TESIS DOCTORAL

THE IMPACT OF INNOVATION ON THE INTERNATIONALIZATION OF MANUFACTURING FAMILY FIRMS

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Antecedentes

Las Empresas Familiares son la tipología de empresa más dominante en la mayoría de los países del mundo y su papel en la economía se refleja en su contribución al empleo o al valor añadido bruto, lo que las convierte en uno de los pilares más importantes de la economía y desarrollo de una nación. Sin embargo, dada las características de las empresas familiares no es posible definir un único perfil de Empresas Familiares y estas de un país a otro debido a algunas diferencias de tipo legales, culturales o de dinámica y comportamiento social. Su nivel de competitividad, entre ellas o frente a las empresas no familiares, la forma en que suelen organizarse y estructurar sus órganos de dirección y gobierno corporativo, o incluso el grado de profesionalización de su gestión, son algunos de los aspectos relevantes que presentan diferencias notables entre empresas familiares de distintos países.

Asimismo, las Empresas Familiares tienen una relevancia mundial siendo las organizaciones con mayor facturación y creación de empleo a nivel global. Se estima que en la Unión Europea existen 14 millones de empresas de propiedad familiar y que generan más de 60 millones de puestos de trabajo en el sector privado. Solo en Estados Unidos generan en torno al 50% del empleo privado y ocupan en torno al 80% del tejido empresarial. Las Empresas Familiares (EFS) también juegan un papel fundamental en la economía española. Actualmente, se estima que 1,1 millones de empresas están constituidas por familias en España; cifra que supone el 89% del total de empresas, son responsables del 57,1% del PIB

y generan el 67% de los empleos privados (Instituto de la Empresa Familiar, 2019). Es importante recalcar que el crecimiento y supervivencia de estas empresas radica principalmente en su capacidad para adaptarse a los constantes cambios del entorno económico y social, y las decisiones relacionadas con cómo las Empresas Familiares expanden sus negocios ya sea horizontalmente, conquistando nuevos mercados, o verticalmente, integrando diferentes empresas de la cadena de valor de su negocio.

Para prosperar y crecer en un entorno global e interconectado, las Empresas Familiares necesitan desarrollar su Capital Intelectual entre otros recursos. A través de la constante contratación y capacitación de sus recursos humanos pueden aportar talento y liderazgo para mejorar sus procesos productivos, la relación con los grupos de interés y, por ende, finalmente, adaptarse a los constantes cambios del mercado. La innovación liderada por las nuevas tecnologías y formas de negocios disruptivos en el mercado desencadenan cambios que hacen que las empresas familiares sean flexibles y adapten su organización interna, procesos productivos y propuestas de productos y servicios para seguir siendo competitivas y exitosas a lo largo del tiempo. Una de las cualidades distinticas de las empresas familiares es la necesidad de mantener un equilibrio constante entre sus objetivos comerciales y sus objetivos familiares, como preservar los valores familiares y proteger la riqueza de la empresa, y para lograr esto muchas de ellas deciden internacionalizar sus negocios permitiéndole de esa manera aumentar las posibilidades de supervivencia.

Para esta tesis, el concepto de Empresa Familiar se entiende como la empresa en la que uno o más miembros de la familia propietaria ocupan cargos directivos, es decir, que un grupo familiar participa activamente en el control o dirección de la

empresa. Esta definición capta la influencia y participación de la familia en la gestión (Fernández y Nieto, 2005).

Una empresa familiar, para seguir siendo competitiva, tiene que tomar una de las decisiones estratégicas más importantes que cualquier empresa puede tomar: internacionalizarse o no. La internacionalización es una estrategia corporativa crucial no solo para que las empresas familiares tengan éxito en su integración horizontal a nivel mundial, sino también para las empresas que abordan la sostenibilidad de sus desarrollos y se beneficien de mercados más atractivos y contrarrestan los ciclos económicos negativos en sus propios países. En otras palabras, la internacionalización es el proceso de involucrarse cada vez más en los mercados internacionales con el propósito de expandir sus mercados, mejorar sus ingresos, extender la vida útil de la empresa, volverse más competitiva y garantizar un proceso de sucesión exitoso para sus futuras generaciones.

Previos trabajos de investigación intentaron comprender si las empresas familiares (ENFs) están impulsadas por los mismos motivadores para internacionalizarse que las empresas no familiares (ENFs) o aplicaron las mismas estrategias y recursos (De Massis et al., 2018). Sin embargo, la mayoría de los académicos está de acuerdo en el hecho de que las EFs son diferentes de las ENFs, ya que las EFs tienen algunas características inherentes y singulares como por ejemplo el miedo a la pérdida del control de la gestión, o al cambio en la orientación temporal de la toma de decisiones, corto plazo en lugar de a corto plazo, lo que puede hacer que las empresas familiares se muestren reacias a tomar la decisión estratégica corporativa de internacionalizar sus negocios.

Por otro lado, otro de los recursos fundamentales de las empresas, tanto familiares como no familiares, es la innovación. El concepto de innovación se define

como “la implementación de un producto (bien o servicio) nuevo o significativamente mejorado, o un proceso, un nuevo método de comercialización o un nuevo método de organización en la práctica empresarial” (OCDE, 2005, p. 47), y es entendida como un factor crucial para mejorar el desempeño y las ventajas competitivas de las empresas (Bettis & Hitt, 1995; Lengnick-Hall, 1992). Diversos académicos (Fang et al., 2021; Lin & Wang, 2021; Zahra, 2020) han estado investigando para saber si las EFs son más innovadores que los ENFs, y el papel de los FF en la inversión en I+D.

Como se explica con mayor profundidad en los capítulos segundo y tercero de esta tesis, la innovación requiere a menudo “la combinación de actividades diversas y/o complementarias (I+D interna/externa, adquisición de maquinaria o formación de recursos humanos) que resulta en una variedad de innovaciones, tales como producto, innovaciones de proceso, organizacionales y/o de comercialización” (OCDE, 2005; Rodial et al., 2016, pág. 250). Por otro lado, es importante destacar que el grado de innovación de una empresa depende tanto del número de innovaciones de un determinado tipo como de los diferentes tipos de innovación que esta empresa implementa y maneja al mismo tiempo (Rodil et al., 2016). En este sentido, surge la pregunta principal asociada a esta investigación: ¿Cómo afecta la innovación (tecnológica y no tecnológica) a la internacionalización de las empresas familiares y no familiares?

Objetivos

El objetivo general de este trabajo es estudiar el papel de los cuatro diferentes tipos de innovación (producto, marketing, proceso y organización) en la internacionalización de las Empresas Familiares. En este sentido, el objetivo general se aborda a través de los siguientes objetivos específicos:

1) El primer objetivo específico aborda la siguiente pregunta de investigación: ¿Qué se ha hecho en el ámbito académico sobre la interrelación entre innovación e internacionalización de las Empresas Familiares? Por tanto, el primer objetivo de esta tesis es conocer el estado actual de la literatura académica sobre la innovación e internacionalización de las Empresas Familiares.
2) El segundo objetivo específico responde a la siguiente pregunta de investigación: ¿Cómo son las relaciones entre los diferentes tipos de innovaciones tecnológicas (de producto y de proceso) y no tecnológicas (de marketing y organizacionales) y el comportamiento exportador en Empresas Familiares y No Familiares? No hay evidencia previa sobre las diferencias entre empresas familiares y no familiares sobre el vínculo potencial entre la innovación tecnológica y no tecnológica y el comportamiento exportador.
3) El tercer objetivo específico responde a las siguientes preguntas de investigación: ¿Existe una sola combinación óptima en términos de innovación (producto, proceso, marketing, organización) que lleve a la internacionalización? ¿Toman las Empresas Familiares y No Familiares los mismos caminos en cuanto a la innovación relacionada con su internacionalización? Por tanto, el tercer objetivo específico es conocer la

combinación de tipos de innovación que utilizan las Empresas Familiares para internacionalizar su negocio.

4) El cuarto objetivo específico se basó en la siguiente pregunta de investigación: ¿Toman las empresas Familiares y No Familiares las mismas decisiones de inversión en innovación cuando cambian las condiciones económicas? ¿Existen trayectorias o configuraciones óptimas de actividades de innovación en Empresas Familiares y Empresas No Familiares para internacionalizarse cuando las condiciones económicas cambian? Así, el cuarto objetivo específico es analizar el comportamiento de las Empresas Familiares en tiempos de entornos internacionales desafiantes. En general, la decisión de innovación en las Empresas Familiares tiende a depender más de la ruta (De Massis et al., 2016; Erdogan Rondi & De Massis, 2020). Por lo tanto, es pensable que continúen con el mismo comportamiento anterior durante los momentos de crecimiento, recesión y recuperación.

Metodología

Para dar respuesta al primer objetivo específico, se realizó una investigación bibliográfica sistemática siguiendo la metodología sugerida por Tranfield, Denyer y Smart (2003). Los términos de búsqueda fueron “Innovación, Internacionalización y empresas familiares” y como resultado de la investigación se analizaron 23 revistas publicadas en revistas internacionales durante 2009 y 2015.

Para dar respuesta al segundo objetivo hemos realizado estadísticas descriptivas, inferenciales y regresiones Tobit y Probit, aplicando cada metodología en función de la definición de la variable dependiente, ya sea EXPORTACIÓN (Probit) o PEREXPORTACIÓN (Tobit).

Finalmente, para dar respuesta al tercer y cuarto objetivo específico se utilizó un Análisis Comparativo Cualitativo (QCA), ya que es el enfoque teórico conjunto que permite un análisis integral de la causalidad entre un conjunto de condiciones, per se o combinadas y un resultado específico (Ragin, 2008).

Para el análisis empírico de los objetivos específicos 2, 3 y 4 se ha utilizado información de la Encuesta de Estrategias Empresariales, que es un instrumento de investigación estadística elaborado por la Fundación SEPI (entidad dependiente del Gobierno de España) que cada año encuesta a un panel de empresas manufactureras españolas. La SBS clasifica la industria manufacturera española en 20 sectores diferentes según los criterios de la Clasificación Nacional de Actividades Económicas (CNAE). La base de datos inicial de la SBS contiene una muestra de 5.840 empresas (2016). Hubo 2.410 empresas que no respondieron a la encuesta en este período, y por lo tanto no proporcionaron ningún dato. Esto significó que la muestra se redujo a 3.430 empresas, proporcionando 18.410 observaciones empresa-año.

El período de tiempo considerado fue de 2007 a 2016. Para cumplir con los objetivos tres y cuatro, se dividió el período en tres subperíodos: 2007-2008 (crecimiento), 2009-2013 (crisis), 2014-2016 (recuperación), de esta manera se observa cómo las empresas cambiaron en términos de las preferencias de innovación y su conexión con su intensidad de internacionalización.

Resultados y Conclusiones

Los resultados de este trabajo doctoral contribuyen al campo del conocimiento de la innovación e internalización de empresas familiares mostrando que para las Empresas Familiares la innovación tiene una relación positiva y significativa sobre

la propensión a exportar cuando se introducen variaciones en la innovación ya sea de producto, de proceso o de marketing.

En primer lugar, los resultados muestran que para la internacionalización de las Empresas Familiares es más útil invertir en innovación en la organización por sí sola que como parte de una estrategia global de innovación combinándolo con la totalidad de los cuatro diferentes tipos de innovación. En ese sentido, nuestros resultados difieren de algunas investigaciones previas (Pino et al., 2016; Azar y Ciabuschi 2017; Véganzonès-Varoudakis y Plane, 2019) que mostraron que las innovaciones organizacionales tienen un efecto directo e indirecto (positivo) sobre el comportamiento exportador.

En segundo lugar, en cuanto a la innovación en producto y marketing, nuestros resultados sugieren que son más indispensables en su conjunto, ya que impulsan la propensión a exportar como lo sugirieron anteriormente diferentes estudiosos como Cassiman, Golovko, & Martínez-Ros (2010) y Caldera (2010) relacionados con la innovación de productos y, por otro lado, Sentürk y Erdem (2008) y Salomon y Jin (2010) relacionados con los esfuerzos de innovación en marketing. Adicionalmente, y con un menor nivel de influencia aparece la innovación de proceso, esto coincide con algunos hallazgos previos como en el trabajo de Klepper (1996) quien afirma que las innovaciones de proceso son más frecuentes en etapas posteriores cuando los volúmenes de producción aumentan significativamente y, por tanto, pueden volverse más atractivo para las empresas que compiten internacionalmente y, además, Cassiman et al. (2010) quienes afirmaron que las innovaciones de nuevos procesos son más eficientes para que una empresa se internacionalice en una etapa posterior.

En tercer lugar, nuestros resultados van en línea con algunas investigaciones previas como es el caso de algunos trabajos de Vernon (1966) y Cassiman, Golovko, & Martínez-Ros (2010) quienes se centraron en el estudio de la innovación dentro del proceso del ciclo de vida. Desde nuestro punto de vista, se puede decir que existe un proceso natural en la forma en que las Empresas Familiares innovan, introduciendo los diferentes tipos de innovación en diferentes etapas, primero la innovación de producto y marketing, luego la innovación de proceso y finalmente la innovación organizacional. Puede ser una contribución relevante al campo, ya que podría describir una especie de puesta en escena que siguen las empresas familiares en la forma en que realizan inversiones en innovación.

En cuarto lugar, y en coincidencia con trabajos pregios de otros investigadores (Chesbrough & Rosenbloom 2002; Teece 1986, 2010), los resultados de este estudio muestran que ninguno de los tipos de innovación per se es una condición necesaria para que las empresas logren la internacionalización a través de la exportación. Sin embargo, la innovación de productos per se es suficiente para impulsar a las empresas a internacionalizarse a través de la exportación. Por lo tanto, este es el tipo de innovación que prevalece. Esto es consistente con investigaciones previas que reconocen el papel principal que la innovación de productos generalmente juega en el comportamiento exportador (e.g., Becker & Egger, 2013; Bernard & Jensen, 2004; Caldera, 2010; Carboni & Medda, 2020; Cassiman & Martínez-Ros, 2007; Nassimbeni, 2001; Tavassoli, 2018).

En quinto lugar, este trabajo nos ha permitido constatar que existen varias combinaciones alternativas de actividades de innovación que son suficientes para la internacionalización y que la innovación de procesos debe combinarse con la

innovación organizativa o de marketing para poder exportar. Esto es interesante porque desafía los hallazgos de una serie de estudios anteriores (p. ej., Cassiman & Golovko, 2010; Edeh et al., 2020), en los que se identifica que la innovación de procesos (usando efectos netos) está positivamente relacionada con, y un determinante principal de la exportación. Puede que sea así, pero nuestros resultados revelan que las empresas también necesitan complementar este esfuerzo de innovación con desarrollos innovadores en otras áreas: marketing y métodos organizativos, respectivamente, en EFS, o únicamente métodos organizativos en ENFS. Por lo tanto, nuestros resultados parecen estar en consonancia con estudios previos (p. ej., Edeh et al., 2020; Medrano-Saiz & Olarte-Pascual, 2016; Rodil et al., 2016), encontrando complementariedades entre dos o más tipos de innovación que ayudan las empresas exportan más.

En sexto lugar, y en relación con la heterogeneidad de las Empresas Familiares, nuestros resultados parecen respaldar los siguientes dos argumentos principales: primero, las EFs y las ENFs ciertamente tienen características distintivas, ya que eligen caminos o configuraciones algo diferentes para sus actividades de innovación cuando deciden internacionalizarse a través de la exportación. Estos hallazgos están en línea con el RBV, que sugiere la existencia de grandes disparidades en términos de paquetes de recursos y capacidades entre ambos tipos de empresas y la mayor relevancia de las innovaciones de marketing en las EFs (e.g., Binz et al., 2013; Sageder, Mitter, & Feldbauer-Durstmüller, 2018; Sciascia et al., 2012; Witkowski & Thibodeau 1999) a la hora de tomar sus decisiones estratégicas, aportando así más evidencia para justificar su diferente comportamiento en actividades empresariales como la innovación. Asimismo, a la luz del mayor número de caminos que conducen a las exportaciones en las EFs,

parece claro que estas empresas deben ser consideradas como un grupo heterogéneo, y quizás más que las ENFs. Nuestros hallazgos respaldan la noción de heterogeneidad familiar en términos de objetivos estratégicos (p. ej., con respecto a las exportaciones) y recursos utilizados o actividades realizadas (p. ej., innovación) para alcanzarlos con éxito. El estudio de la heterogeneidad entre las EFs se ha convertido recientemente en un tema de investigación importante (p. ej., Daspit et al., 2018; Neubaum et al., 2019; Rau et al., 2019; Stanley et al., 2019). Por lo tanto, nuestro estudio contribuye a este reciente y vivo debate sobre la heterogeneidad de la EFs al identificar específicamente una fuente importante de dicha diversidad (la innovación) cuando se decide expandirse al extranjero.

En séptimo lugar, los resultados de esta tesis contribuyen al campo de estudio den un aspecto clave que ha sido ignorado por investigaciones pasadas: la idea de estabilidad/inestabilidad en el impacto que las diferentes actividades de innovación tienen en las decisiones de internacionalización de las EFs y ENFs como resultado de importantes cambios ambientales. turbulencias. Es importante destacar que nuestro estudio también encuentra que las diferentes configuraciones de las actividades de innovación que impulsan a las EFs y ENFs a exportar no son estables en el tiempo. Las EFs utilizan más combinaciones de actividades de innovación que las ENFs en tiempos de crecimiento y crisis, y la innovación de productos siempre está presente en las EFs en tiempos de crecimiento económico, lo que en cierta medida refuta la noción de que las EFs son más conservadoras que las ENFs cuando invierten en actividades innovadoras. En segundo lugar, las EFs implementan estrategias más estrictas de reducción de costos y reestructuración (es decir, innovaciones organizacionales y de procesos) durante una crisis. Asimismo, si bien las EFs y las ENFs internacionales parecen abordar la

crisis de manera bastante diferente en términos de comportamiento innovador, este comportamiento parece volverse más similar en tiempos de recuperación económica. De hecho, es entonces cuando existe una mayor paridad en el comportamiento innovador de las EFs y las ENFs, tanto en el número de configuraciones como en el tipo concreto de actividad innovadora realizada. Sin embargo, una diferencia notable en este punto es que, a diferencia de las EFs, las ENFs parecen seguir confiando más en las innovaciones organizacionales. Finalmente, el cambio en el número de configuraciones y los tipos de combinaciones de actividades innovadoras realizadas en cada período considerado (crecimiento, crisis y recuperación) parecen ser más radicales en las ENFs que en las EFs. En línea con ciertos estudios previos (p. ej., Erdogan et al., 2020), esto sugiere que el comportamiento innovador de las EFs depende más de la trayectoria que en el caso de las ENFs. Debido a su determinación de objetivos corporativos y orientación estratégica a más largo plazo, las EFs tienden a invertir de forma más constante en actividades de innovación para competir en el extranjero.

En último lugar, nuestros hallazgos sugieren que los posibles factores causales que llevan a las empresas a exportar dependen del tiempo o del contexto. Por lo tanto, nuestro estudio sugiere que existe la necesidad de controlar tal dependencia probando la estabilidad estructural de los modelos empíricos. Esto es consistente con investigaciones previas que han planteado la necesidad de verificar dicha dependencia mediante la comprobación de la estabilidad estructural de los modelos empíricos propuestos (e.g., Vicente-Lorente & Zúñiga-Vicente, 2006).

1. INTRODUCTION

1.1. IMPORTANCE OF THE TOPIC AND ANTECEDENTS

Family Firms are the most dominant type of company in most countries in the world and their role in the economy is reflected by their contribution to the employment or Gross Added Value making them this type of companies one of the most important pillars of the economic development of a nation. However, there is not only one profile of Family Firms, but they may also vary from country to country due to some differences. Their level of competitiveness, among them or compared to non-family businesses, the way they tend to organize themselves and structure their management and corporate governance bodies, or even the degree of professionalization of their management present relevant differences among family businesses from different countries. Likewise, each state presents a different regulatory framework and cultural environment, which can impact on the sustainability and competitivity of the Family Firm in each country differently.

Additionally, Family Firms have a worldwide relevance being the organizations with the highest turnover and job creation at a global level. It is estimated that in the European Union, there are 14 million companies that are family-owned and that generate more than 60 million jobs in the private sector. Only in the United States they generate around 50% of private employment and occupy around 80% of the business network.

To prosper and grow in a global and interconnected environment, Family Firms need to stretch and make their Intellectual Capital grow among other resources. Through the constant recruitment and training of their human resources they can provide talent and leadership to improve their production processes, relationship

with stakeholders and therefore, eventually, adapt themselves to the constant changes of the market. Innovation led by new technologies and new forms of disruptive businesses in the market trigger changes that cause family businesses to be flexible and adapt their internal organization, production processes and product and services proposals to remain competitive and successful. Moreover, Family Firms need to maintain a balance between their business goals and their family goals, such as preserving values and protecting wealth, so many of them decide on internationalizing their businesses to grow the chances of survival.

Family Firms (FFs) play a fundamental role in the Spanish economy as well. Currently, it is estimated that 1.1 million companies are constituted by families in Spain; a figure that accounts for 89% of the total number of companies, they are responsible for 57.1 of the GDP and create 67% of private jobs (Instituto de la Empresa Familiar, 2019). The growth and survival of these companies lie on their abilities to adapt themselves to the constant changes of the economic and social environment, and the decisions related to how Family Firms expand their businesses either horizontally, conquering new markets, or vertically, integrating different companies of the value chain to their business.

For this thesis, the concept of Family Firm (FF) is understood as the company in which one or more members of the owner-family occupy managerial positions, it means that a family group is actively involved in the control or management of the firm. This definition captures the family´s influence and involvement in the management (Fernandez and Nieto, 2005).

A Family Firm, to remain competitive, has to make one of the most important strategic decisions any company may make: whether to go international or not. Internationalization is a crucial corporate strategy not only for family firms to succeed

their horizontal integration globally, but also for companies that address the sustainability of their developments and profit from more attractive markets and counteract against negative economic cycles in their own countries. In other words, internationalization is the process of increasing involvement in the international markets for the purpose of expanding their markets, improving their revenues, extending the lifespan of the company, becoming more competitive and guaranteeing a successful succession process for their future generations.

Previous works tried to understand whether Family Firms are motivated by the same drivers to go international than non-family firms (NFFS) or applied the same strategies and resources (De Massis et al., 2018). However, most of scholars agreed on the fact that FFs are different from NFFs, as FFs have some inherent and characteristics namely, for instance, fear of losing control or long-term orientation rather than short-term one, that may make FFs averse to taking the corporate decision of internationalizing their businesses.

Family Firms face a complex decision-making process when deciding on major strategies. Besides the corporate decision of whether to internationalize their companies or not, they must face, additionally, the also difficult decision on how to implement that strategy. To answer that question FFs can chose from various internationalization models to decide among as for instance the Uppsala model (Johanson & Vahlne, 1977). This model was one of the first ones to appear and it proposes a gradual access to the new foreign market. It implies for companies, on the one hand, to commence their international activity by implementing close to home market interactions, and then gradually expanding their activities to the whole world market, therefore increasing their geographical diversification. On the other hand, the second important feature of the Uppsala model is the idea of initiating the

activity in the foreign market by increasing market commitment, it means starting by sporadic exports to finally setting up subsidiaries for the company in the foreign markets. Similarly, the innovation model (Cavusgil 1980), along with the Uppsala model, is also referred to as a “stage model” because they both states that internationalization occurs in incremental steps, companies make small excursions so they can learn gradually of the experience and make the necessary modifications to perform successfully in the new market. According to the innovation model, the internationalization decision is similar to the adoption of an innovation-based process, it is implemented gradually, Rogers (1962).

A third option to be considered when a company decides to initiate commercial activities in a foreign market is the network model (Johanson and Mattsson, 1988) that proposes establishing a geographic expansion by establishing relationship and network of independent actors in one or different countries in a specific marketplace (Johanson and Mattsson, 1988; Johanson and Vahlne, 1990; Mattsson, 1986; Hakansson and Snehota, 1989; Ford, 1990). Those relationships between companies are flexible and of different natures such as legal, personal, or technical, the advantage of this model is its flexibility in dynamic environments. The before mentioned networks are important to have access to some key resources for companies such as information, raw material, markets, and technology (Vandenbempt and Matthyssens, 1999), besides those networks ease and dynamize buyer-vendor relationships to eventually maximize gain and minimize loss (Tanner, 1999).

Regarding internationalization, there is also a forth theory that describes a different pathway to be followed by companies which is the Born Global theory, that sustains that companies which are born global see the world as only one market

and they start selling and exporting to any foreign country since moment one, just responding to demand, so adaptations of the product or any other quality of the marketing mix is limited (Chetty & Campbell-Hunt, 2004; Knight & Liesch, 2016). According to this theory there are some companies that from the very beginning of their existence they design their business for the global market without any previous short or long term in the domestic market. Usually these born global companies are small and technology oriented. Apart from choosing the entry mode family firms must weigh up other factors as for instance the access to strategic resources and how to allocate them.

Innovation is a crucial resource that both family firms and non-family firms must analyze. Innovation is defined as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practice” (OECD, 2005, p. 47), and understood as a crucial factor to improve firms’ performance and competitive advantages (Bettis & Hitt, 1995; Lengnick-Hall, 1992) scholars (Fang et al., 2021; Lin & Wang, 2021; Zahra, 2020) have been researching to know whether FFs are more innovative than NNFs, and the role of FFs in R&D investment.

For some scholars innovation capacity can be considered as an essential factor in facilitating internationalization. Dougherty & Hardy (1996) sustain that decisions around innovation, types and allocation are critical to many organizations as it provides one important way to adapt their business to changes in markets, technology, and competition. Some literature on the question suggest that innovative firms will have the tendency to enter foreign markets to increase their sales volume and distribute fix cost of innovation over a larger quantity of units therefore reducing the individual cost of the product and becoming more competitive

(Tidd et al., 1997). In the case of Family Firms, the interplay of SEW dimensions leads to innovativeness (Gast et al., 2018), therefore it might boost the likelihood of this type of companies to initiate activities in foreign markets. In that sense Sanchez Sellero et al. (2014) proved that due to product innovation family businesses have a positive impact on their export, and that technical progress can be the result of the absorptive capacity from foreign direct investment. Another question that arises around innovation is whether FFs and NFFs are equally efficient when allocating resources. Gallucci, Santulli & Calabro (2015) suggest that family management enhances internal firm performance due to a more efficient management of resources, and that permits a longer lifespan of the company which is one the characteristics of family firms fostering the long-lasting existence of the family business through a successful succession process. The strong bonding between family members fosters loyalty towards the leadership and commitment to work for the long-term and growth of the organization (Miller and Le Breton, 2005). Besides owners perform two complementary strategic functions, resources allocation and control.

As it will be explained more deeply in the third and fourth chapters, innovation often requires “the combination of diverse and/or complementary activities (internal/external R&D, machinery acquisition, training …) that involves a variety of innovations, such as product, process, organizational and/or marketing innovations” (OCDE, 2005; Rodil et al., 2016, pag. 250). Moreover, the degree of innovativeness of a company depends both on the number of innovations of a certain type and also on the different types of innovation this company implements and handles at the same time (Rodil et al., 2016). In this sense, it emerges the main question

associated to this research: how does affect innovation the internationalization of family firms.

1.2. OBJECTIVES

Overall, the general objective of this work is to study the role of the four different types of innovation (product, marketing, process and organizational) on the internationalization of Family Firms. In this regard, the general objective is approached through the following specific objectives:

1) The first specific objective addresses the following research question: What has been done in the academic arena about the interrelation between innovation and internationalization of Family Firms? Therefore, the first objective of this thesis is to know the current state of the art in the academic literature about the innovation and internationalization of Family Firms.
2) The second specific objective responds to the following research question: How are the relationships between the different types of technological (product and process) innovations and non-technological (marketing and organizational) innovations and the exporting behavior in family and non-family firms? There is no prior evidence on the differences between FF and non-FFs on the potential link between technological and non-technological innovation and exporting behavior.
3) The third specific objective addresses the following research questions: Is there only one optimal combination in terms of innovation (product, process, marketing, organization) that leads to internationalization? Do Family and Non-Family firms take the same paths in terms of innovation related to their

internationalization? Therefore, the third specific objective is to know the combination of innovation types used by Family Firms to internationalize their business.

4) The fourth specific objective was based on the following research question: Do Family and Non-Family firms make the same decisions regarding investment in innovation when economic conditions change? Are there optimal paths or configurations of innovation activities in FF and Non-Family Firms to internationalize when economic conditions change? So, the fourth specific objective is to analyze the behavior of Family Firms in times of challenging international environments. In general, innovation decision in FFs tend to be more path-dependent (De Massis et al., 2016; Erdogan Rondi & De Massis, 2020). Therefore they are more likely to continue with the same past behavior during moments of growth, recession and recovery.

1.3. METHODOLY

To respond to the first specific objective, it was carried a bibliographical systematic research following the methodology suggested by Tranfield, Denyer and Smart (2003). Search terms were “Innovation, Internationalization and family firms” and as a result of the research there were analysed 23 journals published in international journal during 2009 and 2015.

To respond the second objective we have performed descriptive, inferential and Tobit and Probit regressions, applying each methodology depending on the definition of the dependent variable, whether it is EXPORT (Probit) or PEREXPORT (Tobit).

Finally, in order to address to the third and fourth specific objectives it was used a Qualitative Comparative Analysis (QCA), as it is the set-theoretical approach that allows a comprehensive analysis of the causality between a set of conditions, per se or combined, and a specific outcome (Ragin, 2008).

For the empirical analysis of specific objectives 2, 3 and 4 it has been used information from the Survey on Business Strategies, which is a statistical research instrument drawn up by the SEPI Foundation (an entity dependent on the Spanish Government) that each year surveys a panel of Spanish manufacturing firms. SBS classifies the Spanish manufacturing industry into 20 different sectors according to the criteria of the National Classification of Economic Activities (CNAE). The initial SBS database contains a sample of 5,840 firms (2016). There were 2,410 companies that did not respond to the survey within this period, and therefore did not provide any data. This meant the sample was reduced to 3,430 firms, providing 18,410 firm-year-observations.

Time period considered was from 2007 to 2016. To fulfil objectives three and four, the period was divided into three sub periods: 2007-2008 (growth), 2009-2013 (crisis), 2014-2016 (recovery), this way it was observable how companies changed in terms of the innovation preferences and its connection to their internationalization intensity.

1.4. MAIN CONTRIBUTIONS

One first contribution of this work was to identify in the academic literature that while most of the research of Family Firms has been focused on R&D as the main

input to relate with internationalization, the less studies consider the effect of innovation and if they do, they only consider one or two of the four types of innovation at a time. This is the gap this research fills. Also, to some extent, the main observations of the literature review were that family firms support their growth on a notable capacity for innovation both in terms of technological resources and management and organization design.

This thesis makes several contributions to the literature on innovation and exporting as we link the technological and non-technological innovations with firm's decision to export. Moreover, we focus on a definition of innovation than contains technological innovations (product and process innovations) and non-technological innovations (marketing and organizational innovations). We focus not only in the decision of to export or not to export, but on how much to export.

We have also considered differences between FF and NFFs in terms of how each particular type of innovation can relate exporting behavior in each type of firm. These relationship between the different types of innovation and the type of firm and its potential link with the exportation activity is another contribution of the study.

Moreover, a fourth contribution of this work is to update the current literature on Family Firms internationalization, on the one hand, by examining the role played by different combination of firms´ innovation activities as causal factors, showing that there is more than one way or path for FFs (and also for NFFs) to get international. This contributes to the spirited discussion on FFs heterogeneity (Krauss et al., 2016; Pukall & Calabró, 2016).

A fifth contribution is related to the similarities between Family and Non-Family Firms regarding the combination of the different types of innovation activities that can motivate these types of companies to get international. This work helps to

explain how different types of innovation activities (product, production, organization and marketing) can actually lead internationalization over time.

Additionally, our work is related to a longitudinal approach to the analysis over 10 years, covering a pre-crisis, crisis and post-crisis period. In that sense this study contributes to a better insight on the role of innovation in the firm´s evolution over time (Leppäaho & Ritala, 2021). Therefore, this work casts some light on how family and non-family Firms react to and adapt themselves to the different external changes in a challenging environment.

Finally, our thesis uses a Qualitative Comparative Analysis (QCA) (Ragin, 1987, 2000) which is becoming popular to study family firms and innovation (e.g. Fainshmidt et al., 2020; Kosmidou & Ahuja, 2019; Kraus et al., 2016) and permits a better understanding of the different configurations of innovation activities both in Family and Non-Family Firms that support their internationalization.

1.5. ORGANIZATION OF THE STUDY

Overall, this document revolves around the strategic decisions that Family Firms make upon innovation and internationalization of their businesses. This topic has gained relevance over the last years he relevance of the role of Family Firms in the economy and the importance that their strategic decisions on innovation and internationalization have gained in recent years (Braga et al., 2017; Ossorio, 2018).

The general and specific objectives are approached through the different chapters to be developed in this thesis. In this regard, to better understand the relationship between innovation and internationalization of Family Firms this document is divided into the following chapters:

Chapter 1, “Introduction”, presents the importance of the topic and antecedents, describes relevant concepts about the topic, and presents objectives, research questions, and contributions of the thesis.

Chapter 2, “Innovation and internationalization in the family business literature” presents the current theoretical framework related to innovation and internationalization of Family Firms. Responds the first specific objective.

Chapter 3, “The relationship between technological and non-technological innovations and exporting behavior: a comparative analysis in family vs non-family firms”. Responds to the second objective.

Chapter 4:” Innovation and internationalization over periods of economic growth, crisis and recovery: a configurational approach comparing manufacturing family and non-family firms”. In this chapter it is discussed innovation and internationalization upon the Resource-Based View and the role of the different types of innovation as drivers of internationalization of Family Firms and it is related to the third and fourth specific objectives.

Lastly, Chapter 5 ¨General Conclusions”, presents the general conclusions, contributions, limitations, and future lines of research of the thesis.

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2. INNOVATION AND INTERNATIONALIZATION IN THE FAMILY BUSINESS LITERATURE

2.1. INTRODUCTION[1]

For Spain, and the rest of the European Community countries, the export of goods and services and the presence of its companies abroad are crucial for the recovery and development of their economies, even after the crisis experienced in the past few years. In that sense, family businesses play a fundamental role in the economy, and both innovation and internationalization are two important strategic decisions that family businesses must make in a world economy marked by several changeable macro and microeconomics conditions, and a permanent threat of recession.

The family business is consolidated worldwide and more specifically in Spain where, year after year, it becomes an asset of great importance for the Spanish economy. Currently, it is estimated that 1.1 million companies are constituted by families in Spain; a figure that accounts for 89% of the total number of companies. Furthermore, family firms' characteristics, solidly based on the clear vision and tireless ambition shared by an entrepreneurial family, make this type of company the biggest generator of employment in Spain (Instituto de la Empresa Familiar, 2019). At present, they create 67% of private employment, with a total of more than 6.58 million jobs, and are responsible for 57.1 of the GDP of the private sector. Additionally, in terms of their internationalization and according to KPMG (2017)

1 A previous version of this chapter was published: Tragant Espeche, J.F., (2019) Innovation and Internationalization in the Family Business Literature. European Journal of Applied Business Management, 5(2), pp. 116-130

76% of Spanish family firms are present in foreign markets. These figures clearly show the crucial role of family business in this country.

Before analysing and making any further suggestion about the future of family firms, it is important to know what has been researched so far on the internationalization and innovation of Family Firms (FFs). Therefore, in this article, an update on what is known about this topic from 2009 to 2018 will be presented. Based on the research conducted by Kontinen & Ojala (2010), the following questions were addressed: i) What is the current state of knowledge concerning the internationalization and innovation of FFs? ii) How could the phenomenon be studied in the future to further develop knowledge concerning FFs innovation and internationalization? In order to do so, paper methodology is presented first, followed by findings, conclusions and limitations, directions for future research and references.

2.2. METHODOLOGY

The literature review in this work has been conducted by considering articles that were published in the prestigious and widely-used database within the Social Science field, particularly within the field of Business and Economics: the Institute of Scientific Information (ISI). This was chosen because, in its database, it has the most important journals allowing researchers to carry out quality work and also as it is common practice for scholars in this field (Benavides-Velasco Quintana-García, & Guzmán-Parra, 2013). Articles were chosen over other sorts of documents, letters or editorials, because they best reflect the production of original research. Based on Kontinen & Ojala's review (2010), a two-stage research was carried out as follows:

a) their findings were used for further analysis by adding a new variable: Determinants of Internationalization; b) the research was replicated by the analysed period being extended from 2009 to 2018, and 'innovation' was added as a new key word in the search; c) the following key words were used: Internationalization – Innovation – Family Firms; d) the keyword search in the database ISI was conducted as summarised in Table 2.1.

Table 2.1: Search Protocol

DATABASE	WOS
GEOGRAPHICAL SCOPE	Global Scientific Production
CHARACTERISTICS 1	Quality indicators, JCR impact factor, immediacy index, times cited quartile
SEARCH TERMS	`Innovation and internationalization and family firms´
SCOPE	Field and document types: title and article
DATA RANGE	2008-2018
RESEARCH AREAS	Business Economics
RESULTS	23 articles

Source: The authors.

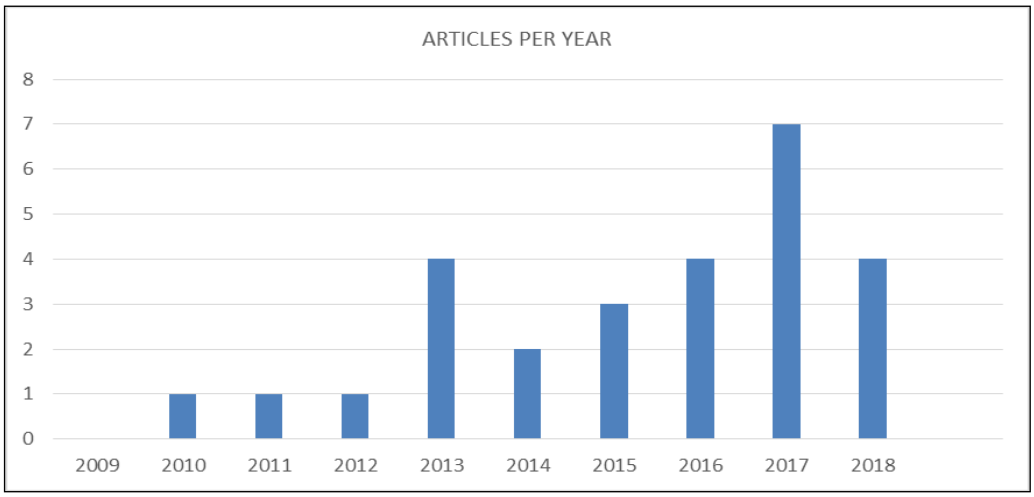
To conduct the research, Transfield, Denyer, and Smart (2003) were taken as reference as they established a set of basic guidelines for a systematic review. Therefore, this review process consisted of three stages: 1) planning the review; 2) conducting the review; and 3) reporting and dissemination. To conduct the search, a group of selected processes defined by different keywords was used, as well as the selection of filters commonly used in the above-mentioned database.

The research covered different stages, as follows: 1) first, and once the ISI front page was operative, the Advanced Search option was selected to introduce the following instruction: TS=(innovation and internationalization and family firms), then

the following parameters were selected: 1) All languages; 2) Articles; 3) Date 2008-2018; and also 4) a. Social Science Citation Index (SSCI) – 1956 - 2018 b. Emerging Sources Citation Index (ESCI) --- 2015 – 2018; 5) within the categories a) Business, b) Management, and c) Economics were chosen. As a result of this search, 27 articles were obtained (see Table 4). However, 4 of them were removed from the sample because their topics were not related to the research. Therefore, 23 articles were accepted for the final review and analysis.

Regarding the year of publication (Figure 2.1), the majority of the studies were published in 2017 (six papers), followed by 2013, 2016 and 2014 (four papers each). It is noted that after 2012 there is a constant increment in the number of articles published (20 of the 23 articles were published between 2013 and 2018: almost 87% of the total). This might be explained by the extensive use of information technologies, as well as by the development of the knowledge and information society (Ortiz-de-Urbina-Criado, Montoro-Sánchez, & Guerras-Martín, 2009). Additionally, it might indicate that the topic remains relevant nowadays.

Figure 2.1: Number of articles per year.



Source: The authors.

Table 2.2: List of Journals

	Journal	Number of Articles Published
1	JOURNAL OF SMALL BUSINESS MANAGEMENT	1
2	GLOBAL STRATEGY JOURNAL	1
3	ENTREPRENEURIAL BUSINESS AND ECONOMICS REVIEW	1
4	INTERNATIONAL JOURNAL OF MANAGERIAL AND FINANCIAL ACCOUNTING	1
5	ASIA PACIFIC JOURNAL OF MANAGEMENT	1
6	JOURNAL OF FAMILY BUSINESS STRATEGY	3
7	JOURNAL OF ENTREPRENEURSHIP IN EMERGING ECONOMIES	1
8	JOURNAL OF SMALL BUSINESS AND ENTERPRISE DEVELOPMENT	1
9	REVIEW OF INTERNATIONAL BUSINESS AND STRATEGY	3
10	JOURNAL OF LEADERSHIP & ORGANIZATIONAL STUDIES	1
11	INTERNATIONAL MARKETING REVIEW	1
12	MANAGEMENT AND ORGANIZATION REVIEW	1
13	JOURNAL OF INTERNATIONAL ENTREPRENEURSHIP	1
14	TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	1
15	INTERNATIONAL BUSINESS REVIEW	1
16	JOURNAL OF INTERNATIONAL MANAGEMENT	1
17	INTERNATIONAL MARKETING REVIEW	2
18	ENTREPRENEURSHIP THEORY AND PRACTICE	1
19	REVISTA DE HISTORIA INDUSTRIAL	1
20	BUSINESS HISTORY	1
Total of articles		**23**

Source: The authors.

The articles included in the analysis (N=23) were published in 20 different academic journals (See Figure 2) between 2008 and 2018. Moreover, some papers have been published in high impact journals, such as Review of International Business and Strategy (three articles), Journal of Family Business Strategy (two articles), International Marketing Review (two articles) and Entrepreneurship Theory and Practice (two articles).

Of all the articles mentioned above, the article with the highest number of citations (174 cites in WOS) is by Chua, Chrisman, Steier, & Rau (2012), Sources of heterogeneity in family firms: An introduction, whose paper contributes to a better understanding of the heterogeneity by examining how vision and goals influence the innovation, internationalization, succession, professionalization, and proactive stakeholder engagement of family enterprises.

The second most cited (49 citations in WOS) is: Geographical Pathways For MSE Internationalization: Insights From An Italian Sample, by D'Angelo, Majocchi, Zucchella, & Buck, T. (2013), whose paper examines the determining factors of two geographical pathways to internationalization for SMEs, providing empirical evidence that product innovation positively impacts on SMEs export performance.

The third most cited article (44 cites in WOS) is Governance Structure and Internationalization: Evidence From India, by Singh and Gaur (2013). It examines the impact of firm-level governance structure on the innovation and internationalization strategies of emerging market firms, finding a positive effect of family ownership and group affiliation on R&D intensity and new foreign investments.

Table 2.3: Most cited articles

Source: Author´s researchAuthor/s	**Journal**	**Cites in WOS**	**JCR2**	**Quartile JCR**
Chua, Chrisman, Steier, & Rau (2012)	Entrepreneurship Theory and Practice	174	3,414	Q1
D'Angelo, Majocchi, Zucchella, & Buck, T. (2013).	International marketing review	49	1,588	Q2
Singh & Gaur (2013)	Journal of international management	44	1,982	Q2
Tsao & Lien (2013)	Management international review	20	1,076	Q3

Source: The authors.

The fourth most cited paper (20 cites in WOS) is *Family Management and Internationalization: The impact on Firm Performance and Innovation,* studying the impact of family management on firm performance and innovation implications of internationalization, finding that family management positively moderates the relation between internationalization and performance/innovation.

Figure 3 depicts the four most cited papers and the quality ranking of the journals publishing them. All this indicates the contemporary nature of family business internationalization research and the significantly growing interest in the phenomenon.

2.3. FINDINGS

2.3.1. Methodological and definitional issues in the articles reviewed

The headings in Table 2.4 Article Description (type of article, country, type of research, time frame, etc.) show the categories applied in the typology of articles. This part will examine the categories and sub-categories in detail. The articles were written by 65 different authors, only six (6) of them being single authors: Fernandez-Moya (2010), Moreno Lazaro (2011), Huang (2014), Banno (2016), Hadrys-Nowak (2018) and Ossorio (2018). The rest were co-authors for 18 of the articles (see table 4).

Table 2.4: Article Description

AUTHOR - YEAR	TYPE OF ARTICLE	COUNTRY	TYPE OF RESEARCH	TIME FRAME	SAMPLE	INDUSTRY - FIRMA SIZE	FAMILY BUSINESS DEFINITION	JOURNAL	METHODOLOGY
Gast, Filser, Rigtering, Harms, Kraus, Chang - 2018	Descriptive	Swiss	Empirical	Cross sectional	452	SMEs - Manufacture	Socio Emotional Wealth - SEW	Journal of Small Business Management	Qualitative
Kano, Verbeke - 2018			Empirical	Cross sectional			Governance - Ownership - SEW	Global Strategy Journal	Quantitative
Hadrys-Nowak - 2018	Exploratory	Poland	Empirical	Cross sectional	420	Small	Resource-Based View	Entrepreneurial Business and Economic Review	CATI – PAPI – CAII - QualitativeQualitative
Ossorio - 2018	Confirmatory	Italy	Empirical	Longitudinal	106	SMEs	Governance - Ownership - Resource Based View	International Journal of Managerial and Financial Accounting	Quantitative
Hung – Tseng – 2017	Descriptive	China - Taiwan	Case Study	Longitudinal - 1976-2014	1	Multinational - manufacture	Institutional Theory - Entrepreneurship	Asia Pacific Journal of Management	Qualitative
Carney, Duran, Van Essen, Shapiro - 2017	Confirmatory	56 countries	Empirical	Longitudinal - 1955-2011	318	Multinational	Transaction Cost T. - International strategy - Governance	Journal of Family Business Srategy	Quantitative
Singh, Kota 2017	Confirmatory	India	Empirical	Longitudinal - 2005-2015	500	Big - Multinational - 20 industries	Governance Stewardship	Journal of Entrepreneurshp In Emerging Economies	Quantitative
Monreal-Perez, Sanchez-Marin - 2017	Confirmatory	Spain	Empirical	Longitudinal - 2006-2012	225	SMEs	Socio Emotional Wealth – SEW - Ownership - Involvement	Journal of Small Business and Enterprise Development	Quantitative
Ratten, Tajeddini - 2017	Confirmatory	Australia	Case study	Cross sectional		Information Technology	Resource-Based View - Agency Cost Theory - Ownership	Review of International Business and Strategy	Qualitative
Braga, Correia, Braga, Lemos - 2017	Confirmatory	Portugal	Empirical	Cross sectional	154	FB	Stewardship	Review of International Business and strategy	Quantitative
Banno – 2016	Confirmatory	Italia	Empirical	Cross sectional	229	FB	Socio Emotional Wealth – SEW - Ownership - Involvement	Journal of Family Business Srategy	Quantitative

Source: The authors.

Table 2.4: Article Description. *(Continuation).*

Almodovar, Verbeke, Rodriguez-Ruiz - 2016	Confirmatory	Spain	Empirical	Longitudinal - 2006-2010	610	SMEs FB	Absorptive Capacity	Journal of Leadership & Organizational Studies	Quantitative
Alonso, Austin – 2016	Exploratory	Australia	Case Sudy	Cross sectional	1	Medium	Resource-Based View	Review of International Business and Strategy	Qualitative
LI, Chen, Chua, Kirkman, Rynes-Weller, Gomez-Mejia – 2015	Exploratory - Descriptive	China	Case Study	Longitudinal - 2006-2010		FB	Socio Emotional Wealth – SEW	Management and Organization Review	Qualitative
Danicolai, Hagen, Pisoni - 2015	Confirmatory	Italia	Empirical	Cross sectional	88	SMEs	Entrepreneurship	Journal of International - Entrepreneurship	Quantitative
Huang – Jacob - 2014	Descriptive	China	Empirical	Cross sectional	38 countries	SMEs - Patent	Resource-Based View	Technological Forecasting and Social Change	Quantitative
Sanchez-Sellero, Rosell-Martinez, García-Vazquez – 2014	Confirmatory	Spain	Empirical	Cross sectional		Manufacturing firms	Dynamic Capabilities	International Business freview	Quantitative
Singh, Gaur – 2013	Confirmatory	India	Empirical	Longitudinal - 2002-2009	16,337 firms	SMEs	Family Ownership Insitutional Ownership Group Afiliation	Journal of International Management	Quantitative
Tsao, Lien – 2013	Confirmatory	Taiwan	Empirical	Longitudinal - 2000-2009		Public Firms	Corporate Governance - Ownership - Agency Cost Theory	Management International Review	Quantitative
D´Angelo, Majocchi, Zuchella, Buck - 2013	Confirmatory	Italy	Empirical	Cross sectional	2,657	SMEs - Manufacturing firms	Resource-Based View	International Marketing Review	Quantitative
Chua, Chrisman, Steir, Rau – 2012	SACAR			Cross sectional			Governance	Entrepreneurship Theory and Practice	Qualitative
Moreno-Lazaro – 2011	Descriptive	Mexico	Case Study	Longitudinal 1944-2010	1	Multinational manufacturing	Ownership	Revista de Historia industrial	Qualitative
Fernandez Moya – 2010	Descriptive	Spain	Case Study	Longitudinal 1869-1988	1	Publishing Sector	Ownership	Business History	Qualitative

Source: The authors.

2.3.2. Type of research

Regarding the type of research, for the sake of organization, the articles were divided into two groups: empirical and case study. The empirical group (where the goal was to verify through statistics theory-driven hypothesis) consisted of 18 articles; the remaining 6 articles belong to the study case group. Therefore, it seems that FBs internationalization research is mostly studied by the empirical approach. Family business innovation and internationalization is a relatively young field of interest: because of this, more exhaustive use of case studies is recommended.

2.3.3. Time frame, sample size and response rate

There were ten (10) longitudinal databases and fourteen (14) of the articles used a cross-sectional source. There is a dominance of longitudinal studies, most likely due to the easy access to current databases. The sample sizes ranged from 88 to 16,337 firms. Regarding the articles based on case-study research, there were three (3) multi-case-articles, and the remaining three (3) focused on only one company.

2.3.4. Methodology

In relation to the analytical approach, it was found that 63% of the articles (15 articles) used some form of quantitative methodology whereas 37% of the articles (9 articles) implemented qualitative methodology. Regarding the analytical approach, it was found that most of the analysed articles reporting specific methodology used some form of regression analysis: for instance, Singh et al. (2017) used a multiple regression model, or the Probit and Tobit Regression used in the article written by Monreal-Perez et al. (2017). Hadrya-Novak (2018) used a three-stage-qualitative

methodology combining Computer Assisted Telephone Interview, Paper Pen Personal Interview and Computer Assisted Internet Interview, resulting in 420 questionnaires used in the statistical analysis. In further studies, attention must be paid to reporting the analytical approaches more systematically to increase the efficacy of some studies. In addition, the use of self-administrated surveys could be of great use.

2.3.5. The findings reported in the articles

The articles were categorized within three groups according to their subject matter; namely, the internationalization process (4 articles) as, for example, in Ratten et al. (2017) and Braga et al. (2017); managerial issues (9 articles) as, for example, in Gast et al. (2018), Kano et al. (2018) and Monreal et al. (2017); and factors influencing FB internationalization (15 articles) as, for example, in Hadrys-Nowak (2018), Ossorio (2018) and Hung et al. (2017), according to Kontinen & Ojala's (2010) review classification. Table 1.5 presents the articles together with the category in which they belong, and additionally a summary of the finding of the article in question.

Table 2.5: Classification under subject

SUBJECT	ARTICLE
INTERNATIONALIZATION PROCESS	Ratten et al. (2017) – Braga et al (2017) – D´Angelo et al. (2013) – Moreno-Lazaro (2011)
MANAGERIAL ISSUES	Gast et al. (2018) – Kano et al. (2018) – Monreal et al. (2017) – Alonso et al. (2016) – Denicolai et al. (2015) – Sanchez-Sellero et al. (2014) – Tsao et al. (2013) – Chua et al. (2012) – Moreno-Lazaro (2011) – Moya (2010)
FACTOR INFLUENCING FBs INTERNATIONALIZATION	Kano et al. (2018) – Hadrys-Nowak (2018) – Ossorio (2018) – Hung et al. (2017) – Carney et al. (2017) – Singh et al. (2017) - Ratten et al. (2017) – Banno (2016) – Almodovar (2016) – Li et al. (2015) – Huang (2014) – Singh et al. (2013) – Tsao et al. (2013) - D´Angelo et al. (2013)

Source: Author´s research

According to the results, most of the articles (15 authors) discussed the different factors influencing FBs internationalization. It is interesting to mention the paper by Hadrys-Novak (2018), which concluded that family firms need to apply entrepreneurial orientation to become international, especially proactiveness towards new challenges and strategic planning tools. Also, Banno (2016) concluded that human asset quality affects the level of export intensity. The second most covered subject is managerial issues with eleven articles (see Table 2.6).

For instance, Alonso et al. (2016) investigated the attitude of family firms towards the protection of innovation outputs. Monreal-Perez et al.'s (2017) paper is also interesting, containing a study of the internationalization of family firms and exploring specifically if the transition of control to non-family control (losing family managerial influence) affects a firm´s export activity. It was found that, from a dynamic perspective, family firms remaining under family control (non-switchers) are

associated with a fall in export activity in comparison with family firms transitioning to non-family control.

Table 2.6: Driven Factors

DRIVEN FACTORS OF INERNATIONALISATION PROCESS	ARTICLES
INNOVATION	Gast et al. (2018) - Ossorio (2018) - Hung et al. (2017) – Singh et al. (2017) Ratten et al. (2017) – Braga et al. (2017) – Alonso et al. (2016) Almodovar (2016) – Li et al. (2015) - Denicolai et al. (2015) Huang (2014) - Sanchez-Sellero et al. (2014) - Singh et al. (2013) Tsao et al. (2013) - D´Angelo et al. (2013) - Chua et al. (2012)
OWNERSHIP STRUCTURE	Gast et al. (2018) - Kano et al. (2018) – Ossorio (2018) – Carney et al. (2017) – Singh et al. (2017) Monreal et al. (2017) – Alonso et al. (2016) - Chua et al. (2012) - Ratten et al. (2017)–) –– Singh et al. (2013) – Tsao et al. (2013) - D´Angelo et al. (2013)

Source: Author´s research

The driven factors for the internationalization process behind those three main topics were also disaggregated. Taking into consideration the keyword and the previous classification in Kontinen & Ojala (2010) two were detected as the most relevant: innovation and ownership structure. On the one hand, regarding innovation (16 articles) it can be seen in Gast et al. (2018), whose work proved that the interplay of SEW dimensions leads to innovativeness, and also in Ossorio (2018), who found that R&D investment has a positive impact on the ratio of sales in foreign countries to total sales. On the other hand, regrading Ownership Structure (11 articles) as, for example, in Carney et al. (2017) whose results confirmed the positive moderator effect of FFP on country export performance; and Singh et al. (2017) who found that

family business are more innovative and internationalised when compared to non-family businesses (see Table 2.6).

2.3.6. Innovation

Innovation capacity can be considered as an essential factor in facilitating internationalization. Urabe (1988) defines innovation as the generation of a new idea and its implementation in a new product, service or process. Some years before, Thompson (1965) had also considered, in a different way, innovation as a broader concept addressing the implementation of new ideas, products or processes and as a tool that might collaborate to boost firms´ performance and competitive advantages (Castaño, Méndez, & Galindo, 2016). Dougherty & Hardy (1996) also defined innovation as being a strategic decision that is critical to many organizations as it provides one important way to adapt to changes in markets, technology and competition.

Innovation is likely to influence, and be influenced by, a firms´ strategic initiatives, processes, and organizational structure. For example, as innovation entails considerable risk-taking (Edgett, Shipley, & Forbes, 1992), successful implementation of an innovation strategy requires making significant systemic changes in a firm to promote risk-taking. Innovation management literature generally predicts that innovative firms will tend to enter foreign markets in order to increase sales volume and spread the fixed costs of innovation over a larger number of units (Tidd et al., 1997). Apart from some exceptions (Becchetti and Rossi, 2000), previous research is quite consistent in supporting the idea that innovation encourages internationalization.

From the sample, we can show many important contributions to the theory of family firms and innovation, as, for example, Gast et al. (2018), who revealed that the interplay of SEW dimensions leads to innovativeness. On the other hand, Hung (2017) proved that latecomer firms can leverage their institutional linkages to acquire resources and develop learning activities for innovation through three pillars of resource: linkage, leverage and learning.

In this group of articles, we can see how companies support their growth by a notable capacity for innovation: not only technological but also in terms of management and organization, advertising campaigns and brand redesign (Fernandez Moya, 2010). It was also noted that some FBs have a positive impact on their exports due to product innovation, and that technical progress can be the consequence of the absorptive capacity from foreign direct investment (Sanchez Sellero et al., 2014). To measure innovation, scholars used the number of patents granted to a firm as an alternative to the use of R&D expenditure, as some prior literature suggests (Tsao & Lien, 2013). Conversely, some previous scholars (Hitt et al., 1991) also suggest the use of R&D expenditure and the number of patents as proxies for innovation, both of which are scaled by total assets at the beginning of the year. Braga et al. (2017) found that there is an association between the processes of innovation and internationalization within family firms. Furthermore, Ratten et al. (2017) found that innovativeness of family firms depends on responsiveness to customer-needs in the international market.

2.3.7. Ownership

In the case of family firms, the strong bonding between family members fosters loyalty towards the leadership and commitment to work for the long-term survival and

growth of the organization (Miller and Le Breton, 2005). Owners perform two main functions: resource allocation and monitoring.

Owners decide about the investment of the residual income among the several investment options at any given time (Singh and Gaur, 2013). Galucci, Santulli, & Calabrò and colleagues (2015) suggest that family management enhances internal firm performance due to a more efficient management of resources, amongst other factors. The same authors maintain that a combination of the management skills and proper communication of family history, values and identity increase the rate of performance, measured as sales growth (Galluci et al., 2015). Other authors, such as Monreal et al. (2017) study how the transition from family control to non-family control affects firms' export activity.

The articles examining this aspect mainly suggest that family management positively moderates the relation between internationalization and performance/innovation (Tsao & Lien, 2013). Family involvement also lends three distinctive advantages to family firms: these are parsimony, personalism and particularism (Carney, 2005). These findings suggest that family management helps mitigate the agency problems associated with internationalization so that family firms experience positive benefits from internationalization in terms of innovation and performance (Tsao & Lien, 2013). Institutional ownership also positively affects new foreign investments (Singh and Gaur, 2013). Owners and managers' active participation in a diversity of social networks, an early and intense internationalization and the professionalisation of the company's management support the growth of the company (Fernandez Moya, 2010).

Authors such as Kano et al. (2018) assessed how family firm governance features determine internationalization patterns on the key dimensions. He concluded that

these were location choice and operating mode. Ossorio (2018), for instance, investigates whether family ownership and state ownership exert a moderating role on the relationship between R&D investment and firms' internationalization, proving that family ownership positively influences the relationship between the above-mentioned variables. Carney et al. (2017) assessed that family firm prevalence positively moderates a series of variables associated with country exports, which was proven correct.

2.4. DISCUSSION AND CONCLUSIONS

This paper updates the current state of the topic and numerous relevant contributions emerge from this study: for instance, it reveals the fact that despite the existence of vast research on the effect of innovation on internationalization of family firms, there are no works that analyze the four types of innovations, and their effect on the internationalization of Family Firms as a whole.

Firstly, this work serves as a step forward to identifying the most relevant driven factors of the internationalization process – innovation and ownership - behind the three main topics mentioned by Kontinen & Ojala (2010): process, managerial issues and factors influencing FFs internationalization. An important number of researchers continue studying the potential effects of innovation, ownership, and organization structure on family firms' international performance, which is undoubtedly a fruitful area of research. This indicates the contemporary nature of Family Firms Innovation and Internationalization research and the significantly growing interest in the phenomenon**.**

Secondly, examination of the main findings firstly corroborates the existence of a great diversity of results supporting, on the one hand, the idea that family ownership has a positive influence on internationalization and, on the other hand, that family management positively moderates the relation between internationalization and performance/innovation.

Thirdly, the findings of this review suggest that there is a positive effect of family ownership and group affiliation on R&D intensity, and that a notable capacity for innovation, not only technological but also in terms of management and organization, supports the growth of the FFs. According to this, work innovation induces family firms to foster their expansion into foreign markets, while product and process innovation are important drives to export, highlighting the importance of innovation efforts to expand FFs to foreign markets.

In conclusion, among the factors affecting family firms' internationalization, and despite the limitations, this study confirms the importance of innovation and ownership structure for the development of family business. It also reveals that up to our knowledge there are not works done relating at the same time the four different types of innovation and the internationalization of family firms, neither how these relation and innovation investment may vary in different scenarios when FFs go through periods of stability or crisis.

2.5. LIMITATIONS AND AVENUES FOR FURTHER RESEARCH

After this review, it can be affirmed that the current studies concerning FB internationalization and innovation are still narrow and the number of articles about these topics is still small. There is considerable potential for expanded research.

A first limitation of this study was the focus on some specific aspects of family firms' internationalization, such as innovation, and the search has proved too narrow, so it could be interesting to expand the scope of the research. A second limitation is that the difference between the innovation strategies or ownership of leading and laggard firms was not distinguished (Cantwell and Mudambi, 2011).

For future research, it will be important for scholars to study this phenomenon in other types of countries, particularly those that are developing and emerging. Thus far, most studies have concentrated on developed countries. If more research is carried out in other countries, the obtained information could be used for comparison with the existent data.

Finally, a recommendation for future research would be to conduct a bibliometric analysis on the topic innovation-internationalization and concentration of property-internationalization and the moderating effect of innovation.

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3. THE RELATIONSHIP BETWEEN TECHNOLOGICAL AND NON-TECHNOLOGICAL INNOVATIONS AND EXPORTING BEHAVIOR: A COMPARATIVE ANALYSIS IN FAMILY *vs.* NON-FAMILY FIRMS

3.1. INTRODUCTION

Innovation is typically viewed as a key driving resource for a firm's competitive advantage. It is clear that under turbulent and changing environmental conditions, firms possessing a strong source of competitive advantage are more likely to achieve superior performance and, ultimately, survive. In this vein, one would expect innovative firms to grow faster and also become more efficient competitors than non-innovators in foreign markets (Edeh, Obodoechi, & Ramos Hidalgo, 2020; Filipescu et al., 2013; Love & Roper, 2015). Thus, it is not surprising that the last few years have witnessed the emergence of a large body of research interested in exploring how the potential linkage between innovation and firm's exporting behavior may be (e.g., Azar & Ciabuschi, 2017; Barrios, Görg, & Strobl, 2003; Basile, 2001; Becker & Egger, 2013; Cassiman & Golovko, 2011; Fang et al., 2018; Edeh et al., 2020; Filipescu et al., 2013; Hernández, Nieto, & Rodríguez, 2022; Lin & Wang, 2021; Zahra, 2020). In fact, the innovation-export linkage is becoming an important research stream in the existing literature in the fields of economics, management, and international business.

Although theoretically is assumed that innovation is a major driver of international activities, the findings from numerous empirical studies are mixed. There are studies reporting that certain types of innovation are positively related to exporting (e.g., Azar & Ciabuschi, 2017; Basile, 2001; Bodlaj, Kadic-Maglajlic, & Vida, 2020; Hernández et al., 2022; Tavassoli, 2018; Zucchella & Siano, 2014), while other studies do not find a significant relationship or even report ambiguous findings (e.g., Brancati et al., 2018; Caldera, 2010; Cassiman & Golovko, 2011; Edeh et al., 2020; Filipescu et al., 2013; Van Beveren & Vandenbussche, 2010).

Unfortunately, most prior empirical studies have primarily focused their attention on technological innovations (especially R&D investment and, to a lesser extent, product/process innovations), while the non-technological innovations (such as, marketing and organizational innovations) have received limited attention (for a recent review on this issue, see Wu, Wei, & Wang, 2021). Therefore, few empirical studies have simultaneously examined the potential link between technological and non-technological innovations and firm' exporting behavior. Certainly, a large number of studies have been centered on examining the role of R&D investment. However, it is important to note that while R&D investment is usually conceived as an important part of a firm's innovation activity, it is not the only source. R&D activities are only one of the inputs in the process of generating potential new innovations and they do not necessarily lead to successful innovations (i.e. outputs). A focus on R&D investment is a good way to gauge valuable innovative practices within a firm, but it does not provide a precise measure of how innovative that firm really is. In this sense, the Organization for Economic Cooperation and Development (OECD) defined the innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practice, workplace organization or external relations" (OECD, 2005, p. 46). This definition has been embraced by numerous researchers over the last few years to obtain a better understanding of the different types of innovation that can be carried out by a firm.

In addition, most past research does not distinguish between family firms (FFs) and non-family firms (NFFs) when the link between innvovation and internationalization via exports is being explored. It is usually recognized that compared to their NFFs peers, FFs tend to exhibit some distinctive characteristics

that can significantly influence in their strategic decision making. In this sense, the preservation of socioemotional wealth is normally viewed as having a strong negative influence on strategic decision making in FFs (Dawson & Mussolino, 2014; Gómez-Mejia et al., 2007), such as internationalization. But family involvement in ownership and/or management can provide other specific advantages for FFs compared to NFFs, such as a greater flexibility when making decisions —thereby facilitating a prompt decision making— as well as the adoption of a long-term perspective. These distinctive characteristics present FFs as relevant sources of innovative activities that can contribute to increase their owners' willingness to invest in business growth (Corsi, & Prencipe, 2018) through entry in new markets via exporting, for example. Thus, it is important to explore whether there are some remarkable differences in the relationship between different types of innovations and exporting in FFs *vs*. NFFs.

In sum, to our knowledge, the empirical research on the potential link between different types of technological and non-technological innovations (in terms of product, process, marketing and organizational innovations) and exporting behavior in FFs and NFFs is practically non-existent. This study attemtps to bridge this gap in the current literature by answering the following research question: *How are the relationships between the different types of technological and non-technological innovations and the exporting behavior in family and non-family firms?* To this end, we use a data set of Spanish manufacturing firms from 2007 till 2016. The focus on exporting is indeed justified because it is usually considered a firm's most prevalent foreign strategy for any kind of firm and especially amongst SMEs (e.g., Cerrato & Piva, 2012; D'Angelo, Majocchi & Buck, 2016; Lu & Beamish, 2001); in fact, the business sector of most countries is made up of SMEs and our sample is also composed mostly of these firms.

This research makes several contributions to the literature on innovation and exporting. On the one hand, we aim to advance our knowledge of firm's decision to export by emphasizing its potential linkage with technological and non-technological innovations. It has been widely recognized that innovations are not homogeneous (Lachenmaier & Wößmann, 2006; Lunn, 1986). In this regard, the definition and measurement of innovation has become an issue of major concern in past empirical research. Specifically, past research has outlined the main problems and challenges in defining and measuring innovativeness activity of a firm (Pastelakos, Theodoraki, & Catanzaro, 2022; Sinclair-Desgagné, 2021). In this regard, following the classification suggested by OECD (2005), we focus our attention on two main types of technological innovations (product innovations and process innovations) and two other types of non-technological innovations (marketing innovations and organizational innovations)[2]. Moreover, we examine the linkage between all types of innovations and exporting in terms of the decision to export and how much to export. We assume that the first decision that a firm's managers have to make is whether or not to export. Next, they need to decide how much to export. In this case, it seems obvious that the greater the export intensity of a firm, the greater its commitment will be to foreign markets. This study will provide on a more precise picture of the link between innovation and exporting as our dataset provides complete information about all these types of innovations and exporting behavior in terms of whether export

[2] The fourth edition of the Oslo Manual has been published in 2018 (OECD, 2018). This new edition has introduced some changes with respect to the third edition when defining the different types of innovation of a firm. However, because we use a dataset between 2007 and 2016, we consider that it is more appropriate to carry out our empirical analysis on the taxonomy proposed in the 3er. edition of the Oslo Manual (OECD, 2005).

or not and how much to export. Therefore, our study will allow to get finer-grained evidence on the so-called self-selection hypothesis, whereby firms that are more innovative self-select to compete in international markets via exports.

Importantly, we are also interested in exploring whether there are some differences between FFs and NFFs in terms of how each particular type of innovation can relate to exporting behavior in each type of firms. Interest in this issue arises because prior research on innovation, on the one hand, and on internationalization, on the other hand, have found that FFs and NFFs can significantly differ both in their innovativeness and international behavior (for reviews on both issues see, for example, Arregle et al., 2017; Calabrò et al., 2019; Pukall, & Calabrò, 2014). But research on the relationship between types of innovations and exporting has not explicitly distinguished between FFs and NFFs. Because exporting and innovation are considered two key levers for growth in a firm, it is important to fully understand what relationship exists between each type of innovations and exporting behavior in FFs and NFFs. Accordingly, drawn from the Resource-Based View (RBV), this study provides insights on whether all different types of innovations carried out by both FFs and NFFs can effectively be considered as one of the main facilitating resources to exporting behavior. Our main assumption in this study is that innovations and export go hand in hand. For a firm (both FF and NFF) to be successful in international markets, it needs to innovate either by introducing significant changes and improvements in production processes, creating a new product or implementing significant improvements in its administrative and marketing methods. We explore to what extent this assumption is true both in FFs and NFFs. Ultimately, this study provides a more holistic view in both research and managerial practice on how

different types of innovations are related to exporting behavior in different types of firms according to their ownership structure and/or management involvement.

3.2. THEORETICAL BACKGROUND AND HYPOTHESES

3.2.1. Innovation And Exporting Behavior In Family And Non-Family Firms

A significant body of literature on exports grounded in the RBV views certain resources as the main cornerstones to compete internationally (e.g., Gaur, Kumar, & Singh 2014; Lindsay, Rod, & Ashill, 2017; Peng, 2001; Sharma & Erramilli, 2004). In general, according to the RBV, innovation is an intangible resource that cannot be readily imitated, is valuable, and non-substitutable and it is, therefore, of particular importance in helping firms to grow and, ultimately, build a sustainable competitive advantage (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). Therefore, the firm's innovativeness can be viewed a strategic resource and/or capability that allow firms to bring superior customer value and also to compete more effectively and efficiently in foreign markets (Bodlaj et al., 2020; Boso et al., 2013; Lages, Silva, & Styles, 2009). In this vein, firms (FFs and NFFs) enter international markets to exploit their most valuable resources, including innovation. Despite FFs may find it more difficult than NFFs to access certain resources and capabilities such as, for example, financial resources or managerial capabilities (Alessandri et al., 2018), that are crucial for competing in exporting markets, these firms might overcome such obstacles by relying on other type of resources that also play a decisive role abroad, namely, innovation.

As noted above, the definition and measurement of innovation is probably one of the issues of major concern in empirical research. One of the typologies more prevalent in the literature on innovation has been the proposed by the Oslo Manual (OECD, 2005) that distinguished four diferent types of innovations: 1) product innovation; 2) process innovation; 3) marketing innovation; and 4) organizational innovation. While the former two types of innovations are usually considered technical innovations, the latter two are typically viewed non-technological innovations (see, for example, Geldes, Felzensztein, & Palacios-Fenech, 2017; Mothe, & Nguyen-Thi, 2010, 2012; OECD; 2005; Pino et al., 2016; Schmidt & Rammer, 2007). As argued by Geldes et al. (2017: 55), "the distinction between technological and non-technological innovations arises from the critics to the traditional view that product and process innovations are not sufficient to explain innovation in firms". Therefore, it is advisable to consider the four types of innovations to obtain a more realistic and complete picture of the innovation-exporting linkage.

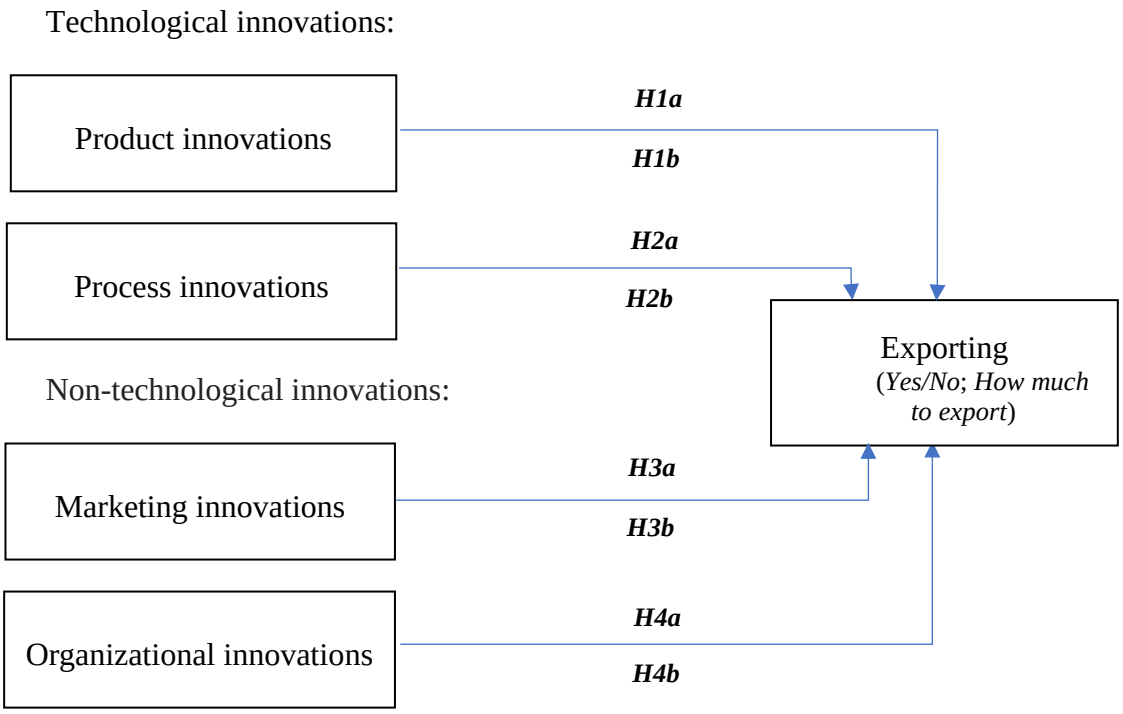
Following the Oslo Manual published in 2005 (OECD, 2005: 48-49), product innovations are defined as the introduction of a good or service that is new or significantly improved with respect to the characteristics or intentional uses. Process innovations refer to the implementation of a new or substantially improved production or delivery method. Marketing innovations are related to the application of a new marketing method that involves substantial changes in product design or packaging, product placement, product promotion and/or pricing. Organizational innovations — also called administrative, management or managerial innovation (e.g., Damanpour, 2014)— refer to the implementation of a new organization organizational method in the firm's business practices, workplace organization or external relations.

Innovations to compete both in local and foreign markets require the collaboration and coordinated work of many different agents and the integration, in most cases, of very diverse activities across different application contexts, fields of knowledge and/or specialized functions. The capability of a firm to innovate is frequently viewed as a necessary pre-condition for a successful use of innovativeness resources and new technologies. Likewise, the implementation of technology-based innovations normally present complex challenges and opportunities for most firms, requiring new organizational forms or leading to significant changes in managerial practices (Lam, 2010). This means, as suggested by prior research (e.g., Ayllón, & Radicic, 2019; Bodlaj et al., 2020; Dora, 2012; Lewandowska, Szymura-Tyc, & Gołębiowski, 2016; Van de Ven et al., 1999), that technological and non-technological innovations are interconnected in some way. Accordingly, because firms can simultaneously introduce different types of innovations, it is importat to know whether each type of innovations is equally important for promoting firm's exporting behavior.

As also noted above, the existing empirical research on the innovation-exporting relationship has paid much more attention to technological innovations (i.e. product and process innovations) than non-technological innovations (i.e. marketing and organizational innovations). Moreover, surprisingly, most prior research does not distinguish between FFs and NFFs. Nonetheless, our main assumption in this study is that all types of innovations —as they are linked to intangible resources and/or capabilities that are valuable, rare, difficult to substitute and difficult to imitate— should be positively related with exporting behavior since through these innovations any type of firm (for example, in terms of FFs and NFFs) will be 'a priori' in a better position to build a sustainable competitive advantage both in the domestic and international markets.

Figure 3.1 presents a graphic summary of our conceptual model and hypotheses. We state four groups of hypotheses: Hypotheses 1a and 1b shows how the expected relationship between product innovations and exporting behavior is in the case of NFFs and FFs, respectively. In a similar way, Hypotheses 2a and 2b summarize how the expected relationship between process innovations and exporting behavior is in NFFs and FFs, respectively. On the other hand, Hypotheses 3a and 3b shows the expected link between marketing innovations and exporting behavior is in NFFs and FFs, respectively. Finally, Hypotheses 4a and 4b summarizes the expected relationship between organizational innovations and exports in NFFs and FFs, respectively. In all cases, exporting behavior is evaluated in the same way: first, in terms of the decision to export and then, the decision on how much to export. Certainly, both decisions are interrelated, but we can find firms that decide export with different levels of commitment in international markets depending on their export intensity.

Figure 3.1. The conceptual model: Relationships between different types of innovation and exporting in NFFs and FFs



Source: The authors.

3.2.2. Relationships between product and process innovations and exporting behavior in family and in non-family firms

The studies by Posner (1961), Hufbauer (1966), and Vernon (1966) are pionners in relating technological innovations to international trade via exports. Posner (1961) and Hufbauer (1966) suggested that both new products and products elaborated with a superior technology would induce firms from the advanced countries to be the first exporters and, in turn, this would allow firms from such countries to preserve the acquired competitive advantage over the next years. Meanwhile, Vernon (1966) turned his attention to the internationalization pattern of new products over their life cycle. He hypothesized that exports tend to follow product innovations when domestic markets are crowded, in a process which normally begin in firms from advanced

countries ─where customers are most willing to pay a premium for innovative products─, while firms from less advanced countries are more likely to manufacture and export goods in their later stages of their life cycle. In accordance with the logic behind the product life cycle view it is, therefore, reasonable, to argue that product innovations should lead to firms to enter new international markets and increased their export intensity (Cassiman, Golovko, & Martínez-Ros, 2010).

On the other hand, Klepper (1996) has suggested that while product innovations tend to be prevalent in the the early stages of the product life cycle, process innovations are more frequent in later stages when production volumes significantly raise and, hence, this latter type of innovations can become more attractive for firms competing internationally. When a more standardizable product design is achieved, it is more likely that competition in domestic and international markets will increase and the focus will be on efficiency by introducing new process innovations rather than developing new products (Cassiman et al., 2010).

Product innovations are more likely to be related to a more dynamic market demand and more technological innovation both in FFs and NFFs (Brancati et al., 2018; Guarascio, & Pianta, 2017). The main objective of FFs and NFFs behind the introduction of this type of innovations in the market is to create new entrepreneurial opportunities and, thus, take advantage of the market power acquired through such innovations. The introduction of these innovations can help FFs and NFFs create a competitive advantage that is neither immediately achievable nor easy to imitate to potential rivals, leading to temporary quasi-rents for those firms that first has introduced it in domestic and foreign markets (Brancati et al., 2018; Dosi, 1988; Coad, 2009). Therefore, product innovations not only help the company decide whether to

export or not, but also to obtain a high market share, both in domestic and foreign markets.

On the other hand, the potential relationship between process innovations and sales growth in domestic and international markets is more likely to pass through the introduction of significant improvements in the production techniques; for example, through the use of new machines or equipment that allow production in a much more efficient way. In this regard, it is important to note that if such machines or equipment entail disruptive technologies, the use of process innovations may also provide firms (both FFs and NFFs) with certain market power which should result in obtaining temporary quasi-rents (Brancati et al., 2018; Dosi et al., 1990; Barletta et al., 2014). Moreover, the introduction of these process innovations should help a company that adopts them efficiently respond to increased demand for its products in international markets. In this way, the company that decides to compete abroad would also be better prepared to absorb potential increases in demand from foreign markets.

In addition, in line with the RBV, when a firm invests in technological resources (i.e. product and/or process innovations), it is likely that such investments will improve both its organizational knowledge and learning capabilities. These capabilities also represent important levers that may significantly contribute to the development of international competitive advantages based on differentiation (especially in the case of product innovations) or cost (especially in the case of process innovations) and, hence, can facilitate both the adoption of a favorable decision on international expansion through exports and/or the increase of export intensity/propensity in foreign markets (Eriksson et al., 2015; Filipescu et al., 2013; Filatotchev & Piesse, 2009). Thus, it is expected that FFs and NFFs introducing product and process innovations will have stronger incentives to expand their activities abroad, compared

to non-innovating firms, because they can earn higher returns from the investments made in technological resources (Bianchi, 2009; Filipescu et al., 2013). In this vein, and even after considering the potential difficulties involved in international activities, many foreign markets can be viewed as attractive places where FFs and NFFs can successfully exploit their product and process innovations and thereby increase their incomes.

A large body of research has been interested in empirically exploring the link between product and process innovations and exporting, supporting in general the assumption that both types of innovations can be important driving forces for firm's exporting behavior. However, most prior empirical studies have not distinguished between FFs and NFFs. In this vein, for example, Basile (2001) shows that, for a large sample of Italian manufacturing firms, firms introducing product and/or process innovations either through R&D or through investments in new capital are more likely to export. Nassimbeni (2001), in a study focused on small manufacturing firms of an Italian region, highlights the importance of product innovation and inter-organizational relations, while process innovation is not so relevant and distinctive. Roper and Love (2002), using data from German and UK manufacturing plants, find that product innovations have a positive and significant impact on both the decision to export and how much to export in both countries. Bernard and Jensen (2004) find that US manufacturing plants switching to primary SIC code, which could indicate new product introductions, significantly increase the probability of their entering export markets. Using data from German manufacturing firms, Lachenmaier and Wößmann (2006) find that product and process innovations are positively and significantly related to export intensity.

Cassiman and Martinez-Ros (2007), on a sample of Spanish manufacturing firms, find a strong positive effect of product innovation on the decision of a firm to export. Nguyen et al. (2008), using a sample of SMEs from Vietnam, find that both product and process innovations are important determinants of the likelihood of exporting. Becker and Egger (2009), based on a sample of Geman firms, conclude that product innovation is of dominant importance relative to process innovation in explaining the decision of a firm to start international operations via exports. Their findings also show that process innovations matter for the decision to export only if accompanied by product innovations.

Caldera (2010), in a work also focused on a large sample of Spanish manufacturing firms, shows a positive impact of firm innovation on the probability of participation in export markets. The results further reveal the heterogeneous effects of different types of innovations on firm export participation. Specifically, product innovation appears to have a larger effect on firms' export participation than process innovations. Halpern and Muraközy (2012), based on Community Innovation Survey for Hungarian firms, find that both probability of exporting and export propensity are significantly and positively related to product and process innovations. Their results suggest that innovating firms can export about 30 times more of their sales that their non-innovating peers. In a similar vein D'Angelo (2012), using a sample of Italian high-technology manufacturing firms, find that product innovations are a positive and significant determinant of export intensity.

Filipescu et al. (2013), using a sample of Spanish manufacturing firms, also find that process innovations are positively related to export breadth and depth. Lo Turco and Maggioni (2015) and Cirera, Marin and Markwald (2015) report that innovation (in terms of product and process innovations) tends to strengthen Turkish firms'

export likelihood and Brazilian firms' export diversification, respectively. They also show that process innovations can reinforce the role played by product innovations when Turkish firms decide to export to developed countries. Tavassoli (2018), on a large sample of Swedish manufacturing and service firms, find that the innovation output of firms (measured as sales due to innovative products) has a positive and significant effect on export behavior, particularly on export intensity. Using data from plants in Germany between 1998 and 2010, Dohse and Niebuhr (2018) also report that product innovation has a positive and significant effect on firm's export intensity. Analyzing the data of 123,395 surveys of firms from 13 European countries, Martínez-Román et al. (2019) also find that product innovation drives the firm's commercial expansion and favors its international activity via exports, though with a non-linear relationship and decreasing performance as the level of innovation increases.

Carboni and Medda (2020) also report that both product innovations and tangible investments are significantly and jointly linked to the export intensity of European manufacturing firms. In a similar vein, Edeh et al. (2020) or Hernández et al. (2022), on samples of firms from transition economies and a lowe-middle income country (Nigeria) respectively, also find a positive and significant linkage between product innovations and export intensity/performance. Specifically, the study by Edeh et al. (2020) highlight that when process innovations increase a 1% this causes an increase by 810% in export performance. Finally, Pastelakos et al. (2022) report that product and process innovations might significantly improve Greece's manufacturing SMEs' ability to enter a greater number of export markets (i.e. countries).

In some way, all prior studies are assuming that the relationship between product and process innovations and export behavior is independent of whether the company is family-owned or not. But, is this really so? In this study, as suggested above, it is

assumed that this should be the case. However, for the purposes of empirical evaluation, a distinction is made between family businesses, on the one hand, and non-family businesses, on the other. Thus, we pose the following hypotheses with respect to the expected relationships between product and process innovations and exporting behavior in FFs and NFFs.

Hypothesis 1a: Product innovations are positively related to exporting behavior in NFFs.

Hypothesis 1b: Product innovations are positively related to exporting behavior in FFs.

Hypothesis 2a: Process innovations are positively related to exporting behavior in NFFs.

Hypothesis 2b: Process innovations are positively related to exporting behavior in FFs.

3.2.3. Relationships between marketing and organizational innovations and exporting behavior in family and in non-family firms

As noted above, marketing innovations refers to the application of new marketing practices that normally involve relevant changes in the design, distribution, promotion and/or pricing of goods and services offered by a firm. One of the main objectives of marketing innovations is to facilitate better perception, understanding and meeting of consumers' needs, improve or repositionate a firm's good or service in the market, open new markets —both in the country of origin and other countries— and, ultimately, increase the firm's sales (Bodlaj, Kadic-Maglajlic, & Vida, 2020; Chetty & Stangl, 2010; Gunday et al., 2011; OECD, 2005; Pino et al., 2016).

On the other hand, organizational innovations involve the introduction of new business practices and procedures with the intention of using firm's resources and capabilities more effectively and efficiently and, thus, achieving better performance than rivals. In general, this type of innovations is related to significant modifications in administrative systems, organizational structure, external and internal relations, knowledge used in management processes and/or managerial skills (Birkinshaw, Hamel, & Mol, 2008; Damanpour, Walker, & Avellaneda, 2009). When a firm introduces organizational innovations generally seeks to reduce different types of costs (such as, for example, administrative, personnel and/or transaction costs), enhance the efficiency and quality of individual and teamwork and/or improve the organizational learning capability through acquisition of external knowledge (Bodlaj et al., 2020; OECD, 2005).

Theoretically, marketing and organizational innovations are also viewed as important factors for firms to achive a sustainable competitive advantage (e.g., Davcik & Sharma, 2016; Epetimehin, 2011; Gunday et al., 2011; Gupta et al., 2016; Hamel, 2006; O'Dwyer, Gilmore, & Carson, 2009; Ren, Xie, & Krabbendam, 2010). In this context, firms (FFs and NFFs) that decide to compete internationally by exporting a larger share of their production should have more incentives to undertake not only product and process innovations, but also marketing and organizational innovations (Mol & Birkinshaw, 2009). Accordingly, both types of innovations can also be fundamental factors for assessing the behavior of firms competing internationally.

Undoubtedly, marketing innovations are an important support when firms sell their products in international markets. The firm's ability to differentiate its product offerings from domestic and international competitors through marketing innovations may also generate substantial added-value. In general, marketing resources enable firms to

better identify, connect, and serve their target markets and, thus, enhancing business performance (Falahat et al., 2020; Hao & Song, 2016). In this context, marketing innovations may facilitate product awareness and access in markets, creating a strong brand image that is difficult for competitors to imitate, and might thereby positively contribute to the firm's expansion abroad. The introduction of marketing innovations might therefore help both FFs and NFFs competing internationally to obtain better outcomes and, hence, gain a competitive advantage. Nevertheless, as most FFs seem to prefer to develop durable links with others that are close geographically, and thus taking advantage of domestic networks (Banalieva & Eddleston, 2011), it seems probable that these firms may be forced to invest more in marketing activities compared to NFFs when they decide to compete abroad. Of course, this does not mean that in NFFs, marketing innovations do not also play an important role in internationalization. As noted below, there is evidence of a positive relationship between marketing innovations and international expansion via exporting.

Most firms (FFs and NFFs) usually adopt organizational innovations to face new environmental conditions (Armbruster et al., 2008; Azar & Ciabuschi, 2017) that frequently lead to substantial modifications in the firm's structure, strategy, administrative methods and/or procedures that help to enhance the firm' communication, human resource practices, collaboration and coordination actitivies within and outside the firm, learning and innovation capabilities (Azar & Ciabuschi, 2017; Damanpour & Aravind, 2011; Gunday et al., 2011; OECD, 2005). Importantly, such process innovations are frequently critical to improve product quality or reduce production costs, thereby also increasing competitiveness in foreign markets (Hitt, Hoskisson, & Ireland, 1994). Therefore, a priori, FFs and NFFs could also benefit

from process innovations when deciding to expand through exporting. Specifically, as also emphasized by the RBV, organizational resources are necessary to compete not only in domestic but also in international markets and, hence, to achieve better performance than rivals (Prange & Pinho, 2017; Prange & Verdier, 2011).

In any case, it is important to recognize that organizational innovations require an adequate orchestration and deployment of different types of resources in such a way that is expected that an optimal combination of such resources to impact significantly both the remaining activities related to innovation, performance and on firm's expansion towards foreign markets (Prange & Pinho, 2017; Sirmon, Hitt, & Ireland, 2007). Ultimately, it is expected that firms that undertake organizational innovations effectively are, a priori, in a better position to achieve a sustainable competitive advantage in the different markets in which they compete. For example, those FFs and NFFs that invest in improving human resource management practices, creating a good work environment, in collaborating with their suppliers or customers to improve certain processes, among others, are in a better predisposition to successfully compete abroad (Leonidou et al., 2007; Prange & Pinho, 2017).

In the last few years, a growing number of empirical studies have begun to explore the relationship between marketing and organizational innovations and exporting behavior without differentiating between FFs and NFFs. In this vein, for example, Imbriani, Morone and Testa (2008), using a sample of Italian manufacturing firms, find that the probability of exporting increases when firms introduce product, process, marketing and organizational innovations. For example, these authors show that organizational innovations increase some firms' likelihood (especially in the case of high-quality firms) to export by just over 4%, whereas marketing innovations can increase exporting likelihood in the same group of firms by more than 10%.

Sentürk and Erdem (2008), using a sample of Turkish firms show that those firms conducting certain types of marketing innovations tend to exhibit higher export intensity. Likewise, Salomon and Jin (2010), on a sample of Spanish manufacturing firms, find a positive and significant relationship between the investment in marketing activities and exporting behavior measured in terms of exporting status and export intensity. Oura, Zilber and Lopes (2016), using a sample of Brazilian firms, also report that marketing innovations contributes significantly and positively to improve export performance. Rodil, Vence and Vence (2016), on a sample of Spanish firms from Galicia, find that marketing innovations have a positive and significant relationship with both the probability of exporting and export intensity. Specifically, their results reveal that the change from not conducting marketing innovations to conducting this type of innovations increase the probability of becoming an exporter a range between 30.4%-34.0%. Bodlaj et al. (2020), using a sample of SMEs from Central and Eastern Europe, find a positive and significant impact of marketing innovations on export growth. Similarly, Edeh et al. (2020) report a positive and significant linkage between marketing innovations and exports. Specifically, this study reveals that when marketing innovations increase 1% an increase by 39.5% is caused in export performance.

Pino et al. (2016), using a sample of firms from three South American emerging countries, highlight that organizational innovations (measured in terms of new and/or improved organizational methods) have a positive and significant impact on market performance of exporting firms. Azar and Ciabuschi (2017), on a sample of Swedish export ventures, find that organizational innovations have both a direct and indirect effect (positive) on export behavior. Finally, Véganzonès-Varoudakis and Plane (2019), using a sample of Indian manufacturing firms, show that both product

innovations and marketing/ organizational innovations are main determinants of exports (measured through the share of total production exported).

In sum, all prior studies confirm that the existence of a positive relationship marketing and organizational innovations and export behavior independently of whether the firm is family-owned or not. But, is this also really so? In this study, as suggested for product and process innovations, it is also assumed that this should be the case. However, as also in the case of product and process innovations, for the purposes of empirical evaluation, a clear distinction is made between FFs and NFFs. Thus, we pose the following hypotheses with respect to the expected relationship between marketing and organizational innovations and exporting behavior in each type of firms.

Hypothesis 3a: Marketing innovations are positively related to exporting behavior in NFFs.

Hypothesis 3b: Marketing innovations are positively related to exporting behavior in FFs.

Hypothesis 4a: Organizational innovations are positively related to exporting behavior in NFFs.

Hypothesis 4b: Organizational innovations are positively related to exporting behavior in FFs.

3.3. METHODOLOGY

3.3.1. Data collection and sample collection

The data used in this study were collected from the Survey on Business Strategies (SBS) over the period 2007-2016. The Ministry of Industry of the Spanish Government provides an annually issue of this dataset. The quality of this survey is guaranteed by the fact that it is originated by a public agency which follows a systematics method to collect, validate and process the information. Dorling and Simpson (1999) consider that the data given by a public agency guarantees the quality of the information (high level of participation, high response rate and representation of the population). The SBS database provides complete data for an average of 1,560 companies per year and although that number varies slightly, the SBS seeks to maintain a stable representative sample over time making the inferences made from the sample remained valid for the population of manufacturing enterprises (FFs and NFFS) through time.

According to some authors (Kotlar, De Massis, & Frattini, 2014) private manufacturing firms have more innovative activities than other types due to the high degree of obsolescence their products suffer. Additionally, according to the OECD (2021) Spain was the 16th largest exporter worldwide. Therefore, we included the 5,840 manufacturing firms (2016) provided by the initial SBS database sample from 2007 to 2016. However, from this number there were 2,410 companies who never responded to the survey during this time framework, and consequently did not provide any data, resulting in 3,430 firms that provided information. Finally, there were removed 79 firms because either they: a) did not provide any data value in the

variable Family or b) were companies founded before 1900, resulting in a final panel of 3,351 representing 18,211 observations. The lowest number of observations was 1,511 in 2014 and the highest was 1,989 in 2009. To assure the representativeness of the sample, we calculate the maximum error for an infinite population. The maximum error is small (e= 0,72), for this reason we can assert that the final sample represents the population under study. The resulting database is an unbalance data panel of 18,211 observations for the period from 2007 to 2016, amounting to a total of 3,351 companies. Besides, focusing on the differences between FFs and NFFs, this sample has been split into two subsamples: one of FFs (n=6.515 firm-year observations) and the other of NFFs (n=5.038 firm-year observations).

3.3.2. Measures

As noted below, most measures used in this study are based on the existing research on the innovation-exports linkage. A detailed list of all measures of the different variables is provided in Table 3.1.

3.3.2.1. Dependent Variables

To assess the international behavior of firms considered in our study, two different variables were used 1) EXPORT propensity binary and 2) numerical PEREXPORT / percentage 0-100. In line with a large number of prior studies (e.g., Basile, 2001; Brancati et al., 2018; Caldera, 2010; Carboni & Medda, 2020; Cassiman & Martinez-Ros, 2007; D'Angelo, 2012; Dohse & Niebuhr, 2018; Halpern & Muraközy, 2012; Lo Turco & Maggioni, 2015; Nguyen et al., 2008; Salomon & Jin, 2010; Sentürk & Erdem,

2008; Tandrayen-Ragoobur, 2022), we examine a firm's exporting behavior is evaluated with a dummy variable, which is used to know whether a firm export or not (EXPORT), and with a continuous variable, which is representative of export intensity (PEREXPORT). Specifically, EXPORT is a variable adopting two values: 1, when export sales take a value greater than zero 0, and 0 otherwise (i.e. when export sales are equal to zero). PEREXPORT is measure as the volume of international sales over the total sales of the firm expressed as a percentage (see Table 1). While the first variable has to do with the decision of whether to export or not, the second refers to the decision of how much to export.

Table 3.1. Definition and measurement of variables

VARIABLE NAME	DEFINITION	TYPE/RANGE
Dependent variables:		
EXPORT	Categorical variable that indicates whether the firm exports.	Binary
PEREXPORT	Percentage of the company's exports ove total sales.	0-100
Independent variables:		
INNMARK	Categorical variable indicating that the company introduced innovation into marketing. They refer to the implementation of a new marketing method that involves significant changes in product design or packaging, product placement, product promotion, or pricing.	Binary
INNORG	A categorical variable that indicates whether the company introduced innovations in organizational methods. They refer to new management procedures in the organization of the workforce or new procedures in the management of external relations with other companies or public institutions.	Binary
INNPROCE	Categorical variable that indicates whether the company has achieved process innovations during the year.	Binary
INNPRODU	Categorical variable that indicates whether the company has achieved product innovations during the year.	Binary
Control Variables:		
AGE	Variable that reflects the age of the firms = 2020 - the year in which the company was incorporated.	Range: 6-120
FORSHARE	Percentage of direct or indirect participation of foreign capital in the share capital of the company.	Range: 0-100
FPSP	Percentage that represents the Equity of the Shareholders on the total liabilities.	Range: 0-100
GMARGIN	Measurement of the profitability of firm, defined as the percentage that the sum of sales, the variation of stocks and other current management income less purchases, external services and labor costs, represent on total sales plus the change in stocks of the same and other current management income.	0-100
INDUSTRY	Code representing the main activity of the company, based on the sum of the CNAE-09 codes of 3 figures to 20 manufacturing industries.	1-20
SIZE	Number of total employees in the firm as of December 31.	Range: 1-9270

Source: The authors

3.3.2.2. Independent variables

In consonance with a large number of prior studies, we consider four dummy variables for the variables representative of different types of innovations (e.g., Basile, 2001; Brancati et al., 2018; Caldera, 2010; Carboni & Medda, 2020; Cassiman & Martinez-Ros, 2007; D'Angelo, 2012; Dohse & Niebuhr, 2018; Edeh et al. 2020; Geldes et al., 2017; Halpern & Muraközy, 2012; Hernández et al., 2022; Nguyen et al., 2008; Lo Turco & Maggioni, 2015; Rodil et al., 2016; Salomon & Jin, 2010; Tandrayen-Ragoobur, 2022). Specifically, Product Innovations (INNPROD) is a categorical variable that indicates wether the firm has introduced new product innovations during the year. It takes a value of 1 if the firm has introduded new product innovations, and 0 otherwise. The variable Process Innovations (INNPROCE) is also a categorical variable that indicates whether the firm has implemented new process innovations during the year. It takes a value of 1if the firm has implemented new process innovations, and 0 otherwise. The variable Marketing Innovations (INNMARK) is also a binnary variable that indicates whether the firm has introduced new marketing innovations during the year. It also takes a value of 1 if the firm has implemented new marketing innovations, and 0 otherwise. Finally, the variable Organizational Innovations (INNORG) is a binnary variable that consider whether the firm has undertaken new organizational innovations during the year. It takes a value of 1 if the firm has implemented this type of innovations, and 0 otherwise (see Table 1). Importantly, all definitions of our independent variables are consistent with the definitions that appear in the Oslo Manual (OECD, 2005).

3.3.2.3. Control variables

In addition to the four main independent variables of interest, a set of covariates are also controlled for, in our empirical study. In explaining a firm's exporting bevavior (in terms of the decision to export and how much to export), the following factors can also become important. Specifically, based on prior research, we used the following covariates. First, we use firm size (SIZE), measured by the natural logarithm of the total number of employees, as previous empirical studies find a positive relationship between export and company size (e.g., Caldera, 2010; Cassiman & Golovko, 2011; Fang et al., 2018; Roper & Love, 2002; Hernández et al., 2022; Tandrayen-Ragoobur, 2022). Firm SIZE is a relevant substitute for the various resources that a company can be endowed with (Brancati et al., 2018; Dhanaraj & Beamish, 2003; Fang et al., 2018; Filipescu et al., 2013; Tandrayen-Ragoobur, 2022). Second, we control the company's AGE, as measured by the number of years the business has been in operation (e.g., Brancati et al., 2018; Hernández et al., 2022). Report a positive relationship between export and age of companies and export. Thirdly, we control the number of sectors where the company operates, the INDUSTRY (e.g., Caldera, 2010; Geldes et al., 2017; Hernández et al., 2022; Nguyen et al., 2008). We differentiate 20 industries via dummy variables. Fourth, we measure leverage defined as FPSP (Percentage representing Shareholders' Equity over Total Liabilities) by adopting a value from 0 to 100 (e.g., Brancati et al., 2018; Fang et al., 2018). The fifth variable was the Gross Operating Margin (GMARGIN) whose value ranges between 0 and 100 (e.g., Fang et al., 2018). Finally, the variable Foreign Ownership (FOROWNER) was measured as the percentage of direct or indirect participation of foreign capital in the share capital of the firm (e.g., Cassiman & Golovko, 2011; Cirera et al., 2015;

Geldes et al., 2017; Tandrayen-Ragoobur, 2022) (see Table 2.1). All explanatory variables (independent and control variables) were lagged one year to control for potential problems of endogeneity/causality.

3.3.3. Econometric analysis

The sample of study corresponds to Spanish companies controlled by families, or third parties not related to family, whose sample included 18,211 firms classified into two independent groups: FFs *vs*. NFFs, with respect to the management and / or control exercised in the administration of the firm as a criterion of the proposed taxonomy.

The study is longitudinal in the period 2007 to 2016, contemplating potential *lags* of total sales resulting from exports made by the company consistent with innovations introduced in previous years. The treatment of the temporal effect of innovation and its impact and/or relationship on/with exports (*lag*) is of utmost importance in the sample treated because it was contemplated that it assumes one year of shift between the results of innovation and the decision to export and export intensity. [3]

Then, descriptive statistics, bivariate and multivariate analysis were applied to test all our hypotheses, using Probit and Tobit analysis, according to the nature of the dependent variables: (1) probit regression to estimate the potential effect of the dependent variable on the *EXPORT* variable and (2) tobit regression, to estimate the potential impact on the *PEREXPORT* variable. The data was processed with the MS

[3] This characteristic of longitudinally, typical of the times involved in innovative processes and sales as a manifest impact of its implementation, it is what it founded the structure of analysis provided by methods Probit and Tobit applied to the study.

Excel and Stata tools (version 14), using the data from the Survey on Business Strategies (SBS) period 2007-2016, which constituted in itself the research instrument, which is duly validated with respect to the reliability and internal consistency of the data collected. Then, it was proceeded to perform the statistical analyses according to the scope of the study: descriptive, inferential (T-test for two groups and bivariate correlation) and, finally, conclusive (Probit and Tobit regressions).

In formal terms, for the Probit Model, the relationship between the dependent variable and the independent variables of the model is represented by the combination of the constant β_0, the coefficients associated with each variable *x* (β_i) and the random error (ε_i) of a standard regression equation:

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \cdots + \beta_k x_{ik} + \varepsilon_i = x_i \beta + \varepsilon_i$$

being the model of the auxiliary random variable, where:

$$Y^* = X^T \beta + \varepsilon, \varepsilon \sim N(0,1)$$

Then, the relationship between the observed dichotomous dependent variable and the value it takes can be formulated as follows:

$$y_i = 1 \ \ si \ y_i^* > 0$$

$$y_i = 0 \ \ si \ y_i^* \leq 0$$

Therefore, for a given value of a single *x*, the probability that the dichotomous variable will take a value of 1 will be:

$$\Pr(y = 1|x) = \Pr\,(y^* > 0|x)$$

demonstrating that the probability of occurrence of *and* depends not only on its relationship with the independent variables of the model, but also on the distribution of the error of the latent variable ε.

The Probit model or *probit regression* derives from assuming that ε is normally distributed (with mean 0 and variance of 1) from the general equation:

$$\Pr(Y = 1|X) = \Phi(X^T\beta) = \int_{-\infty}^{\beta_0+\beta_1 X} \frac{1}{\sqrt{2\pi}} e^{\left(-t^2/2\right)} dt$$

being:

Pr, the probability that the dichotomous independent variable *X* takes a value of 1.

And the dependent variable that characterizes a dichotomous event assuming binary values (0, 1)

β_i, the constants or parameters of the model estimated by Maximum Likelihood.

Φ, the cumulative distribution function (FDA) of the standard normal distribution, typified by the variable *T*.

Therefore, in the *Export* estimation model for the period studied (2007-2016) with our independent and control variables, it was defined as follows:

$$\begin{aligned}\Pr(Export|Innovación) = {} & \beta_0 + \beta_1 INNMARK + \beta_2 INNORG + \beta_3 INNPRODU \\ & + \beta_4 INNPROCE + \beta_5 FPSP + \beta_6 Age \\ & + \beta_7 FOROWNER + \beta_8 Size + \beta_9 GMARGIN + \beta_{10} INDUSTRY + \varepsilon_i\end{aligned}$$

where representing the probability of a company with exports greater than 0 (Y=1) given that it is a family SME (X=1).$\Pr(Export = 1|Innovación) = \Phi(Z)$

On the other hand, the Tobit model indicates that the observable variable *yi* is defined as equal to the latent variable (PEREXPORT), corresponding to a Type I model, with a and *b* set as lower and upper censorship limits respectively:

$$y_i = \begin{cases} y_i^* \ \ si\ 0 < y_i^* < 100 \\ a \ \ si\ y_i^* \ \leq 0 \\ b \ \ si\ y_i^* \ \geq 100 \end{cases}$$

where $y_i^* = \beta x_i + \mu_i$, is the latent variable with and the parameter β results from estimating a regression from the observed values $\mu_i \sim N(0, \sigma^2)_{yi}$ in *xi* by maximum likelihood to ensure its consistency. It is important to note that since it is a censored (or truncated) regression, the regression coefficient in this model cannot be interpreted linearly, but as the combination of two exchange rates in *yi*: i) the one weighted by the probability of exceeding the limit, and ii) the one weighted by the expected value (*μ*) in the probability that it exceeds the limit. Then, *and* it is censored in the range [0; 100] that includes the minimum and maximum respective to the total sales percentages being that PEREXPORT reflects the value zero (0) when the company does not export and higher than zero (0), when it exports. This plant meets the condition of non-negativity of the percentage with maximum in the unit as appropriate to obtain the intended regression.

Then, for the variable of interest, regression was defined as follows:

$$PEREXPORT_i = \beta_i Innovación + \mu_i \quad \Leftrightarrow \ PEREXPORT \ \epsilon \ [0\ ;100]$$

3.4. RESULTS

3.4.1. Descriptive analysis

Table 3.2 provides summary statistics of the variables used in the analysis. It can be seen that in our total sample (*N=18,211*), 43% of the firms correspond FFs. The frequencies show that the export level of companies is approximately 67.66%. On average, the companies in the sample export 23.08% of their sales, 19.11% of companies conduct marketing innovations, 21.72% carry out organizational innovations, 17.45% conduct product innovations and 33.95% conduct process innovations. The equity of the interested parties amounts to 47.88% on average. The average age of the company reaches 40.75 years. 14% of its capital comes from foreign investors. On average, each company has 195 employees. Gross margin is 6% on average.

Table 3.2. Descriptive statistics in total sample, family firms and non-family firms

	Total Sample		**Family firms**		**Non-family firms**	
	Fq	*Frq (%)*	*Cf*	*Frq (%)*	*Cf*	*Frq (%)*
EXPORT	12,383	67,66	5,383	69	6,975	67
INNMARK	3,460	19,11	1,716	22	1,770	17
INNORG	3,955	21,72	1,716	22	2,186	21
INNPRODU	3,178	17,45	1,404	18	1,770	17
INNPROCE	6,192	33,95	2,730	35	3,435	33
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
PERXPORT	23,08	29,3549	21,56	27,7738	24,24	30,4414
FPSP	47,88	23,9962	49,69	24,2966	46,46	23,6571
AGE	40,75	19,3270	41,16	18,6582	40,45	19,8095
FOROWNER	13,65	33,5961	4,93	20,9619	20,17	39,2945
SIZE	194,38	674,4410	124,48	351,8904	245,99	833,8636
GMARGIN	5,97	56,5873	6,84	74,1219	5,31	38,5792
N	*18,211 (100%)*		*7,801 (43%)**		*10,410 (57%)**	

Source: The authors / * The percentage represents 100% independent sample.

Table 3.2 reveals that 69% of FFs export, and on average their international sales (export intensity) represent 21.6% of their total sales. This table also show that

22% of FFs conduct marketing innovations, 22% carry out organizational innovations, 18% conduct product innovations and 35% carry out process innovations. On average, the wealth of interested parties is around 49.69% and their average age is 41.16 years. The presence of foreign investors in these firms is around 5%. On average, FFs have 125 employees, and their average gross margin reaches 6.84%.

On the other hand, as reported in Table 2, 67% of NFFs export and and their average international sales represent 24.24% of their total sales. According to this table, 17.2% of NFFs conduct marketing innovation, 21% carry out organizational innovations, 17% conduct product innovations, and 33% carry out process innovations. On average, the wealth of interested parties is 46.46% with an average age of 40.45 years. The presence of foreign investors ranges from 20.17% and, on average, these firms have 246 employees. The average gross margin is 5.31% for NFFs.

3.4.2. T-test for two independent samples

In order to test if there are significant differences between the average export percentages between FFs and NFFs, a bilateral *t-test* was carried out, first checking that the corresponding assumptions are accomplished: absence of *outliers*, normality of the distribution of the variable PEREXPORT and, homoscedasticity, that is, homogeneous variances between the independent groups. The testing of assumptions proved successful.

Then, the comparison of the null hypothesis of equality of means ($\mu F=\mu NF$) against alternative hypothesis of differences ($\mu F\neq\mu NF$), under criterion of 10% that if it were rejected at this level, it would also be at 5% and 1%, was significant ($p=0.0000$) as outlined in Table 3.3. Thus, at a level of 10%, it is claimed that the

evidence is sufficient to assume that the average percentages of total sales of family exporting firms differ from non-family exporting firms.

Table 3.3. Test *t* for difference of PEREXPORT averages between family and non-family firms

PEREXPORT	N	$\bar{x}$		σ
Family firms	7,801	21,56		0,0036
Non-family firms	2,424	24,24		0,0029
T-test (two independent groups)	*α*	*Zc*	*Z**	*P<0.10*
	0,10	*±1,645*	*-53933*	*0,000000*

Source: The authors

3.4.3. Pearson correlation analysis

Table 3.4 provides information on the bivariate correlations between all variables used in our study. In this analysis we have introduced as an additional variable FAMILY (that indicates whether a firm is a FF or NFFs). It is important to indicate that covariation is positive and statistically significant (at a confidence level of 99%), among several of the main variables of interest, such as export, family, innovation in marketing, innovation in organizational methods, innovation in products and innovation in processes. The table also reveals that multicollinearity does not appear to be a problem in our empirical study because most of the explanatory variables have correlations less than 0.2. The variance inflation factor (VIF) values were calculated and although some of the variables are significantly correlated, the VIF values does not reveal evidence of multicollinearity, all of which take values below 10 (Kleinbaum, Kupper, Muller & Nice, 1998) and even below 5 (Hair, Clark, Babin & Anderson, 2010).

Table 3.4. Pearson correlations

		1	2	3	4	5	6	7	8	9	10	11	12
1	*EXPORT*	1,0000											
2	*PEREXPORT*	0,5441***	1,0000										
3	*FAMILY*	0,0249***	-0,0449***	1,0000									
4	*INNMARK*	0,1376***	0,0282***	0,0551***	1,0000								
5	*INNORG*	0,1539***	0,1191***	0,0099	0,3992***	1,0000							
6	*INNPRODU*	0,2127***	0,1742***	0,0193***	0,3380***	0,2574***	1,0000						
7	*INNPROCE*	0,2176***	0,1864***	0,0142*	0,3135***	0,3967***	0,3468***	1,0000					
8	*FPSP*	0,0223***	0,0155*	0,0663***	-0,0021	-0,0349***	-0,0051	-0,0200**	1,0000				
9	*AGE*	0,2223***	0,1638***	0,0184**	0,0813***	0,0652***	0,0943***	0,0834***	0,1056***	1,0000			
10	*FOROWNER*	0,2554***	0,2963***	-0,2240***	0,0176**	0,0951***	0,0944***	0,1381***	-0,0244***	0,2129***	1,0000		
11	*SIZE*	0,1489***	0,1707***	-0,0891***	0,1217***	0,1510***	0,1547***	0,1607***	-0,0612***	0,1926***	0,2664***	1,0000	
12	*GMARGIN*	0,0149**	0,0130*	0,0133*	0,0097	0,0090	0,0057	0,0299***	0,1017***	0,0005	-0,0008	0,0050	1,0000

Source: The authors / Sample size= 18,211 observations; Number of firms = 3,351. *p<0.10. **p<0.05. p<0.01.

3.4.4. Regression results

Tables 3.5 and 3.6. show the results of the estimation of the probit and tobit random effects models to test all our hypotheses. In each Table, we distinguish between NFFs and FFs and we estimate six models for each type of firms. Models 1-6 in Tables 3.5. and 3.6. refer to NFFs while Models 7-12 in the same tables refer to FFs. Models 1 and 7 in each table only add control variables (these are our basic models). Models 2 and 8 add marketing innovations (INNMARK), models 3 and 9 add organizational innovations (INNORG), models 4 and 10 consider product innovations (INNPRODU), models 5 and 11 include process innovations (INNPROCE). Finally, models 6 and 12 consider all control and independent variables.

The constant (β_0), in all the models obtained by Probit was negative and significant (*p = 0.000,* in all cases), so it is considered part of the model that is selected to represent *EXPORT*, influencing inversely in each model, that is, its value decreases the probability of exporting when the independent variables do not operate in each set or control (see Table 3.5)

The remaining coefficients β_i of the probit regression were analyzed by models to describe them in the proposed taxonomic set, discarding the non-significant ones. It should be remembered that these coefficients should be interpreted as an increase of one unit in EXPORT corresponding to the β_i associated with the increase in the z-score for the probability of each Xi-Y ratio, given mainly by the innovation variables as an effect of the propensity to export attributed to the development of the internalization of a company (see Table 3.5).

Table 3.5. Random effects panel data Probit regression results on innovation and Export / No export

Probit Model	Non family firms						Family firms					
	1	2	3	4	5	6	7	8	9	10	11	12
_CONS	-2,4136***	-2,4189***	-2,4078***	-2,3446***	-2,421***	-2,3656***	-1,9936***	-2,0265***	-2,0008***	-1,9973***	-2,0197***	-2,033***
	(0,000)	*(0,000)*	*(0,000)*	(0,000)	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*
INNMARK		0,2572***				0,0712		0,2709***				0,1806***
		(0,000)				*(0.279)*		*(0,000)*				*(0.006)*
INNORG			0,2687***			0,1219**			0,1402**			-0,0245
			(0,000)			*(0.044)*			*(0.013)*			*(0.708)*
INNPRODU				0,4476***		0,3371***				0,3433***		0,2365***
				(0,000)		*(0,000)*				*(0,000)*		*(0.002)*
INNPROCE					0,3201***	0,2115***					0,206***	0,125**
					(0,000)	*(0,000)*					*(0,000)*	*(0.024)*
FPSP	-0,0001	-0,0002	-0,0002	-0,0002	-0,0003	-0,0003	0,0021**	0,0022**	0,0022**	0,0022**	0,0023**	0,0024**
	(0,0008)	*(0,0007)*	*(0,0077)*	*(0,0006)*	*(0,0005)*	*(0,00045)*	*(0,0009)*	*(0,0008)*	*(0,0007)*	*(0,0009)*	*(0,00089)*	*(0,0009)*
AGE	0,0078***	0,0075***	0,008***	0,0078***	0,008***	0,0079***	0,0059***	0,0058***	0,0061***	0,006***	0,0061***	0,006***
	(0,00154)	*(0,0015)*	*(0,0016)*	*(0,00154)*	*(0,0014)*	*(0,0014)*	*(0,0015)*	*(0,0013)*	*(0,0014)*	*(0,0013)*	*(0,0012)*	*(0,0014)*
FORSHARE	0,008***	0,0081***	0,008***	0,0081***	0,0078***	0,0079***	0,0065***	0,0065***	0,0066***	0,0063***	0,0064***	0,0063***
	(0,0089)	*(0,0079)*	*(0,0009)*	*(0,0078)*	*(0,0081)*	*(0,0009)*	*(0,0022)*	*(0,0023)*	*(0,0023)*	*(0,0023)*	*(0,0024)*	*(0,0024)*
SIZE	0,5263***	0,5161***	0,5133***	0,5024***	0,4989***	0,4818***	0,5787***	0,5703***	0,5708***	0,5601***	0,558***	0,5493***
	(0,0195)	*(0,0197)*	*(0,0197)*	*(0,0199)*	*(0,0199)*	*(0,0202)*	(0,258)	*(0,026)*	*(0,0261)*	*(0,0259)*	*(0,0264)*	*(0,0266)*
GMARGIN	0,0011	0,001	0,0011	0,0012	0,0008	0,0009	0,0024*	0,0025*	0,0024*	0,0025**	0,002	0,0023*
	(0,0011)	*(0,0011)*	*(0,001)*	*(0,001)*	*(0,001)*	*(0,001)*	*(0,0012)*	*(0,0011)*	*(0,0014)*	*(0,00133)*	*(0,0012)*	*(0,0013)*
WALD CHI2	1.353,76***	1.361,86***	1.383,13***	1.389,04***	1.404,13***	1.436,49***	952,78***	948,46***	956,73***	939,68***	960,13***	946,74***
LN(PSEUDOLIKELIHOOD)	-2.733,4499	-2.722,9224	-2.721,0803	-2.709,201	-2.709,6097	-2.691,2297	-2.225,807	-2.214,416	-2.222,7815	-2.212,5326	-2.217,4312	-2.204,6151
PSEUDO R2	0,3237	0,3263	0,3267	0,3297	0,3296	0,3341	0,2502	0,254	0,2512	0,2547	0,253	0,2573
N	6.515	6.515	6.515	6.515	6.515	6.515	5.038	5.038	5.038	5.038	5.038	5.038

Source: The authors / All the models include industry dummies and year as control variables. Standard errors in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Table 3.6. Random effects panel data Tobit regression results on innovation and PEREXPOR

Tobit Model	Non family firms						Family firms					
	1	2	3	4	5	6	7	8	9	10	11	12
_CONS	-27,8271***	-27,9349***	-27,584***	-27,1988***	-27,4287***	-26,9893***	-22,6343***	-22,5441***	-22,6838***	-22,4373***	-22,8951***	-22,4163***
	(0,000)	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*
INNMARK		-1,9918**				-4,2051***		-1,0232				-3,4779***
		(0.021)				*(0,000)*		*(0.226)*				*(0,000)*
INNORG			1,4769*			0,8653			1,729**			1,2401
			(0.064)			*(0.323)*			*(0.041)*			*(0,196)*
INNPRODU				2,5882***		2,0856**				3,4085***		3,1914***
				(0.003)		*(0.024)*				*(0,000)*		*(0.001)*
INNPROCE					4,2389***	4,4329***					3,5857***	3,2618***
					(0,000)	*(0,000)*					*(0,000)*	*(0,000)*
FPSP	0,0125	0,0129	0,0123	0,0116	0,0113	0,0112	0,017	0,0167	0,0182	0,0177	0,0199	0,0203
	(0,367)	*(0,352)*	*(0.374)*	*(0.401)*	*(0.412)*	*(0.415)*	*(0.259)*	*(0.259)*	*(0.219)*	*(0.23)*	*(0.179)*	*(0.168)*
AGE	-0,0289	-0,0273	-0,0291	-0,0281	-0,027	-0,0229	0.0977***	0,0977***	0,0984***	0,0962***	0,0979***	0,0982***
	(0.105)	*(0.125)*	*(0.0103)*	*(0.0115)*	*(0.129)*	*(0,196)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*
FORSHARE	0,0963***	0,0951***	0,0965***	0,0976***	0,095***	0,0936***	0.0812***	0,0812***	0,0822***	0,0822***	0,0824***	0,0812***
	(0,0094)	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*
SIZE	7,565***	7,6808***	7,4646***	7,3652***	7,1361***	7,1413***	6,3745***	6,4351***	6,2466***	6,101***	5,9669***	5,8618***
	(0,000)	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*
GMARGIN	0,0021	0,0021	0,0019	0,0036	-0,0025	-0,0016	0,098***	0,0976***	0,0977***	0,0988***	0,0919***	0,0917***
	(0.913)	*(0.913)*	*(0.919)*	*(0.849)*	*(0.895)*	*(0.934)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*	*(0,000)*
WALD CHI2	2.701,8***	2.707,13***	2.705,23***	2.710,47***	2.736,93***	2.758,92***	1.547,47***	1.548,94***	1.551,66***	1.561,18***	1.569,22***	1.588,18***
P > ^{Chi2} (CI=95%)	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
LN(PLIKELIH.)	-30129	-30127	-30128	-30125	-30112	-30101	-23143	-23142	-23141	-23136	-23132	-23123
PSEUDO R2	0,429	0,43	0,43	0,43	0,435	0,438	0,324	0,324	0,324	0,326	0,328	0,332
Sigma	25,463	25,454	25,456	25,445	25,936	25,353	24,259	24,255	24,249	24,225	24,206	24160
N	6.510	6.510	6.510	6.510	6.510	6.510	5.032	5.032	5.032	5.032	5.032	5.032

Source: The authors / All the models include industry dummies and year as control variables, Standard errors in parentheses; *p<0.1, **p<0.05, ***p<0.01.

3.4.2.1. Probit regression

NFFs, as can be seen in Models 1-6 of Table 3.5, show that in the six models, the control variables were significant at 1%, except for FPSP and GMARGIN that are non-significant. The coefficient of determination analogous to R2 to evaluate goodness of fit (*PSEUDO R2*) indicates that the data of the control variables explain 32.37% to 33.41% these models.

The Models that progressively add the independent variables of interest (Models 2 to 5 of Table 3.5.), were significant for the proposed *p* values ($p < 0.01$ in all models), so each coefficient β_i contributes positively and significantly to the probablity to export when NFFs introduces innovations in marketing, organizational methods, processes and /or products. Finally, in Model 6 the variables representative of product and process innovations (INNPRODU and INNPROCE) maintain the signs and significance levels. On the other hand, the coefficient of INNORG is also positive and significant, such as in Model 3 while the coefficient of INNMARK is positive but non-significant. This means that organizational, product and process innovation are positively and significantly related with the decision (i.e. probability to export).

It can be that somewhat different findings are obtained when the dependent variable of interest is how much to export. In this specific case, our results reveal that there is a positive and significant relationship between product and process innovations (INNPRODU and INNPROCE) and the level of exports abroad. On the other hand, the coefficient of the variable representative of marketing innovations (INNMARK) is now negative and significant, while the coefficient of organizational innovations (INNORG) is positive and significant in Model 3 but is not significant in

Model 6 (see Table 3.6.) This means that only product and process innovations are positively and significantly related to intensity export.

In sum, according to these results, we can confirm that our study provides strong support for Hypotheses 1a and 2a while Hypotheses 3a and 4a are rejected although in the case of organizational innovation (INNORG) our results are contradictory. In other terms, our results highlight that only technological innovations have a positive and significant relationship with exporting behavior (in terms of the decision to export and how much to export).

3.4.2.2. Tobit regression

Model 7 is the basic model as it includes only the control variables. In this model, exports are explained by 25% (*R2=0.25*). It is interesting to note that the evidence for this model of the family business presents less explanatory potential than the non-family business (Model 1) in terms of internationalization if the control variables are considered.

The Models that progressively add the independent variables of interest (8 to 18), were significant at 1%, with associated p values similar to those described in non-family models, except for the variable INNORG by a very small margin (*p = 0.013*) being significant at 5%.

Model 12, according to the results obtained, in addition to the control variables, should include the variable INNMARK and INNPRODU at 99% confidence, when it comes to exports from family businesses, along with the variable INNPROCE if it is estimated at 95% confidence. The important thing is to discard INNORG because it was not significant for any of the levels analyzed: it far exceeds the p values associated with the proposed regression (*p=0.708*). It is interesting to note how

organizational innovation (INNORG) is not significantly related to the probablity to export of the FFS, while in the NFFs it does contribute to its propensity.

Then, the regression coefficients for all independent variables and control variables sustain a direct relationship in the six models ($\beta_i > 0$), mainly providing incremental exchange values for each INN unit added to the *EXPORT* variable. On the other hand, the coefficients of the control variables contribute little, so it can be said that the key to export growth depends more on the innovations introduced.

These results indicate that in a FF innovation has a positive and significant relationship on the propensity to export when changes or improvements are introduced in: marketing, processes and products (see Models 8-12 of Table 3.5.).

On the other hand, as occurred in the case of NFFs, there are some differences in the results obtained for NFFs when the potential relationship between each types of innovations and export intensity are being assessed (see Models 7 to 12 of Table 3.6.). Specifically, our findings reveal that there is a positive and significant relationship between product and process innovations (INNPRODU and INNPROC) and the variable representative of export intensity. The coefficient of the variable representative of marketing innovations (INNMARK) is negative and significant, while the coefficient of organizational innovations (INNORG) is positive but not significant.

In sum, according to these results, we can corroborate that our study also provides strong support for Hypoteses 1b and 2b while Hypotheses 3b and 4b are rejected. In other terms, our results also highlight that only technological innovations have a positive and significant relationship with exporting behavior (in terms of the decision to export and how much to export) in FFs. Table 3.7. summarizes the main findings of our empirical study.

Table 3.7. Main findings of the empirical study

Types of innovations	Hypotheses	Findings
Technological innovations		
Product innovations:	Hypothesis 1a: Product innovations are positively related to exporting behavior in NFFs.	**Accepted**
	Hypothesis 1b: Product innovations are positively related to exporting behavior in FFs.	**Accepted**
Process innovations:	Hypothesis 2a: Process innovations are positively related to exporting behavior in NFFs.	**Accepted**
	Hypothesis 2b: Process innovations are positively related to exporting behavior in FFs.	**Accepted**
Non-technological innovations		
Marketing innovations:	Hypothesis 3a: Marketing innovations are positively related to exporting behavior in NFFs.	**Rejected**
	Hypothesis 3b: Marketing innovations are positively related to exporting behavior in FFs.	**Rejected**
Organizational innovations:	Hypothesis 4a: Organizational innovations are positively related to exporting behavior in NFFs.	**Contradictory**
	Hypothesis 4b: Organizational innovations are positively related to exporting behavior in FFs.	**Contradictory**

Source: The authors.

3.5 DISCUSSION AND CONCLUSIONS

This study is one of the first attempts to explore separately the effect of the four different types of innovation on internationalization of family firms. Therefore, our findings provide original evidence by assessing whether each type of innovation could promote and lead a company to become international. In general, the results show that FFs and NFFs are much more similar than expected.

As it can be observed, Table 7 summarizes our hypotheses and based on results showed in Model 8 we can assert that effectively for FFs there is a positive relationship between marketing innovation and internationalization of family firm, that corroborates H1a. It also showed a positive relationship between organizational innovation and internationalization of family firms, corroborating H1b. Additionally, the results validate H1c as they showed a positive relationship between o product innovation and internationalization of family firms. Finally, H1d is also validated as there was a positive relationship between process innovation and internationalization of family firms, corroborating H1b.

The results in general model (Table 3.6, model 6 and 12) showed the same behavior for Family Firms than in the Tobit regression meaning that also highlight the same behavior regarding Organizational Innovation. This type of innovation was not meaningful in the full model when combined with the other three types of innovation, but it was meaningful when it is applied by itself. However, when analyzing the results for NFFs this behavior changes.

For both typologies, FFs and NFFs, organizational innovation is the least meaningful, compared with the others. What it is even more interesting in FFs which is almost irrelevant, both when it is applied by itself or with the rest of the innovations.

Model 8 showed that effectively for FFs there is a negative relationship between marketing innovation and internationalization of family firm, meaning that H1a is not corroborated. However, it showed a positive relationship between organizational innovation and internationalization of family firms, corroborating H1b. Additionally, the results validate H1c as they showed a positive relationship between o product innovation and internationalization of family firms. Finally, H1d is also validated as

there was a positive relationship between process innovation and internationalization of family firms, corroborating H1b.

In the general model (Models 6 and 12 of Table 3.5) it is observable that Organizational Innovation was not significant, therefore it is more useful for the internationalization of FFs when the innovation in organization goes by itself than a part of a global innovation strategy that combines the four different types of innovation. Our results differ from some previous works (Pino et al., 2016; Azar and Ciabuschi 2017; Véganzonès-Varoudakis and Plane, 2019) that sustained that organizational innovations have both a direct and indirect effect (positive) on export behavior.

On the other hand, innovation in product and marketing are more indispensable in the whole, as they boost the propensity to export as suggested in the literatue by different authors, product innovation (Cassiman, Golovko, & Martínez-Ros, 2010; Caldera, 2010) and marketing innovation (Sentürk and Erdem, 2008; Salomon and Jin 2010). And with a lower level of influence process innovation, that is in the line of Klepper (1996) who stated that process innovations are more frequent in later stages when production volumes significantly raise and, hence, can become more attractive for firms competing internationally, or Cassiman et a. (2010) who stated that new process innovations are more efficient for a company to get international in later stage than developing new products instead.

Our results go in line with some previous works (Vernon, 1966; Cassiman, Golovko, & Martínez-Ros, 2010) who studied innovation withing the life cycle process, therefore, in that sense, it can be inferred that there is a natural process in the way FFs introduce the different types of innovation, coming first product and marketing innovation, then process and finally organizational innovation. It can be a

contribution to the field as it might describe a kind of staging FFs follow in the way the make investments in innovation.

3.6 LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

This work presents some limitations. Firstly, for this research it has been used a data base containing only data from Spanish manufacturing firms. Thus, in future projects it might be recommendable the use of databases from other countries, and perhaps, including other types of industries, even it is suggested to analyse service companies, to compare whether the behaviour observed in this research si comparable to other samples´. Additionally, there is a limitation in terms of the study span, as it was used information from 2007 to 2016, therefore, in future research it could be interesting to analyze a longer period.

3.7 References

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4. INNOVATION AND INTERNATIONALIZATION DURING TIMES OF ECONOMIC GROWTH, CRISIS, AND RECOVERY PRIOR TO COVID-19: A CONFIGURATIONAL APPROACH COMPARING SPANISH MANUFACTURING FAMILY AND NON-FAMILY FIRMS

4.1. INTRODUCTION[4]

The last 25 years have witnessed the emergence of a growing body of research examining whether the internationalization decisions of family firms (FFs) differ from those of non-family firms (NFFs), the ways in which the family nature of such firms (family involvement) influence their international expansion, and the key factors that affect this expansion (see Alayo et al., 2021; De Massis et al., 2018, and Pukall & Calabrò, 2014 for reviews on this topic). It is broadly accepted that FFs may significantly differ from NFFs, as the former have inherent attributes that may both inhibit their international expansion (e.g., fear of losing control) and promote it (e.g., greater stewardship or long-term orientation) (Arregle et al., 2017; Kraus et al., 2016; Xi et al., 2015).

Importantly, the literature underscores the role of knowledge-based resources — such as, for ex ample, innovation— as one of the most important resources for the successful international expansion of both FFs and NFFs (e.g., Azar & Ciabuschi, 2017; Cassiman & Golovko, 2011; Fang et al., 2018; Lin & Wang, 2021; Wu, Wei, & Wang, 2021; Zahra, 2020). Specifically, innovation, which is defined as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practice" (OECD, 2005, p. 47), is viewed as a critical resource that helps to improve firms' performance and competitive advantages (e.g., Bettis & Hitt, 1995; Lengnick-

[4] This chapter has been accepted to be published at the *Journal of Family Business Strategy*, that is currently in production process.

Hall, 1992). It is also a critical resource for overcoming internationalization challenges, especially for small and medium-sized enterprises (SMEs), which tend to have a somewhat narrow range of potential advantages, such as brand-name recognition (Tomiura, 2007), networking, or social capital (Lin & Wang, 2021; Yu et al., 2014). In general, more innovative firms in terms of product, processes, marketing or organizational methods are more likely to have specific advantages compared to their less innovative peers, which suggests that they should be more capable of expanding into foreign markets.

Scholars have been interested in exploring whether FFs are more/less innovative than NFFs, and how such behavior influences expansion into foreign markets. Nonetheless, recent family business research has focused primarily on the role played by the family in R&D investments in internationalization, although their findings are inconclusive (e.g., Corsi, Feranita, & De Massis, 2021; Fang et al., 2018; Fang et al., 2021; Lin & Wang, 2021; Zahra, 2020). While a firm's R&D investment is usually considered an important part of its innovation activity, it is not the only source. R&D is only one of the inputs in the process of generating potential new innovations, and it does not necessarily lead to successful innovations. A focus on R&D investment is a good indicator of best practices within a firm, but it does not provide an accurate measure of how innovative that firm really is. In fact, some of the most innovative FFs and NFFS competing globally do not spend a lot on R&D in proportion to their revenues. Given the potential limitations of R&D investment as a measure of a firm's innovative activity, we focus on the following indicators: a) product; b) process; c) marketing; and d) organization. Thus, unlike most prior research, this study provides direct information on the specific type of innovation

carried out by firms (i.e., innovation output), providing a sharper image of the true link between innovation and internationalization when comparing FFs and NFFs.

It is important to note, however, that prior studies in this field of research, have focused mainly on stable economic settings or favourable market conditions. There are practically no studies on periods of recession and/or recovery. This study seeks to fill the lacuna in the literature by gauging the possible differences in innovative behavior between international FFs and NFFs when environmental conditions change drastically (i.e., from a situation of economic growth to another of downturn and then recovery). Accordingly, this study aims to identify the optimal paths or configurations of innovation activities that FFs and NFFs adopt to internationalise via exporting and examines whether FFs and NFFs act differently over a long time period that includes macroeconomic stages of economic growth, recession, and recovery. Based primarily on the Resource-Based View (RBV) and prior evidence, our main premise here is that different paths of innovation activities may drive internationalization via exporting, and that such paths may substantially differ between FFs and NFFs, and even within each group of firms (i.e., in times of economic growth, recession, and recovery). Exploring this issue is important because the effect of exogenous shocks (e.g., dramatic changes in macro-environmental conditions) may force FFs to adjust in a way that amplifies the potential benefits of family involvement/control in order to better cope with each situation. The business family's long-term orientation and owners/managers' ambition to extend the entrepreneurial dream through future generations (common features among most FFs) can therefore be expected to encourage investments in corporate activities such as innovation in a way that is different to NFFs.

This study contributes to the literature on FF internationalization, on the one hand, by examining the role played by different equifinal combinations of firms' innovation activities as causal factors. Indeed, by examining different innovation paths, this research also adds to the lively debate on FF heterogeneity (Kraus et al., 2016; Pukall & Calabrò, 2014; Rondi, De Massis, & Kotlar, 2019) and by showing that there is more than one way for FFs (as with NFFs) to internationalise, and hence also by delineating several categories of international FFs. On the other hand, it also assesses the existence of potentially significant differences between FFs and NFFs in terms of combinations of innovation activities that prompt both types of firms to internationalise via exporting. Until only recently, traditional research on the potential innovation-internationalization linkage largely ignored these differences between FFs and NFFs because most prior studies had focused primarily on R&D investment. As a result, our understanding is still somewhat limited in terms of whether and how internationalization via exporting —its dominant strategy (e.g., Cerrato & Piva, 2012; Lu & Beamish, 2001; Onkelinx, Manolova, & Edelman, 2016; Salomon & Jin, 2010)— may be driven by an FF's effort to leverage its innovation-linked resources. This study therefore helps to explain how different innovation activities can effectively drive internationalization decisions over time. This has also become increasingly relevant in the management literature as a key priority in the agenda of both policymakers and practitioners alike.

This study also enriches our understanding of the potential effects that certain external factors or shocks may have on firm behavior. Specifically, we further attempt to explain how international firms react and adapt to each macroeconomic phase through different innovation activities or strategies. To the best of our knowledge, our study is among the first to gauge the potential impact that economic

growth, crises, and recovery conditions may have on the innovative behavior of FFs and NFFs that compete abroad. While research on FF innovation has opened up an exciting new area of inquiry, scholars have also decried the literature's limited understanding of innovation's role in the firm's evolution over time (e.g., Leppäaho & Ritala, 2021), and especially when it is considered an important enabler of its internationalization. In order to improve this understanding, we use a large sample of Spanish manufacturing firms over 10 years: from 2007 to 2016. This period coincided with the global economic/financial crisis of 2007-2008. In Spain, this crisis lasted from 2009 to 2013, and was especially virulent in terms of economic recession, bankruptcies, and massive unemployment. We will distinguish three subperiods: growth (2007-2008), crisis (2009-2013), and recovery (2014-2016).

The relatively extreme economic context in the period of crisis in relation to the periods of growth and recovery provides us with an excellent research scenario for our dynamic analysis. In this vein, our study casts some doubts on the traditional assumption of time stability in the causal conditions of firm internationalization that is in some way present in most past research, which has focused mainly on one specific period. This will provide a more realistic view of how different combinations of innovation activities may actually affect internationalization decisions both during crises and at other times. This examination may be of particular interest for better understanding how FFs adapt to new and challenging environmental conditions, and whether there are differences in their response to such conditions compared to NFFs. This study sheds some light on how international FFs and NFFs respond to a situation of crisis and recovery in terms of innovative behavior, so it might also be helpful to verify the extent to which similar response patterns are observed during the crisis caused by the current COVID-19 pandemic.

A final contribution is the application of Qualitative Comparative Analysis (QCA) (Marx, 2010; Ragin, 1987, 2000) to provide a better understanding of potential configurations of innovation activities conducted by FFs and NFFs that compete internationally. This method is becoming increasingly popular in innovation, internationalization, and family business research (e.g., Fainshmidt et al., 2020; Huarng & Roig-Tierno, 2016; Kosmidou & Ahuja, 2019; Kraus et al., 2016; Kraus, Ribeiro-Soriano, & Schüssler, 2018). QCA is particularly suitable for identifying multiple configurations/combinations of causal conditions that are sufficient for a given outcome. Based primarily on an application of crisp-set QCA (csQCA), this study seeks to identify the specific configurations of innovation activities that support internationalization in FFs and NFFs over the timeline considered. This is a complex topic to analyse using exclusively regression techniques, which means this study has a markedly exploratory nature.

4.2. THEORETICAL BACKGROUND

4.2.1. Innovation as a driver of internationalization in family vs. non-family firms in times of economic growth

Building on the RBV, numerous scholars argue that entry into international markets depends on firm-specific resources (e.g., Gaur, Kumar, & Singh 2014; Lindsay, Rod, & Ashill, 2017; Peng, 2001; Sharma & Erramilli, 2004). Innovation is typically considered to be one of the most important resources needed for successful internationalization. In the ever-changing environment that typically defines international markets, firms are forced to continuously develop and update

their bundles of resources and capabilities, whereby innovation becomes a strategic priority (Wu et al., 2021).

It is generally recognised that different types of innovation may involve major benefits for those firms competing internationally, such as the development of differentiated products, cost reductions, and adjustments in organizational structures to respond to increasing environmental uncertainty, thereby achieving competitive advantages and market power, and expediting entry and/or expansion into foreign markets (e.g., Azar & Ciabuschi, 2017; Caldera, 2010; Cassiman & Martínez-Ross 2007; Filipescu et al., 2013; Golovko & Valentini, 2011; Love & Roper, 2015; Tavassoli, 2018; Yi, Wang, & Kafouros, 2013). Furthermore, innovative firms may have stronger incentives than non-innovative ones to explore new markets abroad (Hitt, Hoskisson, & Kim, 1993; Pla-Barber & Alegre, 2007).

Innovations are costly and risky activities, as their outcomes are often not guaranteed. However, once innovations materialise in a new, modified, or better-quality product, a new process, or the implementation of a new organizational or commercialisation method, their use in more than one market incurs little or no marginal cost. Therefore, innovative firms may be more motivated to spread the fixed costs associated with different innovation activities over higher sales in foreign markets. In this regard, firms operating exclusively in domestic markets are more likely to find it difficult to recoup initial investments made in innovation. As a result of the introduction of different types of innovations, the subsequent deployment of stronger capabilities and more valuable knowledge can help firms to manage different export-related costs —such as, for example, the costs of developing more suitable products for other markets, establishing new distribution channels, or

involving transportation/logistics, and deal with information from foreign customers (Golovko & Valentini, 2011; Wu et al., 2021).

A vast body of empirical research has been interested in examining the extent to which different types of innovation activities can be considered a key driver of a firm's internationalization decision via exporting in recent years. The state-of-the-art is divided (for a review, see Wu et al., 2021). Importantly, few of these past studies have explicitly distinguished between FFs and NFFs, and most of them have focused on times of economic growth. Although in the last decade family scholars have started to examine the potential impact of innovation on internationalization in FFs, most research has primarily considered the potential causal effect of R&D investment, thus overlooking the effect of other more appropriate innovation indicators. Overall, many prior studies report R&D investment`s positive direct or indirect (i.e., moderating) effect on the degree of internationalization in FFs compared to NFFs (e.g., Fang et al., 2018; Fang et al., 2021; Lin & Wang, 2021; Ossorio, 2018; Piva, Rossi-Lamastra, & De Massis, 2013; Singh & Gaur, 2013). This circumstance therefore suggests that we in fact know little about how well FFs fare compared to NFFs in terms of their different innovation activities. Nonetheless, the evidence also shows that many of the world's most internationalised and innovative firms are FFs. In this regard, some researchers argue that internationalised FFs—owing to greater wealth concentration, a family's high level of control over the company, and greater relevance of nonfinancial and long-term goals—may achieve a higher innovation output than NFFs, as they tend to convert innovation input into output at a higher rate (e.g., Duran et al., 2016).

A distinctive characteristic of FFs is their owner/managers' greater engagement in strategic decisions, such as those related to innovation and international

expansion (Fang et al., 2021; Harvey, 1999; Zahra, 2003). If FFs and NFFs are assumed to have distinctive attributes, then it is especially important to gauge whether the impact of different innovation activities on internationalization is similar or not in both types of firms. A priori, some differences are expected between FFs and NFFs in the way in which they create and deploy different innovation activities to achieve successful internationalization during times of economic growth.

FFs possess unique bundles of resources and capabilities that benefit the translation of new ideas into different types of innovations. Several exemplary resources and capabilities of FFs that foster learning, and hence the emergence of different innovation activities, are their greater stewardship approach to internal and external stakeholders (Kellermanns & Eddleston, 2006), their informal sharing of knowledge (Zahra, 2012), patient financial and survival capital (Sirmon & Hitt, 2003), and their greater adherence to long-term goals (Zellweger, 2007). We suggest that the distinctness of these resource and capability endowments may exert noticeably different influences on opportunity discovery and the exploitation of innovation activities in FFs compared to NFFs.

Extant research highlights that FFs and NFFs need to introduce some type of innovation in their products if they want to gain competitive advantages abroad. The ability to develop and create new and exclusive products determines a firm's competitiveness, especially when deciding to internationalise (Falahat et al., 2020). There is a large body of empirical research reporting that the introduction of product innovations has a positive effect on a firm’s international expansion via exporting (e.g., Basile, 2001; Nassimbeni, 2001; Becker & Egger, 2013; Bernard & Jensen, 2004; Caldera, 2010; Carboni & Medda, 2020; Cassiman & Golovko, 2011; Cassiman & Martinez-Ros, 2007; Martínez-Román et el., 2019; Tavassoli, 2018).

With respect to process innovations, the extant evidence is largely contradictory; while some studies reveal its positive influence on exporting (e.g., Basile, 2001; Edeh, Obodoechi, & Ramos-Hidalgo, 2020), others report a negative or non-significant effect (e.g., Cassiman & Martinez-Ros, 2007; Nassimbeni, 2001). Interestingly, most of these studies do not distinguish between FFs and NFFs. However, it seems clear that process innovations often help to improve product quality or reduce production costs, thereby also increasing competitiveness in foreign markets (Hitt, Hoskisson, & Ireland, 1994). Therefore, a priori, both FFs and NFFs could also benefit from process innovations when deciding to expand through exporting. Nonetheless, Classen et al. (2014) have used a sample of German SMEs to report that family SMEs tend to outperform their non-family counterparts in terms of process innovation outcomes. In a similar vein, and also using a sample of German firms of all sizes, Broekaert, Andries, and Debackere (2016) report that FFs engage less in R&D, but tend to be more flexible in the way they are organised, which enables them to successfully develop not only new products but also outperform NFFs in process innovation.

We also argue that organizational innovations may have a different level of importance in FFs and NFFs. FFs may benefit from certain aspects of their organizational culture and climate that permeate their attitude and behavior toward innovation, as they tend to have fewer issues with principal-agent problems, greater commitment, and warm, amicable, and close relationships with all their employees, as well as less reliance on formal controls and coordination (e.g., De Massis et al., 2015; Kraus, Pohjola, & Koponen 2012; Sirmon & Hitt, 2003). Most of these aspects may make FFs more efficient regarding the effects of organizational innovations on international expansion and, ultimately, on corporate success. Kraus et al. (2012)

show that the positive relationship between organizational innovation and corporate success is higher in FFs than in NFFs.

The firm's ability to differentiate its product offerings from domestic and international competitors through marketing resources may also generate substantial value. In general, marketing resources enable firms to better identify, connect, and serve their target markets, enhancing business performance (Falahat et al., 2020; Hao & Song, 2016). In this context, marketing innovations may facilitate product awareness and access in markets, creating a strong brand image that is difficult for competitors to imitate, and might thereby positively contribute to the firm's expansion abroad. The introduction of marketing innovations might therefore help both FFs and NFFs competing internationally to obtain better outcomes, and hence gain a competitive advantage. There is evidence of a positive relationship between marketing innovations and international expansion via exporting (e.g., Esteve-Pérez & Rodríguez, 2013; Medrano-Saiz & Olarte-Pascual, 2016; Rodil, Vence, & Sánchez, 2016; Şentürk & Erdem, 2008). Nevertheless, as most FFs seem to prefer to develop durable links with others that are close geographically, and thus taking advantage of domestic networks (Banalieva & Eddleston, 2011), it seems probable that these firms may be forced to invest more in marketing compared to NFFs when they decide to compete abroad.

A firm's innovative ability depends on the number not only of a certain kind of innovations but also of the different types it can simultaneously implement (Rodil et al., 2016). Innovation is a multifaceted activity, as it often requires "the combination of diverse and/or complementary activities (internal/external R&D, machinery acquisition or training, among others) that involves a variety of innovations, such as product, process, organizational and/or marketing innovations" (OECD, 2005; Rodil

et al., 2016, p. 250). Firms are therefore likely to rely on more than one type of innovation when they decide to internationalise. For example, marketing innovations allow firms to create and manage durable relationships with different agents (channel members and customers) in foreign markets (Day, 1994) and successfully introduce new products into such markets. Song et al. (2005) suggest that marketing innovations may play a key role for the firm to profit from innovations introduced in its products. In a similar vein, Medrano-Saiz and Olarte-Pascual (2016), Rodil et al. (2016), Edeh et al. (2020), Donbessur et al. (2020), and Rossi et al. (2021) find that complementarities between two or more types of innovation help firms to internationalise.

We also argue that FFs (like NFFs) are also heterogeneous (e.g., Alrubaishi, Alarifi, & McAdam, 2020; Neubaum, Kammerlander, & Brigham, 2019; Pukall & Calabrò, 2014; Rau, Schneider-Siebke, & Günther, 2019), and so they too may follow different innovation patterns when deciding to branch out abroad under conditions of economic growth. For example, Frank et al. (2019), when examining several cases of successful long-term internationalised FFs, find that these firms not only follow different patterns of innovation but also commonly implement different types simultaneously. This heterogeneity in FFs (and also in NFFs) is precisely in consonance with the main assumptions of the RBV (Barney, 1991, 1996).

4.2.2. The effects of innovation in international family and non-family firms in times of crisis and recovery

Some researchers argue that FFs operating in more uncertain, hostile or dynamic environments tend to be more innovative than those in stable, less dynamic and less competitive ones (e.g., Blake & Saleh, 1995; Casillas, Moreno, & Barbero,

2011). There are also several studies investigating how FFs manage to overcome crisis situations (e.g., Cater & Beal, 2014; Cater & Schwab, 2008; Herbane, 2013; Kraus et al., 2013; Kraus et al., 2020; Faghfouri et al., 2015), and reporting certain differences in innovative behavior by FFs compared to NFFs during a period of recession (e.g., Campello et al., 2011; Duchin, Ozbas, & Sensoy, 2010; Ivashina & Scharfstein, 2010; Llach et al., 2012). However, as noted above, hardly any of the family business literature on the relationship between innovation and internationalization has examined the potentially contingent effect of changing environmental conditions in terms of prolonged periods of downturn and recovery. The global economic and financial crisis of 2007-2008 constituted a severe global macroeconomic shock that has provided an excellent opportunity to consider how a long period of downturn and the subsequent recovery may significantly affect firms' behavior or strategic decisions. This crisis affected both FFs and NFFs, not only by posing major challenges but also by providing significant opportunities.

Drastic changes in environmental conditions in terms of a severe downturn clearly have a major impact on consumers' demands and purchasing behaviors, whereby firms need to rely much more on internationalization and innovation strategies to ensure their survival. Times of crisis also coincide with a sharp deterioration in financial markets, with these macroeconomic changes having an immediate impact on firms' behavior and performance. An economic and financial crisis such as the one in 2008-2009 involved unexpected challenges that required swift and determined strategic decision-making. Here, in line with Kraus et al., (2020), among others, we suggest that FFs might be especially good at reacting rapidly, decisively, and innovatively.

Although an external shock such an economic crisis may have many negative consequences on firm performance, it can also help to foster entrepreneurial activities and identify new markets because managers can think openly about new strategies or ways of doing things (Kraus et al., 2020). In such a context, FFs tend to sacrifice short-term performance and shareholder value for long-term survival (Lins, Volpin, & Wagner 2013; Minichilli, Brogi, & Calabrò, 2016), and may thus also be more willing to use a wider variety of strategies compared to their non-family counterparts. Nonetheless, how does a period of severe economic crisis and the subsequent recovery affect the innovation/internationalization relationship in FFs compared to NFFs?

According to the RBV, FFs are better at coping with periods of economic crisis and recovery due to their superior mix of resources. In this regard, FFs have social, human, patient and/or survivability capital as a safety net when adverse conditions arise (Baù et al., 2020; Cunningham et al., 2016; Sirmon & Hitt, 2003). This is accompanied by other affect-based resources, such as socioemotional wealth (SEW). Furthermore, the family frequently holds the key steering power in the FF governance structure and management, meaning there is greater strategic flexibility, less formalised decision-making processes, and faster proactivity when external conditions so require (Kets de Vries, 1993; Carney, 2005; Le Breton-Miller et al., 2015; Sirmon & Hitt, 2003).

FFs readiness to adopt risky and costly strategies in times not only of economic growth but also of crisis and recovery is usually justified because they tend to be longer-lasting and more care-oriented for both their internal and external stakeholders (Carney, 2005; Cruz, Justo, & De Castro, 2012; Miller & Le Breton-Miller, 2005). In this regard, social capital may decisively contribute to facilitate any

type of innovation, not only in a period of economic growth or stability, but also during times of crisis and recovery because it motivates communication, cooperation, and coordination among different members of the firm (Adler & Kwon, 2002; Sirmon & Hitt, 2003). Specifically, trusting relationships with customers and employees may enhance the benefits of family involvement during periods of crisis and recovery, as well as help to reintroduce entrepreneurial behaviors such as innovative and international activities that again bring positive results (Chirico et al., 2011; Christensen-Salem et al., 2021; Rogoff & Heck, 2003; Salvato et al., 2020). Greater proximity to the market and customer care enable FFs' owners/managers to pre-empt the potential problems caused by a crisis. Moreover, closer personal relationships between employees and owners/managers help to update everyone about potential problems and non-compliances, and therefore adopt those innovative activities needed to successfully cope with a period of economic crisis (Kraus et al., 2013) and recovery. Compared to NFFs, FFs' employees are also more likely to promote deeper levels of firm-specific tacit knowledge (Sirmon & Hitt, 2003) that can be used to generate the necessary innovative activities to deal with the adverse conditions generated by external shocks. These employees may be more willing to actively participate in restructurings or organizational innovations (Kraus et al., 2013). Furthermore, employee and customer feedback in these firms is also essential for a continuous improvement in production processes, new products, and/or the marketing innovations that are often needed to successfully address the subsequent recovery period.

FFs also own patient financial capital and may thus be better prepared to withstand short-term losses for the sake of upholding the family legacy for future generations (Miller & Le Breton-Miller, 2005; Sirmon & Hitt, 2003). This typical long-

term view thus informs the behavior adopted by most FFs (Frank et al., 2019; Lumpkin & Brigham, 2011). During an economic crisis, family members may also reasonably take advantage of their unique propensity to 'prop up' their financially troubled firms with temporary financial support (Villalonga & Amit, 2010), whereby they may continue to invest in different types of innovations and maintain employment levels despite substantial drops in market demand (Minichilli et al., 2016). Specifically, the financial crisis of 2007-2008 made it very difficult for firms to obtain credit and access financial markets. Due to high capitalisation or the use of their own resources in finance (i.e., patient financial capital), FFs may adopt a more resilient approach during hard times, as they can wait for payoffs. From a financial point of view, an FF's capital structure is based less on external finance than NFFs. Additionally, during a crisis, FFs are less subject to credit restrictions than NFFs, as Crespí and Martínez-Oliver (2015) report. During a crisis, and unlike NFFs that will encounter credit restrictions, FFs' relationships and reputation with financial institutions may help them to obtain additional financial resources to fund their investments in different types of innovative activities. As the impact of a lack of credit on their capital structure is less severe than in NFFs during the crisis and recovery, we expect that FFs may conduct different innovative activities more readily than their counterparts, which will have a favourable influence on their internationalization. Moreover, the fact that small FFs, which usually find it difficult to attract external funds and may rely more on funding from family members and friends to finance any type of innovation (Carpenter & Peterson, 2002), might explain the better position of small FFs compared to other types of FFs and NFFs concerning innovation towards internationalization.

The safeguarding of SEW may also lead FFs to adopt far-reaching investment decisions when the economic prospects are not so optimistic. These factors will favour investments in innovation and internationalization, whereby compared to NFFs, FFs will ensure they preserve their SEW under unfavourable economic conditions by adopting more types of innovations. Specifically, when family business owners/managers perceive an economic crisis as a hazard for their performance that may also mean a potential 'loss of SEW' and concrete threats to the family transgenerational control (Zellweger et al., 2012), these owners/managers might adopt a more explorative than exploitative mindset (Patel & Chrisman, 2014). Ultimately, these owners/managers might be more willing to take higher risks to safeguard long-term SEW (Minichilli et al., 2016) by increasing tolerance towards experimentation. In line with other research (e.g., Minichilli et al., 2016; Patel & Chrisman, 2014), we argue that an FF's more explorative attitude when faced with negative economic perspectives might allow it to make decisions (e.g., related to internationalization and innovation) that are critical for reacting effectively when faced with an adverse market situation (Schulze & Kellermanns, 2015). In contrast, as NFFs are less concerned with specific non-economic SEW issues during the downturn, they might opt for more risk-averse and conservative behavior, and it will take longer for an impaired performance to force them to adopt new types of innovations (Minichilli et al., 2016). Ultimately, international FFs' idiosyncratic resources may also influence their ability to adopt a greater variety (combination) of types of innovations compared to NFFs in order to better face a situation of economic crisis and subsequent recovery.

FFs are just as exposed to economic cycle shocks as NFFs are, but their greater resilience, adaptability, and flexibility may make them more robust to the negative

effects involved (e.g., Bauweraerts & Colot, 2013; Kraus et al., 2020; Mzid, Khachlouf, & Soparnot, 2019). Thus, FFs are not expected to use more types (or combinations) of innovation activities solely during times of economic crisis; they might also do so more than NFFs during times of economic growth and recovery. Their better perspective on future market conditions thanks to their long-term orientation, social, human, patient capital, and other affect-based resources (SEW) allows FFs to extend the time for creativity and the achievement of long-term goals in both fair and foul weather (Škare & Porada-Rochoń, 2021).

Extant evidence also shows that innovation decisions in FFs tend to be more path-dependent compared to NFFs (e.g., Berrone et al., 2012; De Massis et al., 2016; Eng et al., 2020; Erdogan, Rondi, & De Massis, 2020). Choosing to continue with past innovation activities may be considered by FF owners/managers as a constructive practice that safeguards family tradition and legacy (Erdogan et al., 2020). FFs are thus more likely than NFFs to persist in their past behavior involving frequent product, process, marketing or organizational innovations over time. The general impression is that most family owners/managers are loss-averse and willing to keep to what they have been doing in the recent past, as long as the outcome is within acceptable levels (Erdogan et al., 2020; Lumpkin & Brigham, 2011). However, under certain conditions (e.g., in times of crisis and recovery), some FFs may choose to renege on their long-lasting traditions, especially when firm survival is threatened (Gomez-Mejia et al., 2011; Chrisman et al., 2012). As suggested by Erdogan et al. (2020), tradition's imprint does not necessarily hamper innovation, as it can also boost the development of different types of innovations.

In sum, we therefore expect to encounter different combinations of innovation activities that drive FFs and NFFs to internationalise via exporting, and that such

combinations may substantially differ between both types of firms, and even within each group of firms, in times of growth, recession, and then recovery.

4.3. EMPIRICAL ANALYSIS

4.3.1. Data collection and sample

The empirical analysis is based on data from the Survey on Business Strategies[5] (SBS) for the period 2007-2016. This is a statistical research instrument drawn up by the SEPI Foundation (an entity dependent on the Spanish Government) that each year surveys a panel of Spanish manufacturing firms. The initial SBS database contains a sample of 5,840 firms (2016). There were 2,410 companies that did not respond to the survey within this time period, and therefore did not provide any data. This meant the sample was reduced to 3,430 firms, providing 18,410 firm-year-observations. There are 2,805 observations with foreign equity participation from international or multinational companies or groups due to strategic holdings or acquisitions during the period analysed. Foreign equity may affect firms' international operations and innovation effort according to available resources (e.g., Cassiman & Golovko, 2011). As the objective is to study Spanish firms, and foreign equity ownership may lead to misinterpretations regarding the internationalization

[5] SBS classifies the Spanish manufacturing industry into 20 different sectors according to the criteria of the National Classification of Economic Activities (CNAE). CNAE is the standard used by Spanish statistical agencies when classifying business establishments for the purpose of collecting, analyzing and publishing statistical data related to the Spanish economy. It is similar to the one used in other countries, such as the North American Industry Classification System (NAICS) —which is used by governments and businesses in the US, Canada and Mexico—or the Statistical Classification of Economic Activities in the European Community (NACE).

process, these observations were omitted. Thus, the final sample consisted of 15,605 observations with complete data for an average of 1,560 firms per year, as some companies do not respond, or cease trading for different reasons, including bankruptcy. The minimum number of observations was 1,304 in 2014, and the maximum was 1,686 in 2016. Most of these firms are SMEs.

There are several reasons for using the SBS in our study. First, one of the main characteristics that differentiate it from other statistics on (Spanish) firms is its explicit brief to generate information with a panel structure. This makes it possible to analyse the behavior of companies over long periods of time. The dataset used in our study covers three very different stages of the economic cycle in Spain, which is consistent with our research purpose: growth (2007–2008), crisis (2009–2013), and recovery (2014-2016). The 1994–2008 period coincides with one of the longest periods of growth that the Spanish economy has experienced over the past fifty years. Specifically, between 2007 and 2008 (growth period) the cumulative GDP rate was 4.5%. Economic growth in Spain was very high compared to the European Union and other developed economies worldwide (The World Bank, 2018). Spanish GDP recorded peak growth in 2000 (5.3%). During this expansionary period, Spain became the eighth largest economy in the world. Similarly, the period between 2009 and 2013 (recession) was one of the worst economic crises in recent times, with the exception of the current COVID-19 pandemic. Unlike other countries, the full force of the economic crisis became apparent in Spain in 2009, and the consequences were devastating because it involved a sharp economic downturn, a dramatic rise in unemployment, and a large number of corporate bankruptcies in most economic sectors. For example, during this period, GDP fell 9.2%. The biggest falls in GDP were recorded in 2009 (−3.6%), 2012 (−2.9%), and 2013 (−1.7%). GDP per capita

in 2013 was $29,237. The unemployment rate rose from 13.8% in 2008 to 25.7% in 2013. The highest unemployment rates were recorded in 2012 (25.8%) and 2013 (25.7%). The total number of firms decreased by about 9% between 2008 and 2013, affecting almost all sectors of the economy. During this period, Spain fell out of the list of the world's top 10 economies. In fact, the country's economy was one of those worst hit in the euro area. Nevertheless, it also recorded a sharp increase in exports compared to the pre-crisis years —the so-called Spanish "miracle" (Máñez, Rochina-Barrachina, & Sanchis, 2020). Finally, between 2014 and 2016 (recovery period) the cumulative GDP rate was 8.2%, thus returning to pre-crisis levels. The SBS stopped collecting data in 2016. Hence the reason the recovery period only covers these three years.

Second, the SBS seeks to delimit and maintain a representative sample of Spanish manufacturing enterprises (FFs and NFFs) over time. The inferences drawn from the sample may therefore be deemed valid for the reference population of Spanish manufacturing firms with 10 or more employees. Importantly, all the information contained in the SBS is subject to stringent quality and consistency controls. Moreover, focusing on the differences between FFs and NFFs, this dataset has allowed us to consider two different subsamples: one of FFs (n = 7,429 firm-year observations) and the other of NFFs (n = 8,176 firm-year observations). Although all the data included in the SBS database are evaluated in terms of quality and consistency, the common method bias needs to be controlled. There are several aspects regarding the data selection that limit the potential for common method bias (Podsakoff et al., 2003; Podsakoff & Organ, 1986). For instance, the amount of data collected through the SBS is very extensive, so the data used in this research on innovation and internationalization are only a marginal part of the

database. Furthermore, the dependent variable (outcome, i.e., internationalise via exporting) and the independent variables (background conditions, i.e., different types of innovation) were assessed from different sections of the survey. The respondents are not therefore aware of the conceptual model of this specific research. The data also deal with the existence or not of specific firm aspects (exporting and innovation types). There is no ambiguity accordingly because, as noted below, the data are dichotomous (yes/no). Additionally, we perform the Harman's one-factor test (Podsakoff et al., 2003). The data adjust to more than one factor, with the first one accounting for 36.1% of the total variance. These results confirm that common-method bias is not a concern in our research.

Third, we have also focused on the manufacturing sector because Spanish exports from this sector outweigh those from services sectors. For example, according to the OECD (2021), in 2019 Spain was the 16th largest exporter in the world, and exports from the manufacturing sectors accounted for almost 2,5 times more than those from the services sectors ($319 billion and $138 billion, respectively) (OECD, 2021).

Fourth, the SBS is designed to capture information about firms' strategies: that is, regarding those decisions firms adopt on the competitive instruments available to them. Specifically, this survey gathers information about firm strategies and behavior (e.g., their internationalization via exporting or the different innovation activities carried out over time). During the period considered (2007-2016), this dataset provides homogeneous and comprehensive information on our main variables of interest: whether firms internationalise via exporting and the different types of innovations considered (i.e., in terms of product, process, organizational and marketing).

Finally, it is also worth noting here that this survey has been used in numerous recent studies on internationalization and/or innovation in Spain (e.g., Benito-Osorio et al., 2020; Caldera, 2010; Cassiman & Golovko, 2011; Cassiman & Martinez-Ros, 2007; Forcadell et al., 2018; Nieto, Santamaria, & Fernandez, 2015). Thus, our results are comparable with many others that have used the same database, but have focused on analysing internationalization and/or innovation decisions during a specific period of time, while they may also considerably facilitate its replicability in future studies.

4.3.2. Method and variables

Qualitative comparative analysis (QCA) was used here, as it is a set-theoretical approach that allows a comprehensive analysis of the causality between a set of conditions, per se or combined, and a specific outcome (Fiss, 2011; Ragin, 2008). By using Boolean algebra, this technique identifies those configurations of conditions that are sufficient and/or necessary for achieving an outcome of interest (Fiss, 2007), as each case is a combination of several causal and outcome conditions. Therefore, the application of QCA here renders it possible to identify the specific causal recipes of types of innovation that lead firms to internationalise (Woodside, 2013).

Although this approach has been used in social sciences for more than three decades (Ragin, 1987), the application of QCA has become increasingly accepted in business and management research fields in general (Roig-Tierno, Gonzalez-Cruz, & Llopis-Martinez, 2017; Kan, et al., 2016; Misangyi et al., 2017; Wagemann, Buche, & Siewert, 2016), FF research (e.g., Kosmidou & Ahuja, 2019; Kraus et al., 2016), innovation research (e.g., Huarng & Roig-Tierno, 2016; Ordanini & Maglio,

2009; Kraus et al., 2018; Kosmidou & Ahuja, 2019), and internationalization research (e.g., Fainshmidt, et al., 2020) in particular.

There are three main variants of QCA: crisp-set (csQCA); fuzzy-set (fsQCA), and multi-value (mvQCA) (Rihoux, Ragin, Yamasaki & Bol 2009). All the variables in this study are dichotomous, and so csQCA has been adopted (Rihoux & Ragin, 2009; Schneider & Wageman, 2012), by using the fs\QCA 2.5 software (Ragin & Davey, 2014). As outlined by Gerring (2001), csQCA is one of the few genuine methodological innovations of recent decades. It provides a set of tools for analysing the necessary and sufficient conditions that explain outcomes (in our case, firm internationalization), "mapping out differences and similarities between various configurations of conditions and cases" (Marx & Dusa, 2011, p. 104). This variant of QCA was the first one to be developed, in the late 1980s (Rihoux & Ragin, 2009). Nevertheless, it has also been questioned by some researchers concerning the validity of the models it generates. For example, Lieberson (2004) suggests that csQCA is unable to distinguish between real and random data, giving rise to 'valid' models and explanations based on the latter. However, this argument has also been refuted by other researchers. For example, Marx (2010) empirically shows that csQCA can indeed distinguish between real and random data. Nonetheless, fsQCA is also used to check the robustness of our findings.

The first step of the csQCA technique involves calibrating the variables, by transforming the outcome and causal conditions into sets. All the variables are dichotomous, or made dichotomous, whereby each case can only be fully inside the set (taking the value 1.0) or fully outside the set (taking the value 0.0). Calibration therefore assigns the full membership or full non-membership to each condition. Although dichotomising continuous variables can lead to a loss of information

(Ragin, 2008), this is not a problem here because the data were also originally dichotomous. Table 4.1 shows the description of the variables (outcome and antecedents) and their calibration. We use exports as an outcome variable because it is considered the dominant strategy for a firm's internationalization, especially among SMEs (Cerrato & Piva, 2012; Fernández & Nieto, 2006; Forcadell et al., 2018; Lu & Beamish, 2001; Salomon & Shaver, 2005).

Table 4.1: Definition of variables and calibration

Variable	Calibration (or measurement)
Outcome Exports	Dichotomous variable which indicates whether the firm had direct or indirect (using group firms) exports during the specific year (1); or not (0).
Antecedent Conditions	
Product innovation	Dichotomous variable which indicates whether the firm obtained product innovations during the specific year (1); or not (0).
Process innovation	Dichotomous variable which indicates whether the firm included process innovations (production or distribution) during the specific year (1); or not (0).
Organizational innovation	Dichotomous variable which indicates whether the firm introduced innovations in organizational methods in the specific year (1); or not (0). This type of innovation comprises new managerial procedures in the workforce organization or new procedures in the management of external relationships with other firms or public institutions.
Marketing innovation	Dichotomous variable which indicates if the firm introduced marketing or commercialization innovations in the specific year (1); or not (0). This type of innovation embraces the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.
Partition variables Family-owned firm (FF)	Dichotomous variable that indicates whether a family group is actively involved in the control or management of the firm (1) or not (0).
Time Period	Categorical variable which indicates in which period of time every year of the data sample falls. Data was organized in three different periods: • growth (2007-2008); • crisis (2009-2013) and; • recovery (2014-2016).

Source: The authors

The second step involves the creation of a truth table, where the data are arranged into a total of 2^k rows, where *k* is the number of causal conditions in the model. These rows encompass all the possible logical combinations of causal conditions, and each row may or may not lead to the outcome (Ragin, 2008). The truth table in our case has a total of 16 rows (2^4).

4.4. RESULTS

Two complementary analyses were performed in the first part of the study, as the sample was divided into two subsamples: one for FFs and the other for NFFs. Therefore, the two csQCA models to be analysed for the necessary and sufficient conditions for growth are as follows:

ExportingFF = f (Product innovation, Process innovation, Organizational innovation, Marketing innovation).

ExportingNFF = f (Product innovation, Process innovation, Organizational innovation, Marketing innovation).

The analysis begins by assessing whether causal conditions are necessary for the outcomes to occur (Schneider & Wagemann, 2010). A causal condition is necessary if its presence (or absence) must exist for the outcome also to be present (or absent) (Rihoux et al., 2009). The consistency score was used to assess whether any of the four causal conditions (innovation activities) are necessary to achieve the outcome, namely, internationalization (Ragin, 2006). A condition can be

classified as necessary if this score is above 0.90, and as “almost always necessary” if the score ranges between 0.80 and 0.90 (Ragin, 2000). Table 4.2 shows that none of the causal conditions (i.e., innovation activities) is necessary or almost always necessary for the outcome (internationalization via exporting) to occur in both subsamples (FFs and NFFs).

Table 4.2.: Summary of necessary conditions for internationalization

	Family Firms		Non-Family Firms	
	Consistency	Coverage	Consistency	Coverage
Product innovation	0.2309	0.8821	0.2122	0.8595
~Product innovation	0.7691	0.6318	0.7878	0.5351
Process innovation	0.4018	0.8043	0.3717	0.7482
~Process innovation	0.5982	0.6108	0.6283	0.5140
Organizational innovation	0.2495	0.7851	0.2414	0.7527
~Organizational innovation	0.7505	0.6463	0.7586	0.5425
Marketing innovation	0.2558	0.8041	0.2105	0.7555
~ Marketing innovation	0.7442	0.6411	0.7895	0.5481

Source: The authors / Note: The tilde symbol (~) before the causal condition represents the absence of the condition.

The next stage refers to the analysis of sufficient conditions, which requires the construction, refinement and examination of a truth table for each subsample (Ragin, 2008). Each one of the initial 16-row truth tables needed to be refined by defining two criteria: a frequency value and a consistency threshold (Kraus, et al., 2018; Ragin, 2006, 2008; Rihoux et al., 2009). The frequency value was fixed at 100 cases for both subsamples (Kraus, et al., 2018; Ragin, 2008), as both of them have a large number of observations, and the consistency thresholds were also set in both situations as the minimums defined by the literature, 0.75 (Ragin, 2006, 2008).

The csQCA produces three different solutions: complex, parsimonious, and intermediate (Ragin, 2008; Rihoux et al., 2009). The first solution (complex) makes no assumptions for simplicity; the second (parsimonious) considers all the simplifying assumptions, and excludes all the remainders, and the third and last one (intermediate) uses some remainders and the assumptions suggested by the literature to simplify the solution. Only the parsimonious and the intermediate solutions were used here to present the results. The notation developed by Fiss (2011) was used to facilitate the presentation and readability: black opaque circles (●) designate the presence of a condition, while the crossed-out circles (⊗) indicate the absence of a condition. The blank spaces refer to situations where a condition is of no relevance to the configuration, and the size of the circles is also relevant: large circles show core conditions (i.e., part of both parsimonious and intermediate solutions), and small circles refer to peripheral conditions (i.e., only part of the intermediate solution). As presented in Table 4.3, all the configurations are core conditions. This means there are no remainders that support the existence of differences between the two solutions. Each column represents a different configuration, based on the analysis of the parsimonious and intermediate solutions, and the configurations are labelled as ‘FF’ and ‘NFF’.

Table 4.3: Configurations for internationalization of family and non-family firms

	Family firms			Non-family firms	
	FF1	**FF2**	**FF3**	**NFF1**	**NFF2**
Product innovation	●			●	
Process innovation		●	●		●
Organizational innovation			●		●
Marketing innovation		●			⊗
Consistency	0.88	0.84	0.83	0.86	0.80
Raw Coverage	0.23	0.17	0.18	0.21	0.08
Unique Coverage	0.11	0.03	0.05	0.18	0.06
Overall Solution Consistency		0.85			0.83
Overall Solution Coverage		0.35			0.27

Note: Black circles indicate the presence of a condition and the circles with an "x" indicate its absence. Large circles indicate core conditions and small circles peripheral conditions. Blank spaces indicate "not important".

Source: The authors

4.4.1. Results for family and non-family firms

Table 3 on the solution consistency (SC) for the internationalization of FFs shows three configurations between the types of innovation (conditions) for internationalization via exporting. This SC records a high consistency (SC = 0.85), meaning that 85% of the FFs in this study sharing one of these configurations internationalise (Ragin, 2008; Schneider and Wagemann, 2012). The solution coverage is also relevant (SCov = 0.35), which means 35% of the firms that exported followed one of these configurations (Schneider & Wagemann, 2012).

Configuration FF1 only includes product innovation as a condition for internationalising and records a high value for consistency (C = 0.88) and a middling value for coverage (Cov = 0.23) The first value means that 88% of FFs with product innovation internationalise, while the second means that 23% of exporting FFs register product innovation. Unique coverage is also relevant (UCov = 0.11), meaning that 11% of all exporting FFs register solely this configuration; this is

therefore the only type of innovation that supports their international activity. Even though product innovation is not a necessary or ‘almost always necessary’ condition, it is enough for FFs to enter international markets. In turn, configuration FF2 includes firms that simultaneously undertake process and marketing innovation. These two conditions combined are also sufficient for FFs to export, again recording a high consistency (C = 0.84) and moderate coverage (Cov = 0.17). Configuration FF3 also includes process innovation, albeit now combined with organizational innovation, recording similar levels of consistency and coverage (C = 0.83; Cov = 0.18). Process innovation is not therefore sufficient per se to prompt firms to internationalise via exporting. This type of innovation needs to be combined with marketing innovation or, alternatively, with organization innovation for internationalization.

Table 3 also shows that the solution for NFFs is also very relevant, as the values for both consistency (SC = 0.83) and coverage (SCov = 0.27) are high. The first impression when analysing the solution is that it is different to the solution for FFs, as only two alternative paths were obtained instead of three.

The first configuration, NFF1, is similar to FF1. Again, this configuration includes only product innovation as the sufficient condition for exporting, and with similar values for consistency (C = 0.86) and coverage (Cov = 0.21). The value of unique coverage (UCov = 0.18) is high, meaning that 18% of all the NFFs that internationalise via exporting only record this configuration. The second configuration, NFF2, is totally different to those found for FFs, revealing that firms with both process and organizational innovation, yet without implementing marketing innovation, also internationalise. This configuration records a high level

of consistency (C = 0.80), and a low coverage value (0.08). Despite this, 6% of the subsample of firms that internationalise via exporting follow this path (UCov = 0.06).

4.4.2. Results for family and non-family firms in each period considered

In the second part of the empirical study, both subsamples (FFs and NFFs) were again subdivided into three subsamples based on the year of the business data. The cases obtained in 2007 and 2008 were therefore classified as “growth” (n = 1,499 for FFs and n = 1,868 for NFFs), the data for 2009-2013 were classified as “crisis” (n = 3,859 for FFs and n = 4,081 for NFFs), and the data for 2014-2016 were categorised as “recovery” (n = 2,071 for FFs and n = 2,227 for NFFs). Again, the sufficient conditions were analysed, with new truth tables being compiled for each subsample (Ragin, 2008). The consistency threshold was set at 0.75 in all the subsamples (Ragin, 2006, 2008) in order to maintain the comparability between the solutions, and the minimum frequency value was set at 5. Even so, the different dimensions of the subsamples mean that the range of threshold frequencies varies from 5 to 22. The results are reported in Tables 4.4 and 4.5. Again, each column represents a different configuration using intermediate solutions, and the configurations for FFs are labelled as ‘FF’, and for NFFs as ‘NFF’, followed by a suffix reference for the period analysed: “g” (for growth), “c” (for crisis) and “r” (for recovery).

Table 4.4: Configurations for internationalization of family firms by period

	Family firms									
	Growth			Crisis				Recovery		
	FF1g[1]	FF2g	FF3g	FF1c[2]	FF2c	FF3c	F1r[3]	FF2r	FF3r	
Product innovation	●	●	●	●			●			
Process innovation		⊗	●		●	●		●		
Organizational innovation	⊗				●	⊗				
Marketing innovation		⊗	●		⊗	●				●
Consistency	0.86	0.83	0.89	0.89	0.85	0.83	0.91	0.85		0.85
Raw Coverage	0.15	0.05	0.11	0.24	0.08	0.05	0.20	0.42		0.24
Unique Coverage	0.07	0.01	0.08	0.18	0.05	0.03	0.03	0.20		0.05
Overall Solution Consistecy		0.87			0.87				0.84	
Overall Solution Coverage		0.24			0.31				0.52	

[1] FF1g, FF2g and FF3g denote configurations of innovative family firms during the period of growth.

[2] FF1c, FF2c and FF3c denote configurations of innovative family firms during the period of crisis.

[3] FF1r, FF2r and FF3r denote configurations of innovative family firms during the period of recovery.

Note: Black circles indicate the presence of a condition and the circles with an “x” indicate its absence. Large circles indicate core conditions and small circles peripheral conditions. Blank spaces indicate “not important”.

Source: The authors

The solutions for the FF subsamples (see Table 4.4) reflect a change in the pattern during the periods considered, even though the number of configurations obtained in each period holds (three). In general terms, FFs that internationalised via exporting before the crisis followed product innovation combined with other types of innovation (present or absent), while after the crisis some firms followed the product innovation path, others followed process innovation, and others marketing innovation.

Table 4.5: Configurations for internationalization of non-family firms by period

	Non-family firms					
	Growth	Crisis		Recovery		
	NFF1g[1]	NFF1c[2]	NFF2c	NFF1r[3]	NFF2r	NFF3r
Product innovation	●	●	●	●		
Process innovation		●			●	⊗
Organizational innovation			●		●	⊗
Marketing innovation			●			●
Consistency	0.85	0.90	0.89	0.87	0.82	0.80
Raw Coverage	0.22	0.15	0.05	0.19	0.18	0.05
Unique Coverage	0.22	0.11	0.01	0.10	0.11	0.04
Overall Solution Consistency	0.85		0.90		0.82	
Overall Solution Coverage	0.22		0.16		0.33	

[1] NFF1g denotes configurations of innovative non-family firms during the period of growth.

[2] NFF1c and NFF2c denote configurations of innovative non-family firms during the period of crisis.

[3] NFF1r, NFF2r and NFF3r denote configurations of innovative non-family firms during the period of recovery.

Note: Black circles indicate the presence of a condition and the circles with an "x" indicate its absence. Large circles indicate core conditions and small circles peripheral conditions. Blank spaces indicate "not important".

Source: The authors

The relevance of two of these configurations (FF1g and FF3g) is high, as their unique coverages are 0.07 and 0.08, respectively. This means that 7% or 8%, respectively, of the FFs in the subsample that export follow only one of these paths.

During the crisis period, the pattern of innovation types prompting internationalization diverged into three new paths. The first (FF1c) is based solely on product innovation. Around 18% of the FFs that internationalise in this period follow solely this path (UCov = 0.18). The second path (FF2c) combines process innovation and organizational innovation, with the absence of marketing innovation. Lastly, the third path (FF3c) combines process innovation with marketing innovation, but unlike the previous path lacks organizational innovation.

The recovery results show an increasingly different arrangement of configurations. Again, there are three new configurations, but each one follows a single innovation type to internationalise. The first path (FF1r) focuses on product innovation, and maintains a configuration from the crisis period subsample (FF1c). The second path (FF2r) includes only the process innovation condition and records the highest unique coverage (UCov = 0.20), meaning that about 20% of the FFs following an internationalization pattern specifically adopt process innovation. On the third path (FF3r), FFs follow marketing innovation.

The solutions for NFF subsamples (see Table 4.5) also reflect a shift in the configurations over the years, modifying their number and composition. At a glance, we may conclude that prior to the crisis, NFFs that internationalise via exporting certainly follow product innovation. This pattern changes with the crisis and recovery, whereby some of them may maintain that path, others follow a path where they combine process and organizational innovation, and others, although failing to perform both process and organizational innovation, implement marketing innovation.

A more itemised analysis shows that in the period before the crisis, NFFs wanting to internationalise needed to invest in product innovation (NFF1g). This configuration achieves a coverage of 0.22, meaning that 22% of these firms follow this path. During the crisis period, firms maintained their focus on product innovation, but combined it with other types of innovation to internationalise in two configurations. In the first configuration (NFF1c), product innovation combines with process innovation, while in the second one (NFF2c), it combines with both organizational innovation and marketing and commercialisation innovation. However, in the period of recovery, the results reveal a totally different set of

configurations. The first configuration (NFF1r) includes only a single condition, namely, product innovation. Therefore, as before the crisis, this is still a path to internationalization, although there are two other alternatives. The second configuration (NFF2r) combines process innovation and organizational innovation. This is the configuration with the highest unique coverage (UCov = 0.11). The third configuration (NFF3r) combines marketing and commercialization innovation with the absence of both process and organizational innovation.

4.5. ROBUSTNESS TEST

Although the crisp-set QCA is more suitable for analysing dichotomous variables, robustness tests were also performed by using fuzzy-set QCA (fsQCA). In these approaches, all the variables were calibrated by using 0 and 1 as qualitative thresholds for full non-membership and full membership, respectively, while 0.5 was defined as the crossover point (Ragin, 2008). In addition, the same criteria as in the csQCA analysis were used in the construction of the truth table. The exception was the inclusion of a minimum threshold of 0.75 (Ragin, 2008) for the proportional reduction in the inconsistency (PRI) score, which prevents the same configuration from leading to a given result and its negation. This threshold did not need to be defined during the csQCA method because the values were equal to those of consistency.

The findings obtained when the whole sample of FFs and NFFs is examined (see Appendix-Panel A) indicate that the configurations obtained are exactly the same, only changing the values for consistency and coverage, reinforcing the strength of our original findings (see Table 9). When distinguishing between FFs and NFFs,

supplementary robustness tests were also performed using fsQCA for each one of the subsamples allocated to different periods (i.e., economic growth, crisis, and recovery). Similarly, the set of configurations obtained for each period in both FFs (see Appendix- Panel B) and for NFFs (see Appendix-Panel C) were identical to the ones recorded with csQCA (see Tables 4.4 and 4.5, respectively). The only changes were related to the values of consistency and coverage of both configurations and solutions, thereby underpinning the stability and robustness of the findings.

4.6. DISCUSSION AND CONCLUSIONS

There is a large body of research on internationalization via exporting and the main drivers or factors that prompt it. Most of this research has been conducted without explicitly distinguishing between FFs and NFFs. Nonetheless, in recent years this issue has attracted the attention of family scholars, who in line with researchers from other fields (principally economics and management) have drawn primarily from RBV arguments to recognise the potential impact that innovation may have on FFs' internationalization via exporting decisions, paying particular attention to the existence of differences with NFFs. They have also been concerned with the role played by R&D investment in international activities (e.g., Piva et al., 2013; Sing & Gaur, 2013; Fang et al., 2018; Ossorio, 2018; Lin & Wang, 2021). Surprisingly, to the best of our knowledge there are no studies that have examined the potential role that different types of innovation (in terms of product, process, marketing. and organization) may play regarding FFs' decisions on internationalization via exporting. Therefore, this study is a first attempt to identify the paths or combinations of innovations FFs and NFFs choose when they decide to branch out abroad by

identifying potential commonalities and differences between them and even within the same group of firms. Furthermore, this study also advances in the knowledge of a key aspect that has been ignored by past research: the idea of stability/instability in the impact that different innovation activities have on FFs and NFFs' internationalization decisions as a result of significant environmental turbulences. Instead of using descriptive and net-effect (e.g., traditional regression-based) techniques, this study uses QCA. The application of the csQCA approach (a type of QCA that uses dichotomic variables) means the same phenomenon can be seen from a different but complementary perspective. Thus, rather than presenting a single solution, as most prior research has traditionally done, the csQCA technique shows several equifinal solutions regarding different combinations of the sundry innovation activities that promote exports in FFs and NFFs.

As suggested by other researchers (Chesbrough & Rosenbloom 2002; Teece 1986, 2010), the results of our study show that none of the types of innovation per se is a necessary condition for firms to achieve internationalization via exporting. This is true for both FFs and NFFs. Nonetheless, product innovation per se is enough to prompt firms to internationalise via exporting. Hence, this is the type of innovation that prevails. This is consistent with prior research that recognises the major role that product innovation generally plays in exporting behavior (e.g., Becker & Egger, 2013; Bernard & Jensen, 2004; Caldera, 2010; Carboni & Medda, 2020; Cassiman & Martínez-Ros, 2007; Nassimbeni, 2001; Tavassoli, 2018). Our findings also challenge the premise often put forward by other researchers that FFs tend to invest more in process rather than product innovation because of the former's higher probability of success (e.g., Broekaert et al., 2016).

Our findings also reveal several alternative combinations of innovation activities that are sufficient for internationalization, specifically three configurations for FFs and two configurations for the NFF subsample. The overall solution for FFs follows three paths, explaining 35% of exporting behavior; while the two solutions for NFFs, explain 27%. In a complementary perspective, 85% of FFs that follow one of the innovation paths manage to export. For NFFs, this value reduces slightly to 83%. Thus, our results show that the paths are somewhat dissimilar between FFs and NFFs. Specifically, the former have more alternative paths to internationalise by using different combinations of innovation activities. Furthermore, process innovation needs to combine with organizational or marketing innovation in order to export. This is interesting because it challenges the findings of a number of earlier studies (e.g., Cassiman & Golovko, 2010; Edeh et al., 2020), where process innovation is identified (using net-effects) as being positively related to, and a major determinant of, exporting. This may be, but our results reveal that firms also need to complement this innovation effort with innovative developments in other areas: marketing and organizational methods, respectively, in FFs, or solely organizational methods in NFFs. Our results therefore seem to be in consonance with prior studies (e.g., Edeh et al., 2020; Medrano-Saiz & Olarte-Pascual, 2016; Rodil et al., 2016), finding complementarities among two or more types of innovation that help firms export more.

The theoretical implications relate both to the specification of different types of innovation, with diverse weights, as relevant for exporting, and to the differences presented for FFs and NFFs, and even within each group of firms. The way in which innovation resources can lead to exporting is similar when firms primarily rely on product innovation, but rather different when they focus on other types of innovation.

In this regard, our results seem to provide support for the following two main arguments: first, FFs and NFFs certainly have distinctive characteristics, as they choose somewhat different paths or configurations for their innovation activities when they decide to internationalise via exporting. These findings are in line with the RBV, which suggests the existence of major disparities in terms of bundles of resources and capabilities between both types of firms and the greater relevance of marketing innovations in FFs (e.g., Binz et al., 2013; Sageder, Mitter, & Feldbauer-Durstmüller, 2018; Sciascia et al., 2012; Witkowski & Thibodeau 1999) when making their strategic decisions, and thus providing further evidence to justify their different behavior in entrepreneurial activities such as innovation. Second, in light of the greater number of paths leading to exports in FFs, it seems clear that these firms need to be considered as a heterogeneous group, and perhaps more so than NFFs. Our findings support the notion of family heterogeneity in terms of strategic goals (e.g., regarding exports) and resources used or activities carried out (e.g., innovation) to successfully achieve them. The study of heterogeneity among FFs has recently become an important research topic (e.g., Daspit et al., 2018; Neubaum et al., 2019; Rau et al., 2019; Stanley et al., 2019). Our study therefore contributes to this recent and lively debate on FF heterogeneity by specifically identifying an important source of such diversity (innovation) when deciding to expand abroad.

Importantly, our study also finds that the different configurations of innovation activities that prompt FFs and NFFs to export are not stable over time. Again, our findings support and also reinforce the notion of heterogeneity not only between FFs and NFFs but also within the group of FFs in their response to drastic changes in environmental conditions, as different innovation paths are identified for FFs and NFFs in times of economic growth, crisis, and recovery. It is also interesting to note

that product innovation is one of the preferred options, either individually or in combination with other types of innovations in times of growth, crisis, and recovery. However, our findings also reveal that both groups of firms, and even firms within each specific group, respond differently to different environmental conditions when deciding to export, with our findings highlighting the following: First, FFs use more combinations of innovation activities than NFFs in times of growth and crisis, and product innovation is always present in FFs in times of economic growth, which to some extent refutes the notion that FFs are more conservative than NFFs when investing in innovative activities. Second, FFs implement stricter cost-cutting and restructuring strategies (i.e., process and organizational innovations) during a crisis. Third, while international FFs and NFFs appear to approach the crisis quite differently in terms of innovative behavior, such behavior seems to become more similar in times of economic recovery. In fact, this is when there is greater parity in the innovative behavior of FFs and NFFs, in terms of both the number of configurations and the specific type of innovative activity carried out. However, a notable difference at this point is that unlike FFs, NFFs seems to keep trusting more on organizational innovations. Finally, the change in the number of configurations and the types of combinations of innovative activities conducted in each period considered (growth, crisis, and recovery) seem to be more radical in NFFs than FFs. In line with certain prior studies (e.g., Erdogan et al., 2020), this suggests that FFs' innovative behavior is more path-dependent than in the case of NFFs. Due to their longer-term orientation, FFs tend to invest more steadily in innovation activities to compete abroad.

Ultimately, our findings suggest that the potential causal factors that lead firms to export are time- or context-dependent. Thus, our study suggests there is a need

to control such dependency by testing the structural stability of empirical models. This is consistent with prior research that has called for the need to verify such dependence by testing the structural stability of the empirical models proposed (e.g., Vicente-Lorente & Zúñiga-Vicente, 2006). This is also in line with the arguments underpinning the dynamic capabilities approach that recognises the role of managers as key drivers of the creation, evolution, and recombination of different resources into new sources of potential competitive advantage (Eisenhardt & Martin, 2000; Henderson & Cockburn, 1994; Teece, Pisano, & Shuen 1997). Our study highlights the ability of managers (both in FFs and NFFs) to achieve new resource configurations in terms of innovation in order to promote exports as environmental conditions change. It is true that our study does not allow us to identify specific dynamic capabilities, but in light of our findings, it could be inferred that some of these dynamic capabilities might be related to innovation activities, and they will differ between FFs and NFFs.

4.7. PRACTICAL IMPLICATIONS

Our findings may also be helpful for practitioners, especially owners and managers, as they make it clear that there is not just one path to internationalize regarding innovation. Product innovation seems to be the type of measure that can lead to internationalization on its own, but if firms are unable to invest in the development of new products, they can also internationalize by combining other types of innovation. These findings may be particularly relevant for those firms with fewer resources (especially SMEs), which intend to expand internationally and need to decide where to assign such resources in a more effective and efficient way. Our

results also provide several pointers for family and non-family business managers as to which innovations are most likely to contribute to their firms' international expansion under changing environmental conditions. This study considers a period of severe economic crisis, so it also provides some insights into how those managers considering how to internationalise might deal with an economic situation such as that currently caused by COVID-19 (which besides the health crisis has triggered a major global economic downturn). In the case of FFs, managers should not rely solely on product innovations. Combinations of process and organizational innovations, or combinations of process and marketing innovations may also lead to internationalization. In turn, NFF managers in the same situation should rely more on combinations of product and process innovations, or alternatively on combinations of product, organizational, and marketing innovations. Finally, our results may also be helpful for governments and policymakers designing public policies, especially subsidies to foster innovation and internationalization activities in firms, as they need to identify those complementary innovation areas within firms that could be eligible for financial aid.

4.8. LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

This research has certain limitations. First, it only uses data from Spanish manufacturing firms. Therefore, using databases from other countries and analysing service firms are a natural extension for this study. Moreover, we also have also a limited data period from 2007 to 2016, which is sufficient to isolate extreme economic and financial conditions, and to measure the potential impact on the

innovative behavior of internationalised firms. However, it would be interesting to have longer time-series data to see the extent to which the behavior identified in FFs and NFFs is reproducible over time. This would be helpful for discovering whether these firms' innovative behavior has followed a similar pattern before, during, and after the current COVID-19 pandemic. The availability of a larger sample, with firms from other countries and longer timeframes, will enable us to further explore the impact of different economic and financial conditions.

Second, it would be interesting to use alternative variables (other than dichotomous ones) for the outcome and causal factors. Instead of using whether firms export or not as an outcome, it may also be pertinent to analyse the weight of exports in total turnover, as well as quantitative indicators of innovation. Thus, instead of using the csQCA method, fsQCA or mvQCA could be applied to discover how far the results are similar.

Third, QCA is not a statistical technique for testing hypotheses in the sense of sample-to-population inference and formulating hypotheses about the different configurations of causal conditions obtained is ultimately challenging. However, our findings provide insights into the need to create more complex models relating innovation to internationalization. They also suggest the need to consider not only the isolated effects of each type of innovation but also the combined effects of different types of innovation when using alternative regression techniques to confirm the potential inhibiting/facilitating factors of internationalization and the stability of their effects during periods of economic growth, crisis, and recovery

Fourth, our study analyses the association between several types of innovation (as causal conditions) and internationalization. A possible extension of this research could explore the asymmetric causality characteristic of QCA (i.e., the causal

conditions that lead firms to avoid internationalization could differ from the opposite of the causal conditions that lead to internationalization). This analysis and the comparison of the results with our findings constitute complementary lines of research.

Fifth, our study does not identify those configurations of innovation activities facilitating international expansion that are more successful (e.g., in terms of economic and/or financial outcomes). Our study reveals that different configurations of causal conditions (paths) can lead to firm internationalization (equifinality), but it would be interesting to explore whether all the configurations identified in FFs and NFFs are related to similar economic and financial outcomes (e.g., in terms of profitability, market value, or productivity).

Finally, although our study highlights the existence of significant heterogeneity within the sample of FFs in terms of their innovative behavior, it does not tackle the root causes, for example, of their different governance structures. In this vein, recent studies have found that different dimensions of family governance can create disparities in FF innovation strategies (e.g., Scholes et al., 2021). Future studies may therefore help to unravel the potential effects that different dimensions of family governance have on heterogeneity in international FF innovation behavior under different environmental conditions. We might thus discover which governance structures are in fact the most effective for responding to drastically different environmental conditions.

4.9. REFERENCES

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5. CONCLUSIONS

5.1. GENERAL CONCLUSIONS

The purpose of this thesis has been to relate different types of innovation (technological and non-technological) with exports, as a decision of internationalization and the differences between family and non-family firms.

The revision of the literature has shown that there is a gap in the academic literature in the effect of innovation on internationalization. Prior research has focused on R & D mainly instead of focusing on innovation and its influence on internationalization. We consider the effect of different types of innovations (technological and non-technological) - on internationalization via export activity and explore the differences in that process between family and non-family firms.

The results obtained in this work showed that for a family Firm innovation has a positive and significant relationship on the propensity to export when variations are introduced in either product, process, or marketing innovation.

On the other hand, as it was observed in the general model, organizational innovation was not significant. It can be said that for the internationalization of Family Firms, when a company decides on investing in organizational innovation, it is more useful to invest in innovation in organization by itself than as part of a global innovation strategy combining the four different types of innovation. In that sense, our results differ from some previous research **(**Pino et al., 2016; Azar and Ciabuschi 2017; Véganzonès-Varoudakis and Plane, 2019) that showed that organizational innovations have both a direct and indirect effect (positive) on export behavior.

Regarding innovation in product and marketing, our result suggest that are more indispensable in the whole, as they boost the propensity to export as it was formerly suggested by different scholars such as Cassiman, Golovko, & Martínez-Ros (2010)

and Caldera (2010) related to product innovation, and, on the other hand Sentürk and Erdem (2008) and Salomon and Jin (2010) related to marketing innovation efforts. Additionally, and with a lower level of influence it appears process innovation, this coincides with some previous findings as in the work of Klepper (1996) who stated that process innovations are more frequent in later stages when production volumes significantly raise and, hence, can become more attractive for firms competing internationally, and, moreover, Cassiman et a. (2010) who stated that new process innovations are more efficient for a company to internationalize in later stage.

Additionally, our results go in line with some previous research as it is the case of some papers by Vernon (1966) and Cassiman, Golovko, & Martínez-Ros (2010) who focused on the study of innovation withing the life cycle process. In our view, it can be said that there is a natural process in the way Family Firms innovate, by introducing the different types of innovation at different stages, coming first product and marketing innovation, then process and finally organizational innovation. It can be a relevant contribution to the field as it might describe a kind of staging Family Firms follow in the way they make investments in innovation.

Moreover, this thesis contributes to the knowledge of a key aspect that has been ignored by past research: the idea of stability/instability in the impact that different innovation activities have on FFs and NFFs' internationalization decisions as a result of significant environmental turbulences. By using the csQCA approach we could show several equifinal solutions regarding different combinations of the sundry innovation activities that promote exports in FFs and NFFs.

As suggested by other researchers (Chesbrough & Rosenbloom 2002; Teece 1986, 2010), the results of this study show that none of the types of innovation per se is a necessary condition for firms to achieve internationalization via exporting. However, product innovation per se is enough to prompt firms to internationalise via exporting. Hence, this is the type of innovation that prevails. This is consistent with prior research that recognises the major role that product innovation generally plays in exporting behavior (e.g., Becker & Egger, 2013; Bernard & Jensen, 2004; Caldera, 2010; Carboni & Medda, 2020; Cassiman & Martínez-Ros, 2007; Nassimbeni, 2001; Tavassoli, 2018).

Another conclusion is the finding that there are several alternative combinations of innovation activities that are sufficient for internationalization, specifically three configurations for FFs and two configurations for the NFF subsample. Thus, our results show that the paths are somewhat dissimilar between FFs and NFFs. Specifically, the former have more alternative paths to internationalise by using different combinations of innovation activities. Furthermore, process innovation needs to combine with organizational or marketing innovation in order to export. This is interesting because it challenges the findings of a number of earlier studies (e.g., Cassiman & Golovko, 2010; Edeh et al., 2020), where process innovation is identified (using net-effects) as being positively related to, and a major determinant of, exporting. This may be, but our results reveal that firms also need to complement this innovation effort with innovative developments in other areas: marketing and organizational methods, respectively, in FFs, or solely organizational methods in NFFs. Our results therefore seem to be in consonance with prior studies (e.g., Edeh et al., 2020; Medrano-Saiz & Olarte-Pascual, 2016; Rodil et al., 2016), finding

complementarities among two or more types of innovation that help firms export more.

Another conclusion is related to the heterogeneity of FFs. In this regard, our results seem to provide support for the following two main arguments: first, FFs and NFFs certainly have distinctive characteristics, as they choose somewhat different paths or configurations for their innovation activities when they decide to internationalise via exporting. These findings are in line with the RBV, which suggests the existence of major disparities in terms of bundles of resources and capabilities between both types of firms and the greater relevance of marketing innovations in FFs (e.g., Binz et al., 2013; Sageder, Mitter, & Feldbauer-Durstmüller, 2018; Sciascia et al., 2012; Witkowski & Thibodeau 1999) when making their strategic decisions, and thus providing further evidence to justify their different behavior in entrepreneurial activities such as innovation. Second, in light of the greater number of paths leading to exports in FFs, it seems clear that these firms need to be considered as a heterogeneous group, and perhaps more so than NFFs. Our findings support the notion of family heterogeneity in terms of strategic goals (e.g., regarding exports) and resources used or activities carried out (e.g., innovation) to successfully achieve them. The study of heterogeneity among FFs has recently become an important research topic (e.g., Daspit et al., 2018; Neubaum et al., 2019; Rau et al., 2019; Stanley et al., 2019). Our study therefore contributes to this recent and lively debate on FF heterogeneity by specifically identifying an important source of such diversity (innovation) when deciding to expand abroad.

Importantly, our study also finds that the different configurations of innovation activities that prompt FFs and NFFs to export are not stable over time. Again, our findings support and also reinforce the notion of heterogeneity not only between FFs

and NFFs but also within the group of FFs in their response to drastic changes in environmental conditions, as different innovation paths are identified for FFs and NFFs in times of economic growth, crisis, and recovery. It is also interesting to note that product innovation is one of the preferred options, either individually or in combination with other types of innovations in times of growth, crisis, and recovery. However, our findings also reveal that both groups of firms, and even firms within each specific group, respond differently to different environmental conditions when deciding to export, with our findings highlighting the following: First, FFs use more combinations of innovation activities than NFFs in times of growth and crisis, and product innovation is always present in FFs in times of economic growth, which to some extent refutes the notion that FFs are more conservative than NFFs when investing in innovative activities. Second, FFs implement stricter cost-cutting and restructuring strategies (i.e., process and organizational innovations) during a crisis. Third, while international FFs and NFFs appear to approach the crisis quite differently in terms of innovative behavior, such behavior seems to become more similar in times of economic recovery. In fact, this is when there is greater parity in the innovative behavior of FFs and NFFs, in terms of both the number of configurations and the specific type of innovative activity carried out. However, a notable difference at this point is that unlike FFs, NFFs seems to keep trusting more on organizational innovations. Finally, the change in the number of configurations and the types of combinations of innovative activities conducted in each period considered (growth, crisis, and recovery) seem to be more radical in NFFs than FFs. In line with certain prior studies (e.g., Erdogan et al., 2020), this suggests that FFs' innovative behavior is more path-dependent than in the case of NFFs. Due to their

longer-term orientation, FFs tend to invest more steadily in innovation activities to compete abroad.

Ultimately, our findings suggest that the potential causal factors that lead firms to export are time- or context-dependent. Thus, our study suggests there is a need to control such dependency by testing the structural stability of empirical models. This is consistent with prior research that has called for the need to verify such dependence by testing the structural stability of the empirical models proposed (e.g., Vicente-Lorente & Zúñiga-Vicente, 2006). This is also in line with the arguments underpinning the dynamic capabilities approach that recognises the role of managers as key drivers of the creation, evolution, and recombination of different resources into new sources of potential competitive advantage (Eisenhardt & Martin, 2000; Henderson & Cockburn, 1994; Teece, Pisano, & Shuen 1997). Our study highlights the ability of managers (both in FFs and NFFs) to achieve new resource configurations in terms of innovation in order to promote exports as environmental conditions change. It is true that our study does not allow us to identify specific dynamic capabilities, but in light of our findings, it could be inferred that some of these dynamic capabilities might be related to innovation activities, and they will differ between FFs and NFFs.

5.2. GENERAL LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

This work has certain limitations, regarding chapter two it can be said that since it was focused on some particular features of family firms´ internationalization it

could be interesting to expand the scope of the research in future works to comprise more factor such as SEW or strategic capabilities.

Additionally, a second limitation is the fact that it has not been differentiated between the innovation strategies or ownership of leading and laggard firms (Cantwell and Mudambi, 2011). As most of the studies were about developed countries, therefore, for future studies it will be important to study this phenomenon in other types of countries, particularly those that are developing and emerging.

Also, it will be important to run a bibliometric analysis on the topic innovation-internationalization and concentration of property-internationalization and the moderating effect of innovation.

Regarding the third and fourth chapter one first limitation comes from using only data from Spanish manufacturing firms, thus it is suggested to use databases from countries and analysing service firms are a natural extension for this study. Secondly, it could be interesting to extend the period analysed as we only used data from 2007 to 2016, with longer time-series data it could be observed whether the behaviors described in this work are stable over time and over different types of crises apart from covid-19. Those larger samples with firms from other countries and longer timeframes, will enable us to understand and analyse innovation and internationalization pathways under different economic and financial conditions.

A second limitation of this part of the work was the use of dichotomous variables, therefore it will be interesting to use other alternative variables as for instance to analyse the weight of exports in total turnover, as well as quantitative indicators of innovation. Therefore, other methodologies can be used to contrast the samples for

instance fsQCA or mvQCA could be applied to discover how far the results are similar to when csQCA method is used.

In third place although the findings of this work provide insights into the need to create more complex models relating innovation to internationalization the nature of the methodology, it is not a statistical technique for testing hypotheses, impedes formulating hypotheses about the different configurations of causal conditions obtained is ultimately challenging. Therefore, it is also suggested the need to consider not only the isolated effects of each type of innovation but also the combined effects of different types of innovation when using alternative regression techniques to confirm the potential inhibiting/facilitating factors of internationalization and the stability of their effects during periods of economic growth, crisis, and recovery.

In fourth place, a possible extension of this research could explore the asymmetric causality characteristic of QCA (i.e., the causal conditions that lead firms to avoid internationalization could differ from the opposite of the causal conditions that lead to internationalization). This analysis and the comparison of the results with our findings constitute complementary lines of research.

In fifth, it would be interesting to explore whether all the configurations identified in FFs and NFFs are related to similar economic and financial outcomes (e.g., in terms of profitability, market value, or productivity), therefore identify which ones are more successful (e.g., in terms of economic and/or financial outcomes).

In sixth place, future studies may help to reveal the potential effects that different dimensions of family governance have on heterogeneity in international FF innovation behavior under different environmental conditions. We might thus discover which governance structures are in fact the most effective for responding

to drastically different environmental conditions. In this line, recent studies have found that different dimensions of family governance can create disparities in FF innovation strategies (e.g., Scholes et al., 2021).

5.3. REFERENCES

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