions of stakeholder pressures has not been studied enough. This study offers empirical evidence for these questions, and offers three main contributions.

First, according to our empirical results, there are three environmental stakeholder groups: internal stakeholders, supply chain stakeholders, and general stakeholders. As to the implementation of environmentally friendly practices with varying degrees of visibility, differences were found among managerial perceptions of these three delimited groups. Managerial perception of internal stakeholder influence (Hypothesis 1a) is greater in the case of the implementation of high-visibility environmentally friendly practices, compared with the implementation of low-visibility environmentally friendly practices. Because shareholders have an important economic

stake in the organization (Donaldson and Preston, 1995), they are very interested in its long term survival (Henriques and Sadorsky, 2006). Employees and headquarters must to obey shareholder decisions, because these are the ultimate owners of an organization. Because shareholders stand to profit from an organization's reputation regarding environmental sensitivity and consciousness, all internal stakeholders might be interested in enhancing revenues as soon as possible *via* the implementation of high-visibility environmentally friendly practices instead of improving environmental performance *via* implementation of low-visibility, but often more effective, environmentally friendly practices. However, as expected, there is a greater managerial perceptions of importance for both supply chain stakeholder (Hypothesis 2a) and general stakeholder influence (Hypothesis 3a), when low-visibility environmentally friendly practices were implemented than when high-visibility environmentally friendly practices are implemented. These findings are opposite to the empirical results of Murillo-Luna et al. (2008) that stated one single dimension of environmental demand exists, and did not differentiate across stakeholder groups. Therefore, managers might perceive different stakeholder influences on the implementation of environmentally friendly practices with different degrees of external visibility. This could be linked to the different informational demands of each stakeholders group and to different objectives pursued by each stakeholders group. Managers attempt to satisfy internal stakeholders, who might be interested in improving the economic outlook of the organization (through high-visibility environmentally friendly practices that quickly enhance profitability). But managers are also aware that compliance with environmental regulations and, to fulfill general or supply chain stakeholder requirements, taking into account pollution figures expressed in physical units through low-visibility environmentally friendly practices might better improve environmental performance.

Consequently, according a resource-based view, an accurate integration of stakeholder concerns into a organization's decision-making process might imply a scarce, valuable, rare, and inimitable resource that leads to a competitive advantage for the organization (Delmas, 2001).

Second, the effect of business performance on the managerial attention paid to stakeholders was mostly unexplored in prior literature. Our study found that an organization's economic situation does not moderate different levels of attention paid to stakeholder groups by managers when they decide to implement environmentally friendly practices with different degrees of visibility, except in the case of supply chain stakeholders. In the case of the implementation of low-visibility environmentally friendly practices, greater managerial perception of the influence of supply chain stakeholders is more related to stagnant or negative business performance. Because consumers and clients are becoming more knowledgeable about the environmental impacts of organizations, managers are interested in working for environmentally friendly organizations (Russo and Fouts, 1997). In these cases, organizations need to use low-visibility environmentally friendly practices to face these informational demands. In the same way, providers and suppliers are requesting greener behaviors from organizations (González- Benito and González- Benito, 2008; Darnall, Gallagher and Andrews, 2001; Darnall, Jolley and Ytterhus, 2007). However, contrary to what we expected, these insights became more important when facilities were in relatively poor economic situations. This may be due to the potential threat of non-compliance with both supplier and consumer environmental requirements. For instance, Sharma and Vredenburg (1998) argued that integrating stakeholder perspectives in the development of business activities lead to environmental cost savings through avoiding sanctions.

This cost reduction could become essential to saving the economic health of an organization.

Finally, although managers are increasingly taking into account the importance of decisions regarding internal processes, including analysis of negative environmental impacts, the literature has mostly focused on high-visibility environmentally friendly practices in society. The attention paid to environmental certification is particularly illustrative. Some empirical studies demonstrate that stringent certification requirements facilitates reductions of negative environmental impacts (Quazi et al., 2001; Christmann, 2004; Russo, 2009) while also being profitable (Dowell, Hart and Yeung, 2000). However, our results support the notion that environmental certification must be accompanied by low-visibility practices that actually improve environmental performance. According to Russo (2009: 308), who stated that “*certification to standards does not mandate emissions reductions*,” we believe that an organization will be more capable in achieving environmentally responsible behavior by using low-visibility environmentally friendly practices (instead of only certification) because these practices are more effective for reducing waste and pollutant figures, in general.

2.6.2. Implications for practitioners and regulators

In addition to the research implications previously explained, our findings also have important implications for practitioners and public regulators. For practitioners, this study offers two main contributions. First, our study shows that improved knowledge of the potential benefits of the implementation of low-visibility environmental practices is useful in identifying potential cost reductions and supporting

environmental decision-making such as, for example, in product and process design, facility siting, resource allocation, waste management, cost estimations, capital investments, and pricing. The in depth assessment of the organization's environmental information enables managers, engineers, and operators to make better decisions about how to run and improve their businesses (Gibson and Martin, 2004; Burritt et al., 2002; Savage and Jasch, 2004). On the other hand, companies that use low-visibility environmental practices may become more eco-efficient (Burritt et al., 2002; Savage and Jasch, 2004) than those that only implement high-visibility practices. For instance, to elaborate an eco-efficiency ratio, financial and physical information on inputs and outputs is necessary. Because routine internal monitoring of environmental performance entails controlling and gathering both economic and physical data, companies might achieve simultaneously cost savings and environmental impact reductions in energy, water, and materials, because all these inputs will be used more efficiently (Burritt et al., 2002; Savage and Jasch, 2004).

As to the concerns of regulators, our results support the prior literature, which has suggested stricter regulation as a driver of an organization's environmental actions (Porter and Van der Linde, 1995; Darnall, Jolley and Ytterhus, 2007). Furthermore, low-visibility environmentally friendly practices may mean a higher level of legal compliance because these practices imply more cost-effective compliance with environmental regulations (Savage and Jasch, 2004). Therefore, a better understanding about how organizations absorb pressures when they implement environmental practices with different degrees of visibility implies an important contribution, because the more capable an organization is in reducing their environmental impacts, the more capable it can be in absorbing stronger regulatory pressures (Darnall, Jolley and

Ytterhus, 2007). Because regulatory pressure is positively associated with monitoring of environmental impacts, public regulators in charge of environmental issues may want to choose to toughen current regulations and stimulate the implementation of these kinds of environmentally friendly practices.

2.6.3. Limitations and Future Works

There are several limitations to our research design that should be considered for future research. First, because survey data was cross-sectional in nature, future research would benefit from using longitudinal data. This information will offer more rigorous evidence for the relationship analyzed in this study. Second, the data was obtained *via* survey, and thus might be biased because of misrepresentation of environmental impacts and business performance by respondents. Furthermore, although the OECD questionnaire attempted to avoid the four typical biases related to data collection through survey techniques, the stakeholder influences in this study were subjectively measured by respondent perceptions. Nevertheless, completely objective measures related to stakeholder influence are rarely found in research (Henriques and Sadorsky, 1999). For this reason, additional empirical evidence must be offered by future studies. Finally, this study considers seven OECD countries and their manufacturing industries. Future research should address these limitations, and should include more countries as well as a greater number of economic sectors.

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CAPÍTULO 3

THE INFLUENCE OF MONITORING ENVIRONMENTAL IMPACTS ON LOW-COST ORIENTATION OF THE FIRM: THE MODERATING EFFECT OF THE INDUSTRY

**THE INFLUENCE OF MONITORING ENVIRONMENTAL IMPACTS ON
LOW-COST ORIENTATION OF THE FIRM: THE
MODERATING EFFECT OF THE INDUSTRY**

Abstract

Recent literature on organizations and natural environment has showed that a proactive environmental strategy positively influence business performance. However previous literature has paid a minor attention to analyze the specific influence of corporate environmental approaches on firm's costs. The influence of the industry on this relationship is particularly relevant to understand implications for scholars, managers, and regulators. Using a sample of 1,961 facilities in manufacturing sectors operating in seven countries (Canada, France, Germany, Hungary, Japan, Norway and United States), we show that a regular monitoring of negative environmental impacts positively influence the low-cost orientation of the firm, and this relationship is higher when the industry have a lower environmental impact. We did not find evidence to support that operating in industries of high environmental impact negatively influence the low-cost orientation of the firm.

Key words: Low-cost orientation, pollutant intensive sector, resource-based view, environmental complexity, multiple linear regression.

3.1 Introduction

Although costs have always been an important managerial concern, the cost leader orientation seeks to obtain the lowest cost in its industry in order to achieve a competitive advantage based on translating this costs difference into higher benefits than competitors (Porter, 1980; 1985). Related to the natural environment, multiple scholars and managers have traditionally assumed that firms interested in the implementation of proactive environmental practices are disadvantaged under a cost point of view (e.g. Walley and Whitehead, 1994). In this context, a low-cost orientated firm should pay a minor attention to the corporate environmental progresses. However, we wonder whether a proactive environmental strategy may be positively related to a firm's low-cost orientation, and how industry influences this relationship.

Hart (1995) proposed that meanwhile product environmental stewardship is related to capabilities focused on differentiation strategy, preventing pollution generates some organizational capabilities which can be linked to costs advantage. These prevention pollution activities, as the regular monitoring of negative environmental impacts, may improve efficiency of the productive processes because it minimizes waste and pollution and promotes the use of less harmful inputs (Hart, 1995; Hart & Ahuja, 1996). Some empirical researches have showed the potential of this relationship (Christmann, 2000; Darnall & Edwards, 2006). However the specific role of the internal

activities concerning environmental issues and the influence of the industry in this relationship remain still unexplored in the existing literature.

Several empirical studies have divided industries in dirty or clean industries analyzing the environmental impact of their activities and using the cost of pollution abatement as operative variable to delimitate this separation (Tobey, 1990; Low and Yeats, 1992). Aragón-Correa and Sharma's (2003) theoretical framework proposed how the characteristics of the general business environment moderated the development of organizational capabilities for an environmental strategy. According to these authors, we analyze how a greater level of complexity concerning operating in a clean/dirty sector moderates the existing relationship between low-cost orientation and the implementation of proactive environmental practices. The current study attempts to demonstrate that a regular monitoring of the environmental impact in the firm positively influence the low-cost orientation and that this positive association is higher for clean industries and lower (although positive and significant) for firms operating in dirty industries.

Hence this paper has two main objectives. The first objective of this paper is to analyze the relationship between pursuing a low-cost orientation by firms and improving environmental performance simultaneously. Understanding this positive relationship is important because environmental costs (which are those costs of external damage that have to be paid by companies) are increasing its importance in the international business field (Savage and Jasch, 2004). Just to illustrate, Ditz et al. (1995) propose that environmental costs can become from five to twenty percent of the total cost of business activities.

The second objective of this paper is to analyze the influence of the industry on the relationship between low-cost orientation and firm's environmental progresses. The complex task of reducing costs and negative environmental impacts in several manufacturing activities which are labelled as dirty sectors makes appealing to find an environmentally friendly way of doing so. Additionally, because environmental costs are expected to rise as pressures for environmental protection regulation will become more stringent (Gale and Stockoe, 2001), not only companies allocated in dirty industries will be affected by the increasing stringency of environmental regulations but also companies allocated in clean activities.

This paper contributes to prior environmental literature in at least three different ways. Firstly, the current study answers a research question that remains unexplored: does a process-focused capability related to friendly environmental practices influence the firm's low-cost orientation? Second, meanwhile previous literature assumed a neutral effect of the industry in the relationship between low-cost orientation and environmental progresses, we will analyze whether industry complexity has a significant effect on this relationship. Third, the current work utilizes data of 1,961 facilities in manufacturing sectors operating in seven countries: Canada, France, Germany, Hungary, Japan, Norway and the United States. Therefore, it offers a global perspective on the extent to which the regular monitoring of negative environmental impacts is related to the low-cost orientation and how being allocated in a clean/dirty sector moderates this relationship.

This paper is divided in four main sections. The first part is a theoretical review about the company's low-cost orientation. The second section is composed by the

development of research hypotheses. Third, the methodological part is presented and finally the fourth section is formed by discussion, conclusion and limitations of the current work.

3.2. The low-cost orientation

Despite costs saving is a managers' general concern, several organizations aim to become the lowest cost producers in an industry (Porter, 1980; 1985). The entrepreneurial orientation of this strategy is similar than "Defenders" of Miles and Snow (1978) because both business strategies emphasize three main ideas: lowering overall costs, implementing strict control system, and achieving a high efficiency level. Several works have offered empirical validity to both the Porter's typology (e.g. Dess and David, 1984; Miller and Friesen, 1986a; 1986b; Miller and Dess, 1993) and the Miles and Snow' typology (e.g. Hambrick, 1983b; 1983c). Moreover, some others have elaborated theirs own strategic typology (Hambrick, 1983a; Mintzberg, 1988) or strategic taxonomy (Miller and Friesen, 1986a; 1986b). In all these cases, the low-cost orientated approach is always mentioned as a strategic option for a firm.

The most important requirements to guarantee the profitability of a low-cost orientated strategy are three. Firstly, firms that pursue low-cost orientation might minimize overall costs in order to reach the lowest costs in its industry (Miles and Snow, 1978; Porter, 1980; 1985; Hambrick, 1983a; 1983b; 1983c; Dess and David, 1984; Miller and Friesen, 1986a; 1986b; Mintzberg, 1988). The lowest costs allow the creation of entry barriers as economies of scale and learning effects avoiding the access

of new competitors or the existence of substitute products in the industry (Porter, 1980). Second, a low-cost orientated firm seeks to translate the cost advantage into higher margins and, thus, obtaining greater benefits than its competitors (Dess and Lumpkin, 2003). This orientation usually bid low prices for their products and/or services (Hambrick, 1983a; 1983b; 1983c; Dess and David, 1984; Miller and Friesen, 1986a; 1986b; Mintzberg, 1988). For instance, due to these greater margins the cost leader is better insulated when inputs price increases and, as a consequence, low-cost orientated firms enjoy a smaller bargaining power of both customers and suppliers. Third, a low-cost orientated firm must have high internal efficiency level (Miles and Snow, 1978; Porter, 1980; 1985; Hambrick, 1983a; 1983b; 1983c; Dess and David, 1984; Miller and Friesen, 1986a; 1986b). The emergence of low-cost airlines might exemplify this efficiency orientation. Related to operative characteristics, low-cost operators use high capacity fleets, they employ secondary or uncongested airports, they often sell short length journeys and they pay competitive wages for high productivity staff (Alamdari, 2005). All these measures contribute to improve the internal efficiency level of airlines and, doing so, they are capable to reduce their operating costs.

With all these prior requirements the firm is able to achieve a competitive advantage based on costs savings. Thus, according to this prior literature, we define a company's low-cost orientation as the business strategy whose competitive strength is based on satisfying consumers' needs by offering quality products and/or services with good prices at the same time that the firm is internally efficient.

3.3. Hypotheses

3.3.1. Firm's regular monitoring of environmental impacts and low-cost orientation

The resource-based view (Wernerfelt, 1984; Barney, 1991) explains competitive advantage as an outcome of the development of valuable organizational capabilities. Organization's capabilities *result from bundles of resources being brought to bear on particular value-added tasks* (Hart, 1995:988). Resource-based view argues that organizations which are able to accumulate resources and capabilities that are rare, valuable, non-substitutable and imperfectly imitable will achieve an advantage over competitors (Barney, 1991). Related to the natural environment, Hart (1995) proposed a natural resource-based-view using three interrelated strategies (pollution prevention, product stewardship and sustainable development) in order to provide a conceptual framework by incorporating environmental issues into strategic management. Multiple works that have analyzed environmental issues using the resource-based view insist on showing the possibilities of increasing the profitability of the organization as a consequence of the development of valuable capabilities generated by the implementation of proactive environmental management (Hart and Ahuja, 1996; Russo and Fouts, 1997; Klassen and Whybark, 1999; Bansal, 2005). Most of these studies have positively related friendly environmental response patterns by companies to differentiation strategy. For instance, some product-focused practices of environmental management, as redesigning packaging or developing new environmentally responsible products, can achieve a differentiation advantage (Christmann, 2000).

However, Hart (1995) also suggested that environmental strategies related to activities seeking to prevent pollution generate some organizational capabilities which can be linked to cost advantages. Minor, although relevant, attention has been paid to

this relationship in the literature. Christmann (2000) showed that complementary capabilities contributed to cost advantage when organizations implemented environmental management “best practices”. Darnall and Edwards (2006) showed that an organization’s prior internal competencies predicted the adoption costs of an environmental management system.

We attempt to highlight here that the first step to implement an effective pollution prevention process within the company is the accurate internal gathering and monitoring of negative environmental impacts. With this type of internally elaborated analysis, managers are able to face the environmental challenge of pollution prevention and they may reduce their environmental costs simultaneously. Costs saving due to pollution prevention can avoid the expense of installing and operating end-of-pipe pollution control technology (Sharma & Vredenburg, 1998), can increase productivity and efficiency because less waste means a better use of inputs, that is lower raw material and waste disposal costs (Hart & Ahuja, 1996), and can reduce or avoid legal sanctions as environmental fines and penalties (Sharma & Vredenburg, 1998).

All these benefits that are consequences of a process-focused orientation can lower the amount of environment-related expenses of the company (Nehrt, 1998; Christmann, 2000). Even they might allow the development of capabilities that permit to obtain a competitive advantage based on low-cost at the same time that improve its environmental performance.

Consequently, we hypothesize:

H1: The business routine internal monitoring of environmental impacts positively influences the low-cost orientation of the firm.

3.3.2 Environmental impact of the industry and low cost orientation of the firm

The classification between dirty and clean industries essentially distinguishes between high and low environmental impacts of their activities. However, as mentioned above, several empirical studies have classified industries as dirty or clean using the cost figure of pollution reduction (Tobey, 1990; Low and Yeats, 1992). For instance, Tobey (1990) defined dirty industry as those in where pollution abatement costs in U.S. exceeded 1.85% of total costs. Similarly, dirty or pollution intensive industries have been delimited are those *which have incurred high levels of pollution abatement expense per unit of output* (Mani & Wheeler, 1997:3). In order to reduce their negative environmental impacts, firms allocated in pollution intensive sectors must regularly monitor their environmental performance in a greater degree than firms allocated in pollution non-intensive sectors for two reasons. On the one hand, firms allocated in dirty sectors need to reduce their high level of pollution and waste generated by their pollutant nature. Due to harmful effects of dirty sectors to the environment degradation, environmental regulators take into account with more stringency the environmental performance of companies allocated in this type of industries. On the other hand, firms allocated in dirty sector are more concerned in reducing their negative environmental impacts than those firms allocated in clean sectors because of avoiding costs of environmental damage that have to be paid by companies *via* the payment of fines and penalties. As a consequence of these two reasons, we assume that firms operating in pollution intensive or dirty sector have to face a more complex business environment

that those firms allocated in clean sectors. Aragón Correa and Sharma (2003:79) defined complexity in the general business environment as *the proliferation and diversity of factors and issues in that environment*. Thus, the need of reducing negative environmental impacts by imperative and/or the threat of the payment of fines and penalties concerning environment-related regulations exemplify the greater level of complexity that firms operating in dirty sector have to withstand. For instance, “*electricity providers in the U.S. have to face complexities related to the regulatory, technical, business and operational aspects of the medium and long term reduction of emissions that . . . are subject to a great variety of factors and opinions* (Rueda Manzanares et al., 2007:190). Therefore, we assume that operating in these dirty sectors and, as a consequence, facing a more complex business environment, is more expensive than operating in clean and less complex business environment. This fact is oppositely to low-cost orientation of the firm.

Consequently, we hypothesize that:

H2: Operating in a dirty industry negatively influences the low-cost orientation of the firm (increasing their costs).

3.3.3. The moderating influence of the industry

Hart (1995) proposed that environmental internal processes, such as monitoring environmental performance, are able to generate organizational capabilities within the firm. These generated capabilities make a positive influence in the competitive advantage of the firm *via* costs reduction. At a first glance, firms operating in pollution

intensive industries must be more capable to develop these capabilities because these firms are used to facing stringent environmental requirements (complexity) in a greater degree than those firms operating in clean sectors. In other words, since it must be more likely that environmental regulation prevails over managers' interests in dirty sectors than in clean sectors, these dirty sectors should be more capable to benefit of the synergy resulting of the association between low-cost orientation and friendly environmentally practices.

However, upon resource-based view, we consider that the development of capabilities related to the low-cost orientation is positively associated with the regular monitoring of environmental performance, even when the company is allocated in a clean sector. For instance, low-cost orientated companies often develop an efficient process-focused ability. Related to the environment, this efficient ability is translated as the eco-efficiency, whose definition is "*the delivery of competitively priced goods and/or services that satisfy human needs and bring quality of life while progressively reducing ecological impacts and resource intensity, throughout the life cycle, to a level at least in line with the earth's estimated carrying capacity*" (www.wbcsd.org¹¹). *A priori*, firms operating in dirty sectors should become more *eco-efficient* than those firms operating in clean sectors. But, we consider that the development of an *eco-efficient* orientation is more related to the low-cost orientation or to the implementation of proactive environmental practices than to the fact of operating in a clean/dirty sector. It is likely that firms operating in dirty sectors have a friendly environmentally behaviour because of the threat of non-compliance with environmental regulation, meanwhile firms operating in clean sectors have a friendly environmentally behaviour *per se*, without the regulation pressure. Thus, we argue that the relationship between

¹¹ This is the web site of the World Business Council for Sustainable Development.

low-cost orientation and proactive environmental activities appears in firms operating in clean sectors in a greater degree than in those firms operating in dirty sectors.

Consequently, we hypothesize that:

Hypothesis 3: The degree of environmental performance of the industry where firms operate moderates the relationships between low-cost orientation and the business routine internal monitoring of environmental impacts in such a way that the relationship is more positive when the industry has a low environmental performance.

3.4. Research Method

3.4.1. Data

The data for this study are taken from a survey developed by OECD Environment Directorate and academic researchers, in which 4,186 facilities with at least fifty employees and from the manufacturing industry in Canada, France, Germany, Hungary, Japan, Norway and the United States were surveyed in 2003. The manufacturing sector was selected because it is a commonly accepted that these industries produce more air, land and water pollution than service facilities (Stead and Stead, 1992). The sample included both publicly and privately owned facilities.

The OECD questionnaire was pre-tested in France, Canada and Japan before it was translated into each country's official language and back-translated to validate the accuracy of the original translation. The respondents were responsible for the facility's

environmental activities. The OECD sent two follow-up mailings to prompt additional responses. The response rate was 24.7 percent which is consistent with previous studies of firms' environmental practices (e.g. Christman, 2000).

There are four specific biases that can appear in data collecting when survey techniques are used: common method variance, social desirability, non-response and lack of generalizability. The OECD questionnaire attempted to avoid these biases as follow. Common method variance refers the amount of spurious covariance shared among variables, and it is assessed by factoring all indicators in the study to see whether a single common factor emerges, that is an indicative of common method variance. To check for this type of bias researches relied on the post-hoc Harman's single factor test (Podsakoff and Organ, 1986). The results of Harman's single-factor test revealed that no single factor accounted for the majority of the variance in variables, thus, common method variance was not a concern. Social desirability bias was controlled by three methods: firstly, ensuring anonymity for all respondents; second, separating questions related to stakeholder influences from questions pertaining to environmental management; finally, finding statistically significant relationships (Hardin and Hilbe, 2001), because where a social desirability bias exists, results are less probable to be statistically significant due to the existence of less variability in respondents' survey answers. The OECD researches examined non-response bias by evaluating the general distribution of its survey respondents. They assessed the industry representation and facility size of the survey sample relative to the distribution of facilities in the broader population, and found no statistically significant differences (Johnstone et al., 2007). Finally, when results can be applied only to the statistical target population of a study,

they will be less generalizable in different populations, thus the more generalizable an estimated parameter is, the more important it is likely to be. Since the OECD survey had broad applicability due to its targeted large and small operations across multiple industry sectors and countries, generalizability was not a concern.

3.4.2. Measures

Both dependent and independent variables explained in next paragraphs were obtained using the OECD questionnaire.

The dependent variable is the facilities' routine internal monitoring of the environmental impact. We relied on data from the OECD questionnaire that asked managers whether several environmental performance measures were regularly monitored in their facilities. Specifically, facilities managers were asked about the routine monitoring of their facilities': use of natural resources (energy, water, etc.), solid waste generation, wastewater effluent, local or regional air pollution and global pollutant. Respondents reported "Yes" or "No" to each item. Thus, these five environmental performance measures were entered into a principal component factor analysis and one unique factor was produced, that is facilities' routine internal monitoring of environmental performance. The total variance accounted for this emerged factor was 45.06 percent. Table 1 summarizes results of this factor analysis.

Table 1: Factor analysis of monitoring environmental performance measures

Items	Factor Loadings
Monitoring the use of natural resources (energy, water, etc.)	0.70036
Monitoring the solid waste generation	0.69657
Monitoring wastewater effluents	0.68094
Monitoring the local or regional air pollution	0.66649
Monitoring global pollutants	0.60768
Cronbach's Alpha	0.6791

Loadings greater than ± 0.50 are bolded

The independent variables are the low-cost orientation, industry and the interaction between both prior variable. Further, the analysis includes several control variables. First, in order to test the low-cost orientation of the firm, we also relied on data from the OECD questionnaire that asked managers how important do they consider the costs saving motivations with respect to the environmental practices of theirs facilities. Respondents could report “not important”, “moderately important” and “very important”. Previously to the inclusion of this variable in the model, we attempted to create a more comprehensive variable which explained low-cost orientation. Christmann (2000) used a subjective measure of cost advantage in order to create the dependent variable of her study. This subjectively measured variable was composed by three items which emerged, showing a Cronbach's alpha of 79%. Similarly to Chirstmann (2000), we attempted to obtain a comprehensive and subjectively measured variable by relying on the OECD survey. Here, the question concerning what the motivations are with respect to the environmental practices of theirs facilities is composed by eight items: “prevent or control environmental incidents”, “regulatory compliance”, “corporate profile/image”, “cost savings”, “new technology development”, “new product development” and “other reasons”. Principal components analysis was applied to these

items at a whole and the motivation “cost saving” did not emerge in any of the obtained factors. For this reason, we decided to include this item alone, as the dependent variable of our empirical model.

Second, in order to create a measure in charge of differentiating clean and dirty sectors, a binary variable was created following prior literature focused on pollution intensive sectors and pollution non-intensive sectors. According to Many & Wheeler (1997) and Gallagher & Ackerman (2000) clean manufacturing activities (1) were: textiles, leather and footwear (SIC 17-19), machinery and equipment (SIC 29-33) and transport-related equipment (34-35). Dirty manufacturing sectors (0) were: pulp, paper, publishing & printing (SIC 20-22), chemical, rubber, plastics and fuel (SIC 23-25), other non-metallic mineral products (SIC 26) and basic metal and fabricated products (SIC 27-28). The OECD questionnaire asked managers to indicate the industrial sector in which they would place the main production activity of their facilities. Respondents could select only one option that refers their specific manufacturing activity.

Third, since one of our main objectives was to study the moderating effect of industry in the relationship between low-cost orientation and the regular monitoring of negative environmental impacts, we created a moderating variable which consisted on the interaction between industry variable and the regular monitoring of environmental impacts. In order to avoid multicollinearity problems among these independent variables they were de-meanned. This process consists of subtracting the mean of these variables in each observation of the sample, previously to the multiplication of them.

Additionally, to address firm heterogeneity, this study includes several control variables. Firstly, facility size was accounted for neperian logarithm of the number of facilities' employees. Second, country dummies were included, being Japan the excluded country dummy. Table 2 contains descriptive statistics and Pearson's correlations of all variables included in our study that are within the range of acceptability.

Table 2: Descriptive Statistics and Pearson’s Correlations of variables

N=1,973	Cost Saving	USA	Germany	Hungary	Norway	France	Canada	Size	Monitoring	Sector	Interaction
Cost saving	1										
USA	0.136***	1									
Germany	-0.136***	-0.221***	1								
Hungary	0.112***	-0.147***	-0.168***	1							
Norway	-0.083***	-0.106***	-0.122***	-0.081***	1						
France	-0.011	-0.123***	-0.141***	-0.093***	-0.068***	1					
Canada	0.035*	-0.118***	-0.136***	-0.090***	-0.065***	-0.075***	1				
Size	0.111***	0.131***	0.022	0.078***	-0.136***	0.037**	0.024	1			
Monitoring	0.125***	0.105***	-0.037**	0.017	-0.022	-0.060***	-0.082***	0.360***	1		
Sector	-0.023	-0.102***	-0.058**	0.073***	-0.006	-0.018	-0.024	0.130***	-0.041**	1	
Interaction	0.056**	0.012	-0.046**	-0.020	-0.045**	0.012	-0.017	0.036**	0.010	0.031*	1
Means	02.39	0.16	0.20	0.10	0.06	0.07	0.07	5.34	0.46	0,39	-0.0207
S.D.	0.618	0.368	0.402	0.301	0.229	0.259	0.251	1.0997	0.978	0.488	0.483

The excluded dummy country is Japan. *** p<0.005; **p<0.05; *p<0.1

Table 3: Multiple Linear Regression model with moderator effects

Dependent Variable:	Model 1: Baseline			Model 2			Model 3: Full Model		
Cost Saving	B	S.E.	S.B.	B	S.E.	S.B.	B	S.E.	S.B.
Constant	2.132***	0.069		2.228***	0.073		2.233***	0.073	
USA	0.197***	0.041	0.117	0.188***	0.042	0.112	0.190***	0.042	0.113
Germany	-0.149***	0.038	-0.097	-0.143***	0.038	-0.093	-0.138***	0.038	-0.090
Hungary	0.215***	0.049	0.104	0.223***	0.049	0.108	0.228***	0.049	0.111
Norway	-0.163***	0.062	-0.060	-0.166***	0.062	-0.061	-0.158**	0.062	-0.058
France	-0.011	0.056	-0.004	0.006	0.056	0.002	0.008	0.056	0.003
Canada	0.095*	0.057	0.038	0.115**	0.058	0.047	0.120**	0.058	0.049
Size	0.045***	0.013	0.081	0.029**	0.014	0.051	0.028**	0.014	0.049
Monitoring				0.058***	0.015	0.091	0.058***	0.015	0.091
Sector				-0.034	0.029	-0.027	-0.035	0.028	-0.028
Interaction							0.062**	0.028	0.049
R2	0.056***			0.064***			0.067***		
Adjusted-R2	0.053			0.060			0.062		
R2 Change	0.056***			0.08***			0.002**		

The excluded dummy country is Japan. *** p<0.005; **p<0.05; *p<0.1

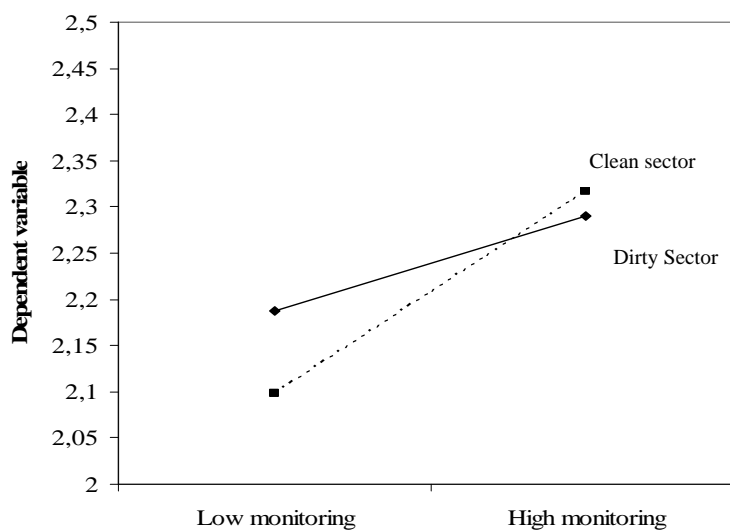
3.4.3. Results

Given the continuous nature of our dependent variable, that is punctuations resulting from the factor analysis of the regular monitoring of several negative environmental impacts, we used multiple linear regression to test our research hypotheses. Linear regression models assume that a “straight line” relationship exists between the dependent variable and each independent variable. Three models were created. The first one is the baseline model and it tested the significance of control variables, specifically country and the neperian logarithm of number of employees. In the second model, explanatory variables related to operating in a clean/dirty sector and low-cost orientation were included in order to test hypotheses H1 and H2. Finally, the third model was formed including all prior variables and the interaction term. With this full model it was possible to test empirically hypothesis H3.

Results are summarized in Table 3. Model 1 is the baseline model and it indicates that facility’s size, which is our control variable, is positive and statistically significant. Most of countries includes as dummies are also statistically significant. Model 2 adds independent variables in the regression. On the one hand, the regular monitoring of negative environmental impacts, as anticipated, was positive and statistically significant. This result supported hypothesis H1 which stated that the low-cost orientation is positively related to business routine internal monitoring of negative environmental impacts. On the other hand, the variable concerning being allocated in a clean/dirty sector was not statistically significant. These findings did not support hypothesis H2 which stated that operating in a dirty industry negatively influences the low-cost orientation of the firm. Conversely as expected, being allocated in a clean or in

a dirty sector did not explain the low-cost orientation. Model 2 has an adjusted R-square of 6% which is statistically greater than the adjusted R-square of model 1 (5.3%), indicating reasonable model fit. Finally, the full model (Model 3) showed that the interaction term were positive and statistically significant. These findings supported hypothesis H3 which stated that industry moderates the relationship between business routine internal monitoring of negative environmental impacts and low-cost orientation. Graph 1 shows the effects of this moderation. In the case of facilities that operate in dirty sectors there is not a great differences in the dependent variable concerning the regular monitoring of negative environmental impacts. However, in the case of facilities that operate in clean sectors the positive relationship between a low-cost orientation and the regular monitoring of negative environmental impact is greater than the same association but in facilities operating in dirty sectors. These findings support hypothesis H3 which stated that industry moderates the relationships between low-cost orientation and the business routine internal monitoring of environmental impacts in such a way that the relationship is more positive when the industry has a low environmental impact.

Graph 1: The moderating effect of the industry



Moreover, the adjusted R-square of model 3 was 6.2 % indicating a higher explanatory power than the baseline model. Augments in adjusted R-Square through models indicate an increasing in the quality of the linear regression findings. This fact highlights that the incorporation of the moderating effect of industry entails an improvement in the methodology, thereby stating the importance of analyzing the low-cost orientation under a friendly environmental resource based view and the moderating effect of operating in a clean/dirty sector.

3.5. Discussion, Implications and Limitations

3.5.1. Discussion and Conclusion

Using a friendly environmental resource-based approach, the current study has analyzed two main insights. On the one hand, our findings demonstrate that a firm's low-cost orientation might be explained by implementation of several friendly environmental practices such as the regular monitoring of negative environmental impacts. The minimization of overall costs, providing products and/or services with lowest prices and having high internal efficiency level suppose the development of synergic capabilities strongly related to a proactive environmental behaviour by firms. Thus, the benefits of this synergy between a low-cost orientation and a "green" orientation by firms created a resource that is rare, valuable and difficult to imitate (Barney, 1991). On the other hand, obtained results highlight that despite being

allocated in pollution intensive or dirty sector have not statistical power to explain the low-cost orientation, the moderator effect composed by the interaction between the regular monitoring of environmental performance and operating in a clean/dirty sector positively explain the low-cost orientation.

This paper contributes to the prior literature in at least three ways. First, our empirical analysis supports previous approaches which argued that friendly environmental progresses are able to achieve costs reduction within the firm (Hart, 1995; Christmann, 2000; Darnall and Edwards, 2006). This work has showed that environment-related internal improvements might positively influence the emergence of competitive advantages. Thus, this study complements Hart's (1995) propositions about the chance of dividing environmental practices in two groups and relating each of these groups to cost leadership strategy and differentiation strategy. Those environmentally friendly practices with an internal orientation, such as pollution prevention activities, will be more related to cost leadership strategy, while those environmentally friendly practices with an external orientation, such as product stewardship, will be more related to differentiation strategy (Hart, 1995).

Second, Rueda Manzanares et al. (2007) explained that:

Recently, the management literature offers two perspectives for the influence of exogenous factors on corporate strategy. One argues that an organization is a self-regulated system and that complex situations may ease change (Brown and Eisenhardt, 1997; MacIntosh and MacLean, 1999). The other argues that organizations are social systems that try to reduce anxiety generated by complexity using analogy or inertia

(Gavetti, Levinthal and Rivkin, 2005; Houchin and MacLean, 2005)

(Rueda-Manzanares et al., 2007:187)

Our findings support two prior approaches concerning the influence of exogenous factors. On the one hand, since results showed that the effect of a greater degree of industry complexity (concerning operating in a clean/dirty sector) does not explained low-cost orientation (hypothesis H2), it is possible to understand the organization as a self-regulated system, which is not influenced by where it is established. On the other hand, findings supported that firms operating in clean sectors offered a more effective use of the combination between proactive environmental practices and low-cost orientation (hypothesis H3). This result is consistent to understand organizations as social systems for two reasons. First, firms operating in clean sectors might be less pressured by stringent environmental regulation than firms operating in dirty sectors. Thus, in clean sectors firms might develop a more environmentally conscious behaviour *per se*, without the threat of non-compliance's fines and penalties. Second, since it is expected to regulation related to environmental protection will become more stringent, firms operating in clean sectors are more capable to anticipate this stringency than firms operating in dirty sectors because firms operating in clean sector have not to focus on the current environmental performance (while firms operating in dirty sectors have to do it). Anyway, in the case of firms operating in dirty sectors, which are yielded to stringent regulations, there is a chance to profit from the synergy between low-cost orientation and proactive environmental practices.

Finally, since this study uses data from 1,973 manufacturing facilities in seven OECD countries, it offers a global perspective on the extent to which low-cost

orientation are related to the regular monitoring of environmental performance and the moderating effect of the industry.

3.5.2. Implications for practitioners and regulators

Our findings also have important implications for practitioners and for public regulators. For practitioners, this study offers empirical evidence about how low-cost orientation is positively related to the implementation of environmentally friendly practices, such as the regular monitoring of environmental performance. Thus, it is critical that managers understand that not only environmentally friendly practices focused on differentiation strategy are able to enhance sales by an *ecological* reputation of the firm, but also there is a positive relationship between environmentally friendly practices and the low-cost orientation.

Related to public regulators, this work offers two main implications. First, our findings show that proactive environmental practices are positively related to low-cost orientation. Hence regulators must motivate *via* fiscal deductions, subsidies, among others, the use of tools and procedures which imply cost savings and negative environmental reductions simultaneously. Second, this study shows that sectorial environmental regulations do not imply disadvantages concerning low-cost orientation of firms. However, a dissimilar environmental regulation might imply opportunist behaviours by several companies. As our results suggest, it is likely that this opportunist behaviour might occur in a greater degree in dirty sectors than in clean sector, whose environmental improvements showed positive synergic effects between low-cost orientation and proactive environmental practices. Thus, a better understanding about

how companies operating in clean/dirty sector face the environmental challenge is essential to harmonize different regulations in different countries and sectors.

3.5.3. Limitations and Future works

In this paper there are several limitations that will have to be solved by future research. First, since survey data were cross-sectional in nature, future works would benefit from using data that were collected longitudinally. This information will offer more rigorous evidence for the relationship analyzing in the current study. Second, the obtained data *via* survey might be biased because of misrepresentation of environmental impacts and business performance by respondent. Third, in this study we assume that firms operating in a dirty sector have to face a more complex environment than those firms operating in clean sectors. However, we acknowledge that other characteristics of the general business environment may also moderate the link between a firm's environmental strategy and low-cost orientation. Future research will solve this limitation by using other business characteristics as uncertainty or munificence (Aragón Correa and Sharma, 2003) or including by other theoretical perspective. Finally, this study considers seven OCDE countries and the manufacturing industry. Future works will be in charge of improving all these limitations, including more countries as well a greater number of economic sectors.

3.6. References

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CAPÍTULO 4

**INTERNALIZING ENVIRONMENTAL COSTS: A
CASE STUDY IN THE SPANISH ROAD FREIGHT
TRANSPORT INDUSTRY**

INTERNALIZING ENVIRONMENTAL COSTS: A CASE STUDY IN THE SPANISH ROAD FREIGHT TRANSPORT INDUSTRY

Abstract

Prior literature focused on transportation and environment has largely studied the external costs caused by the transport industry. However, less is known about which and how environmental costs are internalized by firms that operate in this sector. This paper looks for three main objectives; first, to identify and delimitate a clear description of different environmental costs that should be considered by transport firms; second, to analyze the relationship between regulative measures and environmental costs in this industry; third, and finally, to explore connections between the regulatory efforts by policy makers and managers' perceptions and behaviors in the Spanish transport industry. We will use a theoretical review of academic papers and institutional agendas and a case study in the industry to offer our own proposals and suggestions. Our final findings suggest that since managers perceive that environmental issues in this industry are relegated to a secondary priority by public authorities, companies might be facing environmental issues not beyond legal requirements.

Keywords: environmental costs, road freight transport, regulation, case study, Spain.

4.1. Introduction

The environment is affected by business activity through the consumption of materials and utilities and the generation of wastes and emissions. This consumption of resources and generation of waste represent significant costs that have to be paid by companies (Gibson and Martin, 2004). For instance, GtZ, an international cooperation organization for sustainable development, estimates that non-product-output costs account for between ten percent and thirty percent of total production costs.

As a consequence of the current increasing importance of environmental costs, it seems logic that companies focused on anticipating the appearance of these costs pursue proactive environmental strategies, understanding this proactivity as *the firms' tendency to initiate changes in its various strategies policies rather than to react to events* (Aragón-Correa, 1998:557).

Research on environmental management grounded in resource-based view have widely contributed to show the potential that a proactive environmental management might have in generating valuable organizational abilities related to costs reduction (Hart, 1995; Hart & Ahuja, 1996; Nehrt, 1998; Christmann, 2000; Darnall & Edwards, 2006). For instance, Christmann (2000) showed that several process-focused practices are essential to essential in order to implement proactive environmental practices and, simultaneously, they might imply cost reduction in a relatively short term.

However, little attention is paid about how environmental management could take into account environmental costs and their consequences into business strategy in a greater degree. Thus, analyzing what underlies upon the label of environmental costs and how both companies and public agencies face them becomes a critical issue.

Prior literature focused on transportation and the environment has largely studied the external costs caused by the transport industry (Mayeres, Ochelen and Proost, 1996, Eriksen, 2000, Sælensminde, 2004, Quinet, 2004, Haller, et al., 2007, Lemp and Kockelman, 2008, Arimura and Iwata, 2008). The “*Green Book*” of the European Commission has estimated that external costs caused by the road freight transport sector through noise and pollution account for 0.6% of communitarian GDP (European Union, 1995). According to Baumol and Oates (1988), externalities are defined as “*spillover effects that occur when an economic transaction affects a third party that does not feature in the considerations of those involved in the transaction*” (Hörmandinger and Lucas, 1996:1). In terms of cost, externalities are understood as those costs that are generated as a consequence of business activity but are socially paid. They have been one of the main spotlights of criticism of the transport industry. The road freight transport sector has not been included in those industries affected by emission quotes assigned to diverse European business activities in the framework of Kyoto’s protocol. This decision has been the target of numerous disapprovals by environmental activists arguing that public authorities have intentionally forgotten the environmental damage of this industry, whose only purpose is to minimize their operative costs and allow a better financial profitability. Meanwhile, heads of the industry have frequently argued that, on the one hand, the establishment of those measures would have a harmful effect on European competitiveness and, on the other

hand, that actual industry efforts are not being seriously recognized. In this context, since there is a gap regarding how public authorities, practitioners and ecologists understand the environmental challenge in the transport industry, it seems clear that less is known about which and how these environmental costs are internalized by companies that operate in transport-related industries.

The present study is focused on the road freight transport industry, and there are two main objectives covering theoretical and applied issues. Firstly, after reviewing previous literature, our work proposes a typology of different environmental costs that have to be internalized by firms in the transport industry. Our analysis provides a detailed description and some examples to better understand which environment-related costs are. This objective is especially relevant to knowing how companies should face environmental costs effectively and how policymakers might push to avoid externalities in the transport industry. Identifying the environmental costs is also necessary for the appropriate allocation of these costs. For instance, when environmental costs are not accurately allocated to processes or products that generate them originally, cross-subsidization may occur between processes or products (Graff et al., 1998, Bartolomeo, et al., 2000), and this misallocation of environmental costs can send incorrect signals to decision-makers (Environmental Protection Agency, 1995, Graff et al., 1998).

Secondly, our study considers the existence of a positive relationship between a high degree of environmental proactivity and a greater managerial interest to diminishing all types of environmental costs. Therefore, the novelty of this work is attempting to answer the following research questions that remain unexplored: is it possible to delimitate different types of environmental costs? How is environmental

costs management related to environmental proactivity of the company? To address these research questions, we specifically analyze how regulative measures of the public authorities affect environmental costs. Our fieldwork is on the road freight transport industry in Spain and the regulative efforts developed by two strategic plans (2001-2006 and 2007-2012), which emerged from the Spanish authorities. We also offer some evidence of managers' reactions to these regulative efforts using a case study in the sector.

The rest of the study is divided in four sections. The first contains a theoretical classification about environmental costs, bearing in mind the related prior literature. The second introduces the main acting lines in environmental issues applied by responsible public institutions in the road carriage industry in Spain. The third offers a case study, which highlights how firms face the challenge of the increasing importance of environmental costs inside the sector. Finally, the fourth section summarizes the main conclusions and future research lines.

4.2. Environmental costs under resource-based view

The resource-based view of the firm provides a theory to explain competitive advantage as an outcome of the development of valuable organizational capabilities (Wernerfelt, 1984; Barney, 1991). The resource-based approach argues that companies which are able to accumulate resources and capabilities that are rare, valuable, non-substitutable and imperfectly imitable will achieve an advantage over competitors (Barney, 1991). Related to the environment, several studies focused on the resource-based view have considered that it is possible to reduce firms' costs by means of the

improvements due to the generation of environmentally proactive capabilities (Hart, 1995; Christmann, 2000; Darnall & Edwards Jr., 2006). For instance, the seminal work of Hart (1995) argued that environmental strategies related to activities seeking to prevent pollution generate some organizational capabilities which can be linked to the minimization of firms' costs¹². Specifically, the cost saving due to pollution prevention can avoid the expense of pollution control technology (Hart, 1995; Sharma & Vredenburg, 1998) and can increase productivity and efficiency because less waste is translated as a better use of inputs (Hart & Ahuja, 1996). But not only pollution prevention activities are capable to diminish the firm's costs. Costs amount can be minimized by reducing legal sanctions as fines and penalties for the noncompliance with environmental regulations (Sharma & Vredenburg, 1998). Then, all these environmental deeds related to the manufacturing process can lower the amount of firms' costs (Christmann, 2000; Nehrt, 1998) and simultaneously can allow that firms reduce their negative environmental impacts.

Additionally, in the current general business context an increasing importance on environment-related costs exists. These environmental costs can account for five to twenty percent of the total cost of business activities (Ditz, Ranganathan and Bank, 1995). For instance, according to the study of Ditz et al. (1995), Amoco Yorktown refinery estimated that its environmental costs were a 22% of its total production costs and, the environmental costs of Dupont, the second higher chemical company of the world, were a 15.3% of its fixed production costs and a 3.8% of its variable production costs. Nonetheless, despite the increasing relevance of environmental costs, there is a

¹² Hart (1995) argued that the firms can redesign products in order to eliminate the need for a pollution-generating input in the manufacturing process or redesign products to be less pollutant for consumers.

conceptual lack about what these environmental costs are (Gibson and Martin, 2004, Environmental Protection Agency, 1995, United Nations Division for Sustainable Development, 2001). Most of the schemes developed internationally note that those costs are clearly related to the control or avoidance of pollution, such as costs to prevent the generation of contaminant emissions, to treat generated waste and/or for the remediation of polluted sites (Savage and Jash, 2004). In the accounting field, these types of costs are often referred as Environmental Protection Expenditures (EPE). However, the current study proposes that environmental costs under environmental management perspective include not only EPEs but also other important environment-related expenses.

Prior literature focused on transportation and environment has largely studied external costs caused by the transport industry (Mayeres, Ochelen and Proost, 1996, Eriksen, 2000, Sælensminde, 2004, Quinet, 2004, Haller, et al., 2007, Lemp and Kockelman, 2008, Arimura and Iwata, 2008). The meta-analysis about Western European external transport costs made by Quinet (2004) showed that a wide range of measures and specifications exists when researches attempt to study this topic. Moreover, several studies have classified these external environment-related costs in the transport sector concerning specific characteristics such as vehicle model (Lemp and Kockelman, 2008), or concerning the external cost caused by the use of road transport in cities (Mayeres, Ochelen and Proost, 1996, Eriksen, 2000, Sælensminde, 2004). For instance, according to Mayeres et al. (1996) the marginal external costs of urban transport are congestions, pollution accidents and noise costs, whereas according to Lemp and Kockelman (2008) external vehicle costs include emissions of greenhouses and other gases, crash costs, roadway congestion and space consumption.

However, the literature provides little understanding about how transport firms might internalize and, consequently, diminish these environment-related costs. Thus, a comprehensive study about what environmental costs are might suppose a first stage in order to minimize them and find more efficient ways to minimize externalities in the industry. In other words, if an accurate understanding of these costs exists by both regulators and practitioners, it will be possible to face them effectively. Thus, it is essential to understand the environmental benefits and economic challenges involved in the analysis of environmental costs that might be internalized by companies and, thus, have to be paid by the firms.

Based on prior literature related to environmental costs (Environmental Protection Agency, 1995, Graff, et al., 1998, Gale and Stokoe, 2001, Savage and Jash, 2004), the current study proposes a classification that comprehensively delimitates these environmental costs. Our proposal of theoretical classification includes four types of environmental costs that may be present in the firms: (i) internal, (ii) external, (iii) contingent and (iv) image and relationship costs.

Firstly, internal costs refer to those costs related to the natural environment resulting from the productive process of the firm. These internal costs are composed of direct and indirect costs (Gale and Stokoe, 2001). Direct costs include those costs related to the procurement of raw materials and natural resources (energy, water, etc.). Also, internal direct costs comprise expenses caused by the management and elimination of non-product outputs such as solid and/or hazardous waste, wastewater and air emissions (Savage and Jash, 2004). Both purchasing materials and managing

waste are examples of internal direct costs because they can be traced directly to a specific product or activity (Gale and Stokoe, 2001). Unlike direct costs, internal indirect costs are allocated as a whole to cost centers, departments or facilities (Gale and Stokoe, 2001). For instance, expenses caused by environmental R&D projects or environmental training are internal indirect costs.

Second, external costs are those derived from the environmental damage generated by the firm. Theoretically, this category of costs might be internally monetized in order to delimitate “*the maximum amount that people would be willing to pay to avoid the damage or the minimum amount of compensation that they would accept to incur it*” (Gale and Stokoe, 2001:122). An illustrative example of this category is the payment of a fine because of non-compliance with environmental regulations.

Third, contingent costs refer to environmental costs that, unlike external costs whose circumstances already exist and must be effectively paid for, are not certain to occur in the future but depend on uncertain future events (Environmental Protection Agency, 1995, Gale and Stokoe, 2001). Budget reserves for remediation costs or for repairing a potential environmental problem or costs related to fit for future compliance of a stricter environmental regulation exemplify this cost category.

Finally, image and relationship costs refer to voluntary expenses incurred for corporate image purposes and/or for maintaining or enhancing relationships with regulators, customers, suppliers, host communities, investors/lenders and the general public. This category includes costs for advertising or public relations campaigns. On

the other hand, it might also be included here that there can be lower earnings due to a negative environmental image of the company. Table 1 summarizes our theoretical classification of environmental costs.

Table 1: Proposal of a classification of environmental costs paid by companies

Types of Environmental Costs	Examples
Internal Costs:	<ul style="list-style-type: none"> • Waste Management Costs
<ul style="list-style-type: none"> • Direct Costs 	<ul style="list-style-type: none"> • Production and Procurement Costs • Environmental R&D Projects Costs
<ul style="list-style-type: none"> • Indirect Costs 	<ul style="list-style-type: none"> • Environmental Training Costs
External Costs	<ul style="list-style-type: none"> • Fines and penalties for non-compliance
Contingent Costs	<ul style="list-style-type: none"> • Remediation Costs • Restoration Costs
Image and Relationship Costs	<ul style="list-style-type: none"> • Environmental Advertising Expense • Lower earnings for a negative environmental image

Drawing on resource-based view, Christmann (2000) showed that complementary process capabilities contributed to cost advantage when a firm implemented "best practices" for environmental management. Thus, we argue that the more environmental the firm's commitment is, the more capable the firm is to diminish costs by means of efficiency, a better allocation of resources or by anticipating to more restrictive environmental regulations. After introducing our proposed classification of environmental costs, the current study suggests firms that are more interested in reducing all types of environmental costs will be more likely to implement proactive environmental strategies than firms that do not implement these strategies. For instance, those companies that take into account only environmental internal costs will be more

environmental reactive than those companies that take into account all the environmental costs, from internal costs to image and relationship costs. Thus, we propose that:

Proposition: An interest to minimize all types of environmental costs is more related to the implementation of proactive environmental strategies

4.3. Environmental regulation and the road freight transport industry in Spain

After introducing our proposed classification, this section analyzes how regulators are trying to influence the environmental costs that the firms have to assume. Section 4 will study a case to better understand how managers in the industry are reacting to this regulation and whether the regulation is effective at making a more appropriate approach. In order to achieve these objectives, the analysis of the transport industry is relevant for three reasons. Firstly, the transport industry is very connected to environmental issues, not only because of the potential problems generated through contamination by smoke or noise but also because of non-renewable inputs (specifically, oil use is of key importance for the industry). Second, the transport industry has to comply with strict and growing regulations in regards to both safety and environmental requirements. Environmental activists often target the industry, offering an increased chance of more regulation and governmental pressure in the future. Third, we have delimited the geographical scope of our work in Spain. Although the transport industry is a key industry all around the world, the strategic importance of the transport industry is particularly clear for the Spanish economy as a consequence of the

geographic location of the country in a non-central position in its European market, the role of being an intensive supplier of agricultural products to the rest of the European countries and the importance of the tourism in the country.

Additionally, inside the service sector in Spain for 2007, the transport industry accounted for 8.14% of total business volume, occupying fourth place in the non-financial market services sector (EAS, 2008). Four sectors are part of the group of linked-transport services in Spain: passenger transport, freight transport, postal and mailing activities, and annex-transport activities. Road freight transport generates the highest revenue inside this classification. For example, in 2006, more than half of transport activity companies belonged to road freight transport (61.1% of total volume). Moreover, freight transport generated the highest revenue (39.5%) and employed the greatest percentage of people among the related industries (42.3%) (EAS, 2008). Nonetheless, road freight transport is more than three-fourths of the total transported freight (EAS, 2008). The current study is focused on road freight transport.

The relevant authority in charge of watching the competitiveness and the efficiency of this industry for the whole country is the *General Department of Road Transport* (in Spanish, *Dirección General de Transportes por Carretera*). This agency approved in 2001, with a horizon of five years, a plan called the *Strategic Plan for Road Freight Transport* (in Spanish, *Plan Estratégico para el transporte de mercancías por carretera*), also known for its initials in Spanish as PETRA. The main objective of this plan is to build a reference framework where “*the interconnected interventions of the whole sector can be delimited in order to reach the modernization of this sector and, through it, a competitive position.*” Currently, the *Strategic Plan for Road Freight*

Transport is on its second implantation horizon, which spans from 2007 to 2012, and is called PETRA II since it is merely a continuation of the initial PETRA plan.

Related to environmental issues, PETRA establishes environment protection as one of its cornerstones. With regard to environmental costs that companies have to support, there are two main factors that economically affect the whole sector. On the one hand is investment in “Euro” type vehicles. The “Euro” classification divides vehicles depending on its pollutant power; the “I” category is the most pollutant, while “IV” and “V” categories are less so, since vehicles included in these two levels use urea, a substance that reduces the emissions of pollutant gases. On the other hand, freight operators must pay a tax (€/km) because of their use of infrastructure; the more pollutant the vehicle is, the higher the tax amount is.

To face these two economic factors that affect companies’ costs structure, PETRA has launched three programs of measures: (i) encouragement of the investment in ecological vehicles, (ii) promotion of safety and public identification of the adaptation to environmental requirements and (iii) the establishment of restrictions for vehicles that are not adapted to environmental requirements.

Firstly, environmental cost-savings motivated by encouraging investment in ecological vehicles becomes effective by means of fiscal deduction at the time of investing in “green” vehicles and the inclusion of lower taxes for the use of non-pollutant fuel. This fact is supported by prior research that argued that renewal of old vehicles is an efficient way to avoid the negative environmental impacts of transport activity (Lumbreras, et al., 2008, Iwata and Arimura, 2009). Bearing in mind our

theoretical classification of environmental costs, fiscal and tax deductions related to the use of ecologically friendly vehicles are sorted as a minimization of internal environmental costs, since by not operating with ecologically adapted vehicles and fuels, firms will not be able to profit from fiscal discounts.¹³

Secondly, cost savings motivated by the promotion of safety and public identification of the adaptation to environmental requirements become effective by means of the implantation of “Eco-Audits,” which allow a clear identification of hidden environmental costs in expense centers. The proper allocation of environmental costs avoids the cross-subsidization of products and/or activities. This cross-subsidization means that environmental costs that are allocated to processes or products, which do not generate these costs originally, are being required in order to subsidize the more polluting actions of others (Bartolomeo, et al., 2000). Therefore, and according to our theoretical classification of environmental costs, “Eco-Audits” minimize contingency environmental costs because they can identify in the organization pollutant processes and activities that could become future expenses in two ways: on the one hand, as a consequence of new regulations that penalize these environmentally unfriendly activities and processes and, on the other hand, as a consequence of future ecological responsibilities.

Finally, cost savings motivated by the establishment of restrictions for vehicles that are not adapted to environmental requirements become effective when firms do not have to pay fines and/or penalties enacted in the restrictions. For example, one way to

¹³ Actually, Spanish environmental regulations related to renewal of trucks force companies to invest in Euro IV and Euro V type vehicles. However, companies are using mixed fleets, that is, both ecologically adapted and non-adapted trucks. This fact implies that fiscal advantages are being enjoyed only partially.

introduce restrictions for environmentally non-adapted vehicles is establishing hours and days closed to traffic for those vehicles unable to fulfill ecological requirements. This regulation would apply an external environmental cost to freight transport firms, since their orders can be delayed and even canceled because of the possibility of not arriving on the agreed date.

Table 2 shows a summary of PETRA’s measures and classifications regarding environmental costs, in accordance with the theoretical typology that was introduced in the previous section of the current work.

Table 2: A summary of regulative measures in the industry (PETRA) and connections with the classification of environmental cost

Regulative measure	Objective of the regulation	Type of environmental cost
Encouragement of the investment in ecological vehicles	To favor and to encourage investments in vehicles non-pernicious for the environment, so that external transport costs become minimized at origin	Internal environmental cost, which may be direct or indirect depending on its allocation.
Promotion of safety and public identification of the environmental adaptation	To promote the comparison between diverse firms regarding reached achievements in environmental and road safety issues, as a way to boost the adoption of “best practices”	Contingency environmental cost
Establishment of restrictions for vehicles non-adapted to environmental requirements	To favor a quick adoption of ecological measures which allow reducing external costs at origin	External environmental cost

In general, the proposed measures in both strategic plans of the industry in Spain delimitate a medium term framework for the environmental objectives. In other words, meanwhile PETRA plans consider that safety, training and quality in the road freight transport sector are topics of priority importance for improving the competitiveness and efficiency in the transport industry, measures in environmental issues have to be implemented through a medium-term temporal perspective. Nevertheless, in section 4, a case study carried out in a transport company shows how strategic plans presented by the *Department of Road Transport* affect companies.

4.4. The case study: Hermanos Aznar S.A.

Until now, our study has offered a theoretical classification of environmental costs that firms in the transport industry might have to assume. Later, in section 3, our work will revise how responsible public authorities offer detailed strategic planning in the Spanish industry (and similarly in other countries) to face environmental challenges and how these regulative measures are linked to the different types of environmental costs. Now, our study highlights what occurs in the practical scope, using a case study based on the firm Hermanos Aznar S.A. The SME¹⁴ business orientation and structure of Hermanos Aznar S.A. make this case a good representative of average firms in the Spanish industry.

¹⁴ Small and Medium-sized Enterprises

The analyzed company is a road freight transport company located in Vera, a coastal town in the province of Almeria (Andalucía, Spain). Vera is an important center of road freight transport because of its high level of agricultural exports to the rest of the European Union.

Actually, Hermanos Aznar S.A. specializes in the international road transport of agricultural products. It has valuable relationships with commercial agents located in main Central European cities where most of the communitarian trade transactions of this kind of products take place. Hermanos Aznar S.A. had 60 employees, a fleet composed of 57 trucks and a turnover of more than €3.5 million during 2007. Table 3 summarizes some data about this company.

Table 3: General economic information about the company

Legal Status	Public Company (In Spanish, Sociedad Anónima)
Constitution Date	07/18/1988
Number of employees	60
2007 Sales	€3.557.825,70
2007 Business Performance	€79.969,8

Source: Official Bulletin of the Mercantile Registry¹⁵.

In terms of environmental issues, Hermanos Aznar S.A. has to comply with strict regulations, just like the rest of the industry competitors. The three main environmental issues for the company are (i) the investment in ecological fleets (Euro IV and Euro V vehicles), (ii) the payment of environmental fees and taxes related to

¹⁵ In Spanish, BORME (Boletín Oficial del Registro Mercantil)

combustibles, tires and the use of infrastructure (expressways) and (iii) waste management.

Firstly, referring to the investment in an ecological fleet, the current Spanish regulation requires acquiring non-pollutant vehicles. Thus, the “green transformation” of vehicles takes place as companies update their fleets. Hermanos Aznar S.A. has a fleet composed of 57 trucks, 14 of which are type Euro II vehicles, 32 are type Euro III, and 11 of are type Euro IV. This means that approximately 20% of the current fleet of the company is composed of ecological trucks. The acquisition of Euro IV and V vehicles implies environmental cost savings, specifically indirect internal costs savings, because firms profit from tax deductions for each acquisition. However, the renewal of the remaining 80% of the fleet is going to take place over a long period of time. Therefore, because of the mandatory character of the regulation concerning the ecological fleet and the long-term nature of these renewals, the environmental cost savings due to new acquisitions do not entail a priority deal.

Second, the payment of environmental fees and taxes related to combustibles and the use of infrastructure imply an internal and direct environmental cost savings for two reasons. On the one hand, the more the vehicle pollutes, the higher the payment is. For instance, Antonio Aznar-Domínguez, manager of Hermanos Aznar S.A, commented that the most expensive tax per traveled kilometer that his company has to support is for using German expressways. Thus, since this expense is attributed directly and individually to the service, the payment for the use of infrastructure is an internal direct environmental cost. Hermanos Aznar S.A. can reduce this cost by using type IV vehicles when the company operates with German clients. On the other hand, the use of

urea as a reducer component of emissions implies an increase of the final cost of the service. Concretely, a truck consumes 1 L of Ad-Blue (urea) per 100 km, and 1 L of this component costs approximately €0.5. According to our theoretical classification of environmental costs, this expense is an internal direct cost because it is attributed directly and individually to the service. However, it is not possible to reduce this environmental cost since ecological trucks (type Euro IV and V vehicles) require this chemical component. Unlike prior examples, the environmental tax that has to be paid by the purchasing of tires is considered an internal indirect environmental cost because it is attributed along with the lifespan of the tire. This cost cannot be reduced.

Third, the company's value chain activity that is most important to the managers of Hermanos Aznar S.A. is waste management. The residue and waste produced by the company's garages (filters, aerosols, dirty clothes, etc.) must be collected by specialized companies in waste withdrawal and treatment. But this service is not free in all cases. This service is free only for the case of retiring used oil and batteries, and infrastructure and processes needed for this withdrawal are very specific. Therefore, waste management implies a high internal indirect environmental cost that the company has to support in order to comply with environmental regulations. Table 4 shows a summary of the environmental costs that have been assumed by Hermanos Aznar S.A. and their relationships with the theoretical classification explained in the prior section of this study.

Table 4: Summary of environmental costs of Hermanos Aznar S.A.

Hermanos Aznar S.A.	Theoretical Classification	Is it possible to reduce or eliminate it?
Investment in ecological fleet	Internal Indirect environmental cost	Yes, by tax deduction for acquisition

Payment of environmental taxes in expressways and combustibles	Internal Direct environmental cost	Yes, by accurate planning between freight services and available ecological trucks
Payment of environmental taxes in tires acquisition	Internal Indirect environmental cost	No
Waste Management Costs	Internal Indirect environmental cost	No

4.5. Discussion, Implications and Limitations

4.5.1. Discussion

Drawing on resource-based view, the main objective of this paper is to answer whether an interest to minimize all types of environmental costs is more related to the implementation of proactive environmental strategies. Our proposition is supported by findings because the analyzed company attempts to face its environmental costs as environmental regulation requirements advance. According to our theoretical classification, the not taking into account external, contingent and image and relationship costs implies that the company is only interested in complying with environmental responsibilities, which are not beyond the limits of legal requirements. Thus, there is an important congruence between the environmental orientation of Hermanos Aznar S.A. and environmentally reactive strategies because the company is interested in environmental issues in a parallel way to regulatory requirements (Roome, 1992).

This result agrees with the case study of Haller et al. (2007) about the ecological actions of the Forest Preserve District of Du Page County in Illinois. Haller et al. (2007:12) argued that “*the shortfall or delay in assistance and promotion at the federal*

level limits severely the prospects for voluntary conversion of 'un-mandated' private and public fleets." In the same way, Hermanos Aznar S.A. is not motivated to implement voluntary proactive environmental practices in order to internalize and, subsequently, to minimize its environmental costs because managers perceive that public authorities give a relaxed importance to the environmental issues and do not anticipate serious regulative efforts in the future. The operations manager is clear when he says: "In a global economic bankruptcy, I do not think that governments or managers have real interests in making more serious progresses in the environmental arena. We will have to comply with additional regulations if they appear and we would do it for sure; meanwhile, we will wait for it". Hence, the presented case study highlights the potential presence of an environmentally reactive response pattern within the Spanish transport sector, limiting friendly environmental actions as well as legal requirements are advancing.

4.5.2. Implications for practitioners and regulators

In a parallel way to prior objectives previously explained, the current paper analyzes the level of congruence between academic, public and practical settings for addressing the environmental costs that have to be paid by companies in the road freight transport industry. By using a case study in Spain, this study highlights that regulators have a very relevant role in promoting environmental costs in the industry through different kinds of planning measures. Our findings suggest that both public authorities and practitioners in the Spanish road freight transport give a secondary role to environmental issues. The responsible organism of the road freight transport sector, the *Department of Road Transport*, bestows a medium importance on environmental

actions in the transport sector. Similarly, nowadays managers of Hermanos Aznar S.A. are focused on obtaining the ISO-9001 quality label, meanwhile environmental certifications is push into a less important aim. Combining prior arguments, it seems logical that companies are facing the challenge of internalizing environmental costs not beyond the legal environmental requirements.

Unlike other sectors such as the automobile industry or alimentary industry, whose firms can profit from the benefits of ecological differentiation strategies *via* an increase in sales, managers in the road freight transport industry understand the environmental challenge of an increase in production costs, without an increase in business performance. Moreover, actually in Spain, it looks like public authorities do not contribute enough to change this negative thinking. For all these reasons, it is important to highlight how our study helps to clarify the importance of understanding the different types of environmental costs that are borne by firms. It is especially interesting to see how public regulators do not have a neutral influence on these costs. Furthermore, the selection of regulative measures and their importance in terms of cost have not only a financial effect on firms in the transport industry but probably also on their strategic approaches regarding the natural environment and the vision about how to deal with this issue in the future.

4.5.3. Limitations and Future works

There are three main limitations in this study which must be interpreted as future research. Firstly, case study methodology implies a qualitative analysis of circumstances that occur in a specific company, but this technique does not enjoy benefits of a

quantitative analysis, as the extrapolation of results to other companies and/or sectors. Future research may study the presented topic by an empirical approach in which both databases with economic information about companies (costs or expenses figures) and statistical techniques (as regression) will be applied.

Secondly, our transport-focused approach limits the generalizability of results and, as a consequence, of the proposed classification of environmental costs. Future research may continue the analysis of this internalization of environmental costs by companies established in other sectors and how public authorities influence this challenge.

Finally, future research might study whether a higher amount of environmental costs are correlated to other important strategic variable within the company. For instance, it would be interesting to study whether innovativeness could affect the relationship between environmental costs and proactive environmental strategy.

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CAPÍTULO 5

RECAPITULACIÓN Y CONSIDERACIONES FINALES

5.1. Introducción

El presente capítulo trata de ofrecer un resumen general de las distintas aportaciones obtenidas por los tres artículos de investigación presentados en este trabajo. Así, se pone de relieve los resultados alcanzados con la investigación realizada. Para ello, en primer lugar planteamos las principales conclusiones del presente trabajo. Posteriormente se destacan las implicaciones académicas, de gestión y para los reguladores públicos de dichos resultados. Seguidamente se presentan las limitaciones que han surgido a lo largo del trabajo y, finalmente, el capítulo termina planteando cuáles son las líneas de investigación que se presentan para el futuro.

5.2. Conclusiones del trabajo de investigación

La aportación principal que subyace como hilo conductor a lo largo de todos los artículos de investigación presentados en este trabajo es que la orientación hacia planteamientos internos, enfocados en alcanzar altos ratios de eficiencia en el proceso productivo empresarial o en la disminución de los costes, unida a la implantación de determinadas prácticas medioambientalmente proactivas producen un resultado superior a la suma de los efectos individuales de ambas prácticas por separado. En otras palabras, el presente trabajo demuestra la relación sinérgica y positiva que existe entre determinados planteamientos internos de las organizaciones y la eficaz implementación de una estrategia medioambiental proactiva. A pesar de que este resultado general actúa como co-

lumna vertebral de los artículos propuestos en el presente trabajo, a continuación se presentan por separado las conclusiones individuales de cada uno de los capítulos previos.

Capítulo 2: “Percepciones de los directivos sobre la influencia de los *stakeholders* en la implantación de prácticas medioambientales de baja visibilidad y el efecto moderador del resultado empresarial”. Las principales conclusiones extraídas de este estudio son dos. En primer lugar, los directivos perciben una mayor influencia por parte de los *stakeholders* internos cuando deciden implementar prácticas medioambientales con alta visibilidad que cuando deciden hacerlo con aquellas prácticas con baja visibilidad, mientras que ocurre lo contrario cuando se trata de la influencia percibida tanto por los *stakeholders* de la cadena de valor como de los *stakeholders* ubicados en un entorno general. Este hecho indica que los directivos perciben a las prácticas medioambientales con baja visibilidad como una herramienta más eficaz que las prácticas con alta visibilidad a la hora de satisfacer las demandas de los *stakeholders* y, por consiguiente, este tipo de prácticas con una orientación interna se aproximan más a determinados comportamientos medioambientales proactivos encargados de mejorar el desempeño medioambiental de las organizaciones que aquellas prácticas que gozan de alta notoriedad externa. En segundo lugar, contrariamente a lo que se esperaba, los resultados empíricos obtenidos muestran que la situación económica en la que se encuentra la empresa (medida mediante su desempeño empresarial) no supone una variable que haga variar drásticamente la percepción que los directivos tienen sobre la influencia de los *stakeholders*. Por tanto, bajo la Teoría de los *Stakeholders*, nuestros resultados no apoyan que la existencia de beneficios (o pérdidas) empresariales influya en la toma de decisiones de los directivos a la hora de implementar prácticas de gestión medioambiental de alta/baja visibilidad.

Capítulo 3: “La influencia del control y seguimiento de los impactos medioambientales negativos en la orientación al bajo coste: El efecto moderador del sector”. La conclusión principal que ofrece el artículo presentado es que existe una relación positiva entre la orientación al bajo coste de las empresas y la implementación de determinadas prácticas medioambientalmente proactivas. Además, el análisis efectuado mediante la inclusión del efecto moderador del sector nos lleva a decir que no sólo las empresas establecidas en sectores contaminantes implementan dichas prácticas medioambientalmente proactivas, sino que también las implementan aquellas empresas que operan en sectores limpios o poco contaminantes. Por tanto, los resultados empíricos obtenidos pone de manifiesto la sinergia resultante entre una orientación basada en el ahorro en costes y determinados comportamientos internos medioambientalmente proactivos.

Capítulo 4: “La internalización de los costes medioambientales: Un estudio del caso en el sector del transporte de mercancías por carretera en España”. Las principales conclusiones que se pueden destacar del análisis efectuado giran en torno a las dos preguntas de investigación que constituyen el punto de referencia principal de este tercer artículo y que se relacionan con la posibilidad de identificar los costes medioambientales en el funcionamiento de las empresas y la relación existente entre el planteamiento con respecto a los mismos y la estrategia medioambiental de la organización. En primer lugar, cuanto mayor es la importancia otorgada por parte de las instituciones públicas y los directivos a los costes medioambientales, mayores son los indicios de proactividad medioambiental en sus estrategias y en su sector. En segundo lugar, y centrando la atención en la industria transportista, los resultados indican que los temas medioambientales en el sector objeto de estudio quedan relegados a una prioridad secundaria en el ámbito

institucional y, por este motivo, las empresas van enfrentándose a los mismos según los requerimientos legislativos. Combinando ambas conclusiones se obtiene que dado el escaso interés que suscita el hecho de anticiparse a los costes medioambientales por parte tanto de los organismos competentes como por las empresas que operan en el sector del transporte de mercancías por carretera, dicho sector actúa bajo un patrón de comportamiento medioambiental reactivo.

5.3. Implicaciones del trabajo de investigación.

5.3.1. Implicaciones académicas

Como se ha comentado en epígrafes previos, la investigación sobre la gestión medioambiental de las empresas es un tema relativamente joven en el ámbito académico en comparación con otros campos de investigación de corte medioambiental. La compilación de artículos de investigación que versan sobre la relación existente sobre determinados planteamientos internos y las estrategias medioambientales proactivas pretende aportar nuevos resultados a la temática presentada.

En relación a la Perspectiva de Recursos y Capacidades (Wernerfelt, 1984; Barney, 1991), varios estudios determinan que determinadas prácticas medioambientales con alta visibilidad para el público en general suponen una ventaja para la empresa (ej. Hart, 1995; Delmas, 2001; Darnall, 2006). El presente trabajo pone de manifiesto que no sólo aquellos recursos o capacidades desarrollados en el seno de estrategias medioambientalmente proactivas con una orientación externa son capaces de soportar ven-

tajas competitivas, sino que existen sinergias resultantes de la combinación de dichas estrategias medioambientales y determinados planteamientos internos que benefician de las empresas y a la sociedad en su conjunto.

En relación a la Teoría de los *Stakeholders* (Freeman, 1984), este trabajo complementa y arroja evidencia empírica sobre cómo una adecuada integración de los grupos de interés en la toma de decisiones relativas a cuestiones medioambientales de carácter interno puede suponer el desarrollo de una capacidad organizativa valiosa y difícilmente imitable (Delmas, 2001). Los resultados empíricos presentados en el primer artículo de investigación muestran que, basándonos en las percepciones que los directivos tienen sobre qué grupos de interés afectan a su unidad de negocio, las prácticas medioambientales de baja visibilidad (por ejemplo, la implementación de exhaustivo control y seguimiento del desempeño medioambiental) se aproximan a determinados comportamientos medioambientales proactivos en mayor grado que las prácticas medioambientales de alta visibilidad (por ejemplo, la obtención de certificación ISO14001 pero sin un exhaustivo control y seguimiento del desempeño medioambiental). Por tanto, la aportación de este trabajo a la Teoría de los *Stakeholders* es que los directivos también consideran la influencia de estos grupos de interés a la hora de acometer prácticas medioambientales de baja visibilidad o con una orientación interna.

Además, como consecuencia del alcance internacional y la rigurosidad estadística de la información primaria manejada, los resultados empíricos obtenidos cuentan con gran poder de generalización. Por ejemplo, Michael V. Russo (2009) en uno de sus artículos de investigación comenta que una de las principales limitaciones de la investigación actual es que resulta difícil extrapolar resultados empíricos provenientes de mues-

tras pequeñas, o de muestras recogidas en un solo país, a la generalidad del contexto empresarial. Nuestro trabajo supera ambas limitaciones ya que la información primaria manejada fue recogida para 4.186 unidades de negocio de los distintos subsectores manufactureros que operaban en siete países¹⁶ pertenecientes a la Organización para la Cooperación y el Desarrollo Económico (OCDE), ubicados tanto en Norteamérica como en Europa y Asia. Esta riqueza, medida en términos de cuantía y calidad, indica que los resultados empíricos obtenidos en este trabajo gozan de amplia generalización, lo cual implica un punto de partida para futuras investigaciones relacionadas. Además, el estudio del caso presentado en el tercer artículo ofrece resultados cualitativos que, aún siendo poco generalizables, enriquecen la investigación realizada porque permiten enfrentar y/o corroborar los resultados empíricos obtenidos con la realidad empresarial.

5.3.2. Implicaciones para la gestión

Para los directivos nuestros resultados ponen de manifiesto la necesidad de centrarse en establecer el mayor número posible de relaciones entre determinadas prácticas operativas relativas a los procesos y la implementación de estrategias medioambientales proactivas. Las principales implicaciones para la gestión que ofrece el presente trabajo se resumen en los siguientes puntos.

En primer lugar, la implementación de prácticas medioambientales de baja visibilidad ayuda a identificar potenciales reducciones tanto en los costes como en los impactos perniciosos que las empresas ejercen sobre el medio ambiente. Consecuentemen-

¹⁶ Concretamente, los países fueron Estados Unidos, Canadá, Hungría, Alemania, Japón, Francia y Noruega

te, dichas prácticas ayudan a tomar decisiones empresariales más acertadas desde el punto de vista operativo y social. Además, la orientación hacia la reducción en costes posibilita la aparición de sinergias con respecto a la implantación de estrategias medioambientales proactivas. Todas estas circunstancias arrojan como resultado no sólo una mejora sustancial en los beneficios empresariales, sino también una mejora en el cuidado y protección del medio ambiente, única solución posible para la supervivencia del ser humano en la Tierra.

Sin embargo, resulta esencial una apropiada transmisión de estas ideas al mundo práctico para una adecuada consolidación de la gestión medioambiental en las empresas. Tomando como referencia la entrevista personal realizada al gerente de la empresa objeto de análisis en el estudio del caso presentado en el tercer artículo de este trabajo, se puso de manifiesto como un comportamiento de estrategia medioambiental reactiva va estrechamente ligado a un escaso interés de las empresas por determinados tipos de costes medioambientales. El gerente comentaba: “la lucha contra el deterioro del medio ambiente aumenta el coste de las empresas, no existiendo un rendimiento tangible en ello”. No obstante, esta circunstancia difiere de las acontecidas en otros sectores industriales, los cuales han sido testigos de cómo la posición competitiva de sus empresas (y más específicamente su cifra de venta) ha mejorado mediante la diferenciación ecológica de sus productos y/o servicios, como en el caso de la manufactura de productos perecederos (industria alimentaria) o el sector automovilístico. Por tanto, puesto que los beneficios de las prácticas medioambientales relativas a la diferenciación de los productos y/o servicios comienzan a ser percibidos por parte de los directivos, los resultados de este trabajo pretenden poner de manifiesto que también determinados planteamientos

internos son capaces de generar dichos beneficios, siendo esta relación de gran interés para el ámbito práctico.

5.3.3. Implicaciones para los reguladores públicos

Los resultados obtenidos en este trabajo suscriben las aportaciones de la literatura existente que sugiere que una regulación más estricta da lugar a la puesta en marcha de acciones medioambientalmente proactivas por parte de las empresas (Porter and Van del Linde, 1995; Darnall, Jolley and Ytterhus, 2007). En primer lugar, puesto que la implementación de prácticas medioambientales de baja visibilidad facilita un mayor grado de cumplimiento con las regulaciones relativas al medio ambiente, los reguladores públicos pueden incentivar dicha implementación *via* deducciones fiscales, subvenciones, entre otros instrumentos motivadores para las empresas. Una vez acontecida esta circunstancia, será posible y factible el endurecimiento de la regulación en materia medioambiental y su cumplimiento por parte de las empresas, lo cual redundará en una mejora efectiva del medio ambiente.

Sin embargo, tal y como refleja el tercer artículo de investigación presentado en este trabajo, puesto que los organismos gubernamentales competentes otorgan un papel secundario a los objetivos relacionados con las mejoras del medio ambiente, parece lógico pensar que las empresas sean medioambientalmente reactivas. Por ejemplo, los planes estratégicos del sector transportista llevados a cabo por la Dirección General de Transportes por Carretera dan una *importancia media, de desarrollo a medio plazo* a las actuaciones medioambientales de la industria, mientras que la formación, la seguridad y la obtención de calidad representan *acciones prioritarias sobre las que hay que volcar*

los esfuerzos a corto plazo. Así, resulta evidente el hecho de que los directivos de la empresa analizada mediante el estudio del caso estén centrados en la obtención de la etiqueta de calidad ISO9001, dejando en un segundo plano las certificaciones medioambientales. Combinando las conclusiones previas se deduce que los temas medioambientales quedan relegados a una prioridad secundaria en el ámbito institucional y por este motivo las empresas van enfrentándose a los mismos según los requerimientos legislativos.

Por tanto, siguiendo el mismo planteamiento del epígrafe anterior relativo a las implicaciones para la gestión, se hace necesario manifestar de forma clara y precisa a los organismos responsables de elaborar la regulación en materia medioambiental los beneficios contenidos en la implementación de una adecuada gestión medioambiental por parte de las empresas, sirviendo el presente trabajo como punto de partida para ello.

5.4. Limitaciones del trabajo de investigación

Los trabajos de investigación suelen presentar una serie de limitaciones y, consecuentemente, éste no queda exento.

Centrando la atención en los dos artículos empíricos presentados (capítulo 2 y capítulo 3), existen varias limitaciones de carácter metodológico.

Por una parte y relativo a la información primaria utilizada hay que destacar tres aspectos. Primero, los datos del cuestionario de la OCDE son de naturaleza transversal, lo cual impide analizar la evolución en el tiempo de las distintas variables utilizadas.

Futuros trabajos que cuenten con datos longitudinales serán los encargados de suplir esta carencia. Segundo, la información obtenida mediante cuestionario puede estar sesgada como consecuencia de una mala interpretación de las variables por parte de los encuestados. Además, a pesar que el cuestionario de la OCDE evita los principales sesgos relativos a la recogida de información primaria, el sesgo relativo a que las medidas de las variables utilizadas se realicen a través de la percepción de los encuestados es difícilmente evitable. No obstante, a este respecto, es necesario mencionar que en algunas ocasiones no existen medidas completamente objetivas sobre determinadas variables, como por ejemplo la influencia de los *stakeholders* (Henriques and Sadorsky, 1999). Finalmente, la información primaria utilizada ha sido recogida en siete países de la OCDE y en unidades de negocio pertenecientes a sectores manufactureros, por lo que es posible que los resultados obtenidos no sean extrapolables, por ejemplo, a países subdesarrollados o a empresas ubicadas en el sector terciario. Futuros trabajos podrán superar dicha limitación.

Por otra parte y relativo a las metodologías estadísticas utilizadas, en el capítulo 2 se realiza una regresión logística multinomial con efectos moderadores. La moderación presentada es de tipo lineal. Así, a pesar de que existen casos en los que no se ha encontrado significación estadística para demostrar dicho efecto moderador, esta circunstancia no significa que la moderación no exista, sino que la misma podría ser no lineal.

Centrando la atención en el artículo teórico presentado en este trabajo, se encuentran dos limitaciones principales. En primer lugar, la metodología del estudio del caso implica un análisis cualitativo de las circunstancias que concurren en una empresa

específica, pero no goza de los beneficios del análisis cuantitativo, como puede ser la extrapolación de los resultados a otras empresas y/o sectores no analizados. Futuros trabajos empíricos podrán abordar la temática objeto de estudio desde un punto de vista estadístico, usando tanto bases de datos con mayor número de casos, como técnicas estadísticas de regresión que permitan una amplia extrapolación de los resultados. En segundo lugar, el enfoque realizado para el sector transportista limita la aplicabilidad práctica de la clasificación efectuada sobre los diferentes costes medioambientales. Futuras investigaciones podrán contrastar de manera más genérica la tipología presentada, realizando comparaciones entre empresas, sectores e incluso países.

5.5. Futuras líneas de investigación

El presente trabajo pretende servir como marco de referencia para el desarrollo de futuras investigaciones. Éstas podrán surgir con idea de mejorar los resultados obtenidos en los tres artículos de investigación propuestos y, además, estudios futuros serán los encargados de superar todas las limitaciones expuestas en el epígrafe anterior. Entre las líneas de investigación que serían susceptibles de realización en un futuro destacan las siguientes.

En primer lugar, teniendo en cuenta la naturaleza dinámica de las variables objeto de estudio, sería interesante la realización de estudios longitudinales que permitiesen un seguimiento en la evolución de las mismas. Del mismo modo, los resultados obtenidos serían reforzados de cara a ampliar su generalización si las hipótesis de investigación fueran testadas en empresas ubicadas en el sector Servicios o en sectores primarios, o en un mayor número de países con diferentes tipos de regulaciones medioambientales.

Segundo, los resultados alcanzados podrían ser ampliados mediante la incorporación de nuevas variables que se interrelacionasen con las existentes. Por ejemplo, ¿la capacidad de innovación continua o *innovativeness* actúa como efecto moderador a la relación expuesta? ¿y la orientación exportadora? ¿se cumplen las hipótesis presentadas en el caso de empresas multinacionales?

En tercer lugar, a lo largo del presente trabajo ha quedado patente la necesidad de seguir investigando sobre la relación existente entre el desempeño empresarial y el desempeño medioambiental (Hart y Ahuja, 1996; Russo y Fouts, 1997). Mientras que en el primer artículo presentado el efecto moderador del resultado empresarial no es estadísticamente significativo, el segundo artículo pone de manifiesto que existe una relación positiva entre determinadas prácticas medioambientalmente proactivas y una orientación al bajo coste que, en última instancia, debe desembocar en incrementos de la rentabilidad. Por tanto, estos resultados enfrentados indican que investigaciones futuras deben ir encaminadas mejorar el conocimiento sobre qué subyace bajo la relación existente entre desempeño medioambiental y desempeño empresarial.

Finalmente, estudios futuros podrían intentar corroborar si mayores volúmenes de ciertos costes medioambientales están correlacionados con otras características organizativas. Por ejemplo, cabría plantearse si una mayor orientación innovadora podría suponer una reducción de este tipo de costes.

La importancia de la problemática medioambiental y los avances investigadores en materia de gestión medioambiental llevan a pensar en la necesidad de que este tipo de temas obtengan un mayor interés analítico en un futuro.

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