Universidad de Granada

Facultad de Ciencias Económicas y Empresariales

Departamento de Organización de Empresas

TESIS DOCTORAL

ANÁLISIS CAUSAL DE LA RELACIÓN ENTRE CONOCIMIENTO Y ESPÍRITU EMPRENDEDOR CORPORATIVO. IMPACTO EN EMPRESAS DE ALTA TECNOLOGÍA

PROGAMA DE DOCTORADO DE CIENCIAS ECONÓMICAS Y EMPRESARIALES

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GRANADA, 2013

Editor: Editorial de la Universidad de Granada
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D.L.: GR 119-2014
ISBN: 978-84-9028-699-9

A Casto

A mis padres y hermanos

Esta tesis doctoral ha sido realizada gracias a la beca predoctoral concedida por la Junta de Andalucia "*Incentivos para la Formación de Personal Docente e Investigador Predoctoral en las Universidades Públicas de Andalucía, en Áreas de Conocimiento Consideradas Deficitarias por Necesidades Institucionales Docentes y de Investigación*", el Proyecto de Excelencia de la Junta de Andalucia *"Gestión de Conocimiento y Aprendizaje Organizativo en Empresas del Sector Tecnológico: Requerimientos y Consecuencias en el Ámbito de la Innovación y los Recursos Humanos"* (P08-SEJ-4057), el Proyecto del Ministerio de Innovación y Ciencia del Gobierno de España "*Aprendizaje Organizativo y Gestión del Conocimiento en Empresas del Sector Tecnológico Europeo: Consecuencias y Requerimientos en el Ámbito de los Recursos Humanos y de la Innovación*" (ECO2009-09241), el grupo de investigación *"Innovación, Sostenibilidad y Desarrollo Empresarial"* del Plan Andaluz de Investigación (SEJ-481), el Departamento de Organización de Empresas y la Facultad de Ciencias Económicas y Empresariales de la Universidad de Granada.

AGRADECIMIENTOS

Las primeras líneas de este trabajo de investigación van dirigidas a todas aquellas personas que de forma directa o indirecta han brindado su tiempo, conocimientos y empeño para que esta tesis doctoral se lleve a cabo.

En primer lugar, quisiera hacer mención a mis dos directores de tesis, el profesor Fernando Matias Reche y el profesor Víctor J. García Morales, a los cuales quiero agradecerles sus comentarios, sugerencias, el apoyo y la confianza mostrada hacía mí. Ambos han sido un pilar importe y fundamental durante todo este tiempo, en el que con paciencia, han sabido guiarme y orientarme siempre que lo he necesitado. De ellos he aprendido y enriquecido cada día.

En segundo lugar, quisiera agraceder a la profesora Cristina Firmino por su implicación y amabilidad al permitirme realizar una estancia de investigación en la Universidad del Algarve (Portugal).

Junto a ellos, quiera agradecer a todos y cada uno de los miembros del grupo de investigación ISDE y compañeros del Departamento de Organización de Empresas, por darme la oportunidad de iniciar con ellos esta etapa investigadora, por su apoyo y disponibilidad. Siempre han estado ahí, dispuestos a colaborar en todo lo requerido.

A mis compañeros de los despachos D06-D09, a las “chicas de contabilidad” y a aquellos que pasaron por estos despachos y hoy están por otras tierras. Gracias por su especial apoyo y ayuda durante todo este tiempo. Con ellos he compartido no solo tiempo de trabajo, sino también inquietudes y muchas esperanzas. Espero seguir contanto con todos ellos y colaborar en lo necesario.

Y por último, esta tesis no hubiera sido posible sin el apoyo incondicional de mi familia. A mis padres y hermanos que siempre han estado conmigo en todo momento y aún más en este camino, dando el ánimo, consejo y apoyo para continuar cuando algo no salia bien y los primeros en alegrarse por el trabajo bien hecho. Y a Casto, gracias por su paciencia, comprensión y aliento para seguir adelante cuando el horizonte se veía negro, por animarme a dar un paso más y no rendirme, por compartir tu vida y tiempo conmigo. Gracias a todos por vuestro cariño y comprensión.

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INTRODUCCIÓN: JUSTIFICACIÓN Y OBJETIVOS DE INVESTIGACIÓN

1.1. Interés de la investigación

En las últimas décadas, la llamada economía del conocimiento, se ha convertido en uno de los principales temas de investigación. Todas las organizaciones con éxito generan y usan conocimiento y a medida que interactúan con sus entornos, absorben información, la convierten en conocimiento y llevan a cabo acciones sobre la base de la combinación de ese conocimiento, de sus experiencias, valores y normas internas (Davenport y Prusak, 2001). Es decir, se ha producido un cambio en las entidades ya que se ha pasado de organizaciones basadas en la autoridad y control, a organizaciones basadas en la información y especialistas del conocimiento (Drucker, 2003). En este sentido, el presente trabajo de investigación profundiza en el estudio de tres capacidades organizativas de gran importancia para el mundo empresarial como son la gestión de conocimiento, la capacidad de absorción y el espíritu emprendedor.

El aumento de la relevancia que estas capacidades están obteniendo se debe a que el entorno organizativo ha cambiado de forma considerable en los últimos años, por lo que el desarrollo de ciertas capacidades se convierte en fundamental para la gestión organizativa actual. Así, la gestión del conocimiento, la capacidad de absorción y el espíritu emprendedor son indispensables para adaptarse a un entorno globalizado y en continua evolución. En este sentido, la gestión del conocimiento es esencial para favorecer una estructura empresarial innovadora y eficiente. Si el conocimiento fluye y se transmite de manera correcta en la organización, éste no solo puede crecer sino que aumenta la posibilidad de generar nuevo conocimiento que deriva en aplicaciones nuevas, mejoras en procesos o productos y nuevas formas de hacer negocio para alcanzar futuras oportunidades. Y es que, el conocimiento es la clave del proceso de innovación, lo que implica que las organizaciones son aptas para innovar cuando la compañía tiene la capacidad para generar nuevos conocimientos, diseminarlos entre los miembros de la organización y materializarlos en productos o servicios (Nonaka y Takeuchi, 1999; Rodríguez, 2006). De este modo, el conocimiento habrá de ser renovado con frecuencia, por lo que la capacidad que desarrollen las organizaciones para poder absorberlo será de vital importancia. La capacidad de absorción facilita las actividades de exploración que mejoran la capacidad de innovación de la empresa que lleva a la creación de valor. Para contribuir a esta creación de valor, las organizaciones deben establecer flujos internos y externos para extraer el mayor valor posible de su potencial innovador y, para ello, se requiere que desarrolle la habilidad para reconocer

el conocimiento externo valioso y su posterior transferencia y explotación eficiente. En este sentido, mantener y desarrollar esta capacidad de absorción condiciona la base de conocimiento de la empresa, su posterior uso y, por lo tanto, su supervivencia (González y García, 2011).

Igualmente, el espíritu emprendedor sustenta su influencia en el crecimiento, renovación, rentabilidad y la supervivencia de la organización mediante los procesos de innovación, proactividad, autorrenovación y la creación de nuevos negocios, dimensiones claves y fundamentales para organizaciones que operan en entornos complejos, dinámicos y competitivos (Covin y Slevin, 1991).

La importancia y el interés que despiertan estas capacidades en distintos campos disciplinares, han provocado la proliferación de abundantes estudios sobre gestión de conocimiento, capacidad de absorción y espíritu emprendedor. Nuestra investigación se centra en profundizar en estas tres capacidades organizativas en relación con otras variables estratégicas como son la innovación, las variables tecnológicas, la flexibilidad laboral interna o la integración de los grupos de interés y en relación con los resultados de la organización.

También resulta interesante destacar la metodología que ha sido utilizada a la hora de demostrar estadísticamente las hipótesis planteadas y analizadas en este trabajo, por los siguientes motivos:

- Para la realización de los artículos se han utilizado cuestionarios a distintos tipos de empresas y con distintas bases de datos.

  En el artículo primero las empresas analizadas fueron las mayores empresas tecnológicas españolas, cuyos datos se obtuvieron de la base de datos Dun y Bradstreet (D&B) España. En este caso, las empresas fueron seleccionadas aleatoriamente y el cuestionario se envió a 900 empresas de las que 201 respondieron a todas las cuestiones planteadas.

  En el artículo segundo y tercero se realizaron cuestionarios a nivel europeo. La base de datos utilizada para ver las empresas tecnológicas a evaluar fue la base de datos Amadeus (2009). En este caso, el cuestionario fue enviado a parte de a empresas españolas, a empresas de Alemania, Austria, Bélgica, Dinamarca, Francia, Holanda (Países Bajos), Italia, Polonia y Reino Unido.

- Los métodos estadísticos utilizados en esta investigación han sido dos principalmente. En los dos primeros artículos (capítulo II y III) hemos usado modelos de ecuaciones estructurales. Este método ofrece un adecuado ajuste entre los aspectos teóricos y empíricos. Además, este método tiene en cuenta los errores de medida y las variables de múltiples indicadores o comparaciones multigrupo. En el caso del último artículo (capítulo IV) se ha realizado regresiones lineales jerárquicas.

- Los programas estadísticos empleados para desarrollar estas metodologías estadísticas han sido LISREL 8.30 para el análisis de ecuaciones estructurales del capítulo segundo (artículo 1) y LISREL 8.70 para el capítulo tercero (artículo 2) y SPSS 20.0 para el caso del tercer artículo con regresiones lineales jerárquicas.

- Las preguntas de los cuestionarios han sido usadas en estudios previamente validados.

- Todos los artículos realizados son artículos empíricos sustentados con un buen desarrollo teórico de la literatura y todos ellos cuentan con una serie de implicaciones teóricas y prácticas para los directivos de la empresa.

1.2. Delimitación de los conceptos de las variables objeto de estudio

A continuación profundizamos en los conceptos claves empleados en las investigaciones y más concretamente en las nociones de gestión de conocimiento, innovación, variables tecnológicas en el marco de las empresas tecnológicas, capacidad de absorción, flexibilidad laboral interna, espíritu emprendedor, entorno y la capacidad de integración de los grupos de interés.

1.2.1. Gestión de conocimiento

Una lectura y revisión de las definiciones dadas acerca de la gestión del conocimiento pone en evidencia una falta de unanimidad conceptual atribuible, entre otras causas, a la relativa juventud de la disciplina, que conlleva la ausencia de un cuerpo doctrinal sólido y estructurado (Rodríguez, 2006).

Los entornos turbulentos en los que las organizaciones se enfrentan en la actualidad requieren que las empresas tengan una gran capacidad para responder a los cambios con el fin de seguir siendo competitivos en los mercados actuales (Davenport y Prusak, 2001; Szulanski, 2000). La gestión de la organización en los procesos de cambios, implica la comprensión de la administración, no sólo de recursos económicos y financieros, sino también de la información y los conocimientos disponibles (Drucker, 1969).

En este sentido, el conocimiento implica (1) el reconocimiento del conocimiento, (2) la capacidad de actuar y (3) el entendimiento, que reside o se encuentra dentro de la mente o el cerebro (Liew, 2007). El conocimiento se compone de "verdades y creencias, perspectivas y conceptos, juicios y expectativas, metodologías y know-how" (Wiig, 1993, p. 73). Davenport y Prusak (1998, p. 5) describe el conocimiento como una "mezcla fluida de experiencia enmarcada, valores, información contextual y la vista de un experto que proporciona un marco para evaluar e incorporar nuevas experiencias e información". Considerando que la información puede ser entendida como el proceso de dar significado a los datos al ser puestos en un contexto, el conocimiento analiza la significación de los datos a través de un conjunto de creencias sobre las relaciones causales entre acciones y sus consecuencias probables, ya sea adquirida a través de la inferencia o la experiencia (Bouthillier y Shearer, 2002).

Junto a ello, el conocimiento debe ser manejado adecuadamente (Nonaka y Takeuchi, 1995). Así, la gestión del conocimiento consiste en el "proceso de gestión de todo tipo de conocimiento para satisfacer las necesidades actuales y futuras e identificar y explotar los activos de conocimientos existentes y adquiridos y para desarrollar nuevas oportunidades" (Quintas et al., 1997, p. 387). La gestión del conocimiento maximiza la eficacia de los conocimientos relacionados con la empresa y la rentabilidad de sus activos de conocimiento (Wiig, 1997). La gestión del conocimiento conduce a la aplicación de conocimiento para la toma de decisiones a las actuales y futuras actividades, con el propósito expreso de mejorar la eficacia de la organización (Jennex, 2007). Es decir, la gestión del conocimiento permite a la empresa (Davenport y Prusak, 2001): a) aumentar su capacidad de respuesta a los cambios y a la innovación al hacer el conocimiento visible, garantizando que llegue a toda la organización; b) el desarrollo de una cultura basada en el conocimiento mediante el fomento y la acumulación de comportamientos, tales como el intercambio de conocimientos; y c) la construcción de

una infraestructura de conocimiento o de la red de conexiones en toda la entidad para la interacción y la colaboración mutua. Por lo tanto, "la gestión del conocimiento permite a la organización crear, explotar, renovar y aplicar los flujos de conocimiento en nuevas formas de crear las competencias esenciales para la mejora del desempeño organizativo" (García et al., 2008, p. 299). Así, la gestión de conocimiento impulsa la identificación, optimización y gestión activa de los activos de propiedad intelectual para crear valor, aumentar la productividad y ganar y mantener una ventaja competitiva (Webb, 1998).

La gestión del conocimiento incluye un conjunto de actividades o etapas que permiten a la organización crear valor a partir de los activos de conocimiento que la empresa posee (ej. Alavi y Leidner, 2001; Argote et al., 2003; Bou y Segarra, 2006; Gupta y Govindarajan, 2000; Liew, 2007; Shin et al., 2001; Staples et al., 2001). En este sentido, las actividades esenciales de gestión del conocimiento son la adquisición, transferencia y utilización de los conocimientos (ej. Alavi y Leidner, 2001; Darrow, 2003, 2005; Holzner y Marx, 1979; Pentland, 1995). La gestión del conocimiento puede ser analizado como un proceso que localiza y gestiona la difusión y uso del conocimiento (Darrow, 2003).

La adquisición de conocimientos incluye los procesos orientados hacia la obtención de conocimiento (Hou y Chien, 2010), es decir, todas las actividades relacionadas con la búsqueda, identificación y acceso a nuevos conocimientos relevantes para la empresa (Alavi y Leidner, 2001). La transferencia de conocimiento es el "proceso mediante el cual se ve afectada una unidad, grupo, departamento o división por la experiencia de las otras" (Argote y Ingram, 2000, p. 151). La transferencia de conocimientos facilita la transmisión de know-how generado en una subunidad a otras partes de la organización. También hace que la coordinación del trabajo sea más rápida y precisa mediante la conexión de múltiples unidades que pueden estar dispersas geográficamente, facilita la coordinación de los flujos de trabajo entre las subunidades y permite economías de escala (Schulz y Jobe, 2001). Finalmente, la utilización del conocimiento es la aplicación de los conocimientos transferidos a las diferentes unidades de la organización (Szulanski, 2000). Se refiere a los procesos orientados a la utilización efectiva de los conocimientos después de que se transfieren (Gold et al., 2001; Verkasolo y Lappalainen, 1998). Es esencial que las organizaciones tengan la capacidad de utilizar el conocimiento adquirido y transferido eficientemente (Alavi y Leidner, 2001).

1.2.2. Variables tecnológicas

En esta apartado analizamos los conceptos principales de las variables tecnológicas utilizadas en los trabajos de investigación. Entre todos los activos necesarios para fomentar el conocimiento destacan los activos tecnológicos, tales como el apoyo de la alta dirección en empresas tecnológicas, habilidades tecnológicas de los directivos, o competencias tecnológicas distintivas.

El apoyo de la alta dirección permite a la organización acceder, crear, almacenar, transmitir y manipular datos, información y conocimientos (Carlsson y El Sawy, 2008; Lin, 2007). El apoyo de la alta dirección puede estimular el desarrollo de un ambiente de trabajo que favorezca la gestión del conocimiento y los sistemas de información (Ghosh et al., 2001), puede proporcionar los fondos y recursos apropiados, alentar a los equipos y ayudarles a superar los problemas, fomentando la cooperación multifuncional, el conocimiento y la comunicación (García et al., 2008). En un contexto tecnológico, el apoyo de los altos directivos genera un mayor valor estratégico para el negocio y permite el desarrollo de capacidades tecnológicas entre los miembros de la organización (Byrd y Davidson, 2003).

Asimismo, se requiere en la organización personas con conocimientos tecnológicos, entendidos como una de las dimensiones que distingue y aporta los conocimientos necesarios para producir, establecer una capacidad esencial (Leonard-Barton, 1992). Desde un punto de vista tecnológico, Leonard-Barton (1992) destaca que las habilidades directivas son uno de los cuatro componentes que distingue y suministra el conjunto de conocimiento necesario para producir una capacidad o competencia distintiva. Las habilidades directivas tecnológicas constituyen el sistema técnico completo, que normalmente produce los fundamentos de los primeros productos de la empresa. Por tanto, es necesario estimular las capacidades distintivas tecnológicas, que "representan la experiencia de la organización en la movilización de diversos recursos científicos y técnicos a través de una serie de rutinas y procedimientos que permitan que nuevos productos y procesos de producción sean desarrollados y diseñados" (Real et al., 2006, p. 508). De este modo, las variables tecnológicas desempeñan un papel importante en el acceso a la información y la ubicación de las fuentes externas de conocimiento, así como la asimilación, transformación y explotación del conocimiento. También permiten la eliminación de las limitaciones organizativas, que a menudo bloquean la interacción

entre las diferentes partes de la organización (Doranova et al., 2011; Hendriks, 1999; Jiménez et al., 2011).

1.2.3. Innovación empresarial

El concepto de innovación empresarial es muy amplio, reflejando la existencia de una gran variedad de dimensiones dentro del fenómeno (Damanpour, 1991). Por ello, la innovación puede ser un nuevo producto o servicio, una nueva tecnología para los procesos de producción, una nueva estructura o un nuevo sistema administrativo. A pesar de ello, la innovación empresarial puede ser definida, en términos generales, como la adopción de un nuevo sistema, política, programa, proceso, producto o servicio, que se ha generado internamente o se ha comprado en otra empresa (Daft, 1982; Damanpour y Evan, 1984; Zaltman et al., 1973).

Con intención de centrar el concepto que estamos tratando, cabe mencionar la distinción entre los conceptos invención e innovación tal y como propuso Schumpeter (1934) quién presentó por primera vez la innovación y estableció que, mientras la invención alude al ámbito técnico de cualquier novedad, la innovación implica sobre todo un ámbito comercial, ya que el concepto alude a la novedad y al valor comercial de dicha novedad. Y es que cuanto más se profundiza en el concepto de innovación, más dificultades se encuentran para definirlo, pues debemos determinar si se trata de un proceso o un producto, si se refiere globalmente al proceso de innovación o a una etapa concreta, si lo abordamos desde un punto de vista técnico o administrativo, si se trata de una innovación parcial o fundamental, etc.

En nuestro estudio, la clasificación de innovación que más nos interesa es la que diferencia entre innovaciones técnicas o tecnológicas y las administrativas (Daft, 1978; Damanpour, 1987; Eisenhardt y Martin, 2000; Kimberly y Evanisko, 1981). La innovación técnica o tecnológica aparece como resultado del uso de una nueva herramienta, técnica, servicio o sistema que produce cambios en los productos o servicios o en la forma en que tales productos o servicios son producidos o ejecutados (Damanpour, 1987). Algunos ejemplos de estas innovaciones tecnológicas pueden ser, los catálogos de productos de microfilm de ordenadores, tecnología blu-ray para ordenadores, sistemas de compras automáticos. En el caso de las innovaciones administrativas, éstas implican desarrollos en la estructura de la organización y procesos de administración. Estas innovaciones están indirectamente relacionadas con las

actividades de trabajo básicas de una organización y están más directamente relacionadas con su gestión (Damanpour y Evan, 1984; Kimberly y Evanisko, 1981; Knight, 1967). Algunos ejemplos de innovaciones administrativas son la administración por objetivos, la rotación del trabajo, los sistemas de incentivos de plantilla o los horarios flexibles. En esta investigación nos vamos a centrar en las innovaciones técnicas o tecnológicas que analizan la tecnología como un conductor de cambió (Daft, 1978; Damanpour, 1991).

1.2.4. Capacidad de absorción

Debido a los nuevos entornos competitivos y tecnológicos, las organizaciones encuentran grandes dificultades para crear valor únicamente con fuentes internas de conocimiento (Camisón y Forés, 2010), por ello, se requiere que se desarrolle la habilidad para reconocer el conocimiento externo valioso y su posterior transferencia y explotación eficiente (González y García, 2011). Mediante este proceso las empresas generan y desarrollan conocimiento explícito que, a través de su codificación y aplicación, mejora la toma de decisiones, desarrollan y renuevan las bases de conocimiento (Bergh y Lim, 2008). El conjunto de rutinas y procesos que contribuyen básicamente a este propósito conforman la denominada capacidad de absorción (Cohen y Levinthal, 1990; González y García, 2011; Zahra y George, 2002).

El origen del concepto de capacidad de absorción se deriva del estudio de Cohen y Levinthal (1990, p 128) que la definen como "la habilidad de reconocer el valor de la nueva información, asimilarla y destinarla a fines comerciales". Es una habilidad para detectar en el exterior el conocimiento o la información que pueda ser útil, interiorizarla y explotarla con una finalidad de mercado (González y García, 2011). Es decir, se hace referencia al reconocimiento del conocimiento valioso en el exterior de la organización, a la posterior asimilación interna y finalmente a su aplicación con fines comerciales. Posteriormente, Lane y Lubatkin (1998) consideran la capacidad de absorción desde una perspectiva relativa, es decir en relación con otra empresa. Los autores consideran que el correcto funcionamiento de esta habilidad viene explicado por la proximidad y solidez de la relación mantenida entre el emisor y el receptor del conocimiento, por lo tanto, se considera esta transferencia como un flujo continuo, compuesto por rutinas interrelacionadas.

Más tarde, Zahra y George (2002) amplía el análisis realizado por Cohen y Levithal (1990) incorporando una cuarta dimensión en el proceso. Según estos autores, la capacidad de absorción es un conjunto de rutinas y procesos organizativos a través de los cuales las empresas adquieren, asimilan, transforman y explotan conocimiento con la intención de producir capacidades dinámicas organizativas. Estas capacidades dependen del nivel de conocimiento previo que la organización posea y se realiza de forma acumulativa, de manera que se trata de un proceso prolongado y acumulado de conocimiento.

Teniendo en cuenta las consideraciones de los autores anteriores, Jiménez et al., (2011, p. 192) definen la capacidad de absorción como la "habilidad relativa de una organización que aprende para desarrollar un conjunto de rutinas organizativas y de procesos estratégicos a través de los cuales pueda adquirir, asimilar, transformar y explotar el conocimiento adquirido del exterior con el propósito de crear valor". La capacidad de absorción es por lo tanto considerada como una capacidad dinámica compuesta por dos subconjuntos: capacidad de absorción potencial y la capacidad absorción realizada. La capacidad de absorción potencial se refiere a la adquisición y asimilación de conocimientos y la capacidad de absorción realizada, entendida como la capacidad de la empresa para transformar y explotar el conocimiento asimilado por su incorporación en las operaciones de la empresa (Jansen et al., 2005; Jiménez et al., 2011; Kotabe et al., 2011; Zahra y George, 2002). Así, la capacidad de absorción está determinada por cuatro dimensiones: adquisición, asimilación, transformación y explotación del conocimiento (Jiménez et al., 2011; Zahra y George, 2002):

- Adquisición es la capacidad de una empresa para localizar, identificar, evaluar y adquirir conocimiento externo que es importante para el desarrollo de sus operaciones.
- Asimilación es la capacidad de una empresa de analizar, clasificar, procesar, interpretar y, finalmente, interiorizar y comprender el conocimiento.
- Transformación es la capacidad de una empresa para facilitar la transferencia y la combinación de los conocimientos previos con los conocimientos adquiridos o asimilados.
- Explotación es la capacidad de la empresa para incorporar el conocimiento adquirido, asimilado y transformado en sus operaciones y rutinas para la

aplicación de la empresa y el uso. Esta capacidad dará lugar a la creación o mejora de nuevos productos, sistemas, procesos, formas de organización y las competencias.

En el siguiente cuadro se recogen otras nociones de capacidad de absorción:

Tabla 1.1. Otras definiciones de capacidad de absorción

Autor	Definición
Mowery y Oxley (1995, p. 80)	"Habilidades que reflejan la necesidad de negociar con los componentes tácitos de la tecnología transferida y de modificar una fuente externa de tecnología para aplicaciones domesticas".
Kim (1998, p. 507)	"Capacidad para aprender y desarrollo de habilidades para solucionar problemas".
Lane et al., (2006, p. 856)	"Habilidad de una empresa para utilizar el conocimiento obtenido del exterior a través de tres procesos secuenciales: (1) reconocer y comprender el nuevo conocimiento externo o la empresa potencialmente valioso, (2) asimilar el conocimiento nuevo valioso, y (3) usar el conocimiento asimilado para crear conocimiento nuevo y obtener resultados comerciales".
Todorova y Durisin (2007, p. 776)	Las empresas reconocen el "valor, adquieren, transforman o asimilan y explotan el conocimiento".

Fuente: Elaboración propia y Jiménez (2009)

1.2.5. Flexibilidad laboral interna

La flexibilidad laboral interna, se refiere a la flexibilidad manifestada por el grupo de recursos humanos de la organización en un punto determinado de tiempo (Tsui et al., 1997). Flexibilidad que se genera cuando la alta dirección desarrolla e impulsa a los empleados a adoptar roles de trabajo más flexibles (Beltrán et al., 2009; Tsui et al., 1997). Diferentes investigaciones han analizado el concepto de flexibilidad laboral interna y delimitado sus características (ej. Atkinson y Gregory, 1986; Blyton y Morris, 1992; Pulakos et al., 2000; Shafer et al., 2001). Inicialmente, autores como Looise et al., (1998) y Michie y Sheehan-Quinn (2001) relacionan el concepto de flexibilidad laboral interna al concepto de flexibilidad funcional de los trabajadores, entendida como la facilidad para que los trabajadores puedan moverse entre tareas y puestos de trabajo en la organización. Más recientemente, el concepto de flexibilidad laboral interna ha sido

ampliado indicando que además de flexibilidad funcional, se debe incluir las características de los empleados, como por ejemplo, la velocidad con la que los empleados aprenden o su capacidad para detectar cambios externos. (Bhattacharya et al., 2005; Kara et al., 2002; Verdú, 2002).

En este sentido, adoptamos la conceptualización de Beltrán et al., (2009, p. 1581) que, basándose en la teoría de los recursos y capacidades, definen flexibilidad laboral interna como un "concepto multidimensional formado por los siguientes componentes: (a) flexibilidad intrínseca o "*intrinsic flexibility*"; (b) habilidad maleabilidad o "*skill malleability*"; (c) maleabilidad de comportamiento o "*behavioural malleability*"; y (d) flexibilidad relacional o "*relational flexibility*". Flexibilidad intrínseca o "*intrinsic flexibility*", se refiere a las capacidades de los empleados para trabajar en tareas diferentes y bajo circunstancias diversas. Habilidad maleabilidad o "*skill malleability*", indica mejoras en las habilidades de los empleados y el conocimiento, y que está vinculada a la agudeza de los empleados para dominar continuamente sus habilidades y evitar una especialización en una sola área del conocimiento. Maleabilidad del comportamiento o "*behavioural malleability*", se refiere a los cambios en la forma de actuar de los empleados o las rutinas que siguen cuando se enfrentan a situaciones nuevas. Por último, la flexibilidad relacional o "*relational flexibility*", indica la voluntad de los empleados a cooperar y colaborar con los demás, tanto dentro como fuera de la organización.

La flexibilidad laboral interna es una variable estratégica para el proceso de innovación contribuyendo a una mayor y mejor difusión de conocimientos y habilidades, que facilita la asignación de los trabajadores a las tareas a realizar y la innovación organizativa (Bhattacharya et al., 2005). Los empleados poseen un amplio espectro de habilidades y capacidades que adecuadamente combinadas permiten mejorar la capacidad innovadora de la organización (Arvanitis, 2005; Kelliher y Riley, 2003).

1.2.6. Espíritu emprendedor corporativo

Son muchos los estudios e investigadores implicados en el estudio del espíritu emprendedor corporativo (Álvarez y Barney, 2007; Antoncic y Hisrich, 2001; Antoncic y Prodan, 2008; Badguerahanian y Abetti, 1995; García et al., 2006; Goodale et al., 2011; Ireland et al., 2001; Kelley, 2011; Knight, 1997; Simsek y Heavey, 2011;

Woolley, 2010; Zahra, 1991, 1993, 1995, 1996) y sin embargo no hay un consenso en cuanto a su definición.

Los diferentes autores generalmente se muestran de acuerdo al incidir en la naturaleza emprendedora de las actividades en el interior de las organizaciones y sin embargo, difieren en la terminología utilizada a la hora de describir dichas actividades (Sharma y Chrisman, 1999). A pesar de ello, el espíritu emprendedor corporativo implica extender el dominio de competencia de la empresa y la correspondiente oportunidad establecida a través de nuevas combinaciones de recursos internamente generados (Covin y Slevin, 1991). Por lo tanto, la iniciativa empresarial corporativa se refiere al "proceso por el cual las empresas detectan oportunidades y actúan creativamente para organizar las transacciones entre los factores de producción con el fin de crear valor excedente" (Jones y Butler, 1992, p. 735). Con ello, el espíritu emprendedor corporativo es un concepto general para la organización que está formado por una serie de subconstructos o subconceptos (Antoncic y Prodan, 2008; Knight, 1997), que coinciden mayormente con la creación de nuevos negocios o "*new business venturing*", capacidad de innovación organizativa u "*organizational innovativeness*", autorenovación o "*self-renewal*" y proactividad o "*proactiveness*" (Antoncic y Hisrich, 2001; Antoncic y Prodan, 2008; Knight, 1997; Zahra, 1993). La creación de nuevos negocios puede forzar a la redefinición de los productos de una compañía y el desarrollo de nuevos mercados. La capacidad de innovación se refiere a la innovación de productos y servicios con énfasis en el desarrollo e innovación en tecnología. La autorrenovación refleja la transformación de la organización a través de la renovación de ideas claras en la empresa. Por último la proactividad está relacionada con la propensión al riesgo de la empresa respecto a sus competidores (Antoncic y Hisrich, 2001).

En el siguiente cuadro, se describen las otras nociones de espíritu emprendedor corporativo.

Tabla 1.2. Otros conceptos de espíritu emprendedor corporativo

Autor	Definición
Schollhammer (1982, p. 210)	"Es el elemento clave para que una empresa gane ventaja competitiva y consecuentemente obtenga mayores recompensas financieras".

Autor	Definición
Miller (1983, p. 770)	"Es el compromiso de una compañía para innovar en sus negocios ya existentes. Es el proceso por el cual las compañías se renuevan a sí mismas y a sus mercados".
Burgelman (1983, p. 1349)	"Proceso por el cual las empresas se diversifican a través del desarrollo interno. Tal diversificación requiere combinaciones de recursos que amplíen las actividades de la empresa hacia áreas no relacionadas, o poco relacionadas, con su dominio actual de competencias y con su correspondiente conjunto de oportunidades".
Vesper (1984, p. 295)	"Implica la iniciativa de los empleados de los niveles más bajos de la organización para emprender algo nuevo. Es una innovación llevada a cabo por subordinados sin que sus directivos hayan sido preguntados, sin que lo esperen, o incluso quizás sin que hayan dado su permiso para hacerlo".
Spann et al., (1988, p. 149)	"Consiste en el establecimiento de una organización empresarial separada (normalmente en forma de centro de negocio, de unidad estratégica de negocio, de división o de subsidiaria) para introducir un nuevo producto, servicio o para crear un nuevo mercado o utilizar una nueva tecnología".
Jennings y Lumpkin (1989, p. 489)	"Es el grado de desarrollo de nuevos productos y/o nuevos mercados. Una organización es emprendedora si desarrolla un mayor número de nuevos productos y/o nuevos mercados que la media de organizaciones".
Guth y Ginsberg (1990, p. 5)	"Engloba dos tipos de fenómenos y los procesos que los rodean (1) el nacimiento de negocios nuevos dentro de las empresas ya existentes (*corporate venturing*) y (2) la transformación de las organizaciones a través de la renovación de las ideas clave sobre las que fueron construidas (*corporate renewal*)".
Schendel (1990, p. 2)	"Implica la idea de nacimiento de nuevos negocios dentro de un negocio ya existente y la transformación de su estancamiento, dada la necesidad de renovación y reactivación del negocio ya existente".
Zahra (1991, p. 262)	"Actividades formales e informales encaminadas a crear nuevos negocios en compañías establecidas a través de innovaciones de productos y de procesos y del desarrollo de mercados. Esas actividades pueden tener lugar a nivel corporativo, de división, funcional o de proyecto con el objetivo de mejorar la posición competitiva de la compañía y su desempeño financiero".
Zahra y Covin (1995, p. 44)	"Es un factor clave que revitaliza las compañías establecidas a través de aceptación del riesgo, innovación y comportamientos competitivos proactivos".

Autor	Definición
Zahra (1995, p. 227)	"Es la suma de los esfuerzos en innovación, renovación y creación de negocios. La innovación implica crear e introducir productos, procesos productivos y sistemas organizativos. La renovación implica la revitalización de las operaciones de la compañía, cambiando el alcance de sus negocios, de enfoques competitivos o de ambos. La creación de negocios significa que la empresa acometerá nuevos negocios expandiendo sus operaciones en los mercados existente o en otros nuevos".
Brikinshaw (1997, p. 210)	"Es una iniciativa de un proyecto proactivo y diferenciado que anticipa a la corporación una nueva forma para usar o desarrollar sus recursos".
Sharma y Chrisman (1999, p. 18)	"Es el proceso por el cual un individuo o un grupo de individuos, en asociación con una organización existente, crean una nueva organización, propician la renovación o la innovación dentro de dicha organización".
Barringer y Bluedorn, (1999, p. 422)	"Es un fenómeno comportamental que enmarca a todas las empresas en un espectro continuo desde altamente conservadoras hasta altamente emprendedoras. Las empresas más emprendedoras son propensas al riesgo, innovadoras y proactivas. Mientras que las conservadoras son adversas al riesgo, menos innovadoras y adoptan una postura más de esperar y actuar".
Zahra y Garvis (2000, p. 471)	"Es la suma de la innovación, asunción del riesgo y proactividad de una compañía. Actividades que normalmente buscan incrementar la capacidad de innovación de una compañía, la adaptación y las respuestas estratégicas ágiles para permitir los cambios en el ambiente".
Meyer y Heppard (2000, p. 11)	"El proceso de creación de rentas económicas, por lo que entonces estrategia empresarial y el espíritu empresarial son esencialmente sinónimos. Cualquier estrategia de generación de renta es empresarial".
McFadzean et al., (2005, p. 352)	"Es el esfuerzo para promover la innovación desde una perspectiva organizativa interna, a través de la evaluación de nuevas oportunidades potenciales, de la asignación de recursos y de la explotación y comercialización de dichas oportunidades".
Goodale et al., (2011, p. 1)	"Acciones e iniciativas emprendedoras que transforma la organización a través de procesos de renovación estratégica y de operaciones en nuevos mercados".

Fuente: Elaboración propia; Sharma y Chrisman (1999); Jiménez (2009); Martín (2011).

En definitiva, en el contexto de la creciente competitividad en la economía global, el espíritu emprendedor corporativo se ha convertido en uno de los temas centrales de la

economía. Se considera que la actividad emprendedora representa uno de los más importantes motores del crecimiento empresarial, encontrándose detrás de la mayoría de las nuevas empresas creadas y del desarrollo de las ya existentes (Ireland et al., 2009; Zahra, 1993).

Además, el concepto de oportunidad emprendedora subyace de todas las definiciones de espíritu emprendedor corporativo ya sea desde la visión de nuevas entradas (Ireland et al., 2009) o la renovación, creación o innovación organizativa que toman lugar dentro o fuera de una organización ya existente (Shane y Venkatraman, 2000). Por lo tanto, se puede observar que para que una empresa pueda tener éxito en un entorno muy dinámico y complejo debe de ser bastante emprendedora, sobre todo si se centra en las empresas de tecnología (Brinckmann et al., 2010; Covin y Slevin, 1989; 1991; Shan, 1990; Zahra, 1993).

Además nuestras investigaciones se han enfocado en empresas tecnológicas, por lo que este espíritu emprendedor corporativo puede ser denominado espíritu emprendedor corporativo tecnológico (Antoncic y Prodan, 2008) y que puede ser considerado parte de este espíritu emprendedor corporativo y definido en términos de "actividades que fomentan la capacidad de innovación o "*innovativeness*" tecnológica y de procesos" (Antoncic y Prodan, 2008, p. 258). Pero el que una empresa tenga carácter emprendedor es una condición necesaria, aunque no suficiente para el triunfo de la empresa (Barringer y Bluedorn, 1999; Shan, 1990). Se necesitan una serie de activos complementarios tecnológicos que potencien el espíritu emprendedor, sobre todo en las compañías tecnológicas (Fontes, 2001).

1.2.7. Entorno

El entorno es un importante factor inicial que influye en la estrategia, la estructura y en el proceso de iniciar cualquier iniciativa empresarial. Los gobiernos han señalado que la actividad empresarial es uno de los factores que proporcionan mayor capacidad competitiva de las economías desarrolladas, siendo especialmente importante, comprender los factores que influyen en el desarrollo de la iniciativa empresarial (Gómez et al., 2011). Los investigadores han desarrollado numerosos modelos para identificar la existencia de factores externos e internos que influyen en el espíritu empresarial (ej. Alpkan et al., 2010; Covin y Slevin, 1991; Guth y Ginsberg, 1990; Ireland et al., 2009). En este sentido, uno de los principales problemas con los que se

encuentra la empresa actualmente es el ambiente tan turbulento en el que desarrolla su actividad (Morris y Jones, 1995). El entorno actual puede ser calificado por su carácter dinamismo, amenazador y de una complejidad cada vez mayor (Davis, 1987; Handy, 1990; Hamel y Prahalad, 1993). Por ello, los directivos se enfrenta a periodos de decisión breves y de respuesta rápida, a una falta de recursos estables en el mercado, a una obsolescencia del producto más rápida, etc., que en general provocan una falta de control de recursos a largo plazo (Stevenson et al., 1994). Estas circunstancias, obligan a algunas empresas históricamente prósperas y con buenos resultados, a estar luchando por sobrevivir e intentando aprender nuevas maneras de competir (Hamel y Prahalad, 1993).

1.2.8. Capacidad de integración de los grupos de interés

Los grupos de interés son definidos por Freeman (1984, p. 46) como "cualquier grupo o persona individual que pueden afectar o son afectados por el logro de los objetivos de la organización". Desde un enfoque más tradicional y neoclásico, solo se considerarían los intereses del accionista y la maximización de los beneficios, sin embargo, la teoría de grupo de interés sostiene que otros grupos, incluso aquellos sin reclamos económicos, deben ser considerados por una organización (Kuratko et al., 2007). Es decir, desde un enfoque moderno de la dirección de relaciones con los grupos de interés, las empresas no sólo se deberían centrar en crear valor para los grupos de presión, sino que también deberían ampliar sus objetivos para incluir las expectativas e intereses de los mismos, como puede ser la satisfacción al cliente, buen comportamiento social y responsabilidad social, medioambiental, etc. (Buysse y Verbeke, 2003). En este sentido, como indica Goodpaster (1991) hablamos de dos tipos de grupos de interés. Los grupos de interés estratégicos son aquellos cuyos intereses considera la empresa para poder alcanzar sus propios objetivos estratégicos, es decir, los que pueden afectar el desempeño de la empresa (Rueda, 2005). Sin embargo, los grupos de interés éticos se tienen en cuenta desde una perspectiva de equilibrio de intereses, es decir, los que se ven afectados por la empresa (Rueda, 2005). De tal forma, que una correcta gestión de los grupos de interés puede recoger intereses estratégicos y éticos y así tener una consideración equilibrada de ambos tipos de grupos.

Este proceso se lleva a cabo mediante la capacidad de integración de los grupos de interés, que consiste en la habilidad para establece relaciones de colaboración basadas en la confianza con una amplia gama de grupos de interés, especialmente con aquellos

de objetivos no económicos, tales como valores sociales, medioambientales, etc. La capacidad de integrar el conocimiento de los grupos de interés ayudará al diseño de productos y servicios sostenibles, que facilita la capacidad de innovación, aprendizaje continuo y el desarrollo de iniciativas empresariales innovadoras (Hart y Sharma, 2004; Kuratko et al., 2007). Esta capacidad es una habilidad basada en relaciones cooperativas de confianza entre la empresa y grupos de interés, desarrolladas durante largo periodo de tiempo que implica cambios sustanciales en la filosofía, valores de negocio y diseño de la empresa (Coff, 1997; Rueda, 2005).

1.3. Objetivos de la investigación

El objetivo central de este trabajo consiste en el estudio de los vínculos existentes entre los conceptos anteriormente mencionados de gestión de conocimiento, capacidad de absorción y espíritu emprendedor con variables estratégica como variables tecnológicas (habilidades tecnológicas, competencias distintivas tecnológicas, apoyo de la alta dirección a la tecnología), la innovación, la flexibilidad laboral interna, la capacidad de integración de los grupos de interés, y cómo dichos vínculos afectan al resultado de las organizaciones. Cada uno de los artículos presentados relaciona parte de esta temática, obteniendo finalmente, como resultado, un conjunto de trabajos de investigación interconectados, pero que también conservan su propia contribución individual. A continuación, enumeramos otros objetivos que pretendemos lograr con el desarrollo de esta tesis:

- Analizar los procesos de gestión de conocimiento y como se interrelacionan entre si.

- Observar la importancia del apoyo de la alta dirección a través de las tecnologías de la información y comunicación en el proceso de gestión de conocimiento.

- Observar cómo el apoyo de la alta dirección a las tecnologías de la información y la comunicación fomenta la mejora en el desempeño organizativo a través de su influencia positiva en las etapas interrelacionadas de adquisición, transferencia y utilización de conocimientos.

- Analizar si las variables tecnológicas influyen en la capacidad de absorción de la empresa.

- Estudiar la interdependencia entre capacidad de absorción potencial y capacidad de absorción realizada.

- Estudiar la influencia de las políticas de flexibilidad laboral interna en el resultado de la organización a través de la innovación.

- Observar la influencia del entorno en la iniciativa empresarial.

- Comprobar si las habilidades tecnológicas permiten el desarrollo del espíritu emprendedor.

- Estudiar si la integración de los grupos de interés tienen influencia en el espíritu emprendedor.

- Analizar si la capacidad de absorber conocimiento externo influye en el espíritu emprendedor.

- Finalmente, saber cómo influyen todas estas variables en el resultado de las empresas tecnológicas.

1.4. Estructura del trabajo de investigación

La presente investigación consta, además de este capítulo de introducción, de tres artículos de investigación y de un último capítulo de recapitulación. El hilo conductor que une a los tres artículos reside en las variables anteriormente mencionadas. A continuación realizamos una breve descripción de los contenidos de cada uno de los capítulos.

En el capítulo dos, analizamos las fases del proceso de gestión de conocimiento junto con variables como el apoyo de la alta dirección e innovación en empresas de base tecnología españolas. Basándonos en la literatura, se desarrolla un modelo teórico que muestra las interrelaciones entre estos conceptos. Las hipótesis se contrastan basándose en los datos recogidos de 201 CEOs de empresas de alta tecnología españolas. Las encuestas fueron enviadas por correo a 900 organizaciones seleccionadas junto con una carta de presentación. Se ha empleado este método, ya que permite llegar a un mayor número de organizaciones a un costo menor, ejercer menos presión para la respuesta inmediata, y proporcionar a los entrevistados un mayor sentido de autonomía.

En cuanto a la metodología utilizada, en este caso, ha sido un análisis de ecuaciones estructurales que permite compactar el conocimiento teórico y empírico para ofrecer una serie de resultados bien aplicables al mundo real. Este modelo permite formar un buen ajuste de fenómenos poco observables y, además, tiene en cuentas los errores de medida, indicadores de múltiples variables y comparaciones multigrupos de estas variables. Además nosotros usamos los directivos o "CEOs" de la compañía porque ellos están familiarizados con casi todos los temas sobre los que se les preguntan, ya que por su experiencia en el trabajo pueden informarnos sobre las diferentes cuestiones planteadas.

Con ello, pretendemos verificar empíricamente que hay una relación positiva entre cada una de las etapas del proceso de gestión del conocimiento y que estos procesos no son independientes. Además, pretendemos analizar si el apoyo de la alta dirección a través de las tecnologías de la comunicación e información es necesario para los procesos de gestión del conocimiento. El valor u originalidad es este artículo radica en que la literatura ha estudiado los procesos de gestión del conocimiento de forma independiente o en conjunto, sin embargo, aquí lo hacemos centrándonos en la relación directa entre ellos, en relación con el apoyo de la alta dirección y la implicación con el desempeño.

En el capítulo tercero, estudiaremos la capacidad de absorción, tanto potencial como realizada, relacionada con variables tecnológicas y las políticas de flexibilidad laboral interna. Para ello, elaboramos un cuestionario y planteamos unas hipótesis que han sido probadas empíricamente basándonos en los datos recogidos de 160 CEOs de empresas tecnológicas europeas, utilizando un análisis de ecuaciones estructurales, cuyos resultados muestran que el apoyo a la tecnología y la mejora de las capacidades tecnológicas y las competencias distintivas tecnológicas promueven la mejora en el desempeño organizativo a través de su influencia positiva en los procesos de capacidad de absorción potencial y capacidad de absorción realizada. Además, la inversión en las políticas y estrategias que ayuda a promover la capacidad de absorción realizada aumenta la flexibilidad laboral interna y la innovación como mecanismos para mejorar el desempeño de la organización.

El capítulo cuarto, permite profundizar en la literatura sobre espíritu emprendedor y cómo se ve influida por variables tecnológicas, el entorno, los grupos de interés y la capacidad de absorber conocimiento externo a la empresa en organizaciones de base

tecnológica. En este caso, la metodología empleada ha sido regresiones lineales jerárquicas. La temática en este cuarto capítulo versa sobre la influencia que tienen las variables anteriormente indicadas en el desarrollo de iniciativas empresariales de forma que provoque una renovación de la actividad, el desarrollo de nuevos negocios o nuevas áreas tecnológicas. Al igual que en el caso del capítulo anterior, la originalidad de este capítulo yace en el uso de la variables tecnológicas utilizadas de forma distinta que en capítulos anteriores, junto con las factores del entorno, los grupos de interés y del conocimiento para generar un mayor espíritu emprendedor corporativo. Aspectos estudiados por muy pocos investigadores (Omerzel y Antoncic, 2008).

Finalmente, el capítulo quinto, analiza las principales conclusiones e implicaciones que todas estas hipótesis planteadas pueden conllevar. Asimismo también exponen las principales limitaciones de los estudios y las futuras líneas de investigación que se desprenden de esta temática.

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Capítulo II

THE INFLUENCE OF TOP MANAGEMENT SUPPORT ON ORGANISATIONAL PERFORMANCE THROUGH KNOWLEDGE ACQUISITION, TRANSFER AND UTILISATION

THE INFLUENCE OF TOP MANAGEMENT SUPPORT ON ORGANISATIONAL PERFORMANCE THROUGH KNOWLEDGE ACQUISITION, TRANSFER, AND UTILISATION

ABSTRACT

This research analyses how top management support for information and communication technologies influences organisational performance through the three stages of knowledge management (knowledge acquisition, transfer, and utilisation) and the relationship between these stages of knowledge management. The theoretical model is tested using data collected from March to May 2010 from 201 CEOs in Spanish technology organisations. The results indicate that top management support for information and communication technologies fosters improvement in organisational performance through its positive influence on the interrelated stages of knowledge acquisition, transfer, and utilisation. CEOs should thus support the information and communication technologies necessary to improve all of the interrelated stages of knowledge management as a mechanism for achieving better organisational performance. Various strategic actions (e.g., fostering collaboration among the firm's personnel, developing an organisational culture based on continuous learning, creating organisational routines) should also be stimulated within the organisation to intensify the interrelation between these stages of acquisition, transfer, and utilisation of knowledge.

Keywords: Top management support, information and communication technology, knowledge acquisition, knowledge transfer, knowledge utilisation, organisational performance.

2.1. Introduction

Knowledge management is a strategic factor for the creation of organisational value and the obtaining of sustainable competitive advantage (Camison & Fores, 2010). As an asset, knowledge has meaning in itself and supports organisational decision-making and action. It is fundamental to managing a company's business performance and continuous innovations (Carlucci et al., 2004; Mouritsen et al., 2002). We will focus here on knowledge as a strategic asset (an objective, cognitive, and rational view of knowledge) that can be acquired, transferred, and used (Carlucci et al., 2004). Improvement in the organisation's performance depends increasingly on the capacity to manage knowledge flows efficiently (Lee & Sukoco, 2007). Knowledge management consists of "the process of continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities" (Quintas et al., 1997, p. 387). It "locates knowledge and manages the dissemination and use of knowledge" (Darrow, 2003). Knowledge management "enables [the organisation] to create, exploit, renew and apply knowledge flows in new ways to create the essential competences for improvement of organizational performance" (Garcia et al., 2008, p. 299). It permits "the identification, optimisation, and active management of intellectual assets to create value, increase productivity and gain and sustain competitive advantage" (Webb, 1998, p. 37).

The essential stages of knowledge management are *acquisition*, *transfer*, and *utilisation* of knowledge (Alavi & Leidner, 2001; Darrow, 2003, 2005; Holzner & Marx, 1979; Pentland, 1995), and they may be defined as follows. *Knowledge acquisition* is the initial stage of knowledge management. It involves the "processes oriented toward obtaining knowledge" (Hou & Chien, 2010, p. 98), that is, all activities related to the search for, identification of, and access to new knowledge relevant to the firm (Alavi & Leidner, 2001). The principal mechanisms for acquiring knowledge include hiring technical personnel, formal and informal collaboration, strategic alliances, and benchmarking (Davenport & Probst, 2002). *Knowledge transfer* is the process through which one unit (e.g., group, department, or division) is affected by the experience of another" (Argote & Ingram, 2000, p. 151). Knowledge is transferred from the sender(s) (person, group, team, or organisation) to the recipient(s) (person, group, team, or organisation) (Albino et al., 2001), fostering the spread of know-how generated in one subunit to other parts of the organisation. It makes coordination of work faster

and more precise by connecting multiple units that may be dispersed geographically, facilitates the coordination of work flows among subunits, and permits economies of scale (Schulz & Jobe, 2001). Knowledge transfer requires a good communication structure, the involvement of the organisation's personnel, and the socialisation of knowledge (Argote & Ingram, 2000; Nonaka & Takeuchi, 1995). *Knowledge utilisation* is the application of the knowledge transferred among the different entities of the organisation to the receptor unit (Szulanski, 2000). It involves the different processes oriented to the actual use of the knowledge after its transfer (Gold et al., 2001). Utilising knowledge permits members of the organisation to discount outdated knowledge, activate knowledge transfer, and incorporate knowledge in the organisation's products and services, generating greater added value for them (Bhatt, 2001). While having a good stock of knowledge is important, the differences between organisations' performance lies less in the knowledge that they have than in the application of this knowledge, that is, in the transformation of knowledge into action (Pfeffer & Sutton, 1999).

Organisations are employing different Information and Communication Technologies (ICTs) to foster knowledge acquisition, transfer, and utilisation. Among these ICTs are artificial intelligence, expert systems, database technology, knowledge-based systems, data mining, knowledge management frameworks, and modelling (e.g., Bose & Sugumaran, 2003; Liao, 2003; Schultze & Boland, 2000). ICTs have been shown to assist in the process of knowledge management in organisations (Dougherty, 1992; Venters, 2010) and have great potential to aid in collaboration and cooperation between people. They should therefore be supported by the organisation's top management (Egbu & Botterill, 2002), that is, by the highest ranking executives responsible for the entire organisation (e.g., chief executive officer, president, chairman/chairwoman). Although numerous actors may be involved in the knowledge management process, top management is ultimately responsible for plotting the organisation's direction and plans, as well as for guiding the actions carried out to achieve good management of the knowledge (Westphal & Fredickson, 2001).

Top Management Support for ICTs (TMS) may be defined as "the importance that top management executives place on technology [ICTs]" (Byrd & Davidson, 2003, p. 246). TMS involves economic investment in acquiring new ICTs, as well as greater involvement in the learning of these ICTs (Bolivar et al., 2012; Martin et al., 2011).

TMS enables the organisation to access, transmit, and use knowledge (Carlsson & El Sawy, 2008; Lin, 2007; Martin et al., 2011) by nurturing an environment more favourable to the acceptance and use of ICTs. TMS also provides the appropriate funds and resources, encourages teams, and fosters cross-functional cooperation and communication in the use of ICTs (Garcia Rodriguez et al., 2008).

Research to date has analysed how different general factors affect the stages of knowledge management and how the stages of knowledge management affect organisational performance (e.g., Dröge et al., 2003; Tsang et al., 2004). Studies of factors affecting knowledge management have examined motivation, personal commitment, systems of rewards and incentives (Argote et al., 1990), communication and interaction between people in the firm (Nonaka & Takeuchi, 1995), and the existence of a culture of collaboration and teamwork (Walczak, 2005), as well as different factors specifically related to technology, such as technological innovation (e.g., Scheel, 2002; Wang, 2005) or technological competences (e.g., Gordon & Tarafdar, 2007; Savory, 2006). Little attention has been paid, however, to the influence of TMS on organisational performance through the different stages of knowledge management (e.g., Bolivar et al., 2012; Martin et al., 2011; Salazar et al., 2003).

This investigation deepens theoretical and empirical knowledge of the influence of TMS on organisational performance through the different stages of knowledge management (knowledge acquisition, transfer, and utilisation), while also examining the relationship between these stages of knowledge management. Our investigation draws on this context to propose an integrated model of the interaction and relationships among the constructs mentioned above within the framework of technology organisations. Technology organisations are firms that have a strong orientation to R&D, innovativeness, and entrepreneurship and that maintain a special pattern of work relations (a corporate culture of technology). These elements shape shared values, beliefs, and symbols, as well as the way things are done in the firm. We chose technology firms because of their current importance in modern economies, due to their contribution to economic growth, increase in productivity and creation of new, innovative industries, products and processes (Grinstein & Goldman, 2006). We also chose technology organisations because of the special importance of good knowledge management and the use of ICTs in them (Bolivar et al., 2012; Hine et al., 2007; Liyanage & Barnard, 2002; Martin et al., 2011; Salazar et al., 2003).

To achieve the objectives stated above, the investigation is structured as follows. The next section, Section 2, develops a foundation of prior research from which to propose a series of hypotheses. Section 3 presents the data and the research methodology used in the empirical analysis. Section 4 shows the results obtained. Finally, we present the discussion and implications of the research and the conclusion, limitations, and future research directions.

2.2. Hypotheses

2.2.1. The influence of top management support on knowledge acquisition, knowledge transfer and knowledge utilisation

The top management support for ICTs is strategic in organisations, as it helps to achieve the acquisition, transfer, and utilisation of knowledge. It improves organisational knowledge acquisition, fosters knowledge exchange, and contributes to solving problems (Davenport & Probst, 2002; Reilly et al., 2003). Such support for ICTs from the organisation's top management promotes access to knowledge and its storage, retrieval, transfer, processing, and use among the organisation's members. These activities provide both the foundation for creating networks of knowledge available in the organisation and the knowledge necessary for decision making (Alavi & Leidner, 2001; Nambisan, 2003). TMS thus encourages processes of knowledge management (Huysman & Wulf, 2006; Lin & Lee, 2004).

If we focus specifically on the process of knowledge acquisition, TMS makes it easier to identify the knowledge acquired and stored, independently of the physical or geographical location of the person wishing to access it (Perez & Dressler, 2007). TMS permits the firm to explore and analyse its environment, acquire external knowledge from various members who participate in the value chain (e.g., customers, consumers, partners), and integrate this knowledge into the organisation's existing knowledge (Carlsson, 2004). Supporting the use of applications such as information retrieval engines enables members to find and recover data, texts, and other information, encouraging the process of acquiring and locating the knowledge needed at each moment (Tyndale, 2002). Knowledge portals—entry points to knowledge available primarily via the Web (Carlsson, 2004; Mack et al., 2001; Tsui, 2003)—provide access to internal and external knowledge. Similarly, intellectual capital management systems,

wikis, or blogs foster the organisation's acquisition of knowledge (McDavid et al., 2006).

By encouraging the process of knowledge acquisition through which employees can determine the level of knowledge available, management support for ICTs facilitates efficient access to acquire the knowledge needed to face new competitive challenges. TMS for ICTs helps firms to understand users' needs and preferences and to identify the tendencies and patterns of change in the taste and market behaviour. Acquiring the necessary knowledge enables the firm to react faster and more effectively to changes in the environment (Maswera et al., 2008, 2009). Further, the support of the top management for ICTs such as social networks permits the organisation's personnel to increase their capacity for interaction, location of resources, and communication, fostering a creative, participatory culture open to the environment and the acquisition of knowledge (Argote et al., 1990; McAfee, 2006). Based on the foregoing, we propose the following hypothesis:

H1: *Top management support will be positively related to knowledge acquisition*.

Organisations whose managers support ICTs also tend to transfer knowledge more effectively. Tools such as data warehouses, multimedia systems, simulation software, knowledge portals, workflow, intranets, and forums encourage interaction and communication among the organisation's members, stimulating a culture of learning and support for the transfer of knowledge and ideas (Alavi & Leidner, 2001; Benavides & Quintana, 2005). TMS for ICTs thus enables members to reduce the time and the physical and social barriers that impede knowledge exchange and transfer among members of the organisation (Hendriks, 1999, 2001; Ruggles, 1998).

TMS also facilitates simultaneous and structured access to knowledge needed at the right time by different users (multi-user) as often as necessary (multi-occasion), as well as the transfer of knowledge in multiple formats in real or recorded time at a low cost (Perez & Dressler, 2007). It permits the organisation to overcome barriers associated with time zones and languages and reduces the cost of long-distance communication (Bayar, 1998). TMS thus permits the firm to counteract the physical barriers that prevent it from identifying the location of knowledge within and outside the organisation (e.g., customers, providers, competition), to access this knowledge independently of its location, and to transfer it to the organisation's members (Hendriks,

1999, 2001; Perez & Dressler, 2007). For example, in virtual meetings, managers can promote the use of ICTs as a mechanism to add and transfer knowledge on the topic or suggest new knowledge and insights to solve problems in the organisation (Hendriks, 1999). In addition, managerial support for social networking ICTs, such as social networks or forums, makes it easier to overcome social barriers by fostering a culture of knowledge transfer and making this process of knowledge transfer more dynamic (Perez & Dressler, 2007). For all of the above reasons, TMS not only fosters links between geographically dispersed people but also increases the frequency, volume, and efficacy of knowledge transfer.

Finally, TMS also fosters the transfer of both explicit and tacit knowledge (Roberts, 2000). Explicit knowledge is easier to transfer than tacit knowledge because, among other reasons, it has been articulated, codified and structured. Tacit knowledge is more strategic for the organisation but presents greater difficulty because it involves individual personal beliefs and experiences (Nonaka & Takeuchi, 1995). Support from management for ICTs such as videoconferencing and virtual project rooms provides the face-to-face contact that is often a prerequisite for the successful transfer of tacit knowledge (Roberts, 2000). Based on the foregoing, we propose the following hypothesis:

H2: *Top management support will be positively related to knowledge transfer.*

TMS promotes effective application of the knowledge acquired and transferred (Ng & Li, 2003). It encourages both the conversion of tacit knowledge into explicit and the development of organisational routines to use the knowledge acquired and transferred more efficiently (Alavi & Leidner, 2001; Badamas, 2009; Grant, 1996a). In fact, lack of TMS is one of the primary barriers to effective knowledge utilisation (Storck & Hill, 2000).

Managerial support for using ICTs in knowledge utilisation processes has multiple advantages. Such advantages may take the form of greater creativity, greater flexibility in time and space to develop strategic actions for the firm, or the existence of more fluid exchange of knowledge between the different members of the organisation (Ferro et al., 2009). TMS will also enable faster access to the knowledge to be used, reducing the amount of obsolescent knowledge and allowing more efficient use of the different

knowledge sources available through technological networks or applications (Lara & Duart, 2005; Ng & Li, 2003).

Further, TMS for activities such as e-commerce or customer relations management through the use of ICTs (e.g., Internet, social networks, information and communications systems) promotes the use of knowledge from new perspectives not possible a few years ago (Badamas, 2009; Shen et al., 2012). This support makes it easier for the organisation 1) to determine the products and services that each customer wants, as well as customer preferences, complaints, and tastes; 2) to establish systems with personalised content; and 3) to use this knowledge to develop products and services to meet customers' needs (Perez & Dressler, 2007). TMS thus makes easier to capture customer preferences continuously and apply this knowledge to create value for the organisation (Hollenstein, 2004). Based on the foregoing, we advance the following hypothesis:

H3: *Top management support will be positively related to knowledge utilisation.*

2.2.2. The influence of knowledge acquisition on knowledge transfer

Knowledge acquisition, transfer, and utilisation are interdependent and simultaneous processes of knowledge management developed by individuals, groups, and the organisation in general. Although these processes are highly interconnected, previous research recommends analysing the relationship between the acquisition and transfer of knowledge and between the transfer and use of knowledge (Alavi & Leidner, 2001). We focus first on the relationship between acquisition and transfer of knowledge.

Organisations invest in acquiring knowledge through different activities and practices, such as hiring personnel or new engineers, reassigning workers in the firm, and ensuring that personnel participate in continuing education programs or attend professional conferences (Biskup & Simons, 2004; Huang et al., 2010). These practices encourage the acquisition of knowledge but also enhance the process of knowledge exchange due to the interrelation between acquisition and transfer of knowledge. The greater the knowledge acquired and the effort of acquisition, the greater the transfer of knowledge achieved (Darr et al., 1995).

Just as the benefits derived from the acquisition of knowledge at a given time depend on the prior level of knowledge of personnel or equipment, the effectiveness of the transfer of knowledge at a given time also depends on the levels of knowledge acquired

by both sender and receiver (Darr et al., 1995; Epple et al., 1996). For example, a team for the design of processes that has acquired a high level of knowledge can transfer more knowledge to the team designing the product. Likewise, the product design team is more willing to receive knowledge from a process design team if it perceives that this team has acquired a high level of knowledge (Jacobs, 2006). Different empirical studies show that the efficacy of the knowledge transfer is related to the degree of effort invested, as well as the levels of knowledge acquired by the personnel or teams who participate in the transfer (Argote & Ingram, 2000; Cummings & Teng, 2003; Michailova & Sidorova, 2011). Based on the foregoing, we propose the following hypothesis:

H4: *Knowledge acquisition will be positively related to knowledge transfer.*

2.2.3. The influence of knowledge transfer on knowledge utilisation

Knowledge transfer and knowledge utilisation are closely related, with knowledge transfer generally producing a positive effect on knowledge utilisation (Alavi & Leidner, 2001; Szulanski, 1996). However, certain barriers can inhibit the utilisation of the knowledge transferred by interfering in the communication between employees, blocking the use of knowledge (Szulanski, 1996). Communication problems may reduce the motivation to transfer and use knowledge or prevent the development of knowledge transfer and utilisation capacity among the organisation's personnel (Cohen & Levinthal, 1994; Szulanski, 1996). These barriers may prevent the organisation from obtaining the desired results from its investment in technological mechanisms and applications for knowledge transfer. They may also cause the organisation's employees not to support the transfer and use of knowledge because they do not consider these activities useful or because they do not have the capability to determine the positive effect of transfer and utilisation (Damodaran & Olphert, 2000).

The organisation can use various ICT tools to counteract the barriers that impede the utilisation of knowledge transferred. One tool is the learning map, which enables the description and interpretation of corporate-level plans, transferring these plans as objects and activities that present the ideas to be applied by the organisation more clearly. Tools such as Lotus Development Notes and NetMeeting also permit more efficient transfer and use of organisational knowledge (Ordoñez, 2001).

Simply installing a tool like Notes does not mean that the organisation's members will start to use it and to share and use knowledge. The organisation can, however, foster use of these tools through various organisational strategies (e.g., rewards, evaluation of performance). For this reason, firms promote policies like that of Buckman Laboratories, which distinguishes the 100 employees who achieve the best transfer and use of knowledge each year. Similarly, firms like ABB evaluate their managers based not only on the results of their decisions but also on the knowledge applied in the decision-making process (Roussel et al., 1991).

In addition, different strategic factors such as motivation, reliability, and trust (Szulanski, 1996); the receiver's absorption capacity (Cohen & Levinthal, 1994); and preparation and training (Kogut & Zander, 1993; Ridding & Catterall, 1998) encourage more effective and efficient utilisation of the knowledge transferred (Szulanski, 1996). Merely acquiring and transferring the knowledge to put a radio in a chip, for example, does not ensure that this knowledge will be used to produce a miniature radio. However, the organisation can help to promote such use by fostering preparation and knowledge of miniaturisation, of the design of microprocessors, and of materials and ultra-fine precision bodies (Prahalad & Hamel, 1990). Based on the foregoing, we propose the following hypothesis:

H5: *Knowledge transfer will be positively related to knowledge utilisation.*

2.2.4. The influence of knowledge acquisition, knowledge transfer, and knowledge utilisation on organisational performance

The resource-based theory argues that firms that possess valuable and rare resources and assets can achieve competitive advantage and superior long-term performance. This advantage can be sustained over longer time periods if the firm is able to protect itself against imitation, transfer, and substitution of these resources (Barney, 1991; Galunic & Rodan, 1998). Among such resources and assets, knowledge is crucial for achieving competitive advantage and improving organisational performance (Teece et al., 1997). To improve organisational performance, it is important that knowledge be managed properly in all of its stages (acquisition, transfer, and utilisation) (Nonaka & Takeuchi, 1995), because these stages are interrelated, such that a benefit in one of the stages leads to improvement in the others and thus also in organisational performance (Lee & Yang, 2000).

Various studies that focus specifically on the process of knowledge acquisition demonstrate a positive relation between knowledge acquisition and organisational performance (Inkpen, 1998; Inkpen & Beamish, 1997). Lyles and Salk (1996) show how the process of knowledge acquisition and the characteristics through which knowledge acquisition is developed (active participation of the organisation's members, learning capacity, organisational structure, conflicts and differences between the members, etc.) help to promote the adaptation and creation of competitive advantages, increasing organisational performance. Likewise, in their analysis of 135 Hungarian multinational firms, Steensma and Lyles (2000) indicate that knowledge acquisition has a significant and positive impact on the firm's overall performance through its improvement of employees' competences. Knowledge acquisition not only helps to provide a vision of new business transactions, development of new products, and improvement in different forms of production but also influences the development of new systems and structures that improve organisational performance (Si & Bruton, 2005). Based on the foregoing, we propose the following hypothesis:

H6: *Knowledge acquisition will be positively related to organisational performance.*

A variety of research argues for a positive relationship between knowledge transfer and organisational performance (e.g., Bresman et al., 1999; Davenport & Prusak, 2000). Knowledge transfer among the organisation's members favours the implementation of more flexible production processes, reduces the likelihood of repeating errors (contributing to reducing the firm's overall costs), and improves organisational performance (Alavi, 2000; Puck et al., 2006). Knowledge transfer among the organisation's members also stimulates innovation, mutual learning, and cooperation and coordination, increasing organisational performance (Grant, 1996a; Nonaka et al., 2000; Tsai, 2001). The existence of a greater knowledge base due to the transfer of knowledge makes that the firm's activities more difficult to imitate, increasing its chances of obtaining a competitive advantage (Schulz & Jobe, 2001).

Knowledge transfer among organisational units also enables the connection and coordination of different units that are geographically distant and separated from each other, improving organisational performance (Argote et al., 1990; Baum & Ingram, 1998). O'Dell and Grayson (1998) demonstrate these benefits in their analysis of the effects of the transfer of knowledge among the units of the firm Texas Instruments. This

organisation generated 150 million dollars in manufacturing capacity for silicon memory chips by transferring and sharing knowledge among its thirteen manufacturing plants. Similarly, in the Chevron network, 100 people who transferred knowledge about managing energy use generated an initial savings of 150 million dollars for the organisation.

In short, knowledge transfer influences organisational performance positively by enabling the replacement of inefficient practices with other practices that have demonstrated greater efficiency, replicating best practices throughout the organisation, and identifying and exploiting economies of scale and scope related to knowledge (Schulz & Jobe, 2001; Szulanski, 1996). Based on the foregoing, we propose the following hypothesis:

H7: *Knowledge transfer will be positively related to organisational performance.*

The utilisation of knowledge acquired and transferred is crucial for survival, success, and performance of the organisation (Grant, 1996a; Spender, 1994). A large part of the benefits firms obtain comes from utilisation of this knowledge (Liebeskind, 1996). Knowledge utilisation produces lower costs and higher profit margins for the firm (Nonaka, 1994). Thus, the organisations that generate new knowledge at a lower cost and faster than competitors by using this knowledge effectively and efficiently possess a dynamic capability that allows them to improve their organisational performance (Cohen & Levinthal, 1994; Dröge et al., 2003; Zahra & George, 2002). Organisations that use available knowledge and incorporate it into their production processes are better able to exploit existing opportunities in the market, improving their processes, products, and organisational performance (Jantunen, 2005). In today's turbulent and uncertain markets, not using the knowledge transferred will make it harder to create market value and obtain competitive organisational advantage (Teece, 1998; Wiig, 1997).

Different studies have demonstrated this positive relation between knowledge utilisation and organisational performance. Sarin and McDermott (2003) show that fostering organisational learning enables members and teams in the organisation to apply the knowledge acquired and transferred to develop new products and improve the organisational performance. Claycomb et al. (2002) indicate that the use of knowledge promotes improvement in entrepreneurial and organisational performance. Gold et al. (2001) demonstrate a positive relationship between the use of knowledge and the firm's

efficacy. Along similar lines, Siekman (2002) analyses how the use of the knowledge acquired and transferred in the product supply chain leads to more efficient processes and lower cost of the design and its manufacture, as well as a decrease in the time between the process launch and first delivery of the product to the customers. Other authors show that the use of knowledge previously acquired, classified, ordered, and codified allows the organisation to reduce costs, not only in monetary terms but also in terms of time, achieving a faster competitive response to changes in the market (Haas & Hansen, 2005; Yan & Zhang, 2003). Based on the foregoing, we propose the following hypothesis:

H8: *Knowledge utilisation will be positively related to organisational performance.*

2.3. Research methodology

This section presents the research methodology used in this study. We first describe the sample used and then discuss how each of the variables included in the study is operationalised. Finally, we present the statistical analysis. We used structural equation modelling (SEM), a statistical technique for testing and estimating causal relations from a combination of statistical data and qualitative causal assumptions. SEM enables one to propose the type and direction of the relationships one expects to find among the various variables contained in the model in order then to estimate the parameters specified by the relationships proposed on the theoretical level. This technique has an advantage over other statistical methodologies in that the interdependence of the variables enables one to decompose the total direct effects into direct and indirect effects and to test for the goodness of fit of the model as a whole. Further, SEM is very useful in comparing alternative (competing) models, since it enables the use of latent variables and the consideration of measurement error which, with the variation in the values of the goodness of fit indices, can indicate the existence of improved alternative models (Hair et al., 2010). We chose SEM for its different advantages and because it is the technique used in almost all fields of study for investigations like the one performed in this paper.

2.3.1. Sample and procedure

The first step in an empirical study is selecting the population to be analysed. The population for this study consists of technology organisations in Spain. The sample was selected by means of stratified sampling with proportional allocation (size and

geographical location) from the database Dun & Bradstreet Spain. Choosing a sample of firms located in a relatively homogeneous geographical, cultural, legal, and political space enables us to minimise the impact of the variables that cannot be controlled in the empirical research (Adler, 1983; Hofstede, 1980). The Spanish market is relatively well developed and wholly integrated in the European Union. However, Spain is in a geographical area that has received relatively little attention from organisational researchers.

Drawing on our knowledge about the stages in the knowledge management process (acquisition, transfer, and utilisation) and TMS, previous contacts with interested managers and scholars, and new interviews with managers and academics interested in these strategic variables, we developed a structured questionnaire to perform this investigation. We then established a reliable list of the CEOs of the organisations, with the help of partial funding from the Spanish Ministry of Science and Research and the Council for Economics, Innovation and Science of the Andalusian Regional Government. We omitted the responses of the interviewees in this first stage from the subsequent analysis of the survey data.

We decided to use CEOs as our key informants, since they receive information from a wide range of departments and are therefore a very valuable source for evaluating the different variables of the organisation. They also play a major role in informing and moulding the variables under study by determining the types of behaviour that are expected and supported (Baer & Frese, 2003). The same types of informant were chosen, since this means that the level of influence among the organisations is constant, increasing the validity of the variables' measurements (Glick, 1985).

Surveys were mailed to the 900 selected organisations along with a cover letter in March 2010. We used this method because it enabled us to reach a greater number of organisations at a lower cost, to exert less pressure for immediate reply, and to provide the interviewees with a greater sense of autonomy. The cover letter explained the goal of the study and offered recipients the option of receiving the results once the study was completed. To reduce possible desirability bias, we promised to keep all individual responses completely confidential and confirmed that our analysis would be restricted to an aggregate level that would prevent the identification of any organisation. We told respondents that they would soon receive the questionnaire and reiterated the necessity that the person chosen answer it, even at the cost of receiving fewer responses.

We mailed each manager who had not yet responded two reminders. The questionnaires were received during the months of March, April, and May 2010. The respondents were given the option of contacting us with queries, suggestions or recommendations. 244 valid questionnaires were returned, but because of missing values only 201 questionnaires were included in the research. The response rate was 22.33% (Table 1). We checked for the possibility of non-response bias by comparing the characteristics of the responding businesses with the non-responding businesses. Our analysis indicated that respondents did not differ significantly from non-respondents with respect to return on assets, return on equity, return on sales, or number of employees. Nor did we find significant differences between early and late respondents (Armstrong & Overton, 1977). Likewise, a series of chi-square and t-tests revealed no significant differences due to geographical location or size in the variables studied. Since all measures were collected with the same survey instrument, the possibility of common method bias was tested using Harman's one-factor test (see Konrad & Linnehan, 1995; Scott & Bruce, 1994). A principal components factor analysis of the questionnaire measurement items yielded five factors with eigenvalues greater than 1.0, which accounted for 69% of the total variance. Since several factors, not just one single factor, were identified and since the first factor did not account for the majority of the variance, a substantial amount of common method variance does not appear to be present (Podsakoff & Organ, 1986).

Table 1
Technical details of the research

Sectors	High-tech services and high-tech manufacturing
Geographical location	Spain
Methodology	Structured questionnaire
Procedure	Stratified sample with proportional allocation (size)
Universe of population	50,000 firms
Sample (response) size	900 (201) firms
Sample error	3.3%
Confidence level	95 %, p-q=0.50; Z=1.96
Period of data collection	From March 2010 to May 2010

2.3.2. Measures

The use of constructs has played an important role in designing survey instruments in management research. In any research concerning behavioural elements, no device using a single metric unit can measure precisely, and researchers usually employ two or more measures to gauge a construct or scale. Given that developing new constructs or

scales of measurement is a complex task, wherever possible we used pre-tested constructs from past empirical studies to ensure their validity and reliability.

Top management support. Various studies have measured TMS. Due to the fact that there is a closer link with our research, that they reflect the different prior trends well, and that the scale's validity was verified in detail, we used the scale developed by Byrd and Davidson (2003). These items were duly adapted to the present study (see Appendix). We developed a confirmatory factor analysis to validate the Likert-type 7-point scale (1 "*totally disagree*", 7 "*totally agree*") of four items (χ^2_2=8.28, Normed Fit Index [NFI]=.99, Non-Normed Fit Index [NNFI]=.97, Goodness of Fit Index [GFI]=.99, Comparative Fit Index [CFI]=.99, Incremental Fit Index [IFI]=.99) and showed that the scale was one-dimensional and had good validity and reliability (α=.874).

Knowledge acquisition. Based on work presented by Darrow (2003) and Yli-Renko et al. (2001), we developed a Likert-type 7-point scale (1 "*totally disagree*", 7 "*totally agree*") of eight items. We performed a confirmatory factor analysis to validate our scales, which required deletion of Items 1, 2, 5, and 6 (χ^2_2=6.07, NFI=.96, NNFI=.92, GFI=.99, CFI=.97, IFI=.98). The scale was one-dimensional. The procedure allowed us to choose four items (see Appendix) with high validity and reliability (α=.755).

Knowledge transfer. Due to the fact that there is a closer link with our research and that the scale's validity had been verified in detail, we used a Likert-type 7-point scale (1 "*never*", 7 "*to a great extent*") with four items from the scale developed by Cummings (2001) and Molina et al. (2007). These items were duly adapted to the present study (see Appendix). We developed a confirmatory factor analysis to validate our scales (χ^2_5=5.99, NFI=.98, NNFI=.99, GFI=.99, CFI=.99, IFI=.99) and showed that the scale was one-dimensional and had good validity and reliability (α=.838).

Knowledge utilisation. Based on work by Alavi and Leidner (2001) and Lee et al. (2005), we developed a Likert-type 7-point scale (1 *"totally disagree"*, 7 *"totally agree"*) of four items (see Appendix). Using a confirmatory factor analysis, we validated our scale (χ^2_2=17.27, NFI=.99, NNFI=.97, GFI=.99, CFI=.99, IFI=.99) and then verified the scale's one-dimensionality and its validity and reliability (α=.892).

Organisational performance. Having reviewed how performance is measured in different works of strategic research, we drew up a scale that included six items to measure organisational performance (see Appendix). The use of scales for evaluating

performance in comparison with the main competitors is one of the most widespread practices in recent studies (Douglas & Judge, 2001; Garcia et al., 2008; Vorhies et al., 1999). Various researchers have used managers' subjective perceptions to measure beneficial outcomes for firms. Others have preferred objective data, such as return on assets. The literature has established widely that there is a high correlation and concurrent validity between objective and subjective data on performance, which implies that both are valid when calculating a firm's performance (Homburg et al., 1999; Venkatraman & Ramanujan, 1986). We included questions involving both types of assessment in our interviews, but the managers were more open to offering their general views than to offering precise quantitative data. When possible, we calculated the correlation between objective and subjective data, and these were high and significant. We developed a confirmatory factor analysis to validate our scales (χ^2_9=21.94, NFI=.98, NNFI=.98, GFI=.99, CFI=.99, IFI=.99) and showed that the scale was one-dimensional and had high validity and reliability (α=.905). We used a Likert-type 7-point scale (1 "*Much worse than my competitors*," 7 "*Much better than my competitors*") to ask about the organisation's performance as compared with that of its most direct competitors.

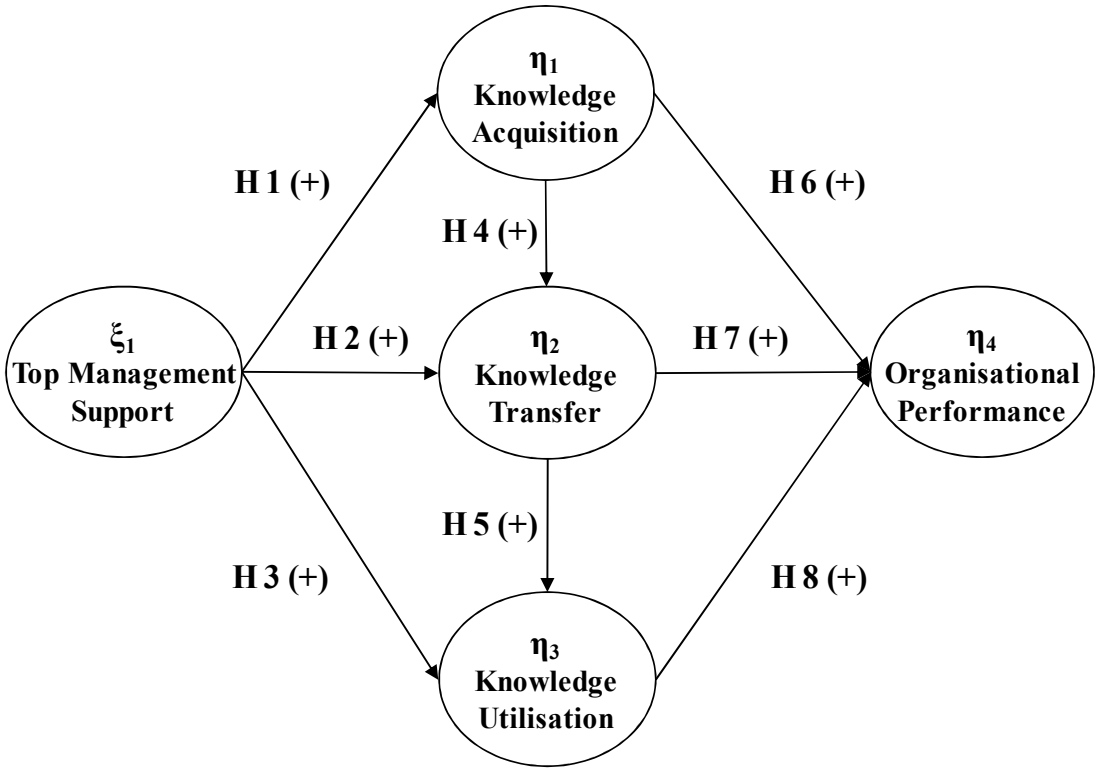

Fig. 1. Hypothesised model

2.3.3. Model and analysis

To estimate and contrast the structural equations model (SEM) proposed in this study, we developed different applications or programs, including EQS, AMOS, and LISREL. LISREL is the program used most often, and it is not uncommon to call these structural equations models LISREL models (Jöreskog et al., 2001). The LISREL 8.30 program was used to test the theoretical model in this research. Figure 1 shows the basis of the model proposed, together with the hypotheses to be contrasted. We used a recursive non-saturated model, taking TMS (ξ_1) as the exogenous latent variable, knowledge acquisition (η_1) as the first-grade endogenous latent variable, and knowledge transfer (η_2), knowledge utilisation (η_3), and organisational performance (η_4) as the second-grade endogenous latent variables. Through flexible interplay between theory and data, this structural equation model approach bridges theoretical and empirical knowledge for a better understanding of the real world. Such analysis allows for modelling based on both latent and manifest variables, a property well suited to the hypothesised model, where most of the represented constructs are abstractions of unobservable phenomena. Further, structural equation modelling takes into account errors in measurement, variables with multiple indicators, and multiple-group comparisons (Koufteros et al., 2009).

2.4. Results

In this section, we present the main research results. First, Table 2 shows the means and standard deviations as well as the inter-factor correlation matrix for the study variables. We observe significant and positive correlations among TMS, knowledge acquisition, knowledge transfer, knowledge utilisation, and organisational performance. A series of tests (e.g., tolerance, variance inflation factor) showed the non-presence of multicolinearity (Hair et al., 2010). Structural equation modelling was performed to estimate direct and indirect effects using LISREL with the correlation matrix as input (Bollen, 1989). This type of analysis has the advantage of correcting for unreliability of measures and also gives information on the direct and indirect paths between multiple constructs after controlling for potentially confounding variables. Figure 2 shows the standardised structural coefficients. The relative importance of the variables is reflected by the magnitude of the coefficients.

Table 2
Means, standard deviations and correlations

Variable	Mean	S.D.	1	2	3	4	5
1. Top Management Support	5.077	1.321	1.000				
2. Knowledge Acquisition	5.754	0.929	.468***	1.000			
3. Knowledge Transfer	4.926	1.170	.493***	.466***	1.000		
4. Knowledge Utilisation	4.684	1.350	.525***	.434***	.637***	1.000	
5. Organisational Performance	4.585	1.089	.319***	.233***	.326***	.311***	1.000

Note: *p<.05;**p<.01;***p<.001(two-tailed). n=201

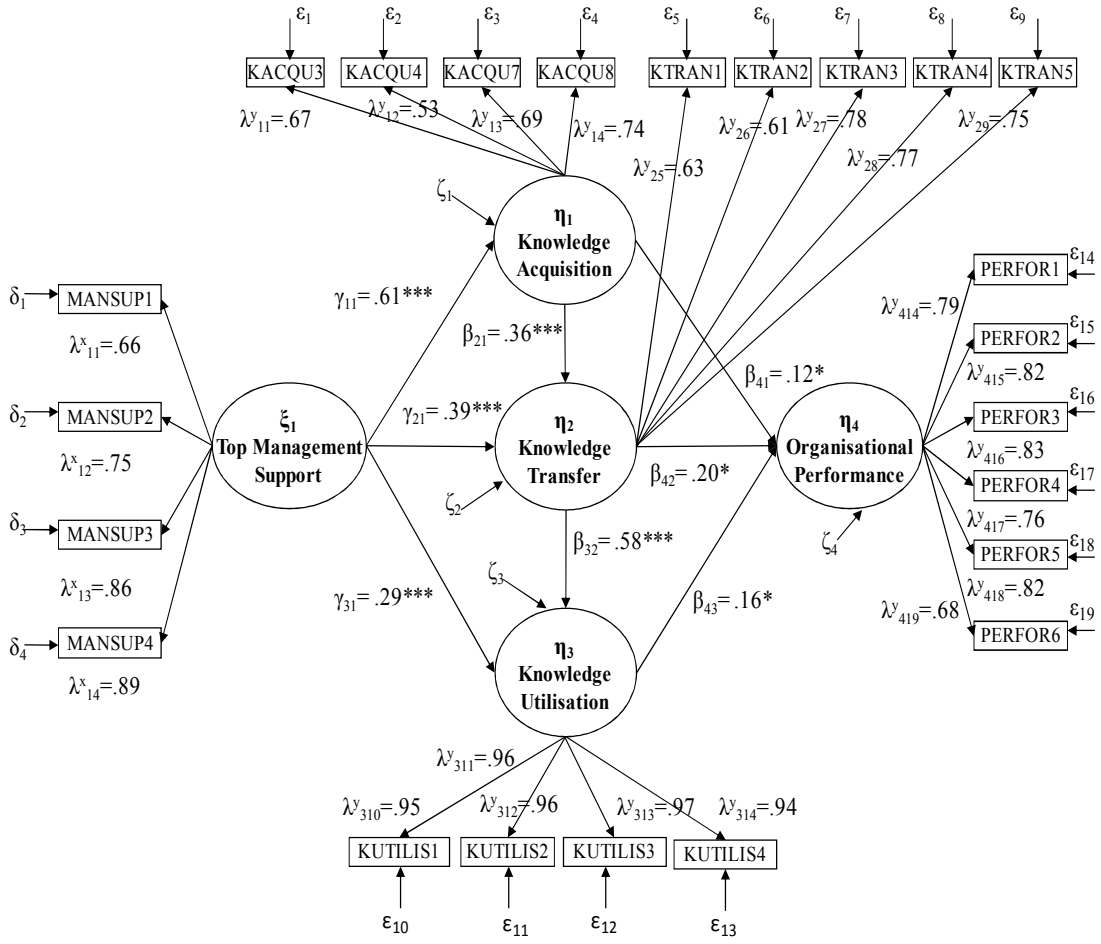

Fig. 2. Results of structural equation model

With respect to the quality of the measurement model for the sample, the constructs display satisfactory levels of reliability, as indicated by composite reliabilities ranging from 0.80 to 0.90 and shared variance coefficients ranging from 0.50 to 0.67 (Table 3). Convergent validity – the extent to which maximally different attempts to measure the same concept agree – can be judged by examining both the significance of the factor loadings and the shared variance. The amount of variance shared or captured by a construct should be greater than the amount of measurement error (shared variance

>0.50). All of the multi-item constructs meet this criterion, each loading (λ) being significantly related to its underlying factor (p>0.001) in support of convergent validity. Likewise, a series of chi-square difference tests on the factor correlations showed that discriminant validity – the degree to which one construct differs from others – is achieved among all constructs (Anderson & Gerbin, 1988). In particular, discriminant validity was established between each pair of latent variables by constraining the estimated correlation parameter between them to 1.0 and then performing a chi-square difference test on the values obtained for the constrained and unconstrained models (Anderson & Gerbin, 1988). The resulting significant differences in chi-square indicate that the constructs are not perfectly correlated and that discriminant validity is achieved.

Table 3
Validity, reliability and internal consistency

Variable	Item	Parameter	Validity, reliability and internal consistency		
			λ*	R^2	A. M.
Top Management Support	MANSUP1	λ^x_{11}	0.66***(f.p.)	0.54	α=0.874 C.R.=0.880 S.V.=0.652
	MANSUP2	λ^x_{12}	0.75***(15.26)	0.57	
	MANSUP3	λ^x_{13}	0.86***(15.84)	0.75	
	MANSUP4	λ^x_{14}	0.89***(15.71)	0.79	
Knowledge Acquisition	KACQU3	λ^y_{11}	0.67***(f.p.)	0.57	α=0.755 C.R.=0.800 S.V.=0.504
	KACQU4	λ^y_{12}	0.53***(12.15)	0.54	
	KACQU7	λ^y_{13}	0.69***(13.87)	0.56	
	KACQU8	λ^y_{14}	0.74***(14.30)	0.61	
Knowledge Transfer	KTRAN1	λ^y_{25}	0.63***(f.p.)	0.51	α=0.838 C.R.=0.851 S.V.=0.536
	KTRAN2	λ^y_{26}	0.61***(14.64)	0.53	
	KTRAN3	λ^y_{27}	0.78***(16.00)	0.61	
	KTRAN4	λ^y_{28}	0.77***(15.86)	0.60	
	KTRAN5	λ^y_{29}	0.75***(16.08)	0.56	
Knowledge Utilisation	KUTILIS1	λ^y_{310}	0.71***(f.p.)	0.50	α=0.892 C.R.=0.891 S.V.=0.674
	KUTILIS2	λ^y_{311}	0.91***(17.85)	0.82	
	KUTILIS3	λ^y_{312}	0.85***(17.72)	0.72	
	KUTILIS4	λ^y_{313}	0.81***(17.43)	0.65	
Organisational Performance	PERFOR1	λ^y_{414}	0.79***(f.p.)	0.62	α=0.905 C.R.=0.907 S.V.=0.621
	PERFOR2	λ^y_{415}	0.82***(15.16)	0.67	
	PERFOR3	λ^y_{416}	0.83***(15.11)	0.69	
	PERFOR4	λ^y_{417}	0.76***(14.61)	0.58	
	PERFOR5	λ^y_{418}	0.82***(15.19)	0.67	
	PERFOR6	λ^y_{419}	0.68***(14.37)	0.52	

Note: λ* = Standardised Structural Coefficient; R^2 = Reliability; α = Alpha Cronbach; C. R. = Compound Reliability; S. V. = Shared Variance; f. p. = fixed parameter; A. M. = Adjustment Measurement; *p < .05; ** p < .01; *** p < .001(two-tailed).

The overall fit measures, multiple squared correlation coefficients of the variables (R^2s), and signs and significance levels of the path coefficients all indicate that the model fits the data well (see Table 4), as they take values within the parameters recommended by the literature (e.g., Byrne, 1998; Hair et al., 2010; Hu & Bentler, 1995). All of the modification indices for the beta pathways between major variables were small, suggesting that adding additional paths would not significantly improve the fit. The residuals of the covariances were also small and centred on zero.

If we look at the standardised parameter estimates (Table 5), the findings show that TMS is closely related to and affects knowledge acquisition (γ_{11}=.61, p<.001, R^2=.37), as was predicted in Hypothesis 1. TMS is also closely related to and affects knowledge transfer (γ_{21}=.39, p<.001). Furthermore, we have shown an indirect effect of TMS on knowledge transfer (.22, p<.001) by knowledge acquisition (.61x.36; see, for instance, Bollen, 1989 for calculation rules). The global influence of TMS on knowledge transfer is thus 0.57 (p<.001), as predicted in Hypothesis 2. Comparing the magnitudes of these effects indicates that the effect of TMS on knowledge transfer is larger than that of knowledge acquisition on knowledge transfer. Globally, knowledge transfer is explained well by the model (R^2=.45).

Table 4
Goodness of Fit Statistics

	Measure	Optimal Values	Value in the Model
Goodness of Fit Statistics	Chi-Square, degrees of freedom (level of significance)	P>0.05 or P>0.01	χ^2_{222}=454.03 (P>0.01)
	Normed Chi-Square	1-3 Good Fit	χ^2_{normed}=2.04
	Goodness of Fit Index (GFI)	GFI 0.90-0.95 Acceptable >0.95 Good Fit	GFI=0.98
	Adjusted Goodness of Fit Index (AGFI)	AGFI 0.90-0.95 Acceptable >0.95 Good Fit	GFI=0.97
	Expected Cross-Validation Index (ECVI)	The Lowest (Used to Compare Models)	ECVI=2.81
	Akaike Information Criterion (AIC)	The Lowest (Used to Compare Models)	AIC=562.03
	Consistent Akaike Information Criterion (CAIC)	The Lowest (Used to Compare Models)	CAIC=794.41
	Normed Fit Index (NFI)	NFI 0.90-0.95 Acceptable >0.95 Good Fit	NFI=0.97
	Non-Normed Fit Index (NNFI)	NNFI 0.90-0.95 Acceptable >0.95 Good Fit	NNFI=0.99
	Incremental Fit Index (IFI)	IFI 0.90-0.95 Acceptable >0.95 Good Fit	IFI=0.99
	Parsimony Goodness of Fit Index (PGFI)	The Highest (Used to Compare Models)	PGFI=0.79
	Estimated Non-Centrality Parameter (NCP)	The Lowest (Used to Compare Models)	NCP=232.03
	Relative Fit Index (RFI)	RFI >0.90 Acceptable Values Next to 1	RFI=0.97
	Comparative Fit Index (CFI)	CFI 0.90-0.95 Acceptable >0.95 Good Fit	CFI=0.99
	Root Mean Square Error of Approximation (RMSEA)	<0.08 Acceptable	RMSEA=0.072

Knowledge utilisation is influenced by TMS (γ_{31}=.29, p<.001). We have also shown an indirect effect of TMS on knowledge utilisation (.35, p<.001) by knowledge transfer (.39x.58) and knowledge acquisition – knowledge transfer (.61x.36x.58). The global influence of TMS on knowledge utilisation is thus 0.64 (p<.001), as predicted in Hypothesis 3. Comparing the magnitudes of these effects indicates that the global effect of TMS on knowledge utilisation is larger than the effect of knowledge acquisition or

knowledge transfer on knowledge utilisation. Globally, human development practices are explained well by the model (R^2=.62).

Knowledge transfer is influenced by knowledge acquisition (β_{21}=.36, p<.001) and knowledge utilisation by knowledge transfer (β_{32}=.58, p<.001), supporting Hypotheses 4 and 5. Furthermore, we have shown an indirect effect of knowledge acquisition on knowledge utilisation (.21, p<.001) by knowledge transfer (.36x.58).

The results indicate that organisational performance is influenced by knowledge acquisition (β_{41}=.12, p<.05), knowledge transfer (β_{42}=.20, p<.05), and knowledge utilisation (β_{43}=.16, p<.05). Further, we have shown an indirect effect of knowledge acquisition on organisational performance (.11, p<.001) by knowledge transfer (.36x.20) and knowledge transfer – knowledge utilisation (.36x.58x.16), as well as an indirect effect of knowledge transfer on organisational performance (.09, p<.001) by knowledge utilisation (.58x.16). The global influence on organisational performance of knowledge acquisition (.23, p<.001), knowledge transfer (.29, p<.001), and knowledge utilisation (.16, p<.05) supports Hypotheses 6, 7, and 8. Organisational performance is also influenced indirectly by TMS (.30, p<.001) through knowledge acquisition (.61x.12), knowledge acquisition – knowledge transfer (.61x.36x.20), knowledge acquisition – knowledge transfer – knowledge utilisation (.61x.36x.58x.16), knowledge transfer (.39x.20), knowledge transfer – knowledge utilisation (.39x.58x.16), and knowledge utilisation (.29x.16). Comparing the magnitudes of these effects indicates that the total effect of TMS on organisational performance is larger than the effect of knowledge acquisition, knowledge transfer, or knowledge utilisation. Globally, organisational performance is explained well by the model (R^2=.17).

Table 5
Structural Model Result (Direct, Indirect and Total Effects)

Effect from		To	Direct Effects [a]	*t*	Indirect Effects [a]	*t*	Total Effects [a]	*t*
Top Management Support	→	Knowledge Acquisition	0.61***	10.57			0.61***	10.57
Top Management Support	→	Knowledge Transfer	0.39***	5.67	0.21***	5.25	0.57***	11.02
Top Management Support	→	Knowledge Utilisation	0.29***	4.66	0.35***	7.28	0.64***	11.90
Top Management Support	→	Organizational Performance			0.30***	11.14	0.30***	11.14
Knowledge Acquisition	→	Knowledge Transfer	0.36***	4.92			0.36***	4.92
Knowledge Acquisition	→	Knowledge Utilisation			0.21***	4.41	0.21***	4.41
Knowledge Acquisition	→	Organizational Performance	0.12*	2.38	0.11***	4.00	0.23***	4.93
Knowledge Transfer	→	Knowledge Utilisation	0.58***	7.96			0.58***	7.96
Knowledge Transfer	→	Organizational Performance	0.20*	2.36	0.09*	2.39	0.29***	4.80
Knowledge Utilisation	→	Organizational Performance	0.16*	2.33			0.16*	2.33
Goodness of Fit Statistics	χ^2_{222}=454.03 (P>0.01) GFI=0.98 AGFI=0.97 ECVI=2.81 AIC=562.03 CAIC=794.41 NFI=0.97 NNFI=0.99 IFI=0.99 PGFI=0.79 NCP=232.03 RFI=0.97 CFI=0.99 RMSEA=0.072							

Notes: [a] Standardised Structural Coefficients; $^{\dagger}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

In testing the theoretical framework, comparisons with reasonable alternative models are recommended as a means of showing that a hypothesised model is the best representation of the data (Bollen & Long, 1993). The research compares the direct model (direct relation of TMS and organisational performance) and the fully mediated model or theoretical model (relation between TMS and organisational performance through intermediate variables of knowledge acquisition, transfer, and utilisation). The results show that knowledge acquisition, transfer, and utilisation mediate the relationship between TMS and organisational performance. The summary statistic in Table 6 indicates that the theoretical model has better fit statistics than the direct model. In sum, the proposed theoretical model represents (Figure 2) the preferred, i.e. the most acceptable and parsimonious, model.

Table 6
Model Statistics against Theoretical Model

Model	Description Relations	χ^2	df	χ^2 / df	$\Delta\chi^2$	ECVI	AIC	NCP	CAIC	PGFI	RMSEA
Direct Model	TMS→Org. Perf. Know. Acq.→Know. Transf. Know. Transf.→Know. Ut. Know. Acq.→Org. Perf. Know. Transf.→Org. Perf. Know. Ut. →Org. Perf.	496.85	223	2.228	42.82	3.01	602.85	273.85	830.93	0.79	0.078
Completely Mediated Model (Theoretical Model)	TMS→Know. Acq. TMS→Know. Transf. TMS→Know. Ut. Know. Acq.→Know. Transf. Know. Transf.→Know. Ut. Know. Acq.→Org. Perf. Know. Transf.→Org. Perf. Know. Ut. →Org. Perf.	454.03	222	2.045		2.81	562.03	232.03	794.41	0.79	0.072

Notes: n=201

2.5. Discussion and implications

Technology, especially ICTs, encourage knowledge management, which is a strategic factor for organisational performance (Alavi & Leidner, 2001; Gatignon & Xuereb, 1997; Nonaka & Takeuchi, 1995). Top management is currently promoting the utilisation of ICTs and providing the resources and mechanisms for their implementation (Garcia Rodriguez et al., 2008). This study constructs a research model that responds to the need to analyse the influence of TMS on organisational performance through the different stages of knowledge management (Alavi & Leidner, 2001; Bolivar et al., 2012; Martin et al., 2011; Pentland, 1995), and the findings provide important implications for research and practice.

Our examination of the relationship between TMS and knowledge management processes reveals the existence of a positive and significant relationship between TMS and each process of knowledge acquisition, transfer, and utilisation in technology organisations. Management's support for using ICTs encourages the organisation's

members to contact each other more quickly and easily, exchanging and using the knowledge acquired and transferred (Davenport & Probst, 2002; Reilly et al., 2003). TMS thus encourages the specific processes of knowledge management (Huysman & Wulf, 2006; Lin & Lee, 2004; Nah et al., 2001).

Top management should encourage audits to analyse the problems, obstacles, and advantages of the ICTs in the organisation. Once the audit has been performed, managers should propose an improvement plan that focuses primarily on the strategic points that require revision (Scott, 1999). Given the importance of the role of TMS, top management should allocate resources and develop strategic policies to motivate the organisation's personnel to adopt ICTs as a mechanism for fostering the acquisition, transfer, and use of knowledge (Christensen & Walker, 2004). The firm should also establish training plans for members of the organisation to ensure that they know how to apply ICTs effectively (Storck & Hill, 2000). To achieve this, managers should attend to organisational learning policies that permit efficient application of ICTs and develop the necessary competences and abilities in the organisation's employees (Christensen & Walker, 2004; Scott, 1999; Storck & Hill, 2000). Good TMS will encourage a culture of learning to generate acquisition, transfer, and utilisation of information and knowledge (Scott, 1999).

The results showing the positive interrelation between knowledge management processes are also important. Knowledge management is a dynamic and continuous organisational phenomenon composed of the processes of knowledge acquisition, transfer, and utilisation. We find these processes to be interrelated amongst themselves (Alavi & Leidner, 2001), such that improvement in one specific stage has a positive influence on improvement in the others, as knowledge value chain theory suggests (Lee & Yang, 2000).

The existence of an organisational culture based on continuous learning fosters the acquisition of knowledge (Senge et al., 1994). A dynamic atmosphere grounded in collaboration and strategic learning encourages the stage of knowledge acquisition (Bhatt, 2001). The perception that the organisation's members have of top management's support for a culture of social interaction and learning is strategic for knowledge acquisition (Lin & Lee, 2004). The use of monetary incentives also stimulates the acquisition of knowledge, but these must be backed by management involved in the process of acquiring knowledge.

Creating a dynamic atmosphere of collaboration, trust, and learning also encourages knowledge transfer (Al-Alawi et al., 2007; Carmeli, 2005). Managers should foster less formalised and centralised organisational structures that stimulate the transfer of knowledge, as these structures encourage the integration of departments, units, and work groups, thereby improving trust and communication among their members (Oyefolahan & Dominic, 2010). The organisation also needs the development of policies for gathering and codifying knowledge to generate groups that share knowledge (Cook & Yanow, 1993; Ordoñez, 2001).

Finally, the existence of a set of rules, norms, procedures, and instructions to convert the tacit knowledge that specialists possess into explicit, integrated, codified knowledge for efficient communication to nonspecialists in the organization will facilitate the access and use of tacit knowledge (Alavi & Leidner, 2001; Grant, 1996a). Likewise the creation of organizational routines that develop ways to execute tasks, coordination patterns, and interaction protocols, as well as specifications for technological process that permit individuals to apply and integrate their specialized knowledge, or autonomous work teams, especially for matters of complex knowledge, promote the utilization of knowledge (Grant, 1996a).

If we turn to the stages of knowledge management taken as a whole and organisational performance, the findings also suggest that there are positive and significant relationships between the two. Although the literature contains numerous studies that suggest the positive impact of knowledge management on organisational performance or the achievement of competitive advantages (Grant, 1996a; Spender, 1994; Szulanski, 1996; Teece et al., 1997), few studies analyse the influence of the processes of knowledge management in disaggregated form on organisational performance. Managers should, however, take into account that the effect of these processes on organisational performance depends to a great extent on internal and external factors that facilitate or impede the processes of knowledge acquisition, transfer, and utilisation. These factors include experience, capacity for transfer and reception of information, absorption capacity, psychological or cultural distance, etc., factors that cannot always be controlled by the firm (Pedersen et al., 2003).

Finally, the analysis performed shows that technology organisations are facing a variable and uncertain environment that emphasises more than it has in the past the strategic labour of top management in identifying business opportunities and searching

for the best ICTs to promote the exploitation and success of the business opportunity detected (Thong et al., 1996). Top management's good choice and support of ICTs encourages improvement of the organisation's knowledge management processes and its achievement of competitive advantages (Scott, 1999). Poor choice of ICTs and lack of top management's support may lead to an unprofitable economic investment that will have a negative impact on the organisation's results (Thong et al., 1996).

2.6. Conclusions

Based on the findings of this study, it can be concluded that the acquisition, transfer, and utilisation of knowledge affect positively the relationship between TMS and organisational performance in technology organisations. The results suggest that, to improve organisational performance, top management should support the ICTs that enhance not only the acquisition of knowledge but also its subsequent transfer and use. The interrelation between these stages of knowledge permits TMS to create loops of positive synergy that enable increase in organisational performance. This study has extended our understanding of the stages of knowledge management as mediators in the relationship between TMS and organisational performance, and it is among the first to attempt an in-depth investigation of TMS and knowledge management processes in technology organisations. Our research also promotes the development of a collaborative scheme between academics and practitioners to generate an organisational strategy around the concepts of "knowledge acquisition," "knowledge transfer," "knowledge utilisation," and "TMS" and to enable the development of the processes, means, and mechanisms by which to transform these assets into sustainable competitive advantage.

Although this study is one of the few that examines the influence of the stages of knowledge management on the relationship between TMS and organisational performance, it has some limitations that may suggest further possibilities for empirical research. First, survey data based on self-reports may be subject to social desirability bias (Podsakoff & Organ, 1986). However, an assurance of anonymity can reduce such bias even when responses are related to sensitive topics (Konrad & Linnehan, 1995). The low risk of social desirability bias in this study was indicated by several managers who commented that it made no sense at all for their companies to go beyond regulatory compliance. Second, the absence of objective measures is a limitation. However, the external validation of these variables from the archival data of a subset of respondents

increased confidence in the self-reports and reduced the risk of common method variance (Sharma, 2000). Further, the possibility of common method bias was tested using Harman's one-factor test and other methods. We also used objective data and randomised the order of presentation of the survey items across the subjects. Common method bias does not appear to be present (Podsakoff & Organ, 1986; Konrad & Linnehan, 1995). Third, the cross-sectional nature of the research into a series of dynamic concepts allows us to analyse only a specific situation in time of the organisations studied, not their overall conduct through time. Our approach has reduced the magnitude of this problem, since dynamic characteristics and causal affirmations can be made if the relationships are based on theoretical rationales (Hair et al., 2010). For this reason, we began with a theoretical effort that would allow us to identify and check the formal existence of the different cause-effect relationships. Finally, the use of a single respondent may have influenced the accuracy of some measurements. Although measures were taken to reduce data inaccuracies, the use of multiple respondents would have been preferable. However, difficulties in obtaining sponsorship for research based on a multiple views for each firm, the value of CEOs' knowledge of their firms, and common practice in organisational research all supported the use of CEOs as respondents.

Our model analyses the direct and indirect relationships between TMS, knowledge acquisition, knowledge transfer, knowledge utilisation, and organisational performance. Further studies should consider other factors, such as organisational learning, information technology department technical quality, or integration of technology and business strategy (Byrd & Davidson, 2003; Senge et al., 1994). Future studies should be based on a larger sample, preferably in more than one country. It would also be interesting to study similar characteristics with information provided by lower levels of management and employees in the organisation. Similarly, future research should focus on longitudinal study, since longitudinal research can approach these variables with greater precision and study their determinants, processes, and results systematically. Such an approach allow us to analyse the evolution of the variables over time and to draw more reliable conclusions about their activity.

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Appendix

Questionnaire items

Top management support

1. Top management cultivates information and communication technology project champions.
2. Top management ensures adequate funding of information and communication technology research and development.
3. Top management restructures work processes to leverage opportunities for information and communication technology in the organisation.
4. Top management facilitates technology transfer throughout the organisation.

Knowledge acquisition

1. The organisation obtains and takes into account the knowledge about changes in the market place.
2. The organisation obtains and takes into account the knowledge provided by customers.
3. The organisation obtains and takes into account the valuable technical know-how that is useful for managing the firm.
4. The organisation actively observes and adopts best practices in our industry.

Knowledge transfer

1. Current objectives, responsibilities, or activities of the group or section.
2. Specific requirements of projects or orders, such as prediction of scales, market

studies, or customers' needs.

3. Written procedures and practical knowledge needed to initiate them (interpretations, classifications of terms, adaptation to the situation…).
4. Practices that have proven superior in their application.
5. Clear recommendation and guidelines for improving the performance of processes.

Knowledge utilisation

1. There are incentives and benefit policies for new ideas or suggestions for utilising existing knowledge.
2. There is a culture that encourages knowledge sharing.
3. The organisation encourages the utilisation and application of available knowledge that has been acquired and shared.
4. The organisation has mechanisms to ensure that the knowledge available that has been acquired and shared is used and applied.

Organisational performance

1. Organisational performance measured by return on assets (economic profitability or ROA).
2. Organisational performance measured by return on equity (financial profitability or ROE).
3. Organisational performance measured by return on sales (percentage of profits over billing volume).
4. Level of return on investments made by the firm.
5. Organisation's market share in its main products/services and markets.
6. Growth of sales in its main products/services and markets.

Capítulo III

INFLUENCE OF TECHNOLOGY ON ORGANIZATIONAL PERFORMANCE THROUGH ABSORPTIVE CAPACITY, INNOVATION AND INTERNAL LABOUR FLEXIBILITY

INFLUENCE OF TECHNOLOGY ON ORGANIZATIONAL PERFORMANCE THROUGH ABSORPTIVE CAPACITY, INNOVATION AND INTERNAL LABOUR FLEXIBILITY

ABSTRACT

This study analyzes how top management support for technology, technological skills, and technological distinctive competencies has a positive effect on the organization's potential and realized absorption capacity and how these capacities interrelate amongst themselves to exert a positive influence on internal labour flexibility. The paper also deepens our understanding of the influence of policies for internal labour flexibility on organizational performance through organizational innovation. These relationships were tested empirically using a sample of 160 European technology firms. The results show that support for technology and improvement of technological skills and technological distinctive competencies promote improvement in organizational performance through their positive influence on the processes of potential and realized absorption capacity. Further, investing in policies and strategies that help to promote realized absorption capacity increases internal labour flexibility and innovation as mechanisms for improving the organization's performance. Finally, the paper discusses and provides several theoretical and practical implications for future research.

Keywords: Top management support, technological skills, technological distinctive competencies, absorptive capacity, internal labour flexibility, organizational innovation.

3.1. Introduction

Organizations make strategic decisions in competitive global environments in which the development of technology and of technological processes is important to maintain levels of competitiveness (Jones et al., 2000). Technology permits firms to introduce systems that reduce their costs or differentiate them from their competitors, contributing to their achievement of good levels of organizational competitiveness (Ross et al., 1996). The term technology is defined "as the set of informational, technical and processes systems needed to change a large number of factors to products or services for the market" (Fuente et al., 1997, p. 293). Technology is an integral driver of innovation (Prajogo & Ahmed, 2006). It is key for business and rapid growth in investments (Skerlavaj & Dimovski, 2006), as well as for firms' overall competitive strategy and positioning (Zahra, 1991).

Technology is a strategic mechanism for improving cooperation, communication, and exchange of information and knowledge (Wageman & Baker, 1997). The flow of communication between the members of the organization is encouraged by the presence and proper use of tools such as e-mail, multimedia conferences, technological applications for exchange of ideas and knowledge, etc., that encourage knowledge and information to flow more rapidly and be spread more easily throughout the organization. Thus, the increase in the demand for technology and the capacity to apply it have heightened the need for organizations to foster support for technology from the firm's management, as well as the development of technological skills and the fostering of technological distinctive competencies (TDCs), which enable the exploitation of technological opportunities, the development of corporate entrepreneurial initiatives, and the generation of competitive advantages for the organization (Alvarez & Barney, 2007; Autio et al., 2000; Martin, Garcia & Garcia, 2011; Martin, Garcia & Mihi, 2011; Real et al., 2006; Woolley, 2010).

Support from the organization's management for information and communication technologies enables the organization to access, create, store, transmit, and manipulate data, information, and knowledge (Carlsson & El Sawy, 2008; Lin, 2007; Martin, Garcia & Garcia, 2011). Top management support for technology (TMS) can stimulate the development of a working environment that supports knowledge management and information systems (Ghosh et al., 2001). It can also provide the appropriate funds and resources, encourage teams, and help them overcome problems, fostering cross-

functional cooperation, knowledge, and communication (Garcia Rodriguez et al., 2008). In a technological context, TMS reflects the importance that top management executives place on technology in many ways (Byrd & Davidson, 2003; Martin, Garcia & Garcia, 2011; Martin, Garcia & Mihi, 2011). Top managers' support for technology generates greater strategic value for the business (Byrd & Davidson, 2003; Martin, Garcia & Garcia, 2011; Martin, Garcia & Mihi, 2011), developing both the technological abilities and the capacities of the organization's members (Al-Adaileh & Al-Atawi, 2011; Benitez et al., 2010; Martin, Garcia & Garcia, 2011; Martin, Garcia & Mihi, 2011; Petroni & Panciroli, 2002).

These technological resources also require people with technological skills, understood as one of the "dimensions that distinguishes and provides the knowledge set needed to produce a core capability" (Leonard-Barton, 1992, p. 113). This dimension of skills encompasses both firm-specific techniques and scientific understanding. It provides the basis for a firm's competencies and sustainable competitive advantage in a particular business (Martin, Garcia & Garcia, 2011; Teece et al., 1997). In applying this understanding to technological issues, Leonard-Barton (1992) stresses that technological skills constitute the entire technical system, which usually trace their roots back to the firms' first products.

It is thus necessary to stimulate TDCs, understood as ''that cushion of actual or potential resources which allows an organization to adapt successfully to internal pressures for adjustment or to external pressures for change in policy, as well as to initiate changes in strategy with respect to the external environment'' (Bourgeois, 1981, p. 30). TDCs represent "the organization's expertise in mobilizing various scientific and technical resources through a series of routines and procedures which allow new products and production processes to be developed and designed" (Real et al., 2006, p. 508).

TMS, the development of technological skills, and the fostering of TDCs, perform a significant role in access to information and the location of external sources of knowledge, as well as the assimilation, transformation, and exploitation of knowledge. They also permit the elimination of organizational limitations, which often block the interaction between different parts of the organization (Doranova et al., 2011; Hendriks, 1999; Jimenez et al., 2011). Technology thus plays an essential role in absorption capacity due to its strategic capacity to support the search for knowledge and

communication, as well as encouraging and enabling collaborative learning (Hargadon, 1998).

The capacity to absorb external knowledge is becoming a key factor for firms, since it permits them to create value and achieve and sustain competitive advantage (Camison & Fores, 2010). Cohen and Levinthal (1990, p. 128) define absorption capacity as "the ability to recognize the value of new information, to assimilate it, and apply it to commercial ends". Absorption capacity is considered a fundamental ability for learning and organizational innovation because it permits the detection of external knowledge that the organization needs in order to internalize and adapt this knowledge to its specific needs (Jimenez et al., 2011). In a 2002 study, Zahra and George analyzed and extended the initial concept to refer to absorption capacity "as a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability" (Zahra & George, 2002, p. 186). Along these lines, Jimenez et al. (2011) analyze absorption capacity "as the organization's relative ability to develop a set of organizational routines and strategic processes through which it acquires, assimilates, transforms and exploits knowledge acquired from outside the organization in order to create value".

Absorption capacity is thus considered to be a dynamic capacity composed of two subsets: potential absorption capacity and realized absorption capacity. Potential absorption capacity refers to the acquisition and assimilation of knowledge and realized absorption capacity to the firm's capacity to transform and exploit the knowledge assimilated by incorporating it into the firm's operations (Jansen et al., 2005; Jimenez et al., 2011; Kotabe et al., 2011; Zahra & George, 2002). Absorption capacity is determined by four dimensions: acquisition, assimilation, transformation, and exploitation of knowledge, and these dimensions become essential for organizations to obtain competitive advantages (Jimenez et al., 2011; Zahra & George, 2002).

We can thus say that "acquisition refers to a firm's capability to identify and acquire externally generated knowledge that is critical to its operations", whereas assimilation refers to the "firm's routines and processes that allow it to analyze, process, interpret, and understand the information obtained from external sources". Likewise, transformation is the "firm's capability to develop and refine the routines that facilitate combining existing knowledge and the newly acquired and assimilated knowledge" (Zahra & George, 2002, p. 189). Finally, the dimension of exploitation is defined "as an

organizational capability … based on the routines that allow firms to refine, extend, and leverage existing competencies or to create new ones by incorporating acquired and transformed knowledge into its operations" (Zahra & George, 2002, p. 190). This capacity enables the firm to exploit the knowledge in a structured, systematic way over time, thereby obtaining improvements in the benefits, processes, and organizational forms (Spender, 1996).

Absorption capacity enables the organization to acquire external knowledge and to assimilate, transform, and exploit this knowledge effectively, strongly affecting the firm's capacity to innovate and to adapt to changes in its environment in order to be competitive (Daghfous & White, 1994). For organizations to develop the ability to transfer and exploit knowledge, it is critical to develop innovative capacities (Sabini & Spagnoletti, 2010). Absorption capacity permits the injection of new ideas into the organization, increases the capacity to understand new ideas, and strengthens creativity and the ability to spot new opportunities (Chesbrough, 2003; Garcia et al., 2008; Gray, 2006; Powell, 1998).

Innovation is one of the main sources of competitive advantage, economic growth, and employment in the organization, and it permits the organization to respond successfully to changes in the environment and the market in which the organization works and to develop competitive advantages that are sustainable over time (Grossman & Helpman, 1994; Furman et al., 2002). Many studies have analyzed the concept of innovation, defining it as a key variable for the organization's performance, since it enables organizations to be better prepared to operate in environments characterized by instability, respond more rapidly to changes, and identify and exploit new products and opportunities in the market (Harris & Mowery, 1990; Miles & Snow, 1978).

Innovation has been defined as a new idea, method, or device; the act of creating a new product, service, or process (PDMA, 2004). Although firm innovation is widely prescribed as a means to improving organizational performance (Hurley & Hult, 1998; Lööf & Heshmati, 2002), many firms do not or cannot develop it properly. Researchers have urged attention to what enables firms to innovate (Zollo & Winter, 2002). Some scholars consider introducing the product on the market and selling it effectively or using the process successfully to be a requirement of innovation (Audretsch & Acs, 1991; Cumming, 1998; Pavitt, 1984). For others, the quality of newness or improvement alone is enough (Damanpour, 1991; Tushman & Nadler, 1986).

Independently of this definition, knowledge and the capacity to absorb it are fundamental for innovation, and their absence is a factor that inhibits innovation (Daghfous & White, 1994). Acquiring information and knowledge is crucial to increasing the firm's innovation capacity, but it is not only necessary to recognize the value of new and external information; the assimilation and utilization of this information is also strategic (Zahra & George, 2002).

Greater absorption capacity also generates a more flexible labour structure with greater adaptation capacity (Beltran et al., 2009; Blyton & Morris, 1992; Kalleberg, 2001; Valverde et al., 2000). Assimilation and exploitation of knowledge involve processes of change that foster greater internal labour flexibility by expanding the functions to be performed and their knowledge, promoting the capacity to work in a variety of areas and stimulating greater capacity to operate firms in different circumstances or scenarios (Atkinson & Gregory, 1986; Blyton & Morris, 1992; Looise et al., 1998; Michie & Sheehan-Quinn, 2001; Urquijo, 2004).

Internal labour flexibility refers to the flexibility demonstrated by the organization's set of human resources at a specific point in time (Tsui et al., 1997). This flexibility is generated when top management develops and stimulates employees to adopt more flexible work roles (Beltran et al., 2009; Tsui et al., 1997). Different studies have analyzed the concept of internal labour flexibility and defined its characteristics (e.g. Atkinson & Gregory, 1986; Blyton & Morris, 1992; Pulakos et al., 2000; Shafer et al., 2001). Initially, authors such as Looise et al. (1998) and Michie and Sheehan-Quinn (2001) related the concept of internal labour flexibility to that of functional flexibility of workers, understood as the facility with which workers can move between work tasks and positions in the organization. More recently, the concept of internal labour flexibility has been extended beyond functional flexibility to include employees' characteristics, such as the speed with which employees learn or their capacity to detect external changes (Bhattacharya et al., 2005; Kara et al., 2002; Verdu, 2002).

We thus adopt the conceptualization formulated Beltran et al. (2009, p. 1581) who, based on the theory of resources and capacities, define internal labour flexibility as "a multidimensional concept made up of the following components: (a) intrinsic flexibility; (b) skill malleability; (c) behavioural malleability; and (d) relational flexibility. Intrinsic labour flexibility refers to employees' abilities to work on different tasks and under diverse circumstances. Skill malleability indicates improvements in

employees' abilities and knowledge, and it is linked to the keenness of employees to continuously master their skills and avoid specialisation in only one area of knowledge. Behavioural malleability refers to changes in the way employees act or the routines they follow when faced with novel situations. Finally, relational labour flexibility indicates employees' willingness to cooperate and collaborate with others both within and outside the organisation".

Internal labour flexibility is a strategic variable for the innovation process, as it contributes to greater and better dissemination of knowledge and abilities that facilitate the assignment of workers to the tasks to be performed and thus also organizational innovation (Bhattacharya et al., 2005). Employees possess a wide range of abilities and capacities that, when combined in the right way, permit the organization to improve its innovation capacity (Arvanitis, 2005; Kelliher & Riley, 2003).

At the same time, this study analyzes the influence of realized absorptive capacity and organizational innovation on organizational performance. In technology sectors, firms are characterized by their highly innovative character, which enables them to respond more rapidly to the changes in the environment and to find the new products and demands present in the market (Jimenez & Sanz, 2005). Organizations that develop dynamic capacities to respond to change and realized absorptive capacity (Nicholls Nixon, 1995; Kraatz, 1998) foster innovative behaviour that enables them to take advantage of technological advances and to improve their organizational performance (George et al., 2001; Zahra et al., 2000). Realized absorptive capacity enables the firm to transform and use the new knowledge, incorporating it into the production process, together with the organization's existing knowledge, encouraging innovations. The greater the use of innovative products, the greater the firm's competitive advantage and the positive repercussions for organizational performance, and the more difficult it will be for competitors to respond efficiently (Sandvik & Sandvik, 2003).

To achieve the objectives presented above, the investigation is structured as follows. Section 2 establishes a foundation of prior research from which to propose a series of hypotheses. Section 3 presents the data and the research methodology used in the empirical analysis. Section 4 shows the results obtained. Finally, in Section 5, we present the discussion of the results, the implications of the research, the study's limitations, and lines for future research.

3.2. Hypotheses

3.2.1. The influence of technology on potential and realized absorptive capacity

The use and application of new technologies and technological processes encourages faster, more efficient access to sources of information and thus knowledge acquisition (Doranova et al., 2011). The presence and proper use of email, discussion lists, electronic bulletin boards, and multimedia conferences or applications for the technological exchange of ideas encourage the spread of knowledge throughout the organization and the improvement of communication and cooperation (Wageman & Baker, 1997). Recently, there has also been greater use and a proliferation of virtual work groups whose members are not physically present in the firm. This growth in virtual groups encourages greater flexibility, response capacity, and learning among the members of the organization (Griffith et al., 2003).

The use of technology plays a crucial role in the access to information and the location of sources of knowledge, as well as in the assimilation of knowledge and the elimination of organizational barriers, which often block the interaction between the different parts of the organization (Doranova et al., 2011; Hendriks, 1999). Technology plays a crucial role in potential absorption, due to its strategic capacity to support communication, the search for knowledge, and the stimulation of collaborative learning (Hargadon, 1998).

Management support for technology encourages the creation of an organizational culture that seeks identification of opportunities and generation of new ideas, knowledge, and concepts. The creation and acquisition of knowledge can come from the exploration of the environment through technological media (e.g., Internet searches on the topic we wish to learn about) or interaction with agents (e.g., workers, customers, members, suppliers), through technology systems or networks (Carlsson, 2004). After having acquired the information and knowledge needed from different sources promoted by the different existing technologies, the firm should process and assimilate those information and knowledge to create new, useful knowledge for its activity. In this way, firms can use the technology to process the information acquired to reveal patterns and enhance their understanding (Carlsson, 2004).

Different firms use technology as a means to foster an open approach that enables them to acquire knowledge for the creation of their products. For example, Fiat used an

open approach to generate design ideas and obtain knowledge for its "Punto" model. Fiat invited customers to select features for the car on its web-site. More than 3000 people took advantage of the opportunity and gave Fiat valuable design information, participating in this co-creation using Internet (Iansiti & MacCormack 1997). Likewise, Hallmark Inc. uses its Hallmark Knowledge Creation Community to acquire and assimilate ideas and knowledge for new products, such as its new greeting cards (Kambil et al., 1999). Finally, many technology-based tools based, supported by management and employees' technological skills and TDCs for their use, permit firms to increase information and obtain knowledge necessary to maintain their competitive advantage (Carlsson, 2004). Having the right technological and personal system in the organization with technological skills encourages different processes for the acquisition and assimilation of knowledge (Apostolou et al., 1999). Based on the foregoing, we propose the following hypothesis:

H1: *Technology will be positively related to potential absorptive capacity.*

Existing technological systems and tools perform a strategic role in the process of knowledge transformation and exploitation. The right technological structure supported by management and workers with the right technological competencies and abilities provides key support for the exchange and exploitation of knowledge (Bolisani & Scarco, 1999). Intranet, Extranet, virtual private networks (VPN) and Ethernet, for example, are instruments that combine technologies and services, enable the construction of a digital environment in which one constantly creates new knowledge, diffuse this knowledge rapidly, and exploit it throughout the organization (Liao, 2003; Tyndale, 2002). However, the choice of technological tools will depend on each organization, based on its size, environment, circumstances, and strategic business policies (Bolisani & Scarco, 1999).

Organizations that invest in technology systems to support the exchange of knowledge among the members of virtual groups or teams contribute not only to obtaining greater performance from the team but also to the development of the organization's realized absorption capacity, since such organizations encourage the transformation and exploitation of knowledge (Young Choi et al., 2010; Rico et al., 2008; Zahra & George, 2002). Thanks to the use of technological techniques and tools, members of work teams interact amongst themselves, not only transforming and transferring knowledge but also solving complex problems and inventing new solutions,

taking into account the diverse perspectives enabled by knowledge exploitation (Boland & Tenkasi 1995).

Use of technology-based tools has acquired greater strategic weight as a mechanism to promote the transfer and exploitation of knowledge in the organization and in the design of organizational policies and strategies (Liao, 2003; Liebowitz, 2001). Technology, duly supported by management and employees with technological abilities and competencies, enables and encourages the transformation and exploitation of knowledge, improving the organization's activities or production processes (Caraynnnis, 1999; Chen et al., 2002; Harun, 2002; Hicks et al., 2002; McCown, 2002; Ramesh & Tiwana, 1999; Robey et al., 2000; Yoo & Kim, 2002).

The use of new technologies also encourages the elimination of obstacles to the transfer and use of knowledge (realized absorption capacity), promoting the most rapid and efficient access to the knowledge available and its use. Much of the knowledge that the organization possesses is semi-structured or partially codified, and having the right technical means and the technological abilities and competencies to use it encourages the process of knowledge transformation and exploitation (Hendriks, 1999). Having these technological tools enables the firm to make available the media and procedures that improve communication among the members of the organization, eliminating physical and spatial barriers that often make it difficult to transmit and exploit knowledge (Hendriks, 1999). This does not mean that having new technologies or technological tools ensures the successful transfer or use of this knowledge, but it does facilitate use of this knowledge and make available to firms and users a means of transferring and using this knowledge to be more competitive (Hendriks, 1999; Nemani, 2010; Tyndale, 2002). Thus, technology has been recommended as a tool that facilitates the transformation and exploitation of knowledge and thus realized absorption capacity (Nemani, 2010). Based on the foregoing, we propose the following hypothesis:

H2: *Technology will be positively related to realized absorptive capacity.*

3.2.2. The influence of potential absorptive capacity on realized absorptive capacity

Potential absorptive capacity (acquisition and assimilation of external knowledge) and realized absorptive capacity (transformation and exploitation of knowledge) are two different components of absorptive capacity, but they coexist and complement each other (Camison & Fores, 2010; Jimenez et al., 2011; Zahra & George, 2002). This

relationship between the two capacities is known as the efficiency factor (Zahra & George, 2002) and suggests that firms vary in their ability to create value from their knowledge base because of differences in their capabilities to transform and exploit knowledge. Since profits are created primarily through realized absorptive capacity, firms that achieve or maintain a high efficiency factor are positioned to increase their performance (Grant, 1996a, 1996b).

Certain social integration mechanisms must be fostered to reduce the barriers between potential and realized absorptive capacity, increasing the efficiency factor and facilitating the exchange and exploitation of knowledge between members of the firm (Oswald, 2006; Spender, 1996) by improving mutual understanding and comprehension (Garvin, 1993). The presence of informal links, such as social networks, or formal links such as redesign of the organization's structure, encourages the efficiency factor (Zahra & George, 2002). These mechanisms may be related to the integration of the firm into social networks or to the firm's own structure, which promotes the interaction of creativity among its workers. The presence of these processes and routines will make it easier for the organization to share knowledge and transfer it from an individual to an organizational level (Zahra & George, 2002).

These mechanisms are based on the generation of cooperation, interaction, and mutual trust, which foster communication and improvement of efficiency of knowledge exchange between the units (Galunic & Rodan, 1998; Oswald, 2006). Firms that use social integration mechanisms also facilitate connectivity and the acquisition of data and knowledge among their employees. These mechanisms contribute to the development of potential absorptive capacity, while also facilitating the free flow of information (Sheremata, 2000), thereby promoting the transformation and exploitation (realized absorptive capacity) of the information acquired (Chaudhuri & Tabrizi, 1999; Oswald, 2006).

Both concepts coexist and form a necessary condition for improving firm performance. Firms cannot exploit knowledge without first acquiring it. Similarly, firms may acquire and assimilate knowledge, but if they lack the capability to transform and exploit the knowledge, they will not be able to improve organizational performance (Zahra & George, 2002). Organizations must recognize that it is not enough to have knowledge to obtain benefits or the competitive advantage that differentiates them from their competitors; this knowledge must also be assimilated, transformed, integrated, and

applied in the firm's activity (Zahra & George, 2002). Organizations that develop the capacity to identify and acquire the knowledge generated outside the organization with the desired intensity, speed, and direction will find that their assimilation capacity improves through improvement in the firm's routines and the processes that enable it to analyze, process, interpret, and understand the information obtained from external sources (Kim, 1997a, 1997b; Szulanski, 1996; Zahra & George, 2002). This development stimulates potential absorptive capacity. If the process is performed correctly, the organization is more likely to have more knowledge and greater means to develop realized absorptive capacity and more efficient processes for the transformation and exploitation of this knowledge (Kostopoulos et al., 2011).

Organizations should thus recognize the value of external knowledge and be able to acquire and assimilate it (Kostopoulos et al., 2011; Todorova & Durisin, 2007), remaining receptive to external knowledge and developing potential absorptive capacity (Jimenez et al., 2011; Lane & Lubatkin, 1998). They must then transform and incorporate this knowledge into the firm's operations and routines to improve their organizational performance (Zahra & George, 2002) by using the right social integration mechanisms to achieve their goals. The firm's success depends on the firm's processes for knowledge transfer and exchange, whether internal or external, and the application of these processes to the creation of new organizational products, processes, or designs (Nelson, 1993). Based on these arguments, we propose the following hypothesis:

H3*: Potential absorptive capacity will be positively related to realized absorptive capacity.*

3.2.3. The influence of realized absorptive capacity on internal labour flexibility and organizational innovation

In rapidly changing and competitive sectors on a global scale, as is the case with technology sectors, it is strategic to develop mechanisms that permit organizations to remain competitive efficiently in an ongoing way in the market (Artigas et al., 2008). Internal labour flexibility is one of the mechanisms that enables management of the firm's workforce with the capacity to face situations of constant change that emerge on the market in which the firm develops its activity (Artigas et al., 2008). To foster such internal labour flexibility, organizations usually invest in improving their realized absorption capacity (Kazanjian et al., 2002; Kostopoulos et al., 2011; Spender, 1996; Tsai, 2001; Zahra & George, 2002). Realized absorption capacity involves the

transformation and exploitation of the knowledge available in the organization (Zahra & George, 2002). Since the human factor is crucial, this capacity requires the participation of the entire organization (Teece et al., 1997).

For the organization, realized absorption capacity requires constant transformation and application of the knowledge generated to make the organization more competitive. The organization's workers must be motivated, willing, and prepared to move in different areas, fulfilling diverse activities and functions formerly performed by several different people. The firm seeks to have workers exercise diverse functions, apply the knowledge generated, and facilitate knowledge transfer at every moment necessary, granting the organization an advantage over the competition (Artigas et al., 2008).

Firms that invest in and foster realized absorption capacity, whether through the transformation, application, or use of knowledge, generate a more flexible labour structure with greater adaptation capacity (Beltran et al., 2009; Blyton & Morris, 1992; Kalleberg, 2001; Valverde et al., 2000). The transformation and exploitation of knowledge usually involves greater internal labour flexibility for the worker as a result of the expansion of the functions to be performed and knowledge of them, promoting the capacity to perform work in diverse areas and stimulating greater capacity for firms to operate in different circumstances or scenarios (Atkinson & Gregory, 1986; Blyton & Morris, 1992; Looise et al., 1998; Michie & Sheehan-Quinn, 2001; Urquijo, 2004). These changes require the firm's members to develop a greater spirit of availability and participation, as well as forms of flexibility in work schedules, ubiquity, etc. (Urquijo, 2001). The firm will foster workers' internal labour flexibility through initiatives and improvements in their area of management and through greater adaptation capacity and application of their knowledge, generating organizational benefits in economic and financial terms (Ordoñez, 2003). Based on the foregoing, we propose the following hypothesis.

H4*: Realized absorptive capacity will be positively related to internal labour flexibility.*

Various studies relate absorptive capacity directly to innovation (e.g., Cohen & Levinthal, 1990; Liu & White, 1997; Joglekar et al., 1997; Veugelers, 1997; Vinding, 2006; Stock et al., 2001; Tsai, 2001; Caloghirou et al., 2004). More specifically, organizational innovation requires information and knowledge, which are then transformed and used in the firm to improve competitiveness and organizational

performance (Exposito et al., 2010; Gebauer, 2011; Weerawardena & Mavondo, 2011). Realized absorptive capacity permits the transformation and use of new knowledge, incorporating it into the production process along with existing knowledge in the organization, thereby encouraging innovation. In this way, the knowledge acquired and assimilated is internalized and then exploited, giving rise to new structures and ways of working, new processes and products that permit the maintenance or improvement of current competitive advantage, or the creation of new competitive advantages through processes of innovation (Jimenez et al., 2011; Zahra & George, 2002). Firms may access new knowledge but not improve their innovation or results if they do not have sufficient realized absorptive capacity to transform and apply the knowledge (Tsai, 2001). Developing the ability to transfer and exploit knowledge is thus critical to organizations' development of innovation capacities (Sabini & Spagnoletti, 2010).

Various studies also analyze how realized absorptive capacity injects new ideas into the organization, increases the capacity to understand new ideas, and strengthens creativity and the ability to spot new opportunities (Chesbrough, 2003; Garcia et al., 2008; Gray, 2006; Powell, 1998). Improving realized absorptive capacity facilitates the development of the firm's innovation capacity through the application of the knowledge acquired both internally and from external sources. Having the right realized absorptive capacity enables the application of acquired and learned knowledge, which act as catalysts in the exploitation of knowledge and the generation of organizational innovation (Cepeda et al., 2010). Investing in improving realized absorptive capacity enables the firm to achieve better organizational innovations (Sabini & Spagnoletti, 2010). Zahra and George (2002) confirm that realized absorptive capacity tends to influence the company's performance by means of product and process innovation. This influence is felt after the firm undergoes the transformation and exploitation capabilities that constitute realized absorptive capacity, as companies can then gain the knowledge that helps to leverage and recombine their expertise to pursue product line extension or new product development (Zahra & George, 2002).

Finally, the capacity to transform and exploit knowledge (realized absorptive capacity) is a requirement for and prior effect of innovation (Moos et al., 2011). Applying new knowledge or reconfiguring existing knowledge results in new products or services, which in turn "culminate in innovation success" (Mitchell, 2006, p. 922). Based on the foregoing, we propose the following hypothesis:

***H5**: Realized absorption capacity is positively related to organizational innovation.*

3.2.4. The influence of internal labour flexibility on organizational innovation

According to the theory of resources and capacities, one strategic element of innovation lies in the ability to develop and reconfigure firms' internal and external competencies and those of their workers in order to respond to continual changes in the environment (Teece et al., 1997). The success of the innovation process depends increasingly on the firm's capacity to integrate internal and external knowledge. Organizations must not only know how to exploit their resources and internal knowledge well; they must also be able to explore and assimilate resources and knowledge that have not been developed internally (Rothaermel & Hess, 2007). In this context, internal labour flexibility is strategic for innovation, as it enables the firm to adapt to changes in the environment in which the firm operates (Bhattacharya et al., 2005). Firms with strategies for internal labour flexibility can adjust more easily to changes in demand in their environment through reorganization of their work positions based on multifunctionality of tasks, teamwork, and employee participation in the design and organization of their work. Internal labour flexibility policies contribute to greater and better diffusion of knowledge and abilities, which facilitates the assignment of workers to tasks to be performed, since such employees possess a wide range of abilities that can be combined to improve innovative the organization's innovative capacity (Arvanitis, 2005; Kelliher & Riley, 2003).

For example, the study by Martinez and Perez (2003) shows that the presence of multifunctional work teams, in which employees participate in the design and planning of their tasks, is positively related to better results in the innovation process in the automotive industry. That is, organizational structures in which the firm's employees are involved in strategies and policies of internal labour flexibility are more likely to be more innovative, since they improve their individual abilities and foster collaboration and coordination between the different areas and departments that make up the organization. This creates opportunities for the adoption of multifunctional teams that require employees with multiple abilities and a wide range of knowledge, in turn improving organizational innovation (Martinez et al., 2011). The formation of work teams thus encourages the creation of working and personal relationships between the workers that not only help the functioning of these multifunctional teams but also

improve innovation, since there is greater commitment and coordination between them (Ehrlich, 1994; Martinez et al., 2011).

Improving strategies and policies of internal labour flexibility requires the support of the entire organization, including directors and top management. This commitment from the organization's management promotes a work climate in which employees feel involved in the strategies of internal labour flexibility. Such involvement encourages workers' trust and initiative and stimulates greater and better innovation in the firm (Martinez et al., 2011). Teams with multifunctional tasks in which employees feel trusted, supported by the management, and secure, usually undertake and learn new actions that promote the generation of organizational innovation (Edmonson, 1999; Edmonson et al., 2001). A psychological contract is thus created in the organization, providing development and training that enable the creation of more productive, innovative labour relations in the firm (Ehrlich, 1994). Improving working and personal relations between employees facilitates the functioning of work teams, departments, etc., in which product and process innovations are developed. As a result, policies and strategies of internal labour flexibility can contribute to the firm's innovation capacity through the commitment and development of employees in the competitive core (Martinez et al., 2011). Based on the foregoing, we propose the following hypothesis:

***H6**: Internal labour flexibility will be positively related to organizational innovation.*

3.2.5. The influence of realized absorptive capacity and organizational innovation on organizational performance

Potential and realized absorption capacity are closely related and complement each other (Camison & Fores, 2010; Zahra & George, 2002). Through the transformation and exploitation of the knowledge incorporated and assimilated by potential absorption capacity, firms manage to renew and improve their knowledge, encouraging the development of new practices, routines, or competencies that improve the development of the management system, production process, or products, thereby improving organizational performance (Kazanjian et al., 2002; Kostopoulos et al., 2011; Nath et al., 2010; Spender, 1996; Tsai, 2001; Zahra & George, 2002).

The capacity for transformation of knowledge enables reinterpretation of knowledge and facilitates the recognition of opportunities and improvement of organizational performance (Flor et al., 2011). The transformation of knowledge enables technological

development and the updating of innovative processes that the organization possesses, thereby maintaining its efficacy, efficiency, and competitiveness by obtaining greater benefits (Miles & Snow, 1978). Likewise, the use of new knowledge by the organization's members in their daily tasks and routines enables the firm to improve its performance and results (Kostopoulos et al., 2011; Tsai, 2001).

Realized absorptive capacity is essential in technology-based firms, since it permits the exploitation of the firm's current knowledge, both internal and external, and the development of specific competencies that permit it to respond to the highly changeable environments that such firms face and improve their organizational performance (Teece et al., 1997). For example, Cohen and Levinthal (1990) examine how the transformation and exploitation of technological knowledge enable improvement of results by improving innovative behaviour. The transformation and exploitation of knowledge acquired and assimilated encourage the creation of organizational value (Granstrand & Sjolander, 1990) and improve organizational performance (George et al., 2001).

In technology sectors, firms need dynamic capacities to respond to change (Nicholls-Nixon, 1995; Kraatz, 1998), and realized absorptive capacity fosters innovative behaviour that permits the exploitation of technological advances and improves organizational performance (George et al., 2001; Zahra et al., 2000). Firms that develop their realized absorptive capacity as part of their corporate strategy have better capacity for improving their organizational benefits (Kostopoulos et al., 2011). We thus propose the following hypothesis:

H7*: Realized absorptive capacity will be positively related to organizational performance.*

The current market, characterized by significant turbulence, conditions firms continually to update their competencies to maintain their levels of competitiveness, making strategic technological investments so that they can respond to the changes and attempt to achieve a solid competitive position (Christensen & Rosenbloom, 1995; Henderson & Clark, 1990; Jimenez & Sanz, 2005; Schumpeter, 1934, 1942; Tushman & Nadler, 1986; Utterback, 1994). Organizational innovation has become a strategic variable for the organization to adapt and compete in these dynamic environments, as it permits them to improve products, processes, or management systems more rapidly and continually than the competition, enabling the organization to maintain its competitive

advantage. Innovative firms are thus able to respond more rapidly to these changes and to find new products and needs on the market (Jimenez & Sanz, 2005).

Various authors have analyzed the relationship between organizational innovation and performance. For example, Abernathy and Utterback (1978) reflect that the adoption of innovations is stimulated by the pressure simultaneously to reduce costs and improve quality, such that firms adopt innovations, whether in product or processes, with the intention of ensuring an improvement in productivity and in the quality of the product or service provided. Similarly, Camison (1999) analyzes how firms with more innovative behaviour are able to follow and respond to the needs and preferences of their customers, achieving a better entrepreneurial result. Thus, innovative firms tend to have greater profitability in the long term and more rapid growth than non-innovative ones (Geroski & Machin, 1992). Innovation is key to achieving entrepreneurial success in the long term, as it is an opportunity for enterprising firms to obtain profits by establishing a temporary monopoly (Schumpeter, 1934).

Adopting innovations simultaneously in products in and processes can have a positive effect on the firm's performance (Damanpour & Gopalakrishnan, 2001). Innovation in processes and products influences the firm's sales, since customers generally buy products that are unique and that provide greater value for the consumer, an advantage for the firm over its competitors. The greater the use of the innovative products, the greater the competitive advantage of the firm and the greater the difficulty for competitors to respond effectively (Sandvik & Sandvik, 2003).

Finally, a positive relationship exists between organizational innovation and performance (Avlonitis & Salavou, 2007; Baker & Sinkula, 1999; Damanpour & Evan, 1984; Damanpour et al., 1989; Ettlie, 1995; Schulz & Jobe, 2001). This relationship occurs not only in large firms but also in SMEs (e.g., Bowen et al., 2009; Rosenbusch et al., 2010). Based on the foregoing, we propose the following hypothesis base:

H8*: Organizational innovation is positively related to organizational performance.*

3.3. Methodology

This section presents the research methodology used in this study. We first describe the sample used and then discuss how each of the variables included in the study is operationalized. Finally, we present the statistical analysis.

3.3.1. Sample and procedure

The population for this study consisted of technological organizations within the geographical area of the European Union. We chose high-tech manufacturing firms due to the interest inherent in carrying out a study of technology and knowledge management on sectors with a high technological component. The Amadeus (2009) database was used. Drawing on our knowledge about key dimensions of this investigation, previous contacts with managers and scholars and new interviews with managers and academics interested in these strategic variables, we developed a structured questionnaire to investigate how organizations face these issues. We then established a list of the CEOs of the organizations, with the help of partial funding from the Spanish Ministry of Science and Research and the Local Council for Economy, Innovation and Science of Andalusia's Regional Government.

CEOs were our main informants, since they manage a great deal of information in all departments in the company. Furthermore, they constitute a valuable source for evaluating and moulding the different variables under study throughout the organization by determining the types of behaviour that are expected and supported (Baer & Frese, 2003). CEOs were also chosen as informants because they are ultimately responsible for plotting the organization's direction and plans, as well as for guiding the actions carried out to achieve them (Westphal & Fredickson, 2001).

First, we used stratified random sampling by country to divide the population into strata (based on the 10 EU countries analyzed: Austria, Belgium, Denmark, France, Germany, Italy, Poland, Spain, the Netherlands, and the United Kingdom). Within each stratum, a random sampling procedure was used. Through systematic sampling in each stratum, we obtained 16 firms for each target country in the study. We put out a call to the CEOs and explained that the data obtained would be confidential and would be treated in aggregate form. We offered to send each CEO a comparative study specific to his/her firm of the variables analyzed. This approach enabled us to obtain an approximate response rate of 17.7% (Table 1).

Technologies have played an important role in market globalization and, in turn, in globalizing business practices. For these reasons is advantageous to carry out the study within the framework of the EU countries (Verdu et al., 2006). Characteristics of the responding businesses were compared to those of the nonresponding businesses to reduce the possibility of non-response bias. The results for return on assets, return on

equity, return on sales, and number of employees indicated that there was no significant difference among respondents and nonrespondents (Armstrong & Overton, 1977). Since all measures were collected with the same survey instrument, the possibility of common method bias was tested using Harman's one-factor test (see Konrad & Linnehan, 1995). A principal components factor analysis of the questionnaire measurement items yielded eight factors with Eigenvalues greater than 1.0, which accounted for 64% of the total variance. A substantial amount of method variance does not appear to be present, since several factors, not just one single factor, were identified and because the first factor did not account for the majority of the variance (Podsakoff & Organ, 1986).

Table 3.1: Technical details of the research

Sectors	High-tech manufacturing firms
Geographical location	Europe (Austria, Belgium, Denmark, France, Germany, Italy, Poland, Spain, The Netherlands, United Kingdom)
Methodology	Structured questionnaire
Universe of population	5441 firms
Sample (response) size	160 firms (17.7%)
Sample error	7.7%
Confidence level	95 %, p-q=0.50; Z=1.96
Period of data collection	From May 2010 to September 2010

3.3.2. Measures

Technology. We used four items developed by Byrd and Davidson (2003) and Ray et al. (2005) to measure top management support to technology, four items developed by Ray et al. (2005) and Byrd and Davidson (2003) to measure technological skills and six items developed by Real et al. (2006) to measure technological distinctive competencies. These items have been duly adapted to the present study (Appendix). We calculated the arithmetical mean of these items (a high score indicated good level of top management support, technological skills, and technological distinctive competencies) and obtained a three-item scale of technology. We developed a confirmatory factor analysis to validate the scale of technology and showed that the scale was one-dimensional and had good validity and reliability (α=.833).

Potential absorptive capacity. We used six items developed by Jimenez et al. (2011) to measure acquisition and assimilation knowledge. These items have been duly adapted to the present study (Appendix). We developed a confirmatory factor analysis to validate the scales and eliminated Item 5 (χ^2_5=11.20, NFI=.96, NNFI=.95, GFI=.99, CFI=.97). The scale was one-dimensional and had adequate validity and reliability (α=.738).

Realized absorptive capacity. We used four items developed by Jimenez et al. (2011) to measure transformation knowledge and two items developed by Jimenez et al. (2011) to measure exploitation knowledge (Appendix). We developed a confirmatory factor analysis to validate the scale (χ^2_9=27.42, NFI=.91, NNFI=.99, GFI=.98, CFI=.94) and showed that the scale was one-dimensional and had good validity and reliability (α=806). A 7-point Likert scale (1 "*totally disagree"*, 7 "*totally agree"*) for this and the preceding variables allowed managers to express agreement or disagreement.

Internal labour flexibility. We used the scales designed by Beltran et al. (2009) and established a scale of seven items (Appendix) to reflect internal labour flexibility: intrinsic flexibility, skill malleability, behavioural malleability, and relational flexibility. Using a confirmatory factor analysis (χ^2_{14}=54.04; NFI=.98; NNFI=.96; GFI=.97; CFI=.90), we validated our scales and found that they had high validity and reliability (α=.819). We used a Likert-type 7-point scale (1 *"Very few employees",* 7 *"Most of the employees"*) for the CEOs to indicate the extent to which employees in their firm possessed different capabilities and skills.

Organizational innovation. We used the four-item scale developed by Zahra (1993) to measure organizational innovation (Appendix). These items have been duly adapted to the present study. We developed a confirmatory factor analysis to validate the scale (χ^2_2=5.04, NFI=.97, NNFI=.94, GFI=.99, CFI=.98). The scale was one-dimensional and had adequate validity and reliability (α=.768). A 7-point Likert scale (1 "*totally disagree"*, 7 "*totally agree"*) allowed managers to express agreement or disagreement.

Organizational performance. After reviewing how performance is measured in different works of strategic research, we used the scale of five items developed by Murray and Kotabe (1999). The use of scales for evaluating performance relative to the main competitors is one of the most widely-employed practices in recent studies (Choi et al., 2008; Douglas & Judge, 2001). Many researchers have used managers' subjective perceptions to measure beneficial outcomes for firms. Others have preferred objective data, such as return on assets. The literature has established widely that there is a high correlation and concurrent validity between objective and subjective data on performance, which implies that both are valid when calculating a firm's performance (Homburg et al., 1999; Venkatraman & Ramanujan, 1986). We included questions involving both types of assessment in the interviews, but the CEOs were more open to offering their general views than to offering precise quantitative data. When possible,

we calculated the correlation between objective and subjective data, and these were high and significant. We developed a confirmatory factor analysis to validate the scales (χ^2_9 =36.57, NFI=.91, NNFI=.90, GFI=.97, CFI=.93) and showed that the scale was one-dimensional and had high reliability (α=.816). We used a Likert-type 7-point scale (1 *"Much worse than my competitors,"* 7 *"Much better than my competitors"*) to ask about the organization's performance as compared with that of its most direct competitors.

3.3.3. Model and analysis

The Lisrel 8.70 program was used to test the theoretical model. Figure 1 shows the basis of the model proposed, together with the hypotheses to be contrasted. We used a recursive non-saturated model, taking technology (ξ_1) as the exogenous latent variable; potential absorptive capacity (η_1) as the first-degree endogenous latent variable; and realized absorptive capacity (η_2), internal labour flexibility (η_3), organizational innovation (η_4), and organizational performance (η_5) as the second-degree endogenous latent variables. Through its flexible interplay between theory and data, this structural equation model approach bridges theoretical and empirical knowledge for a better understanding of the real world. Such analysis allows for modelling based on both latent and manifest variables, a property well suited to the hypothesized model, where most of the constructs represented are abstractions of unobservable phenomena. Furthermore, structural equation modelling takes into account errors in measurement, variables with multiple indicators, and multiple-group comparisons.

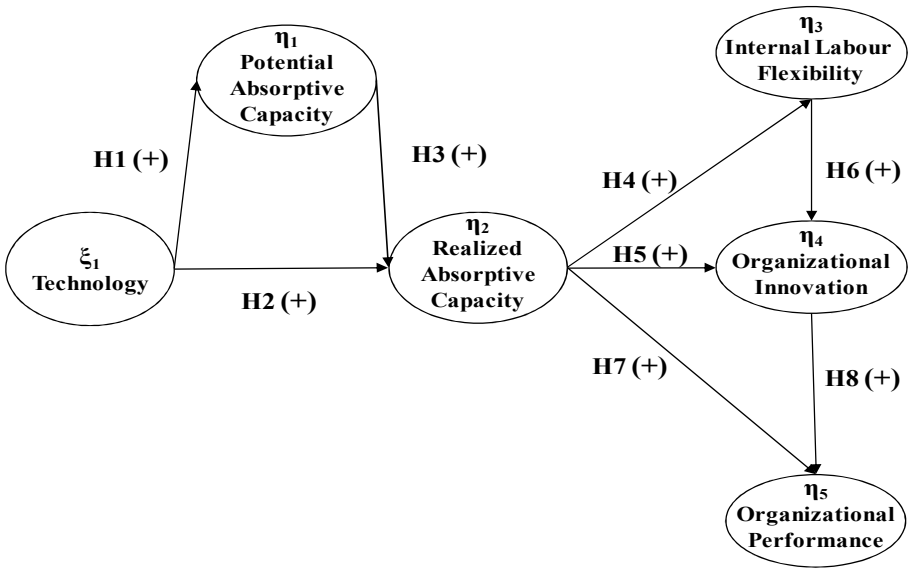

Figure 3.1. Hypothesized Model

3.4. Results

This section presents the main results of our research. Table 2 reports the means and standard deviations for all of the measures, as well as the inter-factor correlations matrix for the study variables. Consistent with the two-step approach advocated by Anderson and Gerbing (1988), we estimated a measurement model before examining structural model relationships.

Table 3.2. Means, standard deviations and correlations

Variables	Mean	S.D.	1	2	3	4	5	6
1.- Technology	5.055	1.111	1.000					
2.- Potential Absorptive Capacity	5.045	1.371	0.282***	1.000				
3.- Realized Absorptive Capacity	5.254	1.277	0.270***	0.478***	1.000			
4.- Internal Labour Flexibility	4.999	1.153	0.443***	0.218**	0.224**	1.000		
5.- Organizational Innovation	4.788	1.373	0.563***	0.223**	0.232**	0.337***	1.000	
6.- Organizational Performance	4.727	1.142	0.404***	0.144†	0.301***	0.215**	0.366***	1.000

Notes: p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001 (two-tailed).

From Table 3, we can see that all of the indexes show very good fit with the model. The constructs display satisfactory levels of reliability, indicated by composite reliabilities ranging from 0.89 to 0.95 and average variance extracted coefficients from 0.65 to 0.87. Convergent validity – the extent to which maximally different attempts to measure the same concept agree – can be judged by examining both the significance of the factor loadings and the average extracted variance. The amount of variance shared or captured by a construct should be greater than the amount of measurement error (average variance extracted>0.50). All of the multi-item constructs met this criterion, each loading (λ) being significantly related to its underlying factor (t-values greater than 13.12) in support of convergent validity. A series of chi-square difference tests on the factor correlations showed that discriminant validity – the degree to which a construct differs from others – was achieved among all constructs (Anderson & Gerbing, 1988). More specifically, discriminant validity was established between each pair of latent variables by constraining the estimated correlation parameter between them to 1.0 and then performing a chi-square difference test on the values obtained for the constrained and unconstrained models (see Anderson & Gerbing, 1988). The resulting significant differences in chi-square indicate that the constructs are not perfectly correlated and that discriminate validity is achieved. We also confirmed that the confidence interval for the correlation between each pair of critical dimensions does not produce a value of 1, which shows the presence of discriminant validity (Anderson & Gerbing, 1988).

Table 3.3. Measurement model results

Variables	Items	λ*	R^2	C.R.	AVE	Correlation Confidence Interval	Goodness of Fit Statistics
Technology (T)	TECHN1	0.98***(55.90)	0.96	0.953	0.873	T-PAC 0.35-0.54 T-RAC 0.33-0.49 T-ILF 0.45-0.61 T-OI 0.59-0.76 T-OP 0.49-0.65 PAC-RAC 0.34-0.49 PAC-ILF 0.22-0.36 PAC-OI 0.22-0.38 PAC-OP 0.24-0.38 RAC-ILF 0.17-0.29 RAC-OI 0.21-0.34 RAC-OP 0.25-0.38 ILF-OI 0.34-0.48 ILF-OP 0.25-0.39 OI-OP 0.37-0.53	χ^2_{420}=598.33 (*P*>0.01) GFI=0.94 AGFI=0.93 NNFI=0.96 IFI=0.97 NCP=178.33 CFI=0.97 RMSEA=0.05
	TECHN2	0.87***(32.10)	0.76				
	TECHN3	0.95***(45.89)	0.90				
Potential Absorptive Capacity (PAC)	PACAP1	0.82***(25.00)	0.67	0.902	0.655		
	PACAP2	0.92***(35.96)	0.85				
	PACAP3	0.90***(29.71)	0.81				
	PACAP4	0.64***(14.74)	0.51				
	PACAP6	0.62***(13.12)	0.52				
Realized Absorptive Capacity (RAC)	RACAP1	0.65***(14.75)	0.50	0.941	0.729		
	RACAP2	0.90***(32.70)	0.82				
	RACAP3	0.87***(32.72)	0.76				
	RACAP4	0.93***(35.74)	0.87				
	RACAP5	0.84***(26.45)	0.70				
	RACAP6	0.87***(28.92)	0.75				
Internal Labour Flexibility (ILF)	FLEXIB1	0.73***(18.85)	0.54	0.943	0.705		
	FLEXIB2	0.75***(19.67)	0.56				
	FLEXIB3	0.85***(27.90)	0.72				
	FLEXIB4	0.95***(40.23)	0.91				
	FLEXIB5	0.87***(32.51)	0.76				
	FLEXIB6	0.88***(31.62)	078				
	FLEXIB7	0.82***(24.08)	0.68				
Organizational Innovation (OI)	INNOVA1	0.83***(23.57)	0.68	0.895	0.683		
	INNOVA2	0.89***(22.67)	0.64				
	INNOVA3	0.79***(22.84)	0.62				
	INNOVA4	0.86***(27.80)	0.74				
Organizational Performance (OP)	PERFOR1	0.80***(24.57)	0.63	0.940	0.725		
	PERFOR2	0.83***(24.65)	0.68				
	PERFOR3	0.82***(27.77)	0.68				
	PERFOR4	0.99***(55.28)	0.99				
	PERFOR5	0.77***(19.73)	0.60				
	PERFOR6	0.88***(30.99)	0.77				

Notes: λ* = Standardized Structural Coefficient (t-students are shown in parentheses); R^2=Reliability; C.R.=Composite Reliability; AVE=Average Variance Extracted; *** $p < 0.001$ (two-tailed).

Table 4 presents the results for the structural model depicted in Figure 2. Structural equation modelling (Bollen, 1989) was performed to estimate direct and indirect effects using Lisrel with the correlation matrix and asymptotic covariance matrix as input. The overall fit of the structural model was good, and the completely standardized path estimates indicate significant relationships among the constructs. If we examine the standardized parameter estimates, the findings show that technology is related and affects potential absorptive capacity (γ_{11}=.73, p<.001) and realized absorptive capacity (γ_{21}=.84, p<.001), as was predicted in Hypotheses 1 and 2. Furthermore, we have shown an indirect effect of technology on realized absorptive capacity (.13, p<.05) through potential absorptive capacity (.73 x .18). These indirect effects may be analyzed in Table 4 (for calculation rules see, for instance, Bollen, 1989). Potential absorptive capacity affects realized absorptive (β_{21}=.18, p<.05), supporting Hypothesis 3. Comparing the magnitudes of these effects indicates that the effect of technology on realized absorptive capacity is larger than the effect of technology on potential

absorptive capacity. Globally, the model provides a good explanation of potential absorptive capacity (R^2=.53) and realized absorptive capacity (R^2=.76).

Internal labour flexibility is affected by realized absorptive capacity (β_{32}=.71, p<.001), supporting Hypothesis 4. Similarly, organizational innovation is influenced directly by realized absorptive capacity (β_{42}=.69, p<.001) and internal labour flexibility (β_{43}=.17, p<.05). Indirectly realized absorptive capacity also affects organizational innovation (.12, p<.05) through internal labour flexibility (.71x.17). The global effect is .81 (p<.001). Hypotheses 5 and 6 are thus supported. Comparing the magnitudes of these effects indicates that the effect of realized absorptive capacity on organizational innovation is larger than the effect of internal labour flexibility on organizational innovation. Globally, internal labour flexibility (R^2=.50) and organizational innovation (R^2=.68) are explained well by the model.

Table 3.4. Structural model results (Direct, Indirect and Total effects)

Effect from		To	Direct Effects	*t*	Indirect Effects	*t*	Total Effects	*t*
Technology	→	Potential Absorptive Capacity	0.73***	13.59			0.73***	13.59
Technology	→	Realized Absorptive Capacity	0.84***	8.92	0.13*	2.20	0.97***	14.41
Technology	→	Internal Labour Flexibility			0.69***	14.17	0.69***	14.17
Technology	→	Organizational Innovation			0.79***	16.13	0.79***	16.13
Technology	→	Organizational Performance			0.74***	16.22	0.74***	16.22
Potential Absorptive Capacity	→	Realized Absorptive Capacity	0.18*	2.06			0.18*	2.06
Potential Absorptive Capacity	→	Internal Labour Flexibility			0.12*	2.04	0.12*	2.04
Potential Absorptive Capacity	→	Organizational Innovation			0.14*	2.05	0.14*	2.05
Potential Absorptive Capacity	→	Organizational Performance			0.13*	2.06	0.13*	2.06
Realized Absorptive Capacity	→	Internal Labour Flexibility	0.71***	11.12			0.71***	11.12
Realized Absorptive Capacity	→	Organizational Innovation	0.69***	7.58	0.12*	2.02	0.81***	11.99
Realized Absorptive Capacity	→	Organizational Performance	0.55***	4.81	0.21*	2.18	0.76***	12.45
Internal Labour Flexibility	→	Organizational Innovation	0.17*	1.99			0.17*	1.99
Internal Labour Flexibility	→	Organizational Performance			0.05	1.40	0.05	1.40
Organizational Innovation	→	Organizational Performance	0.26*	2.19			0.26*	2.19
Goodness of Fit Statistics		χ^2_{427}=670.66 (*P*>0.01) GFI=0.94 AGFI=0.93 ECVI=5.09 AIC=808.66 CAIC=1089.85 NNFI=0.95 IFI=0.95 PGFI=0.81 PNFI=0.81 NCP=243.66 CFI=0.95 RMSEA=0.06						

Notes: Standardized Structural Coefficients ; $^{\dagger}p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Finally, organizational performance is affected directly by realized absorptive capacity (β_{52}=.55, p<.001) and organizational innovation (β_{54}=.26, p<.05). We find an indirect influence of realized absorptive capacity on organizational performance (.21, p<.05) through organizational innovation (.69x.26) and internal labour flexibility (.71x.17x .26). The global effect of realized capacity on organizational performance is .73 (p<.001). Hypotheses 7 and 8 are thus supported. Comparing the magnitudes of these effects indicates that the effect of realized absorptive capacity on organizational performance is larger than the effect of organizational innovation on organizational performance. Globally, organizational performance is explained well by the model (R^2=.60). In addition to these effects, other indirect relationships can be seen in Table 5.

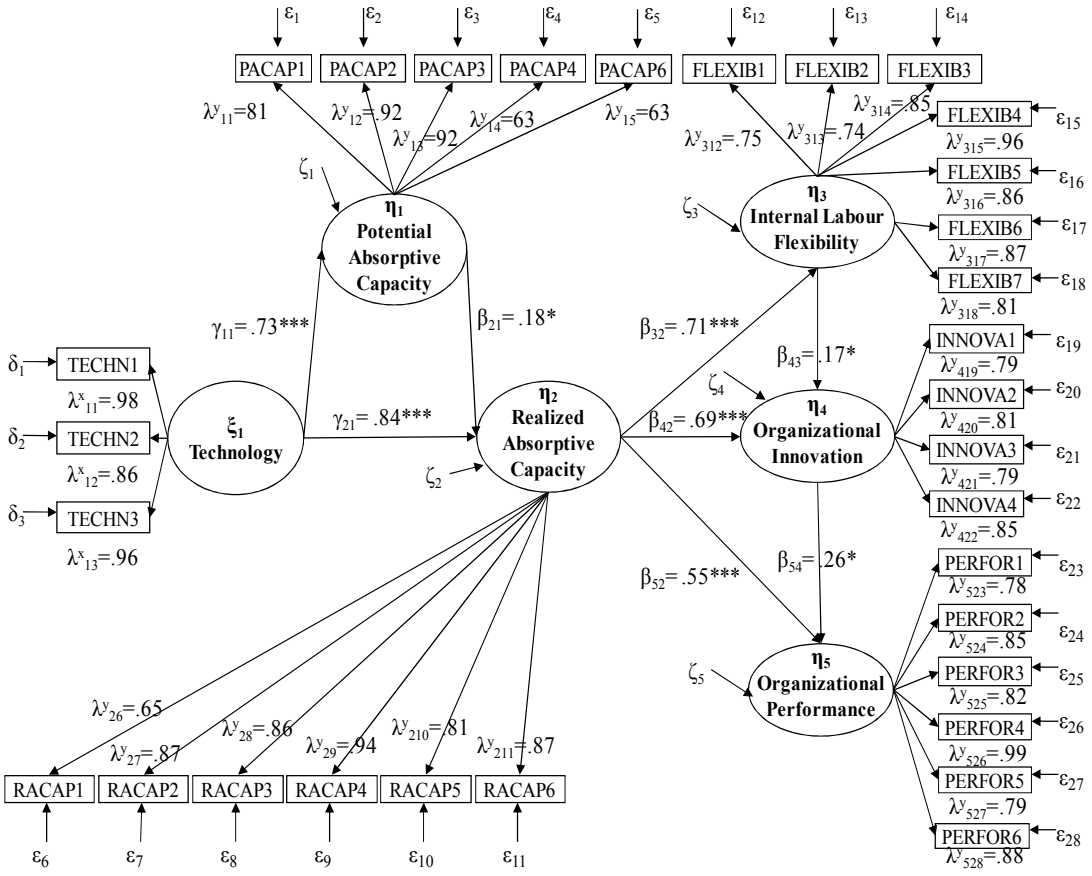

Figure 3.2. Results of Structural Equation Model

In testing the theoretical framework, we fit several nested models, each incorporating different assumptions about parameters. Comparison to reasonable alternative models is recommended as a means of showing that a hypothesized model is the best representation of the data, since comparison is considered to be an important part of assessing model fit (Bollen, 1989). The summary of statistics in Table 5 indicates that Model 1 is preferable to the others, supporting the inclusion of a model with these relationships among the constructs analysed. For example, if we compare the theoretical model (Model 1) to Model 5, we can see that the latter has a worse Root Mean Square Error of Approximation (ΔRMSEA=.005), Non-Normed Fit Index (∇NNFI=.01), Expected Cross-Validation Index (ECVI=.27), Akaike Information Criterion (ΔAIC=44.09), and Estimated Non-Centrality Parameter (ΔNCP=45.09). The results show that Model 1 is preferred to Model 5 ($\Delta\chi^2$ = 46.09). We also observe that the theoretical model is preferable to the other models formulated (Table 5). Although length restrictions prevent a detailed discussion of each model, the proposed theoretical model represents (Figure 2) the preferred, most acceptable and parsimonious model.

Table 3.5.. Model statistics against theoretical model

Model	Description	χ^2	$\Delta\chi^2$	RMSEA	NNFI	ECVI	AIC	NCP
1	Theoretical	670.66		0.060	0.95	5.09	808.66	243.66
2	Without technology to real abs. capacity	717.20	46.54	0.065	0.94	5.37	853.20	289.20
3	Without pot. Abs. Capacity to real abs.capacity	673.62	2.96	0.060	0.95	5.09	809.62	245.62
4	Without real abs. Capacity to int. lab.flexibility	702.68	32.02	0.064	0.94	5.29	840.68	275.68
5	Without real abs. Capacity to org. innovation	716.75	46.09	0.065	0.94	5.36	852.75	288.75
6	Without int. Lab. flexibility to org. innovation	674.37	3.71	0.060	0.95	5.10	810.37	246.37
7	Without real abs. Capacity to org. performance	684.96	14.30	0.061	0.95	5.16	820.96	256.96
8	Without org. innovation to org. performance	674.84	4.18	0.060	0.95	5.10	810.84	246.84

Notes: n = 160.

3.5. Conclusions and future research

3.5.1. Discussion

In this study, we analyze how support for and improvement of technological skills and competencies have a positive influence on both potential and realized absorptive capacity, since these capacities are closely related. We also analyze how realized absorptive capacity influences policies for internal labour flexibility, the development of organizational innovation, and organizational performance. In addition, we study how policies for internal labour flexibility influence organizational innovation, which in turn influences organizational performance. Prior studies have found that these variables are related independently, not as a whole, by analyzing their final effects on organizational performance.

Recent studies show the need to develop a deeper understanding of the effects of employment on technology in organizational performance (Al-Adaileh & Al-Atawi, 2011; Benitez et al., 2010; Martin, Garcia & Garcia, 2011; Martin, Garcia & Mihi, 2011; Petroni & Panciroli, 2002). Our research shows, first, the existence of a positive relationship between technology (top management support for technology, technological skills, and technological distinctive competencies) and organizational performance through a positive influence on the capacity to absorb knowledge and information and on the transformation and exploitation of this knowledge (Carlsson, 2004; Hargadon, 1998; Rico et al., 2008; Young Choi et al., 2010; Zahra & George, 2002).

Top management should promote means and plans for developing technologically to enable the firm to generate a learning culture (Antoncic & Hisrich, 2001), develop technological abilities and capacities that other firms do not have (Leonard-Barton, 1992), and promote a flexible framework that permits the firm to absorb and use knowledge from outside the firm and obtain greater innovation capacity (Leonard-Barton, 1992) in order to generate sustainable competitive advantages (Al-Adaileh &

Al-Atawi, 2011). Support, development, technological training, and technological research and development activities contribute to the generation of absorption capacity and new knowledge, increasing employees' capacities to acquire and implement technological knowledge (Camison & Fores, 2010). Firms should make larger investments in technical media and technological research and development that permit them to increase their knowledge stock and capacity to use this knowledge (Camison & Fores, 2010; Veugelers, 1997).

Firms should also allocate resources and develop plans for improving the technological tools and techniques necessary for knowledge absorption processes. They should develop strategic policies to motivate the organization's personnel to adopt technology as a mechanism for fostering the acquisition, assimilation, transformation, and exploitation of external knowledge (Christensen & Rosenbloom, 1995; Zahra et al., 2000). Firms should also attend to learning policies that permit employees to improve their technical competencies and abilities, facilitating the subsequent exploration and exploitation of knowledge (Christensen & Rosenbloom, 1995; George et al., 2001; Zahra et al., 2000), as employees' technical abilities and competencies and the education, experience, training, and skills they acquire at work represent a prior step to facilitate the absorption of new knowledge (Camison & Fores, 2010). Because endowing specialists, qualified technicians, engineers, scientists, etc. with these skills while also developing research in specific areas, influences the identification, acquisition, assimilation, and exploitation of new knowledge, it is important for the firm to foster policies oriented to differentiating work practices with quality, creating multidisciplinary groups, and rotating work positions as a way to facilitate absorption capacity (Camison & Fores, 2010; Gupta & Govindarajan, 2000; Nonaka & Takeuchi, 1995; Rothwell & Dodgson, 1991; Zahra & George, 2002).

Second, the research shows a positive relationship between realized absorption capacity and internal labour flexibility (Beltran et al., 2009; Blyton & Morris, 1992; Kalleberg, 2001; Valverde et al., 2000), organizational innovation (Jimenez et al., 2011; Zahra & George, 2002), and organizational performance (Kazanjian et al., 2002; Kostopoulos et al., 2011; Spender, 1996; Tsai, 2001; Zahra & George, 2002). Organizations should foster various internal and external factors to facilitate the process of acquiring, transferring, and using knowledge and to promote initiating policies of internal labour flexibility in the organization, with the intention of having personnel

motivated and prepared to assume new tasks, activities, and functions in diverse areas, tasks that were previously performed by various persons (Artigas et al., 2008; Pedersen et al., 2003). Among the internal labour flexibility policies employed, we would stress shorter workday and greater freedom for the business to establish work schedules, whether condensing the weekly workday by concentrating it in three or four days or modulating the workday by establishing average weekly, monthly, or yearly time limits (Ermida, 1992). Organizations can also employ other mechanisms and processes to make internal labour more flexible (e.g., reducing the hours of the workweek or increasing the use of part-time workdays; promoting flexible modalities for hiring women and young people; developing policies for helping, training, and preparing new workers; introducing so-called bankers' hours, especially at peak production times, for which workers are compensated not monetarily for the extra hours they work but in free days or extra vacation time during periods of lower production). Such practices foster the requalification of work, cooperative labour relations, and rethinking of the contractual relationship that assigns greater value to the human factor as a decisive element in the success of the business (Looise et al., 1998; Michie & Sheehan-Quinn, 2001; Urquijo, 2004).

The transformation and exploitation of knowledge is of vital importance for organizational innovation, as it encourages the existence of new structures and ways of working, new processes and products that permit the maintenance or improvement of current competitive advantage, and the creation of new competitive advantages through innovation processes (Jimenez et al., 2011; Zahra & George, 2002). The organization can implement innovative policies oriented to suppliers and customers, whether by means of so-called customer service, commercialization platforms for suppliers, platforms for receiving and sending of orders, etc. (Jimenez et al., 2012). The organization's managers should also incline toward formal structures, but without excessive rigidity, to increase the capacity to acquire, assimilate, transfer, and apply the necessary knowledge and promote organizational innovation capacity (Chen & Chang, 2012). Excessive structural formalization can impede the decision-making process and the implementation of organizational innovation (Chen & Chang, 2012; Hurley & Hult, 1998; Zahra & George, 2002).

It is also necessary to develop policies to improve the processes of transformation and exploitation of knowledge to improve the organization's performance (Kostopoulos

et al., 2011; Miles & Snow, 1978; Tsai, 2001). Organizations should encourage the development of collaborative work environments in which each employee can edit contents and documents and interact with the other members of the organization at any time from any place. Organizations should also invest in tools that permit them to design, modify, execute, and control workflows for all of the different processes in the firm, or in advanced search engines to capture and apply external knowledge (Lyles & Salk, 1996; Powell et al., 1996; Simonin, 1999).

Third, research shows the existence of a positive relationship between internal labour flexibility and organizational innovation (Arvanitis, 2005; Kelliher & Riley, 2003). The dynamic nature of current competitive environments has motivated managers to identify new sources of flexibility based on the organization's human resources. In this sense, internal labour flexibility is strategic for firms, as it facilitates more rapid and efficient adaptation of the organization to the changes produced, while also constituting a source of innovation (Arvanitis, 2005; Kelliher & Riley, 2003). Firms with internal labour flexibility perform better assignment of positions for their workers, with the proper knowledge and the abilities and qualities best suited to the characteristics of the position, improving the organization's innovative capacity (Arvanitis, 2005; Kelliher & Riley, 2003). For example, German legislation permits the so-called "sliding worktime", which allows the worker him- or herself to define the start and end time of the workday. The worker may also be permitted to determine his or her monthly work schedule (for example, working 24/7, which in mathematical terms permits one to work only a week or two every month). Finally, there is the possibility of job sharing, in which two or more people fill a position, sharing the work indiscriminately between them (Ministerio de Empleo y Seguridad Social, 2010; Martinez et al., 2009, 2011; Michie & Sheehan-Quinn, 2003). Firms should also encourage internal promotion as a mechanism for obtaining internal labour flexibility, as this permits the firm to balance the need to develop organizational responses to external challenges with a guarantee of better working conditions and greater stability for employees (Beltran et al., 2009; Wilthagen & Van Velzen, 2004). Different European countries (e.g. Italy) have created so-called "solidarity contracts" that suspend workers' contracts during certain periods but commit the organization to continuing to pay the costs of the social welfare benefits. In this way, the company does not have to pay salaries and the compensation for years worked but avoids having to lay workers off and preserves the possibility of

reincorporating them into the organization at a period agreed upon in advance (Beltran et al., 2009). It is also common to apply contracts called "cassa integrazione," which are applied at the request of the firm in cases of temporary crisis and that consist of a reduction in employees' workday while giving them remuneration equivalent to a means of support for their income (Ministerio de Empleo y Seguridad Social, 2010; Martinez et al., 2009, 2011; Michie & Sheehan-Quinn, 2003).

Fourth and finally, we find the influence of organizational innovation on organizational performance (Avlonitis & Salavou, 2007; Baker & Sinkula, 1999; Damanpour & Evan, 1984; Damanpour et al., 1989; Ettlie, 1995; Schulz & Jobe, 2001). The managers of the organization should foster practices that encourage collaboration between the members of the organization. Fostering technologies for collaboration (e.g., videoconferences between members of the firm) will permit the firm to provide technical and training support that promotes trust in collaboration strategies and stimulates a culture of innovation (Avlonitis & Salavou, 2007; Baker & Sinkula, 1999; Lyles & Salk, 1996). Firms should also promote communication between all members of the organization. To achieve this, managers should promote the presence of inter-hierarchical lines of communication between the organization's members so that there is free flow of ideas to stimulate innovation (Avlonitis & Salavou, 2007; Baker & Sinkula, 1999; Jimenez et al., 2011; Zahra & George, 2002). They should also encourage employees to undertake risks as a mechanism to promote innovation (Baker & Sinkula, 1999).

3.5.2. Limitations and future research

The investigation presented exhibits several limitations that should be considered. First, survey data based on self-reports may be subject to social desirability bias (Podsakoff & Organ, 1986). However, an assurance of anonymity can reduce such bias even when responses are related to sensitive topics (Konrad & Linnehan, 1995). The low risk of social desirability bias in this study was indicated by several managers who commented that it made no sense at all for their companies to go beyond regulatory compliance. Still, the responses are subject to interpretation by individual managers.

Second, although Harman's one-factor test and other method tests did not identify common method variance as a problem, it still might have been (Podsakoff & Organ, 1986; Konrad & Linnehan, 1995). Although Spector (2006) has argued that it is incorrect to assume that the use of a single method automatically introduces systematic

bias, we recommend that future research gather measures of independent and dependent variables from different data sources to minimize the effects of any response bias (Podsakoff et al., 2003).

Third, our data are cross-sectional, making it difficult to examine the evolution of the different variables in our study. This aspect is of particular interest when considering the dynamic nature of some of our variables. Although we tested the most plausible directions for the pathways in our model, longitudinal research is needed to assess the direction of causality of the relationship and to detect possible reciprocal processes. We have tried to temper this limitation through attention to theoretical arguments by rationalizing the relationships analyzed and integrating temporal considerations into measurement of the variables (Hair et al., 1999). Fourth, this study has considered all of these variables in European market—only ten OECD countries. More countries should be included and a greater number of economic sectors.

Finally, the model analyzes the relation of technology (influenced by top management support, technological skills, and technological distinctive competencies) on potential and realized absorptive capacity and the influence of realized absorptive capacity on internal labour flexibility, organizational innovation, and organizational performance. It should be noted that the variables selected explain an acceptable amount of the variance of this research. However, other constructs affected by realized absorptive capacity, such as the type of strategy that the organization uses (exploratory, defensive, analytical, or reactive [Flor et al., 2011; Miles & Snow, 1978]), specialization of work positions (Cohen & Levinthal, 1990), size of the organization, or rotation of work positions (Jansen et al., 2005) might be analyzed. The homogeneous geographical context examined here limits the influence of external factors, but future research might well explicitly integrate the influences of external factors (Aragon & Sharma, 2003). More empirical papers supporting (or rejecting) our results, in different contexts, would be welcomed (especially longitudinal studies).

3.6. References

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Appendix

Questionnaire items

Tecnology

Top management support

1. Top management cultivates technology project champions.
2. Top management ensures adequate funding of technology research and development.
3. Top management restructures work processes to leverage technological opportunities in the organization.
4. Top management facilitates technology transfer through the organization.

Technological Skills

1. Are very superior to those of closest competitors in hardware and operating systems performance.
2. Are very superior to those of closest competitors in business applications software performance.
3. Are very superior to those of closest competitors in communications services efficiency.
4. Are very superior to those of closest competitors in the generation programming languages.

Technological Distinctive Competencies

1. Capability to obtain information about the status and the progress of science and relevant technologies.
2. Capability to generate advanced technological processes.

3. Capability to assimilate new technologies and useful innovations.
4. Capability to attract and retain its qualified scientific-technical staff.
5. Capability to dominate, generate, or absorb basic and key technologies.
6. Effectiveness in setting up programs oriented to internal development of technological or technology absorption competencies, either from R+D centres or from suppliers and customers.

Potential Absorptive Capacity

1. There is close personal interaction between the two organizations.
2. The relation between the two organizations is characterized by mutual trust.
3. The relation between the two organizations is characterized by a high level of reciprocity.
4. The workers regularly have to communicate with colleagues about work-related issues.
5. The organizational cultures of the two organizations are compatible.

Realized Absorptive Capacity

1. Interdepartmental meetings are organized to discuss the development and tendencies of the organization.
2. The important data are transmitted regularly to all units.
3. When something important occurs, all units are informed within a short time.
4. The organization has the capabilities or abilities necessary to ensure that knowledge flows within the organization and is shared between the different units.
5. There is a clear division of functions and responsibilities regarding use of information and knowledge obtained from outside.
6. There are capabilities and abilities needed to exploit the information and knowledge obtained from the outside.

Internal Labour Flexibility

1. If the need emerged, employees of this firm could easily be transferred to other

jobs with responsibilities similar to those of their current jobs.

2. If the need emerges, employees of this firm could easily be transferred to more qualified jobs.
3. Employees in this firm attempt constantly to update their skills and abilities.
4. Employees in this firm are quick to learn new procedures and processes introduced in their job.
5. When employees detect problems in performing their jobs, they voluntarily try to identify the causes of these problems.
6. Employees in this department act efficiently in uncertain and ambiguous circumstances.
7. Employees in this department exchange ideas with people from different areas of the organization.

Organizational Innovation

1. The spending on new products/services development activities.
2. The number of products/services added by the organization that are already on the market.
3. The number of new products/services that the organization introduced on the market for first time.
4. The emphasis in RandD, technological leadership and innovations.

Organizational Performance

1. Organizational performance measured by return on assets (economic profitability or ROA).
2. Organizational performance measured by return on equity (financial profitability or ROE).
3. Organizational performance measured by return on sales (percentage of profits over billing volume or ROS).
4. Organization's market share in its main products and markets.
5. Growth of sales in its main products and markets.

Capítulo IV

Analysis of the Influence of the Environment, Stakeholder Integration Capability, Absorptive Capacity and Technological Skills on Organizational Performance through Corporate Entrepreneurship

ANALYSIS OF THE INFLUENCE OF THE ENVIRONMENT, STAKEHOLDER INTEGRATION CAPABILITY, ABSORPTIVE CAPACITY AND TECHNOLOGICAL SKILLS ON ORGANIZATIONAL PERFORMANCE THROUGH CORPORATE ENTREPRENEURSHIP

ABSTRACT

This research seeks to analyze how factors such as the environment, stakeholder integration capability, absorptive capacity, and technological abilities influence corporate entrepreneurship, and what repercussions these factors have for the organization's results. The relationships studied are confirmed empirically through the use of hierarchical regression models. The sample was selected from the Amadeus database, which provided 160 European firms. The results obtained in the research show: 1) There is a positive relationship between the factors of the environment and stakeholder integration and corporate entrepreneurship. The uncertainty and complexity of the environment in which the organization operates and its relationship with stakeholders require the firm to be involved in constant updating, collaboration between parties, and innovation of processes, products, and its system to maintain competitive advantage. 2) The capacity to absorb new knowledge and the development of technological abilities enable the generation of new, advanced technological processes and fostering of an corporate entrepreneurship to detect opportunities on the market and transform them into an additional advantage over competitors. 3) Entrepreneurial activities contribute to the economic development of the firm, due to the creation and setting up of new business, the renewal of activity, and/or the creation of new products or processes.

Keywords: Environment, stakeholder integration capability, absorptive capacity, technological skills, corporate entrepreneurship, organizational performance.

4.1. Introduction

In the new economic scenario, characterized by high dynamism and complexity, firms should develop new responses so that they can survive and succeed (Bojica & Fuentes, 2012). Corporate entrepreneurship is a necessary condition for the creation of wealth (Bojica & Fuentes, 2012; Phan et al., 2009; Zahra et al., 2009). Various researchers have shown that corporate entrepreneurship is driven by the prior existence of different strategic factors that have been analyzed extensively in the literature, for example, the structure of the organization (Covin et al., 2006), cultural diversity (Richard et al., 2004), and form of government (Zahra et al., 2000). This study aims to analyze how corporate entrepreneurship is influenced by other factors, such as the environment, stakeholder integration capability, absorptive capacity, and technological skills and the repercussions of these factors for the results of the organization. The research is motivated by the lack of literature on this topic and the importance these factors have for the development of the entrepreneurial initiative (e.g., Alvarez & Barney, 2005; Alvarez et al., 2006; Bojica & Fuentes, 2012).

Corporate entrepreneurship involves "extending the firm's domain of competency and corresponding opportunity set through internally generated new resource combinations" (Covin & Slevin, 1991, p. 1). Corporate entrepreneurship indicates "the process by which firms notice opportunities and act to creatively organize transactions between factors of production so as to create surplus value" (Jones & Butler, 1992, p. 735). Corporate entrepreneurship is understood as a means to renew established organizations, to innovate, and to increase organizations' capability to compete in global markets (Martin et al., 2011). The growing interest in the study of corporate entrepreneurship stems from the belief that this activity can lead to better performance in the organization (Covin & Slevin, 1991). Corporate entrepreneurship is a key element for obtaining competitive advantage and greater financial reward, since it is a process by which the firm can detect an opportunity and act creatively to create value (Jones & Butler, 1992; Schollhammer, 1982).

Corporate entrepreneurship can be affected by the environment, stakeholder integration capability, absorptive capacity, and technological skills (Alvarez & Barney, 2007; Bolivar et al., 2012; De Clercq et al., 2013; Gomez et al., 2011; Ireland et al., 2009; Leonard-Barton, 1992; Martin et al., 2011; Sharma & Henriques, 2005; Woolley, 2010). The environment includes the macroeconomic and structural factors that affect

entrepreneurs' activity. Environment is an important initial factor influencing strategy, structure, and the process of initiating any entrepreneurial adventure. One of the main problems firms encounter today is the extremely turbulent environment in which they develop their activity (Morris & Jones, 1995). The current environment can be characterized by its dynamic, threatening, and increasingly complex character (Davis, 1987; Handy, 1990; Hamel & Prahalad, 1993). Managers face short decision-making periods and the need for rapid response, a lack of stable resources on the market, increasingly fast product obsolescence, etc. These conditions generally cause lack of control of resources in the long term (Stevenson et al., 1994). In such circumstances, some firms that have prospered and had good results in the past struggle to survive and to attempt to learn and undertake new ways of competing (Hamel & Prahalad, 1993).

Corporate entrepreneurship is also influenced by the different stakeholders (Sharma & Henriques, 2005; Vandekerckhove & Dentchev, 2005). Freeman (1984, p. 46) defines the stakeholder as "any group or individual who can affect or is affected by the achievement of the organization's objectives." Although a more traditional, neo-classical focus considers only the interests of the shareholder and the maximization of profits, stakeholder theory argues that the organization should consider other groups, even those without economic claims (Kuratko et al., 2007). As Goodpaster (1991) notes, we are referring to two kinds of stakeholder. Strategic stakeholders are those whose interests the firm considers in order to achieve its strategic goals, that is, stakeholders who can affect the firm's performance. However, organizations should also consider stakeholders from a perspective of balance of interest, including those that are affected by the firm (Rueda, 2005). Proper management of stakeholders thus includes strategies and ethics, balancing consideration for both kinds of stakeholder. This process is performed through stakeholder integration capability, in which the firm establishes collaborative relationships based on trust in a wide range of stakeholders, thereby facilitating innovation capacity, continuous learning, and the development of innovative entrepreneurial initiatives (Hart & Sharma, 2004; Kuratko et al., 2007).

Along with these factors, absorptive capacity is key in the entrepreneurial process, as it permits the firm to recognize and explore new opportunities through the construction of new capabilities, to create value, and to maintain competitive advantage (Zahra et al, 2009). In the entrepreneurial process as a whole, absorptive capacity is a very important issue, especially when the process is dynamic and continuous over time (Reuber &

Fischer, 1993). Cohen and Levinthal (1990, p. 128) define absorptive capacity as "the ability to recognize the value of new information, to assimilate it, and apply it to commercial ends." Absorptive capacity is considered to be a fundamental ability for learning and organizational innovation, since detecting business opportunities depends on the intensity of knowledge that the firm possesses (Sommer & Haug, 2011).

Finally, as to technological abilities, Teece et al. (1990, p. 29) define managerial skills as "a set of differentiated skills, complementary assets, and routines that provide the basis for a firm's competitive capacities and sustainable advantage in a particular business." If we apply this idea to technological issues, Leonard-Barton (1992, p. 113) emphasizes that "technological skills constitute the entire technical system, which usually traces its roots back to the firm's first products." Technological abilities have been described as managerial capacities that constitute a unique, distinctive, inimitable resource (Danneels, 2007, 2008; Martin et al., 2011). They "reflect the ability of a firm to make certain physical products or processes which enable the firm to serve a particular customer group" (Danneels, 2008, p. 520). In relation to corporate entrepreneurship, technological abilities provide the capability to respond faster to an opportunity. By making resources available to the entrepreneur in a more appropriate form, technological abilities provide the ability to obtain a competitive advantage and exploit the resources that lead to greater profitability for the firm (Perez & Alegre, 2012).

This study also seeks to analyze the influence of corporate entrepreneurship on organizational performance. In sectors like the technology sector, firms are characterized especially by the existence of entrepreneurial behavior and their highly innovative character. Such characteristics drive the development of entrepreneurial activities, permitting firms them to respond more rapidly to changes in the environment, to obtain new products, and to respond to current demands on the market (Jimenez & Sanz, 2005; Martin et al., 2011). Entrepreneurial capacity permits organizations to anticipate and to act in the face of future desires and needs in the market, benefitting from competitive advantage and the economic profit that it can produce in the organization (Fuentes et al., 2010; Lumpkin & Dess, 1996).

To achieve the goals proposed above, we have organized the research as follows. In Section 2, we explain the foundations of the research, proposing a series of hypotheses. Section 3 presents the data and research methodology used in the empirical analysis.

Section 4 presents the results obtained. Finally, in Section 5, we discuss the results, implications of the research, and limitations of the study, as well as future lines of research.

4.2. Theoretical background

Corporate entrepreneurship is a means of renewing organizations that increases innovation and the capability to compete in global markets (Martin et al., 2011). But the most important issue is not only to identify individuals who wish to be entrepreneurs, but to detect the most valuable entrepreneurial opportunities for the organization (Ruiz et al., 2009; Shane & Venkatraman, 2000). Identification and selection of the right opportunities for creating new or advancing current business depends on specific factors that influence the ability of the manager or entrepreneur to detect these new opportunities. In the following sections, we describe how the factors in the environment and stakeholder integration capability, absorptive capacity, and technological abilities affect corporate entrepreneurship.

4.2.1. The influence of environment and stakeholder integration capability on corporate entrepreneurship

The environment is an essential factor influencing strategy, structure, and the processes of entrepreneurial activities (Wandosell, 2003). The characteristics that define the environment affect the fit between the firm's strategic behavior and corporate entrepreneurship (Covin & Slevin, 1989; Zahra & Garvis, 2000). Numerous studies have therefore analyzed the elements and characteristics of the environment that affect corporate entrepreneurship (e.g., Kuratko et al., 2004; Sathe, 2003; Stopford & Baden-Fuller, 1994). Stevenson and Jarillo (1990) review the different studies of the figure of the entrepreneur and conclude that the environment is relevant and even essential for entrepreneurial action, not only for providing opportunities to take advantage of the market's lack of efficiency, but above all because it offers more or less favorable situations for the entrepreneur. Corporate entrepreneurship does not seem to depend only on genetic or psychological characteristics of the entrepreneur but also on circumstances external to the entrepreneur, which make him/her react, recognize opportunity, and take advantage of it (Martin et al., 2011). Without an environment that fosters the detection of opportunities, corporate entrepreneurship will not develop (Stevenson & Jarillo, 1990).

A hostile and dynamic environment affects organizational performance (Covin & Slevin, 1989), giving rise to the need to establish entrepreneurial strategies to improve the organization's results (Zahra, 1991). Lumpkin and Dess (1996) suggest that firms that face rapid evolution of the competitive environment are more inclined to apply strategies characterized by corporate entrepreneurship. Competitive intensity is one of the most influential strategic factors affecting the development of corporate entrepreneurship, since it forces firms to create and exploit new alternatives to maintain their competitive advantage (Ireland et al., 2009; Porter, 1980). Without a competitive environment, motivation by the organization itself, and the right policies and incentives to detect opportunities, it is harder for corporate entrepreneurship to emerge (Wandosell, 2003).

The environment plays a special strategic role in the case of technology firms (Covin & Slevin, 1989). Changes in technology sector firms are continuous. Firms should promote technological improvement, seek strategic markets, develop innovative business models, and exploit and value the opportunity of competing in different areas that distinguish them from the competition. Driven by the environment in which firms in the technology sector operate, technological changes require these firms to innovate continually and promote entrepreneurial activities if they wish to remain competitive on the market (Ireland et al., 2009). Based on the foregoing, we propose the following hypothesis:

H1a: *The environment is positively related to corporate entrepreneurship.*

Stakeholders such as investors, employees, managers, customers, ONGs, etc., influence the implementation of entrepreneurial strategies and the organization's performance (Kuratko et al., 2007). Greater knowledge of stakeholders can provide opportunities to develop new products and services (Vandekerckhove & Dentchev, 2005). It is within this framework that the role of entrepreneur gains importance, in identifying the opportunities that greater knowledge provides and taking advantage of them through entrepreneurial activities (Martin et al., 2011). Thus, proactive management of stakeholders can give rise to intangible and socially complex resources that increase the firm's ability to excel over its competitors in terms of long-term value creation (Hillman & Keim, 2001; Rueda, 2005). Long-term relationships with stakeholders can have dynamic repercussions in the firm, permitting it to respond rapidly to the changing circumstances of the environment (Harrison & St. John, 1996).

This process in its entirety will be possible through the integration of stakeholders in the firm, which leads to the creation of relational interactions beyond mere economic exchange between the parties to assume the development of long-term relations of trust. Further, the creation of relational interactions with stakeholders can generate competitive advantages for the firm that are quite difficult for competitors to copy (Rueda et al., 2008).

The organization is also exposed to the needs of its stakeholders and should maintain good relationships with the various groups, which can come to be potential suppliers of new entrepreneurial behavior (Vandekerckhove & Dentchev, 2005). The organization should therefore share the tacit knowledge of its stakeholders and be able to identify their needs and develop new products and improve its services (Wiklund & Shepherd, 2003). The most entrepreneurial organizations will be those that identify and exploit these opportunities first and best (Martin et al., 2011), whereas firms adopt a more reactive stance are less entrepreneurial and thus less likely to find these opportunities and obtain benefits from them (Bojica & Fuentes, 2012). Stakeholder integration can help to generate ideas, technologies, and new perspectives for entrepreneurial activity. The integration of suppliers or customers, for example, can help to design new products and services, produce knowledge that permits the development of continuous innovation and learning capacities, and generate competitive imagination (Hart & Sharma, 2004; Sharma & Vredenburg, 1998).

Vandekerckhove and Dentchev (2005) propose two ways for the entrepreneur to find the opportunities that can derive from the relationships with stakeholders. The first is direct integration of the stakeholders in the firm's strategy in order to explore new business possibilities. Initially, one might think that this idea contradicts what is required for the firm's achievement or profitability, but this is not the case. With greater participation of groups in the firm, the entrepreneur can obtain a new perspective on stakeholders' activities and identify new business opportunities (Hart & Sharma, 2004). As Sharma and Henriques (2005) argue, when interdependence between the firm and stakeholders exists for a great number of resources, it is very likely that the two parties will adopt a strategy of direct influence, such that the goals of both groups are satisfied (Frooman, 1999). For example, in the forestry industry, the most important customers—such as the construction firms and furniture manufacturers—have worked with the

supply firms to implement norms and practices of more sustainable forestry certification and lumber exploitation.

Second, we propose that the entrepreneur is involved with the stakeholders indirectly in order to obtain information for the effective resolution of possible conflicts between them. That is, the opportunities that arise from the round tables in which the different stakeholders in the firm participate permit the entrepreneur to engage in a continuous and creative learning process that enables him or her to be involved and to capture the information and opportunities that derive from these processes. This will permit the firm to fulfill stakeholders' expectations, the commitments and the considerations of each stakeholder, and thus to improve the firm's situation (Vandekerckhove & Dentchev, 2005). For example, environmental groups and ecological associations participate actively in the evaluation meetings of the Canadian government to renew or reject permits for exploitation of forests (Sharma & Henriques, 2005). The same occurs when they demand changes the contractual practices establishing one can only buy wood products from Canadian firms that adopt sustainable practices. This is a strategy of indirect influence (Sharma & Henriques, 2005).

Given this perspective, and due to the variety of economic and social issues involved, the development of entrepreneurial activities transcends the frontiers of the organization itself and requires knowing the perspectives of a wide range of stakeholders, both internal and external (Cennamo et al., 2012; Westley & Vredenburg, 1991). Entrepreneurs are taking into account the increasingly influential role stakeholders are assuming, changing their way of thinking, and including these factors in the concept of corporate entrepreneurial capacity (McGrath & Macmillan, 2000). The new opportunities proposed often require a new definition of the firm's purpose in adapting to changes that the development of products and services implies, taking into account stakeholders. Based on the foregoing, we propose the following hypothesis:

H1b: *Stakeholder integration capability is positively related to corporate entrepreneurship.*

4.2.2. The influence of absorptive capacity on corporate entrepreneurship

Absorptive capacity indicates the firm's capacity to identify, accumulate, process, and use the new knowledge acquired from external sources (Zahra et al, 2009). Having this capacity can significantly improve the firm's ability to recognize and explore new

opportunities through the construction of new capabilities and the reduction of cognitive rigidity among the firm's top managers. The external knowledge transmitted and disseminated through the firm's absorptive capacity permits improvement of the knowledge already available in the organization and can lead the organization's managers to explore different entrepreneurial strategies that encourage the firm's growth (Cohen & Levinthal, 1990; Zahra et al, 2009). Firms should thus develop their absorptive capacity to recognize, evaluate, assimilate, and exploit new knowledge, as these activities are crucial for the effective integration of different kinds of knowledge and resources, as well as the generation of entrepreneurial activities and of competitive advantage (Sirmon et al., 2007). Knowledge, and specifically absorptive capacity, is a strategic entrepreneurial factor (Barney, 1991; Barney et al., 2001). Oviatt and McDougall (2005) hold that business opportunities depend on the intensity of knowledge that the firm possesses. In this way, the identification and evaluation of an opportunity and its possible exploitation are influenced by the attitudes and networks the organization possesses, as well as the know-how available (Sommer & Haug, 2011).

Absorptive capacity facilitates exploration activities that improve the firm's innovation capacity, in turn driving value creation (Zahra et al., 2009). Likewise, when the firm possesses a high level of absorptive capacity, its capacity to learn how to develop and use new knowledge in entrepreneurial activities is greater (Leonard-Barton, 1992; Zahra & George, 2002). New knowledge changes established routines in the firm, permitting it to generate new capabilities and entrepreneurial opportunities (Bojica & Fuentes, 2012). The construction of these capabilities requires the mobilization of significant resources, the development of new systems for combining these resources, and widely different deployment of assets in seeking new sources of competitive advantage and exploring more innovative options. This greater knowledge can nourish firm's ability to take advantage of its existing resources and support entrepreneurial activities and initiatives to increase value creation (Sirmon et al., 2007).

The continuous search for and exploitation of new business opportunities also requires the injection of resources and new knowledge and the use of multiple external sources (Zahra et al., 2009). If the firm does not develop its absorptive capacity and demonstrates an attitude of inactivity toward technological advance, a new product, etc., it may not be able to appreciate the opportunities that the environment offers and may lose competitiveness (Cohen & Levinthal, 1990). Therefore, firms that acquire and

exploit knowledge from external sources tend to improve their source of resources, which, with the businessperson's capability to recognize these opportunities and mobilize resources to bring new inventions on the market, will have repercussions for the results of the organization (Bojica & Fuentes, 2012; Qian & Zoltan, 2013). Thus, absorptive capacity can indicate new uses for current resources to fill resource gaps that the firm's behavior generates. Therefore, for firms that have a proactive strategic orientation, absorptive capacity increases the ability to respond properly to a dynamic environment, providing the best conditions to translate entrepreneurial strategy into greater performance (Bojica & Fuentes, 2012). Superior absorptive capacity increases the firm's capability to recognize opportunities proactively instead of reactively (Thorpe et al., 2005).

In conclusion, absorptive capacity permits the exploitation and integration of external knowledge, which increases the probability of achieving better comprehension of the opportunity and thus ability to respond to entrepreneurial activities (Zahra et al., 1999). These activities involve a process of acquisition, assimilation, and use of knowledge and the ability to mobilize external resources, attract customers, and identify entrepreneurial opportunities (Fuentes et al., 2010; Granovetter, 1985). Based on the foregoing, we propose the following hypothesis:

H2: *Absorptive capacity is positively related to corporate entrepreneurship.*

4.2.3. The influence of technological abilities on corporate entrepreneurship

The organization's corporate entrepreneurship will be greater if technological abilities are fostered (Kelley, 2011). Managers with technological abilities have a greater capability to detect the opportunities in the environment and, through corporate entrepreneurship, to develop products or deliver different services that are more difficult for the competition to imitate or substitute (Perez & Alegre, 2012), thereby generating competitive advantage in the organization and obtaining greater profitability (Martin et al., 2011). Fostering these technological abilities in managers is a necessary condition for developing corporate entrepreneurship (Brio & Junquera, 2003). Entrepreneurs possess a series of remarkable skills (among them, technological abilities) that permit them to innovate and respond to existing opportunities in dynamic and turbulent environments (Leonard-Barton, 1992). Technological abilities foster the creation of an organizational structure that supports entrepreneurial activities, increases the preparation to undertake entrepreneurship, and improves evaluation and decision

making (Kelley, 2011). The firm's success is thus based to a great extent on the existence of a group of people with experience in technological abilities who promote corporate entrepreneurship (Antoncic & Hisrich, 2001; Cooper, 1973; Omerzel & Antoncic, 2008). Authors like Zahra and Garvis (2000) stress that US firms promote the development of technological abilities that are tied closely to corporate entrepreneurship. According to various studies, when organizations are in these circumstances and face the need to develop this kind of technological ability among their personnel, they should propose plans to work with educators, universities, etc. to focus on recognizing the challenges and opportunities of the current economy and to make the changes in training programs necessary for the development of knowledge, skills, and technological abilities that employees, managers, and owners of the business will need in the new economy (Boyles, 2012; Lemke et al., 2003; Vockley, 2008; Wagner, 2008). Technological abilities generate a capability to think and reason logically and a more open vision for solving complex problems and recognizing possible opportunities in today's dynamic environments (Boyles, 2012; DeTienne & Chandler, 2004; Hills & Shrader, 1998).

Further, for managers to discover technological opportunities and perform entrepreneurial activities, they must already possess the strategic information that permits them to detect these opportunities, as technological abilities are key in the process of previous gathering of crucial information and the discovery of business opportunities (Shane & Venkataraman, 2000). Damanpour (1991) shows that the presence of technological abilities in the organization's managers facilitates entrepreneurial and business activity. Thus, technological abilities encourage better exploitation of existing resources and opportunities by driving entrepreneurial activities that permit one to obtain greater competitive advantage and profitability for the firm (Perez & Alegre, 2012). Based on the foregoing, we propose the following hypothesis:

H3: *Technological abilities are positively related to corporate entrepreneurship.*

4.2.4. The influence of corporate entrepreneurship on organizational performance

Corporate entrepreneurship is a strategic variable for the survival of organizations in highly competitive environments like the current one (Batjargal, 2007), and this variable promotes the achievement of competitive advantage (Antoncic & Prodan, 2008; Covin & Slevin, 1991; Zahra, 1991, 1993). In the current environment of hostility and world crisis, with business opportunities shrinking, firms should foster entrepreneurial

corporate activities that permit managers to seek innovative solutions to reduce or manage these sources of instability and hostility (Covin & Slevin, 1991; Martin et al., 2011; Zahra, 1993). Organizations should identify and neutralize threats and weaknesses through entrepreneurial activities that permit them to obtain higher levels of growth and profitability (Antoncic & Hisrich, 2001; Batjargal, 2007). There is a positive relationship between corporate entrepreneurship and the organization's growth and profitability (Antoncic & Hisrich, 2001; Martin et al., 2011).

In the area of technology firms, entrepreneurial behavior promotes the development of entrepreneurial opportunities, generating new products or services and fostering business alliances and strategic networks (Batjargal, 2007; Martin et al., 2011). Various studies (Antoncic & Hisrich, 2001; Audretsch et al., 2008; Martin et al., 2011; Pearce et al., 2010; Zahra, 1991, 1993; Zahra & Covin, 1995) have shown the existence of a positive relationship between corporate entrepreneurial initiative and organizational performance. Audretsch et al. (2008) demonstrate that obtaining positive results in high technology firms depends on the capacity of local, regional, or national authorities to support entrepreneurial initiatives. In the same way, various authors have indicated that entrepreneurial innovation motivates technology firms to exploit the competitive advantage that comes from being pioneers and obtaining better business results than their competitors (Antoncic & Hisrich, 2001; Pearce et al., 2010; Zahra, 1991, 1993; Zahra & Covin, 1995). Proactive technology firms develop emerging opportunities that permit them to anticipate and act on future market desires and needs in order to obtain advantages that derive from being the first to act among competitors (Fuentes et al., 2010; Lumpkin & Dess, 1996). Similarly, Mascarenhas (1992) shows that pioneering firms have a higher survival rate in foreign markets.

Greater commitment to innovation and the existence of innovative products or processes influences the firm's performance positively (Miller 1983; Lumpkin & Dess 1996; Zhao et al., 2011). Corporate entrepreneurship can redefine the way in which the firm competes and redirects the achievement of its operations toward new segments (Zahra, 1991). For example, firms like Chrysler (Vlasic, 1998), General Electric (Smart, 1996), and Mattel (Bannon, 1998) have created innovative products to address new market segments and to enter foreign markets, a process that has enabled them to renew their way of working and improve their profitability (Baden-Fuller & Stopford 1994; Zahra & Garvis, 2000). Beyond this, entrepreneurial activities not only generate

products and processes that satisfy the customer's needs but also provide a significant opportunity for learning that permits firms to position themselves in the strongest position in the market (Zahra & Garvis, 2000).

The results of an entrepreneurial activity are not always easy to predict, and they are influenced by a series of factors that help or hinder the effects of an entrepreneurial strategy on the organization's performance (Bojica, et al., 2011). Lumpkin and Dess (1996) stress the importance of and the need to study factors that can affect the relationship between corporate entrepreneurship and the business results (Bojica & Fuentes, 2012). Among others, we would stress resources based on knowledge of firms, (Wiklund & Shepherd, 2003), organizational structure (Covin et al., 2006.), network capability (Walter et al., 2005) and cultural diversity (Richard et al., 2004). Further, we note that entrepreneurial activity involves certain risks that the organization should assess. Assuming risks has a positive effect on organizational performance up to a certain point, but beyond this point, increased risk assumption begins to have a negative effect on the organization's results (Begley & Boyd, 1987). If the risk assumed is greater than the demands of the environment or if the proper fit does not occur between the investment and the benefits expected, the effect on organizational performance will be negative (Zahra, 1993). Along these lines, Zahra (1993) suggests that risky, renewing activities that respond to the demands of the environment in which the organization operates will be rewarded by improved competitiveness, performance, or both simultaneously. Based on the foregoing, we propose that:

H4: *Corporate entrepreneurship is positively related to organizational performance.*

4.3. Methodology

4.3.1. Sample and procedure

The population for this study consisted of technology organizations within the geographical area of the European Union. We chose high-tech firms due to the interest inherent in performing a technological and entrepreneurship study on sectors with a high technological component. Technological firms are potential vehicles for transferring knowledge from the academic environment to the production sector and are strategic for the economy (Fontes, 2001). The sample (900 firms) was draw from the Amadeus (2009) database, which provides comprehensive financial and business data, by assets, on around 19 million companies in 43 European countries. The database is a

Table 4.1. Technical details of the research

Country	Austria	Belgium	Denmark	France	Germany	Italy	Poland	Spain	The Netherlands	United Kingdom	Total
Sample Size (% Response)	125 (12.80%)	105 (15.23%)	118 (13.55%)	96 (16.66%)	72 (22.22%)	84 (19.04%)	87 (18.39%)	75 (21.33%)	70 (22.85%)	68 (23.52%)	160 (17.7%)
Sectors	High-tech firms (pharmaceutical industry, hardware and other computer science equipment, automotive industry, space and aeronautics products)										
Methodology	Structured questionnaire										
Universe of population	5441 firms										
Sample error	7.7%										
Confidence level	95%, p-q=0.50; Z=1.96										
Data collection period	From May 2010 to September 2010										

complement to Datastream from Thomson Reuters. Drawing on our knowledge of key dimensions of this investigation, previous contacts with managers and scholars and new interviews with managers and academics interested in these strategic variables, we developed a structured questionnaire to investigate how organizations face these issues. We then established a list of the CEOs of the organizations, with the help of partial funding from the Spanish Ministry of Science and Research and the Local Council of Economy, Innovation and Science of Andalusia's Regional Government.

We decided to use CEOs as our key informants, since they receive information from a wide range of departments and are therefore a very valuable source for evaluating the different variables of the organization. CEOs also play a major role in informing and molding the variables under study by determining the types of behavior that are expected and supported (Bolivar et al., 2012). Although numerous actors may be involved in the management process, the CEO is ultimately responsible for plotting the organization's direction and plans, as well as for guiding the actions carried out to achieve them (Westphal & Fredickson, 2001). The same type of informant was chosen, since this means that the level of influence among the organizations is constant, increasing the validity of the variables' measurements.

We used stratified random sampling by country to divide the population into strata (based on the 10 EU countries analyzed: Austria, Belgium, Denmark, France, Germany, Italy, Poland, Spain, the Netherlands, and the United Kingdom). Within each stratum, a random sampling procedure was used. Through systematic sampling in each stratum, we obtained 16 firms for each target country in the study (160 firms). We put out a call to the CEOs and explained that the data obtained would be confidential and would be treated in aggregate form. We offered to send each CEO a comparative study specific to his/her firm on the variables analyzed. This approach enabled us to obtain an approximate response rate of 17.7% (Table 1).

Characteristics of the responding businesses were compared to those of the nonresponding businesses to reduce the possibility of non-response bias. The results for return on assets, return on equity, return on sales and number of employees indicated that there was no significant difference between respondents and nonrespondents (Armstrong & Overton, 1977). Since all measures were collected with the same survey instrument, the possibility of common method bias was tested using Harman's one-factor test (see Konrad & Linnehan, 1995). A principal components factor analysis of

the questionnaire measurement items yielded various factors with eigenvalues greater than 1.0, which accounted for 66% of the total variance. A substantial amount of method variance does not appear to be present, since several factors, not just one single factor, were identified and because the first factor did not account for the majority of the variance (Podsakoff & Organ, 1986).

4.3.2. Measures

The use of constructs has played an important role in designing survey instruments in management research. In any research concerning behavioral elements, no device using a single metric unit can measure precisely, and researchers usually employ two or more measures to gauge a construct or scale. Given that developing new constructs or scales of measurement is a complex task, wherever possible we use pre-tested constructs from past empirical studies to ensure their validity and reliability.

Environment. Using scales established by Tan and Litschert (1994), we developed a Likert-type seven-point scale (1 "*completely disagree*", 7 "*completely agree*") of three items (see Appendix) to reflect the effect of environment. We developed a confirmatory factor analysis to validate our scales. The scale was one dimensional and showed high reliability (α=.747).

Stakeholder integration capability. Using scales established by Buysse and Verbeke (2003), Henriques and Sadorsky (1999), and Sharma and Henriques (2005), we developed a Likert-type seven-point scale (1 "*no attention*", 7 "*maximum attention*") of ten items (see Appendix) to reflect stakeholders influences. We developed a confirmatory factor analysis to validate our scales, which required eliminating Item 1 (χ^2_{27}=82.84; Normed Fit Index, NFI=.95; Non-Normed Fit Index, NNFI=.96; Goodness of Fit Index, GFI=.96; Comparative Fit Index, CFI=.90). The scale was one dimensional and showed high reliability (α=.820).

Absorptive capacity. We used three items to measure knowledge acquisition, two items to measure knowledge assimilation, four items to measure knowledge transformation, and two items to measure knowledge exploitation (1 "*completely disagree*", 7 "*completely agree*"). These items have been duly adapted to the present study (Appendix) and they were developed by Jimenez et al. (2011). We calculated the arithmetic mean of these items (a high score indicated good level of knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge

exploitation) and obtained a 4-item scale for absorptive capacity. We developed a confirmatory factor analysis to validate the scale (χ^2_2=4.46, NFI=.96, NNFI=.94, GFI=.99, CFI=.98) and showed that it was one-dimensional and had adequate validity and reliability (α=.720).

Technological abilities. We used the scales designed by Ray et al. (2005) and Byrd and Davidson (2003) to establish a Likert-type seven-point scale (1 "*completely disagree*", 7 "*completely agree*") of four items (Appendix) to reflect technological skills. Using a confirmatory factor analysis (χ^2_2=1.26, NFI=.99, NNFI=.99, GFI=.99, CFI=.99), we validated our scales and then verified each scale's one-dimensionality and its high validity and reliability (α=.849).

Corporate entrepreneurship. We used Likert-type seven-point scales (1 "*completely disagree*", 7 "*completely agree*") of three items developed by Zahra (1993) to measure new business venturing, three items developed by Knight (1997) to measure proactivity, three items developed by Zahra (1993) to measure self-renewal, and four items developed by Zahra (1993) to measure organizational innovation. These items have been duly adapted to the present study (Appendix). We calculated the arithmetic mean of these items (a high score indicated good level of new business venturing, proactivity, self-renewal, and organizational innovation) and obtained a 4-item scale of corporate entrepreneurship. We developed a confirmatory factor analysis to validate the scale for corporate entrepreneurship (χ^2_2=4.30, NFI=.98, NNFI=.97, GFI=.99, CFI=.99) and showed that it was one-dimensional and had good validity and reliability (α=.792).

Organizational performance. After reviewing how performance is measured in different works of strategic research, we used a Likert-type 7-point scale (1 *"Much worse than my competitors,"* 7 *"Much better than my competitors"*) of six items developed by Murray and Kotabe (1999) to ask about the organization's performance as compared with that of its most direct competitors (Appendix). The use of scales for evaluating performance relative to the main competitors is one of the most widely-employed practices in recent studies (Choi et al., 2008; Douglas & Judge, 2001). Many researchers have used managers' subjective perceptions to measure beneficial outcomes for firms. Others have preferred objective data, such as return on assets. The literature has established widely that there is a high correlation and concurrent validity between objective and subjective data on performance, which implies that both are valid when calculating a firm's performance (Homburg et al., 1999; Venkatraman & Ramanujan,

1986). We included questions involving both types of assessment in the interviews, but the CEOs were more open to offering their general views than to offering precise quantitative data. When possible, we calculated the correlation between objective and subjective data, and these were high and significant. We developed a confirmatory factor analysis to validate the scales (χ^2_9 =24.60, NFI=.94, NNFI=.94, GFI=.98, CFI=.96) and showed that the scale were one-dimensional and had high reliability (α=.816).

Control variables. The research adds control variables for several other factors that may influence the estimation results. In this case we take into account that firms may vary in industry or sector, size and country or nationality. Industry type has been included, as in other similar studies on entrepreneurial activities or opportunities for innovation (Covin & Slevin, 1991; Zahra, 1993, 1996). The measurement of size is a difficult question, as multiple focuses may be adopted to be operational (Gupta & Govindarajan, 2000). Size could be measured by the number of employees, the volume of sales, activity or net assets (in millions of Euros), although all of these options would measure size as an organizational factor (Damanpour, 1992). The items used initially were volume of annual sales and number of employees. Both items had a high significant correlation in our sample, however. We therefore decided to use number of employees in our models, since CEOs are more reluctant to give an accurate figure for sales. To avoid desirability bias due to the range of variance values throughout the sample, we measured size through a logarithmic transformation in the number of employees instead of gross data (Damanpour, 1992; Gupta & Govindarajan, 2000; Kimberly & Evanisko, 1981). The nationality variable was included as a nominal variable with ten categories divided based on the data for the GDP per capita in PPS published by the European Union in Eurostat.

4.4. Results

In this section we present the research results. First, Table 2 shows the means and standard deviations, as well as the inter-factor correlation matrix for the study variables. There are significant and positive correlations among environment, stakeholders, absorptive capacity, technological abilities, corporate entrepreneurship, and organizational performance. We also find a positive correlation among size and environment, stakeholder integration capability, corporate entrepreneurship, and organizational performance. The largest firms usually have the advantage of greater

variety in their knowledge supply and more funds and means to develop training and education programs that help to produce more entrepreneurs (Pavitt, 1991). The largest firms are therefore in a better position to venture into national and international markets, complex and hostile environments, and scenarios of collaboration and coordination with different stakeholders. They have the potential to obtain higher levels of corporate entrepreneurship and organizational performance (Ireland et al., 2009; Zahra & Garvis, 2000). Small organizations have simpler organizational structures that also promote the use of available knowledge, absorptive capacity and new technological abilities (Real et al., 2006). Further, there is a positive correlation between country and organizational performance, since the organization's performance will be greater if one country invests more in R&D than another. Brouthers (2002) shows that organizations achieve better financial performance if they take into account the institutional and cultural context of the country in which they invest. For example, nations that emphasize institutional support and more entrepreneurial values and behavior encourage entrepreneurial capability and the achievement greater organizational performance (Zahra & Garvis, 2000). Countries that stress more conservative values, however—those that neither invest in R&D nor develop policies to support companies—will have more limited organizational performance (Kannan-Narasimhan & Glazer, 2005).

With respect to the quality of the scales used, the constructs display satisfactory levels of reliability, as indicated by composite reliabilities ranging from 0.93 to 0.83 and shared variance coefficients ranging from 0.63 to 0.55 (Table 3). Convergent validity, the extent to which maximally different attempts to measure the same concept agree, can be judged by looking at both the significance of the factor loadings and the shared variance. The amount of variance shared or captured by a construct should be greater than the amount of measurement error (shared variance >0.50). All of the multi-item constructs meet this criterion, each loading (λ) being significantly related to its underlying factor (t-values greater than 7.67) in support of convergent validity. Likewise, a series of chi-square difference tests on the factor correlations showed that discriminant validity–the degree to which a construct differs from others–is achieved among all constructs (Anderson & Gerbing, 1988). Discriminant validity was established between each pair of latent variables by constraining the estimated correlation parameter between them to 1.0 and then performing a chi-square difference test on the values obtained for the constrained and unconstrained models (see Anderson

Table 4.2. Means, standard deviations and correlations

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Sector	1.731	0.733	1.000								
2. Size	3.697	1.634	-.026	1.000							
3. Country	5.528	2.894	-.122	.019	1.000						
4. Environment	4.968	1.274	.050	.166*	.048	1.000					
5. Stakeholders	4.536	1.189	.087	.203**	-.024	.222*	1.000				
6. Absorptive Capacity	5.016	1.135	.002	.144	-.133	.347***	.188*	1.000			
7. Technological Abilities	4.807	1.394	.045	.120	-.022	.308***	.214***	.190***	1.000		
8. Corporate Entrepreneurship	4.738	1.151	.039	.172*	-.007	.396***	.283***	.319***	.539***	1.000	
9. Organizational Performance	4.727	1.142	-.013	.193*	.200*	.236**	.230***	.329***	.279***	.387***	1.000

Note: *p<.05;**p<.01;***p<.001(two-tailed). n=160

& Gerbing, 1988). The resulting significant differences in chi-square indicate that the constructs are not perfectly correlated and that discriminant validity is achieved.

Second, Hypotheses 1a, 1b, 2, and 3 were tested using the hierarchical regression method (Cohen & Cohen, 1983). We checked for the presence of multicollinearity in these regression analyses and determined that they meet the requirements for measures of the tolerance value and variance inflation factor (Hair et al., 2010). In the first step, the dependent variable of interest (CE) was regressed on the control variables (Model 1). Next (Model 2), the variables of environment and stakeholder integration capability were introduced. Subsequently, (Model 3) the variable of absorptive capacity was added. Finally (Model 4), we added technological abilities (Table 4).

Hypotheses 1a, 1b, 2, and 3 suggest that the environment, stakeholder integration capability, absorption capacity, and technological skills will be positively related to corporate entrepreneurship. As shown in Model 2, environment (β=0.358, $p<.001$) and stakeholders (β=0.225, $p<.001$) had a significant positive relationship with corporate entrepreneurship, and together accounted for 17.9% of the variance in corporate entrepreneurship. Thus the data support Hypotheses 1a and 1b. The presence of a hostile, uncertain environment and the integration of stakeholders lead the organization to establish entrepreneurial strategies to improve organizational results (Zahra, 1991). Further, rapid evolution of the competitive environment and scenarios of collaboration and coordination of the different interests favors the opportunities for business development or innovation in products, processes, or structural systems that encourages entrepreneurial initiative (Ireland et al., 2009).

Hypothesis 2 suggests that absorptive capacity will be positively related to corporate entrepreneurship. As shown in Model 3, absorptive capacity (β=0.169; $p<.05$) had a significant positive relationship to corporate entrepreneurship and accounted for 1.9% of the variance in corporate entrepreneurship. Thus, the data support Hypothesis 2. Absorptive capacity permits the exploitation and integration of external knowledge, which increases the probability of achieving better understanding of the opportunity and thus of responding with entrepreneurial activities (Zahra et al., 1999). That is, absorptive capacity permits greater knowledge that promotes firms' capacity to exploit their existing resources and support entrepreneurial activities and initiatives to increase value creation (Sirmon et al., 2007).

Hypothesis 3 indicates the existence of a positive relationship between technological abilities and corporate entrepreneurship. As shown in Model 4, technological abilities (β=0.418; p<.001) had a significant, positive relationship to corporate entrepreneurship and accounted for 15.4% of the variance in corporate entrepreneurship. Thus, the data support Hypothesis 3. Technological abilities foster the creation of an organizational structure that supports entrepreneurial activities, increases training for entrepreneurship, and improves evaluation and decision making (Kelley, 2011).

The F-tests on all adjusted R square changes are significant, indicating that successive factors added in the regression models significantly improve the prediction for corporate entrepreneurship. Sector, size, and country are not significant variables in Models 2, 3 and 4 analyzed which relate to corporate entrepreneurship.

Table 4.3. Validity, reliability and internal consistency

Variable	Item	Validity, reliability and internal consistency		
		λ*	R^2	A. M.
Environment	ENT1	0.92***(21.57)	0.84	α=0.747
	ENT2	0.71***(11.38)	0.50	C.R.=0.836
	ENT3	0.74***(12.81)	0.54	S.V.=0.632
Stakeholders	STAKE2	0.76***(21.70)	0.57	α=0.820 C.R.=0.934 S.V.=0.615
	STAKE3	0.76***(18.53)	0.57	
	STAKE4	0.71***(13.34)	0.50	
	STAKE5	0.80***(20.94)	0.64	
	STAKE6	0.80***(22.25)	0.64	
	STAKE7	0.76***(13.79)	0.57	
	STAKE8	0.84***(28.29)	0.70	
	STAKE9	0.83***(24.81)	0.68	
	STAKE10	0.81***(16.28)	0.65	
Absorptive Capacity	ABSCA1	0.76***(8.04)	0.57	α=0.720 C.R.=0.831 S.V.=0.551
	ABSCA2	0.74***(7.67)	0.54	
	ABSCA3	0.71***(11.20)	0.50	
	ABSCA4	0.76***(12.34)	0.57	
Technological Abilities	SKILL1	0.72***(11.34)	0.51	α=0.849 C.R.=0.867 S.V.=0.622
	SKILL2	0.81***(14.56)	0.65	
	SKILL3	0.85***(16.84)	0.72	
	SKILL4	0.77***(13.32)	0.59	
Corporate Entrepreneurship	ENTRE1	0.82***(19.10)	0.67	α=0.792 C.R.=0.856 S.V.=0.599
	ENTRE2	0.72***(12.35)	0.51	
	ENTRE3	0.73***(11.08)	0.53	
	ENTRE4	0.82***(18.93)	0.67	
Organizational Performance	OPERF1	0.73***(11.53)	0.53	α=0.816 C.R.=0.907 S.V.=0.621
	OPERF2	0.72***(11.71)	0.51	
	OPERF3	0.80***(17.99)	0.64	
	OPERF4	0.91***(29.66)	0.82	
	OPERF5	0.71***(9.40)	0.50	
	OPERF6	0.84***(14.62)	0.70	

Note: λ* = Standardized Structural Coefficient; R^2 = Reliability; α = Alpha Cronbach; C. R. = Compound Reliability; S. V. = Shared Variance; f. p. = fixed parameter; A. M. = Adjustment Measurement; *p < .05; ** p < .01; *** p < .001(two-tailed).

Table 4.4. Regression analysis

	Dependent Variable			
Independent Variables	Model 1	Model 2	Model 3	Model 4
Constant	4.175*** (11.165)	2.008*** (4.032)	1.451** (2.618)	0.745 (1.460)
Sector	0.043 (0.541)	0.001 (0.010)	0.008 (0.111)	0.001 (0.020)
Size	0.173* (2.196)	0.067 (0.908)	0.057 (0.775)	0.042 (0.636)
Country	-0.003 (-0.041)	-0.020 (-0.271)	0.006 (0.084)	0.015 (0.230)
Environment		0.358*** (4.917)	0.302*** (3.962)	0.193** (2.726)
Stakeholders		0.225*** (3.066)	.202** (2.761)	.135* (2.024)
Absorptive Capacity			.169* (2.182)	.143* (2.060)
Technological Abilities				.418*** (6.166)
R^2	0.031	0.217	0.241	0.393
Adjusted R^2	0.013	0.192	0.211	0.365
Change in adjusted R^2		0.179***	0.019*	0.154***
F	1.989	8.539	8.083	14.036
Std. Error	1.144	1.035	1.022	0.917

Note: *$p < .05$; ** $p < .01$; *** $p < .001$(two-tailed); t-students are shown in parentheses below the variables.

Finally, Hypothesis 4 was tested using the hierarchical regression method and similarly checking for multicollinearity and the compliance of requirements of the tolerance value and variance inflation factor measures. In the first step (Model 1), the dependent variable of interest (organizational performance) was regressed on the control variables. Finally (Model 2), the independent variable (corporate entrepreneurship) was introduced (Table 5). Hypothesis 4 suggests that corporate entrepreneurship will be positively related to organizational performance. As shown in Model 2 of Table 5, corporate entrepreneurship (β=0.366, p<.001) had a significant positive relationship to organizational performance and accounted for 12.7% of the variance in organizational performance. The data therefore support Hypothesis 4. The F-test on change in adjusted R square is significant, indicating that the factor corporate entrepreneurship added in the

regression model significantly improved the prediction for organizational performance. Greater commitment to corporate entrepreneurship (e.g., innovation, proactivity, creation of new products or processes, etc.) influences the firm's performance positively (Miller, 1983; Lumpkin & Dess, 1996). Country is a significant variable analyzed in its relation to organizational performance. Organizations achieve greater financial performance if they take into account the institutional and cultural context of the country in which they invest (Brouthers, 2002). As to sector and size, no significant differences were found with respect to organizational performance.

Table 4.5. Regression analysis

	Dependent Variable	
Independent Variables	Model 1	Model 2
Constant	3.740*** (10.326)	2.224*** (4.922)
Sector	0.017 (0.218)	0.001 (0.016)
Size	0.192* (2.492)	0.128 (1.767)
Country	0.201** (2.594)	0.202** (2.805)
Corporate Entrepreneurship		0.366*** (5.034)
R^2	0.077	0.207
Adjusted R^2	0.059	0.186
Change in adjusted R^2		0.127***
F	4.337	10.097
Std. Error	1.108	1.030

Note: *$p < .05$; ** $p < .01$; *** $p < .001$(two-tailed); t-students are shown in parentheses below the variables.

4.5. Conclusions

4.5.1. Discussion

In the research, we analyze how the environment, stakeholder integration, absorptive capacity, and technical abilities influence the development of entrepreneurial activities and their repercussions for the organization's performance. Entrepreneurial initiative is a significance driver of the creation of organizational wealth, as are growth and

profitability (Martin et al., 2011). Most entrepreneurs orient and develop activities with an eye to achieving new business, the creation of new units or firms, innovation in products, services, and strategic processes of self-renewal, the assumption of risks and proactivity, etc. (Antoncic & Hisrich, 2004). Firms with high levels of entrepreneurship are more likely to achieve better business results than firms with lower levels of entrepreneurship. This means that corporate entrepreneurship can impact three significant elements of performance—wealth creation or new funds; growth of the business, whether by increase in sales, number of employees or market share; and profitability of capital and assets relative to the competition (Antoncic & Hisrich, 2004). Traditional entrepreneurial management should therefore change to adopt an orientation to models based on knowledge and entrepreneurial policies with different requirements for control and reward systems etc. that permit it to motivate and detect the opportunity and possibilities for success (Stevenson & Jarillo, 1990).

Firms currently face dynamic environments that increase the need to be involved in entrepreneurial activities enabling them to face continuous changes in their environment through innovative strategies (Miles & Snow, 1978; Rueda, 2005; Sharma, 2000). Today's environment impels the need to foster continuous innovation and organizational learning to generate entrepreneurial dynamic capabilities (Sharma & Vredemburg, 1998). Likewise, munificence of the environment makes it more necessary for firms to achieve resources to develop entrepreneurial capabilities (Rueda, 2005). Thus, the availability of resources as a result of government policies, incentives, rapid growth markets, qualified labor, valuing creativity, innovation, etc. can provide firms with opportunities to innovate and invest in the products, processes, and changes in organizational structure that are needed to generate a proactive strategy (Gomez et al., 2011).

Further, there is a positive relationship between the capacity for integrating stakeholders and corporate entrepreneurship. The use of information derived from third parties can facilitate entrepreneurs' management of the discovery of new opportunities (Kuratko et al., 2007). Adopting this point of view implies a deliberate change in thinking for the entrepreneur, one that fosters collaboration and the involvement of third parties. To achieve this perspective, a network system could be useful, as such a system involves a process of repeated analysis, continuous learning, and capturing of changes, which would lead the entrepreneur to have a source of important additional information

from which to derive greater knowledge of customers, suppliers, shareholders, etc. and the possibility of detecting opportunities for new business (Vandekerckhove & Dentchev, 2005). The competitive benefits of the capability to integrate stakeholders are revealed in better corporate reputation and translate into favorable economic agreements and increased legitimacy, which help to ease the possible positions found in both parties when they perform daily operations and development plans (Sharma & Vredenburs, 1998). Further, in sectors where reputation and brand image are important, anticipating stakeholders' demands can provide a source of differentiation and competitive advantage (Spar & La Muse, 2003).

Finally, we must take into account the need, primarily for the organization's managers but also for other employees, to develop their technological abilities and knowledge through educational and training plans. Such plans help them to achieve and understand, in the best way possible, the need to have a good knowledge base, prior learning, and experience that permit the organization to improve evaluation of an opportunity, make the right decisions, and respond to new expectations for business and improvement (Kelley, 2011). Acquiring these values involves a complex, long-term process and should be carried out in conjunction with a corporate business strategy based on knowledge and innovation (Zahra & Covin, 1995). Greater absorptive capacity will increase the organization's autonomy through the adoption of more flexible organizational structures, which motivate members to achieve knowledge flows and increase participation of the most creative employees and thus corporate entrepreneurship (Antoncic & Hisrich, 2001). In technology firms, the use of available knowledge and the capacity to absorb new technological abilities or generate new, advanced technological processes will permit the entrepreneur to locate him- or herself in a more favorable position to detect opportunities, and thus the possibility of obtaining additional competitive advantage over competitors (Martin et al., 2011; Real et al., 2006). In the same way, a proactive attitude helps firms to adopt technologically more advanced postures and take advantage of the new opportunities that emerge continually in environments immersed in intense technological changes (Bolivar et al., 2012; Garcia et al., 2007).

Entrepreneurial activities contribute in a very significant way to the firm's development and economic growth, due to the creation and setting up of new firms and businesses that contribute to generating innovation, renewal of the fabric of production,

and creation of new work positions through the dissemination and exploitation of knowledge (Acs & Plummer, 2005). It is the innovative character of entrepreneurial initiatives that permits firms to generate new ideas and perform R&D activities that allow it to develop new products or processes (Lumpkin & Dess, 1996). With these, the firm manages to maintain not only the competitive advantages it already has but also a constant adaptation to the environment. The firm can thus face the threats confronting it, taking advantage of the new opportunities and their resulting influence on the organization's performance (Ruiz et al., 2009).

4.5.2. Limitations and future research

This investigation has several limitations that may suggest further possibilities for empirical research. A first limitation involves the cross-sectional nature of the research. Cross-sectional research into a series of dynamic concepts (e.g., corporate entrepreneurship, technological skills) allows us to analyze only a specific situation in time of the organizations studied, not their overall conduct through time. Our approach has reduced the magnitude of this problem, since dynamic characteristics and causal affirmations can be made if the relationships are based on theoretical rationales. For this reason, we began with a theoretical effort that would allow us to identify and confirm the formal existence of the different cause-effect relationships. Nonetheless, future research should focus on longitudinal study, since longitudinal research can approach these variables with greater precision and study their determinants, processes, and results systematically, permitting us to analyze the evolution of variables over time and to draw more reliable conclusions about their activity.

Second, this cross-sectional nature of the research introduces another potential limitation—common method bias. We were aware of this possibility, however, and took steps to guard against it. Podsakoff et al. (2003) provide guidance to reduce common-source bias in this regard, stressing two key points: 1) ensure anonymity in survey administration; and 2) improve items used to measure constructs. We followed both of these recommendations. By clearly communicating study goals and by assuring respondents of the anonymity of the survey administration, we were able to meet one of the study's key recommendations: well-tested and well-validated scales have the benefit of reducing item ambiguity, a key recommendation by Podsakoff et al. (2003). Likewise, in measuring study constructs, we relied on previously tested scales. We also randomized the order of presentation of the survey items across the subjects.

The effects of these steps together minimize common method bias (Pandey et al., 2008). Further, the possibility of common method bias was tested using Harman's one-factor test and other methods. Common method bias does not appear to be present (Konrad & Linnehan, 1995; Podsakoff & Organ, 1986).

Third, the absence of objective measures is a limitation. In this sense, the anonymity of this research provides an important way to increase the value of these subjective measures and to reduce social desirability bias when responses are related to sensitive topics (Konrad & Linnehan, 1995). The low risk of social desirability bias in the study was indicated by several managers who commented that it made no sense at all for their companies to go beyond regulatory compliance. Moreover, other research indicated that external validation of these variables from the archival data of a subset of respondents increased confidence in self-reports and reduced the risk of common method variance (Konrad & Linnehan, 1995; Podsakoff & Organ, 1986). Thus, to confirm the validity of the information provided by the CEO in our research, we obtained additional information from organization members of various selected firms. The results were contrasted with those obtained in the main research survey by means of various tests to confirm that there were no significant differences between the research variables. Further, when possible, we calculated the correlation between objective and subjective data for some variables (e.g. organizational performance), and these were high and significant. Likewise, various studies show that using CEOs as respondents to questions of corporate entrepreneurship can provide valid measures (Bolivar et al., 2012; Martin et al., 2011).

Fourth, our model analyzes how corporate entrepreneurship influences factors such as environment, stakeholder integration capability, absorptive capacity, and technological abilities and their repercussions for the organization's results. Other variables could be analyzed. However, it should be noted that the strategic variables we chose explain a significant amount of variance in corporate entrepreneurship and organizational performance. More attention to the influence of other specific variables on corporate entrepreneurship is needed. Future studies should be based on a larger sample, in other firms from other sectors (this research has concentrated on the technology sector), and might well explicitly integrate the influence of external factors. Development of a collaborative scheme between academics and practitioners would allow generation of an organizational strategy for the technology sector.

4.6. References

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Appendix

Questionnaire items

Environment

1. The environmental factors that affect our firm's functioning (such as technology, customer preferences, suppliers, competitors, legislation, etc.) are very numerous.
2. Environmental factors have had a strong impact on our firm's functioning.
3. Environmental factors that affect our firm have changed significantly.

Stakeholder Integration Capability

1. Shareholders/Owners.
2. Employees.
3. Customers.
4. Suppliers.
5. Financial Institutions.
6. National (and regional) governments.

7. Media.
8. Competitors.
9. Citizens/Communities.
10. NGOs.

Potential Absorptive Capacity

Knowledge acquisition

1. There is close personal interaction between the two organizations.
2. The relation between the two organizations is characterized by mutual trust.
3. The relation between the two organizations is characterized by a high level of reciprocity.

Knowledge assimilation

4. The workers regularly have to communicate with colleagues about work-related issues.
5. The organizational cultures of the two organizations are compatible.

Knowledge transformation

6. Interdepartmental meetings are organized to discuss the development and tendencies of the organization.
7. The important data are transmitted regularly to all units.
8. When something important occurs, all units are informed within a short time.
9. The organization has the capabilities or abilities necessary to ensure that knowledge flows within the organization and is shared between the different units.

Knowledge exploitation

10. There is a clear division of functions and responsibilities regarding use of information and knowledge obtained from outside.
11. There are capabilities and abilities needed to exploit the information and knowledge obtained from the outside.

Technological abilities

1. Are very superior to those of closest competitors in hardware and operating systems performance.
2. Are very superior to those of closest competitors in business applications software performance.
3. Are very superior to those of closest competitors in communications services efficiency.
4. Are very superior to those of closest competitors in the generation of programming languages.

Corporate Entrepreneurship

New business venturing

1. The organization has broadened the business lines in current industries.
2. The organization has pursued new businesses in new industries related to current business.
3. The organization has entered new businesses by offering new lines and products/services.

Proactivity

4. In general, the top managers at our firm have a strong propensity for high-risk projects (with chances of very high returns).
5. In general, the top managers at our firm believe that, owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives.
6. When confronted with decision-making situations involving uncertainty, our organization typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.

Self-renewal

7. The organization has coordinated activities among units to enhance organizational innovation.
8. The organization has adopted flexible organizational structures to increase

innovation.

9. The organization has trained and encouraged the employees to be creative and innovative.

Organizational innovation

10. The spending on new product/service development activities.
11. The number of products/services added by the organization and already existing in the market.
12. The number of new products/services introduced for first time in the market by the organization.
13. The emphasis on R&D, technological leadership and innovations.

Organizational Performance

1. Organizational performance measured by return on assets (economic profitability or ROA).
2. Organizational performance measured by return on equity (financial profitability or ROE).
3. Organizational performance measured by return on sales (percentage of profits over billing volume or ROS).
4. Recovery of investments.
5. Organization's market share in its main products and markets.
6. Growth of sales in its main products and markets.

Control Variables

1. Sector
2. Size.
    2.1. Total number of employees in the organization in 2009.
    2.2. Volume of sales in 2009 (millions of Euros).
    2.3. Total number of employees in the organization in 2009.
3. Nationality.

Capítulo V

CONCLUSIONES

5.1. Conclusiones

El presente capítulo trata de ofrecer un resumen general de las distintas aportaciones obtenidas en todo el trabajo, además de las incluidas en los tres artículos de investigación presentados en esta tesis doctoral. Por lo tanto, en primer lugar, se ponen de relieve las principales conclusiones generales, así como las conclusiones de cada artículo. A continuación, se destacan, tanto sus implicaciones teóricas como las implicaciones prácticas. Seguidamente se describen las limitaciones que ofrece la investigación relacionadas con la muestra, con los problemas encontrados en la medición, con el sesgo ofrecido por la subjetividad de las respuestas en las encuestas y con el estudio longitudinal de las variables. Finalmente, se describen las posibles líneas futuras de investigación que se desprenden de esta investigación y que quedan abiertas tras la conclusión del trabajo.

La aportación principal del trabajo de investigación desarrollado reside en la difusión, profundización y análisis de los procesos de gestión de conocimiento, capacidad de absorción y espíritu emprendedor. En primer lugar, se amplia la literatura sobre gestión de conocimiento, recogiéndose una influencia indirecta en el resultados de la organización a través de las tecnologías de la comunicación e información.

Junto a ello, se ha analizado la literatura en materia de capacidad de absorción en la empresa. La capacidad de absorción permite reconocer y explorar nuevas oportunidades mediante la construcción de nuevas capacidades, crear valor y mantener una ventaja competitiva (Zahra et al., 2009). Y es que es un aspecto de gran importancia, especialmente, cuando este proceso se realiza de forma dinámica y continua en el tiempo (Reuber y Fischer, 1993).

Además, se ha extendido la literatura en materia de espíritu emprendedor corporativo. En la época de recesión en que vivimos, el papel del espíritu emprendedor corporativo es vital para el resultado en todas las empresas de tecnología (Antoncic y Hisrich, 2001). El espíritu emprendedor corporativo no debe ser estudiado aisladamente, sino que su análisis debe estar acompañado de otra serie de variables estratégicas tales como los factores del entorno y la capacidad de integración de los grupos de interés, el conocimiento y los activos tecnológicos. Las variables tecnológicas apenas habían sido previamente analizadas empíricamente, sobre todo, su influencia en el espíritu emprendedor corporativo y posteriormente, sobre los resultados en empresas tecnológicas (Omerzel y Antoncic, 2008).

El enfoque hacia el análisis de la influencia de las variables tecnológicas o de tecnologías de comunicación e información viene justificado por el echo de que la mayoría de las decisiones estratégicas que la empresa toma hoy en día, en un ambiente globalizado y cada día más competitivo, hacen especial énfasis en el desarrollo de la tecnología (Jones et al., 2000). Sin embargo este acento en la tecnología nunca ha sido fácil, no obstante con ella las empresas incorporan sistemas que permiten reducir costes y un mayor éxito empresarial, siendo la tecnología una herramienta esencial para esta época que atravesamos (Ross et al., 1996). El valor de estas iniciativas tecnológicas yace en la mejora de la competitividad empresarial, que es incierta e incuantificable (Ross et al., 1996), por lo que cuando se consigue tener una alta competitividad se favorece la existencia de una ventaja competitiva sostenible (Porter, 1980).

Una vez destacadas las principales aportaciones de este trabajo, se pasan a analizar las principales conclusiones obtenidas en cada capítulo a modo de síntesis de cómo se ha ido respondiendo a los objetivos inicialmente planteados.

En el capítulo II, titulado *"The influence of top management support on organisational performance through knowledge acquisition, transfer and utilisation"*, se refleja como la adquisición, transferencia y utilización de los conocimientos afectan de manera positiva la relación entre el apoyo de la alta dirección a través de las TIC (TMS) y el desempeño organizativo en organizaciones de base tecnológica. Los resultados sugieren que, para mejorar el desempeño organizativo, TMS mejora, no sólo la adquisición de conocimientos, sino también su posterior transferencia y uso. La interrelación entre estas etapas del conocimiento permite a la alta dirección crear lazos de sinergias positivas que permiten aumentar el rendimiento de la organización (Alavi y Leidner, 2001). En este estudio se ha ampliado nuestra comprensión de las etapas de la gestión del conocimiento como mediadores en la relación entre TMS y el desempeño organizativo, siendo uno de los primeros trabajos de investigación que analizan a fondo la relación el TMS y los procesos de gestión del conocimiento en las organizaciones de tecnología. Nuestra investigación también promueve el desarrollo de un esquema de colaboración entre académicos y profesionales para generar una estrategia de la organización en torno a los conceptos de "adquisición de conocimiento", "transferencia de conocimiento", "utilización de conocimiento" y "TMS", que permita el desarrollo de procesos, medios y mecanismos por los cuales, estos activos, se puedan transformar en fuente de ventaja competitiva.

El capítulo III titulado, "*Influence of technology on organizational performance through absorptive capacity, innovation and internal labour flexibility*", analiza como el apoyo y la mejora de las habilidades y competencias tecnológicas influye positivamente, tanto en la capacidad de absorción potencial como en la capacidad de absorción realizada, estando ambas capacidades estrechamente relacionadas. Y como la capacidad de absorción realizada influye en las políticas de flexibilidad laboral interna, en el desarrollo de la innovación y en el desempeño de la organización. Junto a ello, se estudia como las políticas de flexibilidad laboral interna influyen en la innovación y estás, en el desempeño de la organización. En investigaciones previas, estás variables se han relacionado de forma independiente y no de forma integradora, analizando sus efectos finales sobre el resultado de la empresa.

La tecnología es un mecanismo estratégico para mejorar la cooperación, la comunicación y el intercambio de información y conocimientos (Wageman y Baker, 1997). El flujo de comunicación entre los miembros de la organización se ve favorecida por la existencia y el uso adecuado de herramientas tales como los correos electrónicos, las conferencias multimedia, las aplicaciones tecnológicas de intercambio de ideas y conocimientos, etc., que favorecen que el conocimiento y la información fluyan de forma más rápida y se extiendan más fácilmente por toda la organización. En este sentido, el incremento de la demanda de tecnología y de la capacidad para aplicarla ha potenciado la necesidad de fomentar en las organizaciones un apoyo a la tecnología desde la dirección de la empresa, el desarrollo de habilidades tecnológicas y el fomento de competencias distintivas tecnológicas (TDCs). Éstas permiten la explotación de oportunidades tecnológicas, el desarrollo de iniciativas empresariales corporativas y la generación de ventajas competitivas para la organización (Álvarez y Barney, 2007; Autio et al., 2000; Martín, García y García, 2011; Martín, García y Mihi, 2011; Real et al., 2006; Woolley, 2010).

Pero junto a ello, la organización requiere una estructura laboral más flexible y con mayor capacidad de adaptación (Beltrán et al., 2009; Blyton y Morris, 1992; Kalleberg, 2001; Valverde et al., 2000). La asimilación y explotación de conocimiento lleva consigo procesos de cambio que fomentan una mayor flexibilidad laboral interna como resultado de la ampliación de las funciones a desempeñar y de sus conocimientos, potenciando la capacidad para el desempeño del trabajo en diversas áreas y estimulando la mayor capacidad de operar de las empresas en diferentes circunstancias o escenarios

(Atkinson y Gregory, 1986; Blyton y Morris, 1992; Looise et al., 1998; Michie y Sheehan-Quinn, 2001; Urquijo, 2004).

En el cuarto capítulo, titulado "*Analysis of the influence of the environment, stakeholder integration capability, absorptive capacity and technological skills on organizational performance through corporate entrepreneurship*", se analiza como el entorno, la integración de los grupos de interés, la capacidad de absorción y las habilidades técnicas influyen en el desarrollo de actividades emprendedoras, y su repercusión en el desempeño de la organización.

La iniciativa emprendedora es un importante motor de creación de riqueza organizativa, así como de crecimiento y de rentabilidad (Martín, García y García, 2011). La mayoría de emprendedores orientan y desarrollan actividades para lograr nuevos negocios, la creación de nuevas unidades o empresas, innovación en cuanto a productos, servicios y procesos estratégicos de autorenovación, asunción de riesgos y proactividad, etc. (Antoncic y Hisrich, 2004). Pero la iniciativa emprendedora se ve afectada por una serie de factores que pueden incentivar o dificultar el desarrollo de la misma. El entorno y los grupos de interés son algunos de ellos. La hostilidad y dinamismo del entorno y las relaciones con los grupos de interés pueden ser fuentes de oportunidades para el desarrollo de nuevos productos y servicios (Vandekerckhove y Dentchev, 2005). Y es que una gestión proactiva de los factores del entorno y los grupos de interés puede dar lugar a recursos intangibles y socialmente complejos que pueden incrementar la habilidad de la empresa para superar a sus competidores en términos de creación de valor a largo plazo (Hillman y Keim, 2001; Rueda, 2005).

Junto a ello, el desarrollo de habilidades tecnológicas abren una oportunidad para explotar una capacidad o competencia tecnológica que sea realmente difícil de imitar por los competidores (Álvarez y Barney, 2007). Esta ventaja competitiva llegará a ser sostenible en el tiempo si la empresa renueva continuamente sus conocimientos y habilidades en todos los niveles organizativos y que hacen que las empresas puedan llegar a ser consideradas entidades cognitivas, donde el conocimiento adquirido y las nuevas competencias pueden ser perfectamente desarrolladas (Leonard-Barton, 1992; Senge et al., 1994).

Una vez observadas todas estas conclusiones se puede comprobar que se han cumplido prácticamente todos los objetivos que al inicio fueron planteados. Se ha comprobado que los procesos de gestión de conocimiento están conectados e

interrelacionan entre si, de forma que la mejora o dificultad en alguna de las etapas de gestión de conocimiento tienen repercusión en las restantes. También hemos evidenciado la importancia del apoyo de la alta dirección a través de las tecnologías de la información y comunicación en el proceso de gestión de conocimiento, y como este apoyo mejora el desempeño organizativo.

En el caso de la capacidad de absorción, hemos comprobado que la tecnología y concretamente, el apoyo a la tecnología desde la dirección de la empresa, el desarrollo de habilidades tecnológicas y el fomento de competencias distintivas tecnológicas (TDCs) favorecen la adquisición, asimilación, transferencia y utilización del conocimiento externo. El excedente o disponibilidad de recursos tecnológicos facilitan el desarrollo de competencias tecnológicas de la organización, por lo que éstas son desarrolladas una vez que existen recursos en la organización. Estas competencias son también mejoradas por las habilidades directivas y por el apoyo de la alta dirección de una forma positiva y significativa. También se ha comprobado que la capacidad de absorción potencial y capacidad de absorción realizada se encuentran interrelacionadas entre sí, y que son necesarias políticas de flexibilidad laboral interna, que tienen su repercusión en el resultado de la organización a través de la innovación.

Junto a ello, hemos analizado el espíritu emprendedor, comprobando que el entorno y la capacidad de integración de los grupos de interés pueden dar lugar al desarrollo de nuevos productos, procesos o sistemas de producción que le otorgue una ventaja competitiva. Otras veces es el espíritu emprendedor corporativo el que incentiva a los directivos a mejorar en la empresa. Sin embargo, aquí se ha comprobado que también puede ser que sean las decisiones y las inversiones de los altos directivos las que incentivan ese espíritu emprendedor corporativo y más concretamente, la presencia de habilidades tecnológicas.

Se demuestra que la capacidad de absorción influye positivamente en el espíritu emprendedor corporativo, llevando a cabo una estrategia corporativa basada en el conocimiento y la innovación (Zahra y Covin, 1995), donde la disponibilidad de conocimiento ayuda al desarrollo de nuevas oportunidades emprendedoras.

Finalmente y con respecto al resultado empresarial, hemos demostrado que vendrá dado por el mayor uso de las tecnologías de la comunicación y de la información y por una cultura basada en el conocimiento y en la innovación.

5.2. Implicaciones del trabajo de investigación

En este apartado se hace referencia a una serie de implicaciones que se desprenden de las anteriores conclusiones, lo que aumenta el interés de estas investigaciones para los directivos.

5.2.1. Implicaciones teóricas

La gestión del conocimiento es un fenómeno organizativo dinámico y continuo, compuesto por los procesos de adquisición, transferencia y utilización de conocimientos. Consideramos que estos procesos están interrelacionados entre sí (Alavi y Leidner, 2001), de tal manera que la mejora en una fase específica tiene una influencia positiva en la mejora de los demás, como sugiere la teoría de la cadena de valor (Lee y Yang, 2000). Junto a ello, la existencia de una cultura organizativa basada en el aprendizaje continuo favorece la adquisición, transferencia y uso de conocimientos (Senge et al., 1994). La percepción de los miembros de la organización de que tienen el apoyo de la alta dirección, una cultura de interacción social, un ambiente dinámico, de colaboración, confianza y de aprendizaje es estratégico para la adquisición, transferencia y utilización de conocimiento (Lin y Lee, 2004).

Junto a ello, la presencia de variables tecnológicas ayuda a los procesos de conocimiento, tanto internos como externos. Y es que el apoyo de la alta dirección a través del uso de tecnologias de la información y comunicación, las habilidades tecnológicas y las capacidades distintivas tecnológicas alientan a los miembros de la organización a ponerse en contacto entre sí con mayor rapidez y facilidad, intercambiando y utilizando los conocimientos adquiridos y transferidos (Davenport y Probst, 2002; Reilly et al., 2003). En este sentido, la promoción de medidas y planes de desarrollo tecnológicos permiten generar una cultura de aprendizaje, desarrollar habilidades y capacidades tecnológicas que otras empresas no tienen e impulsar un marco flexible, que permite a la empresa absorber y utilizar conocimiento del exterior y una mayor capacidad de innovación para generar ventajas competitivas sostenibles (Al-Adaileh y Al-Atawi, 2011; Antoncic y Hisrich, 2001; Leonard-Barton, 1992).

Asimismo, la transformación y explotación de los conocimientos resulta de vital importancia para la innovación organizativa ya que favorecen la existencia de nuevas estructuras y formas de trabajo, nuevos procesos y productos que permiten mantener o mejorar la ventaja competitiva actual o crear nuevas ventajas competitivas a través de

procesos de innovación (Jiménez et al., 2011; Zahra y George, 2002). De este modo, los directivos de la organización deben tender hacia estructuras formales pero sin excesiva rigidez, que puedan aumentar la capacidad de adquirir, asimilar, transferir y aplicar los conocimientos necesarios e impulsen la capacidad de innovación organizativa (Chen y Chang, 2012). Un exceso de formalización estructural puede impedir el proceso de toma de decisiones y la implementación de la innovación organizativa (Chen y Chang, 2012; Hurley y Hult, 1998; Zahra y George, 2002). La naturaleza dinámica de los actuales entornos competitivos ha motivado a los directivos a identificar nuevas fuentes de flexibilidad basada en los recursos humanos de la organización. En este sentido, las empresas con estrategias de flexibilidad laboral interna realizan una mejor asignación de puestos a sus trabajadores, con los conocimientos adecuados y con las habilidades y cualidades que mejor se ajustan a las características del puesto, mejorando la capacidad innovadora de la organización (Arvanitis, 2005; Kelliher y Riley, 2003).

La literatura contiene numerosos estudios que sugieren un impacto positivo de la gestión del conocimiento en el desempeño organizativo (Grant, 1996a; Spender, 1994; Szulanski, 1996; Teece et al, 1997), pero pocos estudios han analizado la influencia de los procesos de gestión del conocimiento en forma desagregada sobre el desempeño organizativo. Los gerentes deben, sin embargo, tener en cuenta que el efecto de estos procesos en el desempeño organizativo depende, en gran medida, de factores internos y externos que facilitan o dificultan los procesos de adquisición, de transferencia y de utilización de conocimiento. Estos factores incluyen la experiencia, la capacidad para la transferencia y recepción de información, capacidad de absorción, la distancia psicológica o cultural, etc. Factores que no siempre pueden ser controlados por la organización (Pedersen et al., 2003). En este sentido, en las empresas tecnológicas, que se enfrentan a un entorno variable e incierto, la alta dirección se ve forzada a la identificación de oportunidades de negocio y la búsqueda de las mejores TIC para promover la explotación y el éxito de la oportunidad detectada (Thong et al, 1996). La buena elección de las TIC fomenta la mejora de los procesos de gestión del conocimiento y el logro de ventajas competitivas (Scott, 1999). Sin embargo, una mala elección de las TIC y la falta de apoyo de la alta dirección pueden dar lugar a una inversión no rentable, que puede tener un impacto negativo en los resultados de la organización.

Desde el punto de vista del espíritu emprendedor, las empresas se enfrentan actualmente a entornos dinámicos, en los que el uso de la información que se deriva de terceros puede facilitar la gestión de los empresarios en el descubrimiento de nuevas oportunidades (Kuratko et al., 2007). Esto provoca que sea necesario que las empresas se impliquen en actividades emprendedoras a través de estrategias innovadoras para poder hacer frente a los cambios continuos existentes en su entorno (Miles y Snow, 1978; Rueda, 2005; Sharma, 2000). En este sentido, la disponibilidad de recursos como consecuencia de políticas gubernamentales, incentivos, valoración de la creatividad e innovación etc., y un cambio de pensar en el empresario, que fomente la colaboración e implicación de terceros, pueden generar una estrategia proactiva para proporcionar a las empresas oportunidades para innovar y realizar inversiones en productos, procesos y cambios en estructuras organizativas (Gómez et al., 2011).

Además, es necesario que el personal de la organización desarrolle sus habilidades tecnológicas y conocimientos. Para ello puede utilizar planes educativos y formativos, que les ayude a alcanzar y comprender, la necesidad de tener una buena base de conocimiento, aprendizaje previo y experiencia. De esta forma, se puede mejorar la evaluación de una oportunidad y tomar las decisiones adecuadas ante nuevas expectativas de negocio o mejora (Kelley, 2011). La adquisición de estos valores implica un proceso complejo y a largo plazo, que debe llevarse a cabo junto con una estrategia corporativa basada en el conocimiento y la innovación (Zahra y Covin, 1995). En este sentido, una mayor capacidad de absorción aumentará la autonomía de la organización, se adoptan estructuras organizativas más flexibles donde el conocimiento fluye, se incrementa la participación de los empleados más creativos y por lo tanto, se incentiva el espíritu emprendedor (Antoncic y Hisrich, 2001).

En las empresas tecnológicas, el uso del conocimiento disponible, la capacidad de absorber nuevas habilidades tecnológicas o generar nuevos procesos tecnológicos avanzados van a permitir al emprendedor situarse en una posición más favorable para detectar las oportunidades, y con ello, la posibilidad de poder obtener una ventaja adicional respecto a sus competidores (Martín, García y García, 2011; Real et al., 2006). De igual manera, una actitud proactiva ayuda a las empresas a adoptar posturas tecnológicamente más avanzadas y a aprovechar las nuevas oportunidades que surgen continuamente en entornos sometidos a intensos cambios tecnológicos, con las

consiguiente repercusión en el desempeño de la organización (Bolívar et al., 2012; García et al., 2007; Ruiz et al., 2009).

5.2.2. Implicaciones para la gestión

Dada la importancia que representan las variables tecnológicas en los procesos de gestión de conocimiento y en la capacidad de absorción, los directivos de la organización deben tomar medidas que fomenten su uso y aplicación. El apoyo de la alta dirección de la empresa y la formación y desarrollo tecnológico contribuyen a la generación de capacidad de absorción y de nuevos conocimientos, incrementando asimismo las capacidades de los empleados para adquirir e implantar conocimientos tecnológicos (Camisón y Forés, 2010). Las empresas deberían realizar mayores inversiones en medios técnicos, en investigación y en desarrollo tecnológico para incrementar el stock de conocimiento y la capacidad de utilización del mismo (Camisón y Forés, 2010; Veugelers, 1997). Para lograr esto, los gerentes deben prestar atención a las políticas de aprendizaje de la organización para la aplicación eficaz de las TIC y el desarrollo de las competencias y habilidades necesarias en los empleados de la organización (Christensen y Walker, 2004; Scott, 1999; Storck y Hill, 2000). Igualmente, se debe prestar atención a las políticas de aprendizaje que permiten mejorar las competencias y habilidades técnicas de los empleados, facilitando la posterior exploración y explotación del conocimiento (Zahra et al., 2000). En este sentido, las habilidades y competencias técnicas de los empleados, su educación, experiencia, entrenamiento y destrezas adquiridas en el trabajo representan el paso previo que facilita la absorción del nuevo conocimiento y gestión de conocimiento (Camisón y Forés, 2010). Así, la dotación de especialistas, técnicos cualificados, ingenieros, científicos, etc., junto con el desarrollo de investigación en determinadas áreas, tiene influencia en la identificación, adquisición, asimilación y explotación de nuevo conocimiento. De ahí, la importancia de que la empresa fomente también prácticas de trabajo con calidad, la creación de grupos multidisciplinares y la rotación de puestos de trabajo como una forma de ayuda a facilitar la capacidad de absorción (Camisón y Forés, 2010; Gupta y Govindarajan, 2000; Zahra y George, 2002).

Junto a ello, el fomento de estructuras organizativas menos formalizadas y centralizadas estimularan el proceso de transferencia de conocimiento, ya que estas estructuras fomentar la integración de los departamentos, unidades y grupos de trabajo, mejorando así la confianza y la comunicación entre sus miembros (Oyefolahan y

Domingo, 2010). En este sentido, la puesta en marcha de políticas de flexibilidad laboral interna con la intención de tener personal motivado y preparado para asumir nuevas tareas, actividades y funciones en diversas áreas, etc. puede ayudar a este proceso (Pedersen et al., 2003). Algunas de esta políticas son, la reducción de la jornada laboral y la existencia de una mayor libertad empresarial para fijar horarios, ya sea para compactar la jornada semanal, concentrándola en cuatro días o para modular la jornada estableciendo límites de duración promedio semanal, mensual o anual (Ermida, 1992). Asimismo, las organizaciones pueden emplear otros mecanismos y procesos de flexibilización laboral interna que fomenten la recalificación del trabajo, la existencia de relaciones laborales cooperativas y el replanteamiento de la relación contractual para fomentar la mayor valoración del factor humano como elemento decisivo para el éxito del negocio (Looise et al., 1998; Michie y Sheehan-Quinn, 2001; Urquijo, 2004).

La organización también necesita el desarrollo de políticas para la recopilación y codificación de conocimientos a fin de generar grupos que comparten conocimientos (Cook y Yanow, 1993; Ordóñez, 2001). La existencia de un conjunto de reglas, normas, procedimientos e instrucciones para convertir el conocimiento tácito que poseen los especialistas en explícito, el conocimiento integrado y codificado para una comunicación eficiente a los no especialistas en la organización, etc., facilitará el acceso y uso del conocimiento tácito (Alavi y Leidner, 2001; Grant, 1996a). Asimismo, la creación de rutinas, patrones y protocolos de interacción permiten a los individuos aplicar e integrar sus conocimientos, especialmente cuando se trata de conocimiento complejo (Grant, 1996a).

Igualmente, es necesario desarrollar políticas de mejora de los procesos de transformación y explotación del conocimiento para mejorar el rendimiento de la organización (Kostopoulos et al., 2011; Miles y Snow, 1978; Tsai, 2001). Los directivos de las organizaciones deberían fomentar prácticas y tecnologías que fomenten la colaboración entre los miembros de la organización (ej., videoconferencias entre los miembros de la empresa), proporcionando un soporte técnico y formativo que potencie la confianza en las estrategias de colaboración y que estimule una cultura de innovación (Avlonitis y Salavou, 2007; Baker y Sinkula, 1999). Asimismo, debe potenciarse la comunicación entre todos los miembros de la organización. Para ello, los directivos deben promocionar la existencia de líneas inter-jerárquicas de comunicación entre los miembros de la organización para que exista un flujo libre de ideas y se estimule la

innovación (Avlonitis y Salavou, 2007; Baker y Sinkula, 1999; Jiménez et al., 2011; Zahra y George, 2002). Además, se debe animar a los empleados a asumir riesgos como mecanismo para impulsar la innovación (Baker y Sinkula, 1999).

Junto a mecanismos internos de comunicación, puede ser útil el empleo del sistema de red en la relación con terceros. Este sistema se puede convertir en un proceso de análisis repetitivo, de aprendizaje continuo y captador de cambios, que lleve al empresario a tener una fuente de información importante y adicional de la cual se deriva un mayor conocimiento de clientes, proveedores, accionistas, etc., y la posibilidad de detectar oportunidades de nuevos negocios (Vandekerckhove y Dentchev, 2005). Los beneficios de la integración de los grupos de interés se manifiestan en una mejora de la reputación corporativa y se traduce en acuerdos económicos favorables y aumento de la legitimidad, que lleva a un alivio de las posibles posiciones encontradas entre las partes en la realización de las operaciones diarias y planes de desarrollo (Sharma y Vredenburs, 1998). Además en sectores donde la reputación e imagen de marca es importante, anticiparse a las demandas de los grupos de interés puede ser fuente de diferenciación y ventaja competitiva (Spar y La Muse, 2003).

5.3. Limitaciones del trabajo de investigación

En este apartado reflejamos algunas de las principales limitación de los trabajos de investigación realizados.

- Los datos del estudio basados en auto informes pueden estar sujetos al sesgo de subjetividad social (Podsakoff y Organ, 1986). Sin embargo, asegurar el anonimato puede reducir este sesgo, incluso cuando las respuestas seguirán siendo sensibles a temas importantes para la organización (Konrad y Linnehan, 1995). No obstante, las respuestas están sujetas a interpretación por los directivos individuales.
- La ausencia de medidas objetivas para todas las variables es una limitación. Sin embargo, la validación externa de algunas variables desde un subconjunto de encuestados incrementó la confianza en los auto informes y redujo el riesgo de método común de la varianza. En consecuencia, la posibilidad de un método con sesgo común fue comprobada usando el test de un factor de Harman y otros métodos. Nosotros también usamos datos objetivos y cambiamos el orden de presentación de los ítems del estudio entre los

distintos sujetos. De esta manera el método de sesgo común no parece estar presente (Konrad y Linnehan, 1995; Podsakoff y Organ, 1986).

- La naturaleza de corte transversal de la investigación en una serie de conceptos dinámicos nos permite analizar sólo una situación específica en el momento de las organizaciones estudiadas, y no su conducta global a lo largo del tiempo. Nuestra aproximación ha reducido las magnitudes de este problema, porque las características dinámicas y las afirmaciones causales pueden ser hechas si las relaciones están basadas en evidencias teóricas (Hair et al, 1999). Por esta razón, se hizo un esfuerzo teórico que permite identificar y comprobar la existencia formal de las diferentes relaciones causa-efecto.
- El uso de una única respuesta puede haber influido en la precisión de algunas medidas. Sin embargo, las dificultades para obtener patrocinadores para la investigación basada en múltiples visiones de cada empresa, el valor del conocimiento de los CEOs de la empresa, y la práctica común en la investigación organizativa dan lugar a tomar a los CEOs como principales encuestados.
- Sería necesario analizar los resultados en otros sectores estratégicos.
- Hay que indicar que, aunque se han analizado diferentes variables, un gran número de variables de otro tipo pueden ser analizadas u otras combinaciones pueden ser realizadas para analizar su influencia en el espíritu emprendedor corporativo.
- En el capítulo II, la muestra seleccionada fue de empresas de España, por lo que el estudio debería ampliarse a empresas europeas o globales de forma que los resultados puedan ser más generalizables. No obstante, esta limitación ha sido resuelta en los capítulos III y IV, al ampliar el estudio a empresas europeas, aunque un estudio con un mayor número de empresas podría realizarse y el siguiente paso sería estudiar no sólo empresas europeas si no ir más allá para poder hacer los resultados globales.

5.4. Futuras líneas de investigación

Los estudios futuros deberían estar basados en una muestra más grande y podrían integrar perfectamente la influencia de factores externos. También sería interesante

estudiar similares características, no solo a nivel de directivos, sino a todos los niveles de la organización, es decir, que los empleados fueran también encuestados en estos estudios, aunque esto sería realmente caro.

Siguiendo con las líneas de esta investigación se podría ver si una vez alcanzado un buen conocimiento tecnológico, adquirido con los procesos de gestión de conocimiento y capacidad de absorción, el espíritu emprendedor seguirá aumentando.

Otra investigación interesante sería comprobar la relación entre políticas de flexibilidad laboral interna y espíritu emprendedor, cada uno de los procesos de gestión de conocimiento y espíritu emprendedor. También sería importante, plantear estos estudios desagregando el espíritu emprendedor corporativo en las variables que aquí lo forman. Concretamente, como se relacionan las políticas de flexibilidad laboral interna con "*organizational innovativeness*" u orientación a innovar por parte de la empresa, con "*new business venturing*" o creación de nuevos negocios, con "*proactiveness*" o proactividad y con "self-renewal" o autorrenovación respectivamente.

Por último, sería interesante la aplicación de otras formas de demostrar empíricamente nuestras hipótesis, tales como la aplicación de variables mediadoras en nuestras relaciones, o de variables moderadoras en los modelos de regresiones lineales jerárquicas. Junto a ello, una investigación longitudinal puede aproximar estas variables con mayor precisión y estudiar sus determinantes, procesos y resultados sistemáticamente, por lo que nos permitirá analizar la evolución de las variables con el tiempo y proponer conclusiones más acertadas sobre su actividad.

5.5. Bibliografía

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Capítulo VI

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