The Effects of Management Innovation on Export Performance

Iman Pirayandeh

Submitted in accordance with the requirements for the degree of
Doctor of Philosophy

The University of Leeds
Leeds University Business School
September 2021

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

Acknowledgments

I wish to express my sincere gratitude to my world-class supervisors Professor Keith Glaister, Professor Jim Love, and Professor Annie Wei for their constructive comments and suggestions, which helped me to considerably improve this thesis.

I would also like to appreciate independent reviewers' useful comments and critiques provided at the 46th European International Business Academy Annual Conference and the Academy of International Business Annual Conference 2020 and 2021.

Lastly, I would like to thank my family that has been always an incredible source of support and encouragement. This thesis is dedicated to you.

Abstract

While scholars have devoted great attention to exploring the link between a firm's innovation and export activities, most studies have concerned technological innovations, consequently the relationship between non-technological innovations, particularly management innovation, is under-explored. Management innovation is defined as "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals" (Birkinshaw et al., 2008, p.829). The thesis examines the role of management innovation at two distinct phases of export activities, namely, pre-export phase and actual export phase (post-export stage). Building on the link between productivity and exports, the first study argues that management innovation influences a firm's decision to start exporting through productivity growth and then activating the self-selection mechanism into export markets. The second study concentrates on the post-export phase and develops previously untested premises regarding export survival consequences of different configurations of management innovation. The third study centers on the phenomenon of "learning-by-exporting" and hypothesizes that the introduction of management innovation enables exporters to accrue more benefits *after* the foreign market entry in terms of technological innovativeness. To empirically examine proposed conjectures and theoretical arguments, this research applies sophisticated statistical and econometric tools allowing for the control of endogeneity that has been widely reported in prior innovation-export research. The significant findings are outlined as follows. Using a comprehensive data set of firms from 55 countries, most of which are emerging and developing economies, this thesis finds that higher productivity of exporters than non–exporters before entering into the export market can be explained by management innovation. Furthermore, by analyzing a unique longitudinal data set of Spanish firms it is observed that implementing management innovation matters to the survivability of firms in the export market only if it is coupled with the introduction of new products and processes. Meanwhile, individual and cumulative forms of management innovation are ineffective in and even unexpectedly harmful to the longevity of export operations. Finally, the empirical analysis of the same Spanish data set shows that the learning-by-exporting effects are considerably greater for exporters introducing management innovation than exporters that do not introduce management innovation.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AR	Auto regressive
CMP	Conditional mixed-process
CPI	Consumer price index
ESEE	Encuesta Sobre Estrategias Empresariales
GDP	Gross domestic production
GMM	Generalized method of moments
IB	International business
IV	Instrumental variable
LPM	Linear probability model
MI	Management innovation
MIS	Management information system
ML	Maximum likelihood
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary least square
R&D	Research and development
RBV	Resource-based view
SME	Small- and medium-sized enterprise
STS	Socio-technical system
SUR	Seemingly unrelated regression
TFP	Total factor productivity
WB	World Bank
WBES	World Bank Enterprise Survey

Chapter 1: Introduction

One of the major tenets of international business research is that the introduction of innovations can aid firms to outperform their rivals in today's global fast-paced business environment. Despite the fact that innovation is one of the widely studied topics in practitioner and academic outlets alike, research has traditionally approached firms' innovative activities as the introduction of technological innovations, i.e., product and process innovations (Crossan and Apaydin, 2010). However, rapid changes in technology and intensive competition in the international market may result in the competitive advantage created by the introduction of these innovation types to become relatively short lived (Heyden et al., 2018). This necessitates firms to look for other areas in which to innovate so that they can safeguard their competitive edge and stay ahead of the competition. Thus, it is essential to put effort into not only recognizing the effects of a firm's technological progresses on its international competitiveness, but also in exploring the consequences of new changes to the nature of management within the firm, i.e., management innovation.

Nevertheless, the review of the innovation-exports literature reveals that previous research has predominantly focused on exploring the role of technological innovations. This has led the relationship between non-technological innovations, especially, management innovation and export performance remains in question. This shortcoming in knowledge is worth addressing in great detail in that there are good reasons to believe that firms' export performance is influenced by management innovation. It is argued that management innovation is typically more systemic, less tangible, and more difficult to imitate than technological innovations (Damanpour, 2014). Hence, it is reasonable to assume management innovation is a source of competitive advantage (Barney, 1991; Teece, 2007), which may be leveraged in the increasingly competitive international business context and thereby affects firms' export performance. Furthermore, the very recent article of Bloom et al. (2021) on a sample of Chinese and U.S. companies, the world's two largest export economies, shows that better-managed firms attain higher export performance. Thus, one may expect that management innovation, as an effective way for the improvement in the quality of firms' management (Birkinshaw et al., 2008), can be linked with export performance of firms.

1.1 What Is Management Innovation?

Management innovation is defined by Birkinshaw et al. (2008, p.829) as "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals". Accordingly, management innovation manifests itself in a significant departure from traditional management practices (the routines that turn the ideas into actionable tools); in processes (what managers do as a part of their jobs); in structure (the way in which responsibilities are allocated); and in techniques (the procedures used to accomplished a specific task or goal) (Birkinshaw et al., 2008; Hamel, 2006; Volberda et al., 2013).

Management innovation differs from technological innovation in terms of scope. While management innovation is related to the novelties in the social structure of a firm and focuses on what managers do through changes in practices, processes, structures, or techniques (Evan, 1966; Kimberly, 1981), technological innovations are associated with changes in its technological domain and usually referred to as new products introduced to meet an external user need or new elements introduced into the firm's production processes (Damanpour and Aravind, 2012). Technological innovations are directly related to the primary work and activities of the firm and encompasses changes mainly in the operating system, management innovations are indirectly associated with primary work of the firm and influence mainly management systems (Damanpour and Evan, 1984). In other words, management innovation encompasses new changes in "the rules and routines by which work gets done inside the organization" (Birkinshaw et al., 2008, p.828).

Management innovation is an old concept that has seen a resurgence in recent academic outlets. One of the most prominent, classical examples of management innovation that became the predominant organizational structure for decades is the introduction of the multidivisional structure (the M-form) at DuPont and General Motors in the 1920s (Chandler, 1962). More recent examples of management innovation which point to the contemporary developments in this area are total quality management programs (TQM), ISO certificates, and the self-managed team (Volberda et al., 2013). Although the implementation of a change is a requirement for innovation, the change itself in a firm

does not constitute management innovation. Vaccaro et al. (2012) express that the firm may undergo considerable changes by downsizing, but these changes are not labeled as management innovation as long as its managerial arrangements remain unchanged. Therefore, genuine management innovation is introduced within the firm when it experiences a marked departure from traditional ways by which management works are undertaken (Hamel, 2006).

Administrative innovation and organizational innovation can be also referred to as management innovation. Damanpour (2014) asserts that notwithstanding different terms have been proposed by researchers to conceptualize the phenomenon of management innovation, the key components of their definitions overlap significantly (see Table 1.1). This thesis uses the term "management innovation" which has gained popularity in recent publications and applies Birkinshaw et al.'s (2008) definition. Considering the locus of innovation, management innovation is defined as new to the state of the art. Nonetheless, Birkinshaw and collegues note that new to the state of the art and new to the organization are "two equally valid points of view" (p.828) concerning the newness of management innovation. For this thesis, management innovation is defined as the state of the organization. Focusing on this level of analysis, enables this thesis to empirically examine a set of premises at the firm level on a much more sizable sample of firms (Vaccaro et al., 2012).

Table 1.1 Definition of management innovation in selected studies

Study	Term	Definition
Evan (1966)	**Administrative innovation**	" pertains to the recruitment of personnel, the allocation of resources, the structuring of tasks, of authority, of rewards and is related to the administrative core of the organization."
Damanpour and Evan (1984)	**Administrative innovation**	"Administrative innovations are defined as those that occur in the social system of an organization. […] it also includes those rules, roles, procedures, and structures that are related to the communication and exchange among people and between the environment and people."
Williamson (1975)	**Organizational innovation**	" pertains to the changes in organizational forms and refinements in organizational procedures."

Table 1.1 (continued)

Hamel (2006)	**Management innovation**	" a marked departure from traditional management principles, processes, and practices or a departure from customary organizational forms that significantly alters the way the work of management is performed."
Birkinshaw et al. (2008)	**Management innovation**	" the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals."

The implementation of management innovation necessitates owning specific capabilities which are not tradable in markets (Battisti and Iona, 2009). Moreover, management innovation is context-specific, intangible, and difficult to replicate (Damanpour and Aravind, 2012; Volberda et al., 2013). All these characteristics together make this innovation type as one of the most important sources of long-lasting competitive advantage (Hamel, 2006; Teece, 2007). Even though it is possible that a firm draws on novel management practices, processes, structures, or techniques that have been previously introduced elsewhere, the firm can successfully use these management initiatives if they are fully adapted to its own idiosyncratic organizational context (Abrahamson, 1996; Ansari et al., 2014). Thus, scholars emphasize that the true implementation of management innovation within firms is a complex, time-consuming process and involves internal as well as external change agents (Birkinshaw et al., 2008; Heyden et al., 2018). While internal change agents are an innovating firm's employees and managers who are proactive in driving the need for and experimenting with the new managerial arrangement in question, external change agents are independent consultants, academics and other external actors interested in developing and legitimizing the effectiveness of novel managerial processes (Mol and Birkinshaw, 2014).

Management innovation is usually concerned with improvement in the effectiveness and efficiency of firms' internal mechanisms (Hamel, 2006). It economically matters as it contributes to firms' performance and productivity (Walker et al., 2015) and thus helps economic well-being at the

macroeconomic level (Armbruster et al., 2008). Different theoretical approaches have been proposed by Birkinshaw et al. (2008) regarding the motivation for the introduction of management innovation, namely, rational, institutional, fashion, and cultural. Following previous work (e.g., Vaccaro et al., 2012), this thesis remains close to the rational perspective of management innovation. In this school, internal and external change agents intentionally drive the process of implementing novel management practices, processes, structures, or techniques in order to improve organizational performance.

1.2 Research Aim

Though management innovation, according to its definition, is driven within firms aimed at furthering organizational goals (Birkinshaw et al., 2008), surprisingly, very little scholarly attention has been given to recognizing the role of management innovation in the fulfilment of the firm's goals regarding exporting activities. These goals can be addressed in two different stages of export activities, namely, pre-export and post-export phases (Gkypali et al., 2021). Scholars elaborate on the distinction between pre-export and post-export phases by suggesting that the internationalization journey commences not when a firm actually enters the export market but in the pre-export stage (e.g., Welch and Wiedersheim-Paul, 1980). This stage is a stepping stone to the whole internationalization journey through exports as a firm in this phase evaluates its export-related capabilities and should make a strategic decision to implement, postpone or even abandon the plan of the foreign market entry (Tan et al., 2007). The pre-export phase might be followed by the export stage, i.e., post-export phase, when businesses have actually entered the export market. The main objective of this dissertation is to analyze the effects of management innovation in these two different stages of export operations.

The aim of this dissertation is to examine the role of management innovation in the pre-export phase and post-export phase.

The present work attempts to operationalize this objective by addressing the following research questions.

Research Question 1: How does management innovation influence exporting?

A large body of the literature has shown that innovation is an important factor in explaining the entry into foreign markets (Basile, 2001; Becker and Egger, 2013; Cassiman and Golovko, 2011; among others). Prior research has considerably advanced understanding of how the engagement in research and development (R&D) activities or introduction of technological initiatives, e.g., new products, processes, or patents, by a firm may affect its decision to start exporting. Nonetheless, to date, very little progress has been made in exploring knowledge of management innovation's effects on the export orientation of firms. Recognizing the effects of management innovation in the pre-export stage is meaningful in that introducing novelties in management practices, processes, structure, or techniques is widely known as a source of long-lasting competitive advantage (e.g., Birkinshaw et al., 2008; Hamel, 2006), which could also be leveraged in the complex context of the international business environment. Meanwhile, it is striking that management innovation and export literature has developed in isolation and the link between these two streams of scholarship is missing.

Research Question 2: How do different configurations of management innovation affect firms' export survival?

Although firms put a lot effort into finding a way into the export market and pass the pre-export phase, a considerable proportion of new exporting firms are found to be short-lived and prone to export failure (Albornoz et al., 2016; Blum et al., 2013). This might be explained by the fact that the internationalization poses extremely difficult challenges to the management of exporting firms: new entrant firms are exposed to today's increasingly intense competition of the global market, higher levels of financial risks, e.g., volatilities in exchange rate, political uncertainties, e.g., instability in trade laws, etc., all of which threaten a firm's export survival-the duration a firm continuously exports

(Love and Máñez, 2019). Identifying the determinants of export survival, particularly the role of firms' innovation activities, has become the subject of debate among scholars (e.g., Deng et al., 2014; Sui and Baum, 2014). However, these researchers have significantly contributed to the understanding of whether and how technological progresses of the firm influence its competitive position and survival in the export market. This means that we know very little about the effects of management innovation activities on the survivability of exporting firms. Nor do we know about export survival consequences of different configurations of management innovation.

Research Question 3: How do the effects of learning-by-exporting vary by the implementation of management innovation?

One of the most often cited reasons for the importance of studying the export survival of firms is that survival in the export market is a necessity for improving firm performance after entering the export market (Andersson and Lööf, 2009). The positive effects of exporting on two related dimensions of performance, i.e., productivity and innovativeness, at the post-export phase is a phenomenon that has been investigated under the banner of "learning-by-exporting" (Golovko and Valentini, 2014). In fact, exporters may enjoy superior productivity and innovativeness levels as exporting "tangible commodities facilitates the exchange of intangible ideas" (Grossman and Helpman, 1991, p.518). Exporting firms, however, do not equally learn from the overseas operations and there exists a variation in terms of learning-by-exporting effects across firms. Pioneering researchers have generated valuable insights into the origins of such heterogeneity by highlighting the vital role of Cohen and Levinthal's (1990) concept of absorptive capacity (e.g., D'Angelo et al., 2020; García et al., 2012; Xie and Li, 2015) and emphasizing the importance of industry conditions (Salomon and Jin, 2008). Despite the usefulness of these insights in a better understanding of why learning-by-exporting effects differ across firms, knowledge of how management innovation activities

of firms impact the effectiveness of exporting on firm technological innovativeness is scant in the extant literature.

In sum, the research gaps motivating this thesis and three research questions proposed accordingly are shown in Table 1.2.

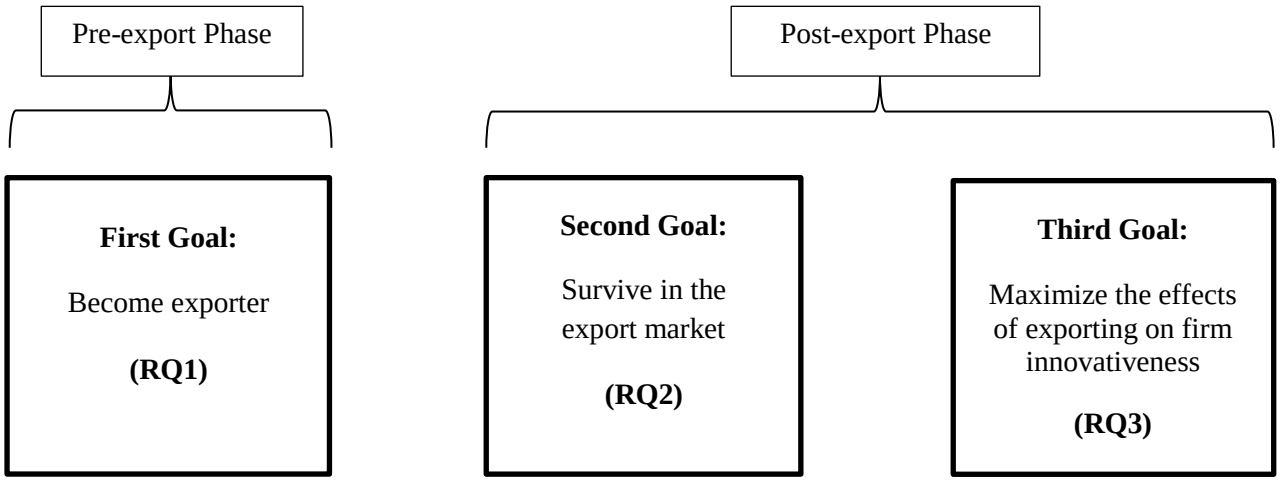
Table 1.2 Synopsis of literature gaps and research questions

Research Gap	Research Question
The effects of management innovation on firms' export status	**1:** How does management innovation influence exporting?
The effects of management innovation and its different configurations on firms' export survival	**2:** How do different configurations of management innovation affect firms' export survival?
The effects of management innovation on the exports-technological innovativeness link	**3:** How do the effects of learning-by-exporting vary by the implementation of management innovation?

Addressing these research questions is not only of importance for advancing knowledge of management innovation in the export literature but it holds significance for managers. As stated earlier, management innovation is aimed at furthering organizational goals. Export-related goals can be pursued by managers at two stages of export activities, i.e., pre-export phase and post-export phase (Gkypali et al., 2021). The authors assert that the primary goal that might be addressed by managers at the pre-export stage is that via developing capabilities and obtaining new competences the firm overcomes export barriers and becomes an exporter (first goal). Gkypali et al. (2021) further note that once a firm enters the foreign market, at the post-export phase, managers may set a new orientation, that is, to secure the competitive position, outdo rivals and extend the duration of export operations (second goal). If export activities continue successfully, managers may be able to address the goal of taking full advantage of knowledge flows in the export market and thus enhance the innovation

consequences of export operations as much as possible (third goal). By the completion of this dissertation and finding the answers to the three proposed research questions, this thesis offers mangers valuable perspectives on whether and how introducing novelties in management practices, processes, structure, or technique help the realization of their export-related goals. Figure 1.1 illustrates the relevance of research questions (RQs) to export-related goals.

Figure 1.1 The export-related goals



1.3 Thesis Structure

The rest of this thesis is composed of a literature review chapter and a research methodology chapter, followed by three empirical chapters, each of which addresses one of the three proposed research questions, and a closing chapter, summarizing significant findings from the three empirical chapters and discussing implications for academics and practitioners.

2. Literature review

This chapter presents core theories relating to the innovation-exports research. It also reviews the extant literature and displays pioneering researchers' findings concerning the association between innovation and exports.

3. Research methodology

This chapter explains why positivism is chosen as the underlying philosophical approach of this thesis. It discusses justifications for using the quantitative methodology for data analysis procedures. It also sets out the research methods adopted for the three studies.

4. – 6. Empirical chapters on three research questions

The first empirical study examines the effects of management innovation on the export decision of firms from 55 countries, most of which are from emerging and developing economies. The second empirical study centers on the notion of export survival and by using a Spanish dataset examines the effects of different configurations of management innovation on the longevity of export activities. The third empirical study focuses on the learning-by-exporting phenomenon and studies the moderating effects of management innovation on a sample of Spanish exporters.

7. Discussion and conclusion

This chapter summarizes the significant findings of the empirical studies. It then presents the theoretical and practical contributions of the thesis and its implications. This chapter also discusses the limitations of this dissertation and presents future research opportunities.

Chapter 2: Literature Review

2.1 Introduction

This chapter represents a fairly high-level overview on the innovation-exports literature. It is intended to discuss the current state of knowledge regarding the association between innovation and exporting and discover knowledge gaps leading to the three research questions addressed by this thesis. Each empirical chapter will later review the specific evidence relevant to each research question. This chapter is structured as follows. Section *2.2 The Link between Innovation and Exporting* discusses theoretical frameworks and prior empirical literature concerning the effects of innovation on export activities of firms. Section *2.3 The Link between Exporting and Innovation* reviews previous theoretical and empirical work about the influences of exporting on firms' innovativeness. Finally, section *2.4 Conclusion* explains how this thesis is connected to the previous innovation-exporting research.

2.2 The Link between Innovation and Exporting

Firms strategically invest in innovation as by improving products and services it enables them to meet the demand of the domestic market and also to begin overseas operations through exporting (Cavusgil and Knight, 2015). Innovation is considered the most important source of the creation of competitive advantage in the international business environment (Kotabe and Kothari, 2016), which can play a vital complementarity role with exports for sales growth (Golovko and Valentini, 2011). Hence, recognizing the effects of innovation on firms export activities has drawn widespread scholarly attention in the field of international business (e.g., Cassiman and Golovko, 2011), innovation (e.g., Roper and Love, 2002), marketing (e.g., Filipescu et al., 2013), economics (e.g., Caldera, 2010), and strategy (e.g., Salomon and Jin, 2010).

The theoretical basis for the relationship between innovation and exports is based on consolidated macro- and micro- level frameworks. The early theoretical debate on the innovation-export link was built on the insights of neo-endowment models (Davis, 1995). Research in the neo-

endowment school postulates that the variation of export performance across firms is mainly attributable to factor-based advantages: the endowment of a certain factor, e.g., skilled/unskilled labour, raw materials, or knowledge, may effectively contribute to a firm's competitiveness if the firm has the natural monopoly of the factor, or, for instance, is operating in a region wherein that particular factor is abundant (Ganotakis and Love, 2010). Other important macro-level conceptual approaches which have been extensively used by scholars to theorize the innovation-export relationship are technology based models such as the technology-gap theory of trade (Posner, 1961) and product life-cycle model (Vernon, 1966). The core argument of these models is that firms' in advanced economies are able to develop new differentiated products or services, driving the internationalization process of firms through the export of innovative products to less-developed economies. When these theoretical macro-level perspectives are applied at the micro-level, it suggests that innovation activities facilitate the foreign market entry procedure, confer a greater market power and ultimately result in superior export performance (Roper and Love, 2002).

Apart from macro-level models, the relationship between innovation and exporting has been studied in a more specific manner from micro-level perspectives. An important theoretical framework that has been highly helpful in explaining why innovation influences export performance of firms is Barney's (1991) resource based view of the firm (RBV). According to this theory, firms are different in terms of the possession of resources and capabilities which can be used for gaining and sustaining competitive advantage. Barney in his definition of the RBV emphasizes a particular resource has potential to generate sustainable competitive advantage only if it meets four specific conditions: it must be valuable, rare, non-substitutable, and inimitable. A firm's technological resources, in particular, have been widely argued to fulfil these conditions and thus give it superior advantage and a higher capacity to access export markets (Beleska-Spasova et al., 2012; Dhanaraj and Beamish, 2003; Oura et al., 2016; among others). Firms replete with technological resources are able to design new products with higher quality (Cho and Pucik, 2005). By offering high-quality products which can better satisfy foreign customers' needs, this allows them to implement a product differentiation strategy and gain international competitiveness (Zahra and Covin, 1994). As highlighted by Styles and

Ambler (1994), providing new unique products with superior quality is a necessity for success in overseas operations. Also, firms owning technological resources are more likely by developing novel more efficient production processes to gain cost advantage and compete with other firms in the international market in terms of price by setting lower selling prices (Rodríguez and Rodríguez, 2005).

Furthermore, researchers assert that innovative firms are more inclined to enter the export market in pursuit of earning higher returns from investments in innovation activities (e.g., Pla-Barber and Alegre, 2007). One reason for this is that exports may lead to an increase in the firm's sales volume, thus costs of developing innovations, especially research and development (R&D) which to a large extent are fixed, are recouped on a larger number of units, that, in turn, causes exporting to become profitable for innovative firms (Alvarez and Robertson, 2004). Also, innovative firms that choose to operate purely in the domestic market may find it more difficult to accrue such returns from investments in innovation because either the domestic market is too small or it is quite costly in terms of time (Rodríguez and Rodríguez, 2005). This perspective on the innovation-exports association is consistent with Castellani and Zanfei's (2006) idea of "asset-exploiting", which constitutes one of the internationalization strategies of businesses. This strategy might be addressed by a firm to develop new markets for its existing product portfolio and it is used in the innovation literature to refer to the export of innovations introduced by the firm (Tavassoli, 2018).

The review of the literature suggests that examining the effects of innovation on firms exporting activities has long been subject to empirical analyses in a wide range of academic disciplines. The innovation-exports literature by using various indicators of technological innovation activities, including R&D, product or process innovation, and patents, has provided plenty of evidence that supports the validity of theoretical arguments regarding the positive effects of innovation on export performance of firms (see Table 2.1). Nonetheless, a limited number of researchers report firms' innovative endeavors are not significantly associated with export activities (e.g., Ayllón and Radicic, 2019; Faustino and Matos, 2015; Gashi et al., 2014; Lefebvre et al., 1998) or even, unlike the

prevailing wisdom, adversely influence exporting operations (e.g., Deng et al., 2014; Wakelin, 1998; Roper and Love, 2002; Tavassoli, 2018).

2.2.1 Innovation and Selection into Exporting

Prior macro- and micro-level conceptual models aligned with the rich empirical literature have significantly contributed to the understanding of how innovation influences exporting, although they did not clearly differentiate between the direct and indirect relationships between innovation and exporting. Based on the established link between productivity and fixed costs of foreign market entry, researchers have developed conceptual frameworks connecting the decision to start exporting to productivity differences across firms before entry into the export market (e.g., Clerides et al., 1998; Roberts and Tybout, 1997). For instance, Melitz (2003) develops a model of industry dynamics involving heterogonous firms, i.e., firms with different levels of productivity. According to this model, because the process of foreign market entry incurs significant sunk costs, only more productive firms which have sufficiently low marginal costs have profits large enough to afford these costs and self-select into the foreign market. The importance and existence of the "self-selection" is highlighted and evidenced by Wagner's (2007) comprehensive literature review on 54 micro-based articles on exporting published between 1995 and 2006. The author finds overwhelming evidence suggesting that future exporters, relative to non-exporters, are more productive years before the export commencement, and typically have higher growth rates of productivity at the pre-export phase.

But how do firms become more productive to self-select and start selling abroad? Melitz (2003) assumes the productivity level of firms is exogenously determined. For instance, severe demand shocks resulting from changes in consumer tastes may influence productivity of firms. This assumption, however, might be considered as the shortcoming of Melitz's model because little room is left in this model for a firm's planned strategies and activities for the improvement of productivity before the self-selection into the export market. In the follow-up research, Bustos (2011) redresses this shortcoming and extends Melitz's framework by endogenizing exogenous productivity discrepancies of firms. Bustos (2011) proposes that higher productivity of exporters before foreign

market entry stems from random exogenous draws as well as their prior deliberate engagement in productivity-enhancing activities such as investments in product innovation (upgrading their technology) and process innovation (reducing the marginal cost of production).

The preceding theoretical discussion implies that innovation might affect export activities through an indirect channel: innovation enhances firm productivity, and more productive firms select into exporting. The empirical investigation in line with the theoretical model confirms the existence of the indirect relationship between innovation and firms' export propensity (status). Perhaps the most prominent and thought-provoking work is the article of Cassiman and Golovko (2011). The researchers examine the effects of innovation on export propensity of small- and medium-sized Spanish enterprises (SMEs) and report that product innovation not only directly influences firms' decision to start exporting due to the differentiation and higher quality, but it also enhances the productivity level of firms and subsequently leads to the self-selection into the export market. The authors further find evidence suggesting that firms which pursue the internationalization goal through exports have a specific strategic intention to invest in product innovation in order to attain higher productivity at the pre-export phase, i.e., conscious self-selection or learning-to-export.

The recent study of Gkypali et al. (2021) lends further credence to the significance of innovation in enhancing firms' productivity and preparing for self-selection. The authors by analyzing a sample of UK SMEs show that, unlike the prevailing view, non-exporting firms are heterogeneous in terms of export capabilities and accordingly they can be classified into two categories: domestically focused firms and export capable firms. Not having benefitted from productivity gains after the commencement of export operations[1], export capable firms, which have not yet become an exporter, are found to be significantly more productive than their domestic peers and hence more likely to self-select. Gkypali et al. (2021) find that this productivity premium can be explained by export capable firms' earlier strategic engagement in innovation activities, in particular, process innovation aimed at strengthening productivity performance before starting overseas operations through exports.

[1] The implications of exporting for firms' productivity and innovativeness will be fully discussed in Section 2.3.

The debate above implies that researchers have put a lot of effort into theorizing and empirically examining the complex association between innovation and exports. Meanwhile, it is striking that most anecdotal evidence and theoretical arguments have to date concerned technological innovation activities' input, i.e., R&D, or output, i.e., new products and processes, or patents. The literature review of this thesis, consisting of 71 published articles (see Table 2.1), evidently indicates that except for a few recent studies that have taken account of management innovation's effects in the analysis of the innovation-exports relationship, in general, this long-standing literature has been dominated with research that has traditionally tended to investigate the consequences of technological innovation activities on firms' export performance. However, exploring the effects of management innovation on export performance of firms merits much more scholarly attention. The important, recent study of Bloom et al. (2021) on Chinese and American firms, the world's two largest export economies, shows that improvements in the management of firms contributes to attaining superior export performance. Hence, there are good reasons to expect that management innovation, as an instrumental means for improving the management of firms, may play a key role in boosting export performance.

As Table 2.1 demonstrates, the effects of management innovation on export performance have begun to gain more scholarly evaluation in recent years. Previous studies in this nascent strand of the innovation-exports literature has investigated the effects of management innovation and various measures of export performance, though contradictory empirical results have so far emerged from this growing body of research. The positive effects of management innovation on the subjective measure of export performance have been documented in the study of Azar and Ciabuschi (2017) and Azar and Drogendijk (2016), for Swedish firms, and Prange and Pinho (2017), for Portuguese SMEs. Nonetheless, Radicic and Djalilov (2019) do not find a significant relationship between management innovation and export intensity (export levels over sales) in a sample of SMEs from the European Union (EU) states. Bortoluzzi et al. (2018) by using primary data collected from firms operating in 4 European economies test the nexus between management innovation and the breadth of exports (the number of regions/ countries the firm exports to) and observe the existence of a non-linear (J-shaped)

association. Yet, despite valuable insights generated by these studies into the burgeoning management innovation-export performance research, none of them examines how firms' strategic decision to start exporting (export propensity), at the pre-export phase, is affected by management innovation (Research Question 1).

Furthermore, the review of the literature illustrates that relatively little attempt has been made in recognizing the relationship between innovation and export survival – the duration a firm exports (e.g., Deng et al., 2014; Love and Máñez, 2019; Sui and Baum, 2014). Although these authors' work by exploring the effects of product innovation, process innovation, and patenting on firms' endurance of export operations have taken the debate on the association between innovation and exporting further, the verification of whether and how management innovation and its different configurations impact firms' survivability at the actual export phase is scarce (Research Question 2).

2.3 The Link between Exporting and Innovation

Researchers have extensively argued that the direction of causality can run from exporting to innovation. The theoretical underpinning of this notion comes from global economy models of endogenous innovation and growth such as those proposed by Romer (1990) and Grossman and Helpman (1991). According to Ganotakis and Love (2010), the channels for such a reverse causal relationship are threefold. First, since competition in the international market is more intense than the home market, to stay ahead of the competitors, exporting firms need to invest more in R&D activities in order to upgrade products and new processes. Second, economies of scale or static efficiency gains effects (Silva, A. et al., 2012). As stated earlier, starting export operations extends the market over which margins can be earned. In the meantime, the costs of introducing innovations, in particular R&D costs, are to a larger extent fixed, which can be spread over a larger number of units, resulting in improved productivity providing, greater incentives for more investments in innovation activities. Third, the learning-by-exporting phenomenon suggests that exporting exposes firms to a wider variety of market and technological knowledge from different cultures and countries. By gaining superior

access to diverse portfolios of foreign knowledge that are not available in the domestic market allows exporting firms develop new production processes or introduce new products.

While not all effects of exporting on firms' innovativeness refer to learning-by-exporting, the review of the literature indicates that prior researchers have directed great attention to exploring this complex phenomenon (see Table 2.2). Nevertheless, it is worth noting that a substantial body of the learning-by-exporting literature has primarily examined the effects of exporting on firms' productivity (see Silva, A. et al., 2012). This stream of the literature argues that the foreign knowledge an exporting firm acquires from overseas operations can manifest itself in productivity improvements after the entry into the foreign market. Indeed, exporting is a knowledge-transmission channel through which market-related and technological-related knowledge can be gained and then used for the reduction of inefficiencies and to stimulate the renewal of production processes (Andersson and Lööf, 2009). Despite the theoretical consensus on the effects of exporting on firms' productivity, studies empirically examining the exports-productivity association have yielded conflicting results. Evidence on the positive effects of exporting on firms' productivity is found in the studies of a number of scholars, such as García et al. (2012), Love and Mansury (2009), Van Biesebroeck (2005). Nonetheless, other researchers do not observe such effects (e.g., Arnold and Hussinger, 2005; Castellani, 2002; Greenaway et al., 2005). One possible explanation for such mixed findings is that there exist a myriad of factors besides exporting determining a firm's productivity level, which make capturing the pure effects of learning-by-exporting on productivity of the firm difficult (Gkypali et al., 2021). For example, an exporting firm's productivity growth can be the result of accompanying training programs for employees or changes in organizational routines rather than learning-by-exporting.

As articulated earlier, the review of the learning-by-exporting literature shows that researchers have also studied the effects of exporting on firms' innovativeness, which is argued to be a better measure of learning outcomes of firms (Love and Ganotakis, 2013). Displayed in Table 2.2, there are numerous studies pointing to the contributory role of exporting in firms' technological

innovation activities, whereas a number of researchers do not observe learning-by-exporting effects. For example, Salomon and Shaver (2005) find that the start of export operations leads to an ex-post improvement in the number of product innovations introduced and patent applications filled by Spanish firms. Analogously, using a sample of Spanish enterprises, Golovko and Valentini (2014) observe that participation in the export market increases the likelihood of being both a product or process innovator. In contrast, Girma et al. (2008) test the two-way relationship between R&D and exporting by using firm-level datasets from Britain and Ireland and find that only Irish exporters are more likely to be involved in R&D activities after foreign market entry. Ren et al. (2015) examine the learning-by-exporting hypothesis on a sample of Chinese SMEs and report that the intensity of export activities has no significant effects on exporting firms' yearly number of patent applications.

Despite the usefulness of insights offered by previous studies in providing a better understanding of the learning-by-exporting phenomenon and its effects on the innovativeness of firms, the literature suffers from important shortcomings. As Table 2.2 illustrates, there is ample research documenting the impacts of exporting on the input of technological innovation, i.e., R&D, or its outputs, i.e., product innovation, process innovation, or patents. Nevertheless, the exports-management innovation nexus has not been adequately tested under the banner of learning-by-exporting. Build on the reference group framework, Mol and Birkinshaw (2009) derive and test hypotheses about the antecedents of management innovation while controlling for the possible effects of firms' export intensity on management innovation in their empirical investigation. Mol and Birkinshaw observe that, contrary to their expectations, the intensity of export activities does not play much of a role in the propensity of introducing new management practices within a sample of UK firms.

Moreover, the inconclusive and inconsistent empirical findings on the effects of exports on technological innovation activities (or productivity) suggests that there might be moderating factors that facilitate or hinder a firm's ability to utilize the flow of foreign knowledge it encounters at the actual phase of exporting. Researchers acknowledge that some firms are better at learning from

overseas operations and thus recognize the moderating effects of a number of industry- and firm-level variables. Salomon and Jin (2008), for instance, investigate the effects of industry heterogeneity and report that Spanish exporters operating in technologically leading industries are more likely to engage in patenting than exporters functioning in lagging industries. Studies looking for firm-level moderators, through the lens of the RBV, have typically focused on the unequal distribution of technological capabilities across firms and hence underscore the importance of Cohen and Levinthal's (1989) concept of absorptive capacity in explaining why some exporters are more innovative than others (e.g., D'Angelo et al., 2020; García et al., 2012; Salomon and Jin, 2010; Xie and Li, 2015). Such a focus on the notion of absorptive capacity implies that the moderating impacts of other firm-level factors, such as management innovation, on the relationship between exports and technological innovativeness are still somewhat poorly understood (Research Question 3).

2.4 Conclusion

In summary, this chapter has sought to present a review of the innovation-exports literature. The literature review illustrates that scholars have traditionally tended to focus on exploring the association between technological innovation activities and export performance. This means that little is known regarding the relationship between management innovation and export performance of firms. This thesis addresses this void in knowledge while it is connected to previous research in three ways: i) examining the effects of management innovation on export propensity of firms; ii) exploring export survival consequences of different configurations of management innovation; iii) investigating the moderating effects of management innovation on the exports-technological innovativeness link.

The next Chapter (Research Methodology) describes the research design supporting the three empirical studies presented in Chapters 4, 5, and 6 of this thesis.

Table 2.1 A summary of previous research on the effects of innovation on exports

	Author	Context	R&D	Product or Process innovation, Patent	Management innovation	Export performance measure	Significant findings
1	Lefebvre et al. (1998)	Canadian firms	✓			Export propensity Export intensity	Insignificant (IN. hereafter)
2	Wakelin (1998)	UK firms		✓		Export propensity	Negative effect (-NE hereafter) on export propensity
3	Sterlacchini (1999)	Italian firms	✓	✓		Export propensity Export intensity	Positive effects (+ PE hereafter), not all innovation indicators statistically significant
4	Becchetti and Rossi (2000)	Italian firms	✓	✓		Export propensity Export intensity	IN. for R&D +PE for innovations
5	Basile (2001)	Italian firms		✓		Export propensity Export intensity	+PE
6	Nassimbeni (2001)	Italian firms		✓		Export intensity	+PE
7	Sterlacchini (2001)	Italian firms	✓	✓		Export propensity Export intensity	+PE innovations IN.R&D
8	Bleaney and Wakelin (2002)	UK firms		✓		Export propensity	+PE
9	Roper and Love (2002)	German and UK firms	✓	✓		Export propensity Export intensity	+PE product innovation on propensity but not intensity -NE R&D
10	Barrios et al. (2003)	Spanish firms	✓			Export propensity Export intensity	+PE
11	Dhanaraj and Beamish (2003)	Canadian and US firms		✓		Export inetnsity Export breadth	+PE
12	Özçelik and Taymaz (2004)	Turkish firms	✓	✓		Export intensity	+PE for innovations except process innovation
13	Yang et al. (2004)	Taiwan firms	✓			Export propensity	+PE
14	Flor and Oltra (2005)	Spanish firms	✓			Subjective export performance	IN.

Table 2.1 (continued)

15	Rodríguez and Rodríguez (2005)	Spanish firms	✓	✓		Export propensity Export intensity	+PE for innovations except R&D
16	Lachenmaier and Wößmann (2006)	German firms	✓	✓		Export intensity	+PE
17	Pla-Barber and Alegre (2007)	French firms		✓		Export intensity	+PE
18	Tomiura (2007)	Japanese firms	✓			Export propensity	+PE
19	Girma et al. (2008)	UK and Irish firms	✓			Export propensity Export intensity	IN. British firms +PE Irish firms
20	Harris and Li (2008)	UK firms	✓			Export propensity	+PE
21	Filatotchev et al. (2009)	Chinese firms	✓			Export propensity	+PE
22	Filatotchev and Piesse (2009)	French, German, Italian, UK firms	✓			Export intensity	+PE
23	Caldera (2010)	Spanish firms	✓	✓		Export propensity	+PE
24	Cassiman et al. (2010)	Spanish firms		✓		Export propensity	+PE product innovation IN. process innovation
25	Damijan et al. (2010)	Slovenian firms		✓		Export propensity	IN. product and process innovations
26	Ganotakis and Love (2010)	UK firms		✓		Export propensity Export intensity	+PE
27	Ito and Lechevalier (2010)	Japanese firms	✓			Export propensity Export intensity	+PE on export propensity IN. on export intensity
28	Añón Higón and Driffield (2011)	UK firms		✓		Export propensity	+PE
29	Aw et al. (2011)	Taiwanese firms	✓			Export propensity	Mutually reinforcing postive effects
30	Braymen et al. (2011)	US firms	✓			Export propensity	+PE
31	Cassiman and Golovko (2011)	Spanish firms		✓		Export propensity	+PE product innovation IN. process innovation
32	Golovko and Valentini (2011)	Spanish firms		✓		Export propensity	Innovation and exports reinforce eachother

Table 2.1 (continued)

33	Beleska-Spasova et al. (2012)	British firms		✓		Subjective export performance	+PE
34	Monreal-Pérez et al. (2012)	Spanish firms	✓	✓		Export propensity	+PE innovations IN. R&D
35	Becker and Egger (2013)	German firms		✓		Export propensity	+PE product innovation + PE process innovation if it is introduced with product innovation
36	Boso et al. (2013)	Firms from Ghana and Bosnia		✓		Export sales	+PE
37	Esteve-Pérez and Rodríguez (2013)	Spanish firms	✓			Export propensity	+PE
38	Filipescu et al. (2013)	Spanish firms	✓	✓		Export breadth Export intensity	+PE R&D and process innovation IN. product innovation
39	Wang et al. (2013)	Chinese firms	✓	✓		Export intensity Export sales	+PE
40	Yi et al. (2013)	Chinese firms		✓		Export intensity	+PE
41	Deng et al. (2014)	Chinese firms		✓		Export survival	-NE
42	Gashi et al. (2014)	Firms from transition economies	✓			Export propensity	IN.
43	Sui and Baum (2014)	Canadian		✓		Export survival	+PE
44	Cirera et al. (2015)	Brazilian firms	✓	✓		Export diversification	+PE
45	Faustino and Matos (2015)	Portuguese firms	✓			Export propensity	IN.
46	Fernández-Mesa and Alegre (2015)	Italian and Spanish firms		✓		Export intensity	+PE
47	Fryges et al. (2015)	German firms	✓			Export intensity	+PE
48	Máñez et al. (2015)	Spanish firms	✓			Export propensity	+PE
49	Azar and Drogendijk (2016)	Swedish firms		✓	✓	Subjective measure of export performance	+PE management innovation

Table 2.1 (continued)

50	Lewandowska et al. (2016)	Polish firms		✓		Export intensity	+PE
51	Love et al. (2016)	UK firms		✓		Export intensity Export breadth	+PE on export breadth
52	Oura et al. (2016)	Brazilian firms		✓		Subjective export performance	+PE
53	Rodil et al. (2016)	Spanish firms	✓			Export propensity Export intensity	IN. R&D
54	Azar and Ciabuschi (2017)	Swedish firms		✓	✓	Subjective measure of export performance	+PE management innovation
55	Azari et al. (2017)	Norwegian firms		✓		Subjective export performance Export breadth	+PE for product innovation -NE for process innovation
56	Di Cintio et al. (2017)	Italian firms	✓			Export intensity	+PE
57	Prange and Pinho (2017)	Portuguese firms			✓	Subjective export performance	+PE management innovation
58	Silva et al. (2017)	Portuguese firm		✓		Subjective export performance	+PE
59	Blyde et al. (2018)	Chilean firms		✓		Export sales	+PE
60	Bortoluzzi et al. (2018)	Firms from 4 EU countries		✓	✓	Export breadth	Curvlinear effects
61	Carboni and Medda (2018)	Firms from 7 EU countries	✓			Export propensity	+PE
62	Dohse and Niebuhr (2018)	German firms		✓		Export propensity	+PE product innovation IN. process innovation
63	Tavassoli (2018)	Swedish firms	✓	✓		Export propensity Export intensity	+PE product innovation -NE R&D
64	Ayllón and Radicic (2019)	Spanish firms	✓	✓		Export propensity	IN.
65	Falk and de Lemos (2019)	Austrian firms	✓			Export propensity	+PE
66	Love and Máñez (2019)	Spanish firms		✓		Export survival	+ PE patent and process innovation IN. product innovation

Table 2.1 (continued)

67	Radicic and Djalilov (2019)	Firms from 28 EU countries		✓	✓	Export intensity	+PE product and process innovations IN. management innovation
68	Saridakis et al. (2019)	UK firms		✓		Export propensity	+PE
69	Véganzonès-Varoudakis and Plane (2019)	Indian firms	✓			Export intensity	+PE
70	Gkypali et al. (2021)	UK firms		✓		Export propensity	+PE
71	Wu, L. et al. (2021)	Chinese firms		✓		Export propensity Export intensity	+PE

Table 2.2 A summary of previous research on the effects of exports on innovation

	Author	Context	Export performance measure	R&D	Product or Process innovation, Patent	Management innovation	Significant findings
1	Zhao and Li (1997)	Chinese firms	Export intensity	✓			+PE
2	Alvarez and Robertson (2004)	Chilean and Mexican firms	Export intensity	✓	✓		+PE
3	Salomon and Shaver (2005)	Spanish firms	Export propensity		✓		+PE
4	MacGarvie (2006)	French firms	Export propensity		✓		IN.
5	Liu and Buck (2007)	Chinese firms	Export intensity		✓		+PE
6	Aw et al. (2008)	Taiwanese firms	Export propensity	✓			+PE
7	Girma et al. (2008)	British and Irish firms	Export propensity	✓			IN. British firms +PE Irish firms
8	Salomon and Jin (2008)	Spanish firms	Export propensity Export volume		✓		+PE
9	Mol and Birkinshaw (2009)	UK firms	Export intensity			✓	IN.
10	Wang and Kafouros (2009)	Chinese firms	Export intensity		✓		+PE
11	Criscuolo et al. (2010)	UK firms	Export propensity		✓		+PE
12	Damijan et al. (2010)	Slovenian firms	Export propensity		✓		+PE
13	Salomon and Jin (2010)	Spanish firms	Export propensity		✓		+PE
14	Harris and Moffat (2011)	UK firms	Export propensity	✓			+PE
15	Bratti and Felice (2012)	Italian firms	Export propensity		✓		+PE
16	Filipescu et al. (2013)	Spanish firms	Export intensity Export breadth	✓	✓		+PE
17	Love and Ganotakis (2013)	UK firms	Export propensity Export intensity		✓		+PE
18	Ren et al. (2015)	Chinese firms	Export intensity		✓		IN.
19	Xie and Li (2015)	Chinese firms	Export propensity		✓		+PE
20	Tse et al. (2017)	Chinese firms	Export volume	✓			+PE
21	Fassio (2018)	Firms from 5 EU countries	Export propensity		✓		+PE

Table 2.2 (continued)

22	Xie and Li (2018)	Chinese firms	Export intensity		✓		+PE
23	Genc et al. (2019)	UAE firms	Subjective export performance		✓		IN.
24	D'Angelo et al. (2020)	Italian firms	Export propensity Export intensity Export breadth		✓		+PE

Chapter 3: Research Methodology

This chapter presents an overview of the methodology concerning the three empirical studies of this thesis. It discusses the philosophical underpinnings of the research design and explains the common methodological approach of this thesis for conducting the three following empirical studies.

3.1 Philosophical Approach

The philosophical foundations of the quantitative methodology of this thesis come from the philosophy of positivism. Building on the important insights of leading empiricist philosophers, e.g., John Lock (1632-1704) and David Hume (1711-1776), positivist philosophers are proponents of the notion that knowledge is derived from sensory experience. For positivists also Algebra is the formal language of expressing theoretical propositions. Halfpenny (1982) stresses that the greatest advantage of Algebra which attracts positivist philosophers is that it permits the accurate articulation of complex relationships between components of a theoretical statement by means of content free symbols. As a result, the truth or falsity of theoretical statements, translated into Algebra, can be verified by inputting empirical observations (experience) into mathematical formulas. A sticking point among positivist philosophers, however, is the method by which the truth or falsity of a verified theoretical proposition (theory) can be generalized in order to become a "universal law".

One group of positivist philosophers who were known as the "Vienna Circle" maintained that induction is the only way through which the truth or falsity of a theory can be generalized. A scientist by collecting systematically a set of true empirical observations can induce that the theory is also universally true. This school, however, was later seriously critiqued by Popper (1959). He emphasizes any inferences through the induction method is wrong as a limited number of true observations do not suffice to infer that the theory is also universally true. In fact, human understanding about the nature of the world is quite little and thus an exception rejecting the truthfulness of the theory is always likely to be found. Instead, Popper proposes the theory of falsification. He asserts that as scientists are

critical, they are looking for evidence to prove that existing theories are incorrect. In Poppers' perspective, what scientists should do is that by finding an exception falsify the established theory and show it is wrong deductively (Van Witteloostuijn, 2016).

Popper (1959) believes that scientific progress evolves by bold conjectures and critical refutations. He further proposes a trial and error procedure, i.e., the hypothetical-deductive method, which can be applied by scientists to develop and test empirically falsifiable hypotheses regarding a theory. If the test results show the theory is incorrect, in other words, empirical observations indicate the theory's predictions are incorrect, it is deduced that the theory subjected to test is false. In these circumstances, scientists should work on developing new theories which can better fit empirical observations (Van Witteloostuijn, 2016). Noteworthy, in Popper's opinion, a theory is never verified. Even if empirical observations support the hypothesis, i.e., observations are in accordance with the theory's predictions, the theory is not verified, but it is corroborated and left to further examination that may refute it.

Building on the principles of the positivism philosophy, this thesis tests the applicability of theoretical frameworks which have been developed and used by pioneering researchers to explain the technological innovations-exports relationship in the context of a specific type of non-technological innovation, namely, management innovation. To do so, this thesis applies a hypothetical-deductive method. Hence, by developing new hypotheses and using datasets (empirical observations), this thesis examines whether the association between management innovation and export performance of firms can be also explained by the extant theoretical frameworks. If hypotheses are confirmed, conceptual models subjected to the empirical examination are corroborated and generalized. Otherwise, it is deduced that these models cannot be generalized and new conceptual models are needed to theoretically explain the management innovation-exports link. At this situation, it can be also concluded that theoretical models on the relationship between innovation and exporting were generated under certain conditions and their applicability may be limited at new, different situations (Cuervo-Cazurra et al., 2016).

3.2 Quantitative Research Methodology

The key element of Popper's notion of falsification is that a theory is generalized by means of deduction. In line with this idea, this thesis adopts a deductive approach and attempts to recognize generalizable, explanatory, casual relations. The characteristics of the deductive research approach have been extensively discussed by methodologists (e.g., De Vaus, 2001; Saunders et al., 2007). This approach is used for theory development by means of rigorous tests. Unlike the inductive approach which moves from empirical observations to the theory and aims to theory building, the deductive approach moves from the theory to the data and intends to test the existing theory. Through the inductive reasoning a scientist explains *why* something happens, whereas a researcher adopting deduction strives to describe *what* is happening. Deduction is applied when the researcher wishes to establish causal links between variables. The deductive part of this thesis allows for testing empirically theoretically-derived premises on the role of management innovation at pre- and post-export stages of exporting. Hence, this thesis by adopting the deduction approach establishes a causal relation between management innovation and exporting and thereby advances knowledge of *what* is happening between a firm's innovative endeavors and export activities.

A study which commences from the deduction position pursues the goal of testing empirically hypotheses regarding the theory, therefore, concepts in the study should be operationalized quantitatively (Ghauri and Grønhaug, 2010). The quantitative methodology in business and management studies is a synonym for the process in which the researcher should deal with and use numerical data which is typically gathered by means of questionnaires, and analyzed via statistical and mathematical techniques (Saunders et al., 2007). In contrast, the qualitative methodology is a synonym for the process in which data collection is done via interviews and other forms of direct interactions with employees, managers, or other firm stakeholders, non-numerical data is usually utilized or generated, and the researcher's focus is on data categorization (Beugelsdijk et al., 2020). In discussing differences between quantitative and qualitative methods, Small (2011, p.59) elaborates that

‘‘the quantitative versus qualitative opposition has been used to contrast many kinds of alternative studies: large-n versus small-n, nomothetic versus idiographic, causal versus interpretive, variable-based versus case-based, explanatory versus descriptive, probabilistic versus deterministic, and numerous others.”

Thus, quantitative methods enables the researcher to empirically test whether theoretically-derived associations hold on a large number of individuals, firms, or countries (Cuervo-Cazurra et al., 2016). The quantitative methodology of this thesis seeks to test empirically different conjectures regarding the role of management innovation in export operations on a sizable sample of firms. Given the philosophical approach of the thesis, employing quantitative methods is also quite helpful in that they allow for testing the applicability of exiting theoretical frameworks in predicting management innovation’s effects at different stages of export activities and reporting the results of examination in a quantifiable manner.

This thesis is of an explanatory nature. Studies that aim to establish causal links between variables are termed “explanatory” (Saunders et al., 2007). Saunders and colleagues further state that whereas descriptive studies address the purpose of recognizing variables and should be considered as a means to an end, explanatory research is the end itself and aims to generate insights by the empirical examination of causal theoretical explanations between variables. Ghauri and Grønhaug (2010) emphasize that in explanatory studies researchers are faced with “cause-and-effect” problems and intend to develop causal relationships between variables. This thesis can be categorized as an explanatory study as it aims to test causal relationships between management innovation and firms’ export commencement and long-term survival in the foreign market. Also, this thesis examines whether management innovation could be the reason for the heterogeneous effects of learning-by-exporting phenomenon across firms.

3.3 Data Source

As noted earlier, the cornerstone of Popper’s hypothetical-deductive method is using empirical observations (data) to test hypotheses regarding the applicability of existing theories in a new context. Thus, to test theoretically-derived hypotheses on the relationship between management innovation

and export performance of firms, it is essential to use relevant observations (data) allowing for the operationalization of concepts and examination of theoretical propositions. Researchers in management and business studies may obtain that data needed for testing theory either by gathering new (primary) data, or using data that has been already collected by others (secondary data).

This thesis uses secondary data sets for empirical investigation. The advantages and disadvantages of using secondary datasets have been widely discussed by researchers (e.g., Cowton, 1998; Ghauri and Grønhaug, 2010; Saunders et al., 2007). According to these authors, using secondary data is advantageous in that the researcher may save enormous time and money. In general, primary data collection is much more expensive than using secondary data. Also, due to access problems to respondents or a low response rate, the process of gathering new data may lead to delay in the data analysis and consequently completion of the research project in the given timeframe. The other important reason for employing secondary datasets is that they are usually of a higher quality than new data gathered by the researcher him/herself. Because secondary data sets are typically collected by individuals specifically trained for the purpose of conducting surveys, the data collected by them is less likely to be affected by response bias and thus is of higher validity and reliability. On the other hand, the main disadvantage of secondary data set is that the data might have been collected for purposes that may not match the objectives of a certain research project. Therefore, the data might be inappropriate for answering research questions addressed by the researcher.

The role of management innovation at the pre-export phase (Chapter 4) will be studied in a comprehensive cross-sectional, firm-level dataset which comes from the World Bank Enterprise Survey (WBES). This survey has been conducted on a large number of firms in 135 countries since 2000, and it has a special focus on developing and emerging economies for data collection. This is of particular interest to this thesis because the review of the innovation-exports literature indicates that our knowledge regarding the role of management innovation in firms' export activities is scarce, let alone in the context of emerging and developing economies (see Chapter 2). The other advantage of using such a comprehensive database is that it can significantly contribute to the generalizability of

the empirical findings of this thesis. Also, the great diversity of countries in the final sample is, of course, very favorable for conducting research in the field of international business.[1]

The conjectures regarding the role of management innovation at the actual phase of exporting (Chapters 5 and 6) will be tested on a popular panel data set in the innovation-exports literature, that is, Spanish Survey of Business Strategies (ESEE). This data set has attracted scholars' attention because it contains very detailed information regarding firms' export and technological innovative activities. Interestingly, the question capturing management innovation was added to its questionnaire from 2007 and the last round of available data is 2016, leading to a 10-year period panel dataset. The main advantage of using a panel dataset is that it permits the study of change and development of a phenomenon (Saunders et al., 2007). Hence, the ESEE dataset is well-suited to investigating the effects of management innovation because the implementation of management innovation is gradually completed and thus its outcomes may need a longer time to appear (Mol and Birkinshaw, 2009). In addition, testing hypotheses regarding export survival and learning-by-exporting may essentially require employing panel datasets given the fact that both phenomena implicitly include an element of time.

The next chapter addresses the first research question of this thesis. It aims to examine the role of management innovation at the pre-export phase by investigating its effects on the decision of firms to start overseas operations through exports.

[1] The final sample size, data cleansing process, and variables will be fully discussed in each empirical chapter.

Chapter 4: Management Innovation and Internationalization through Exports

4.1 Introduction

" Over the past 100 years, management innovation, more than any other kind of innovation, has allowed companies to cross new performance thresholds" (Hamel, 2006, p.72). In fact, the relatively short-lived competitive advantage offered by technological and product innovation, intensified competition, and rapid, day-to-day changes in technologies have increased the importance of management innovation (hereafter MI) as an influential factor in the creation of a long-lasting competitive advantage (Heyden et al., 2018; Teece, 2010). Earlier studies on MI such as Chandler (1962), and more recent work by Birkinshaw et al. (2008), for instance, have explicitly illustrated how benefits of changes in the nature of management of a company go beyond its boundary when they redefine an industry by impacting the spread of novel ideas (Vaccaro et al., 2012). This has led to studies underlying the importance of MI as a fertile ground for introducing innovations that could produce a variety of benefits (e.g., Birkinshaw and Mol, 2006; Volberda et al., 2013). Birkinshaw et al. (2008, p.829) point out that MI is a particular case of organizational change and define it as "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals".[1] With respect to this definition, the "newness" of MI is determined at large, or new to the world. Classic examples of MI are Toyota's lean manufacturing process, General Electric's M-form structure, and Procter and Gamble's brand management techniques that have led to the change of industry landscapes and provided long-lasting competitive advantage for these firms (Hamel, 2006). More recent instances of MI are self-managed (introduced by Royal DSM in the Netherlands) and non-hierarchical workplace arrangement (developed by Vodafone UK) (Heyden et al., 2018).

[1] This definition is adopted for the present study. Further information concerning the level of analysis will be presented in Section 4.2.2.

Given the significant role of MI in furthering organizational goals (Birkinshaw et al., 2008), surprisingly, the bulk of the work on the relationship between innovation and exporting examines the effects of research and development (R&D) investments and technological innovation activities, i.e., product and process innovation. Yet, apart from the few recent exceptions assessing the consequences of MI for export performance (e.g., Azar and Ciabuschi, 2017; Radicic and Djalilov, 2019), little attention has been directed to evaluating MI's impacts on the firm's decision to export. This shortcoming in the innovation-export literature will be addressed in the present study by considering an important research question: how does management innovation influence exporting?

Prior studies have provided valuable insights indicating the role of innovation activities in the firm's foreign market entry (e.g., Aw et al., 2008; Bustos, 2011; Caldera, 2010; Dhanaraj and Beamish, 2003). Accordingly, innovation facilitates the entry into export markets through two established theoretical channels. The first channel is based on the creation of competitive advantage by means of product and process innovations. Building on Porter's (1980) generic competitive strategies, product innovators by employing a differentiation strategy and process innovators by implementing a cost leadership strategy can build competitive advantage in international markets (Basile, 2001; Becker and Egger, 2013; Rodríguez and Rodríguez, 2005). Hence, companies introducing technological innovations, i.e., product and process innovation, have the potential to apply those competitive strategies enabling them to directly seek customers in foreign markets and start exporting. This link is supported by a plethora of studies reporting that innovation, in general, and product innovation, in particular, are important factors for success in the entry into exporting (e.g., Becker and Egger, 2013; Bernard and Jensen, 2004b; Cassiman and Martinez-Ros, 2007). The second channel is called the "self-selection" mechanism. Based on this mechanism, productive firms with sufficiently low marginal costs have profits large enough to overcome sunk costs, i.e., irreversible of the foreign market entry (Clerides et al., 1998; Helpman et al., 2004). Theoretically, the introduction of technological innovations, *ceteris paribus*, can lead to attaining better productivity levels (Griliches, 1998) that in turn enables innovators to self-select into exporting. Evidence for the self-selection mechanism has been well-documented in the literature (see Wagner, 2007); and investments

in innovations prior to foreign market entry is an important source of heterogeneity of productivity across companies and then self-selection (Cassiman and Golovko, 2011).

In this research I particularly focus on the second channel. The primary purpose for introducing MI is to enhance organizational efficiency and effectiveness (Mol and Birkinshaw, 2009). Managers redesign the organizational architecture by adopting new practices, processes, or organizational structure aimed at improving internal cooperation and coordination (Gunday et al., 2011) and mitigating the *novel* problem undermining organizational performance (Birkinshaw et al., 2008). More importantly, MI is intangible and context-specific (Damanpour, 2014), therefore, it cannot be easily commercialized and traded in markets (Battisti and Iona, 2009; Volberda et al., 2013). In addition, the extent to which MI and its types offer potential for creating competitive advantage through the differentiation or cost leadership strategy, for instance, is still open for empirical testing (Birkinshaw et al., 2008). The core of this research is to empirically investigate the consequences of the innovation of management practices, processes, or structures on the productivity of firms and then the self-selection into exports. This will be done on a sample of over 14400 manufacturing firms based in 55 countries. The insights from this research can be of benefit to both practice and research. This study informs managers of the importance and influence of the change in the organization's administrative system in the entry to exporting. Bloom et al.'s (2012) findings in 20 countries demonstrate that exporting firms are better managed than companies serving only the domestic market. From the research perspective, the present study provides an additional answer to the question of where the higher productivity of firms prior to exporting is sourced from.

This study contributes to the literature at least in two ways. First, this study adds to the well-documented productivity-export literature by providing empirical evidence showing in addition to technological innovations, the adoption of MI prior to exporting has an important role in the growth of firm productivity and then self-selection. This study establishes a link between two important strands of the literature, namely, MI and exporting, which have been studied separately in prior studies. Establishing such a relationship responds to the call of Cassiman and Golovko (2011) to examine the impact of alternative productivity enhancers in the innovation, productivity, export relationship.

Therefore, instead of concentrating on product and process innovations as sources of firms' productivity, this study investigates the consequences of a less studied type of innovation, that is, MI.

Second, by the empirical examination of the link between MI and firms' productivity, this study increases understanding of the extent to which MI beside traditional determinants of productivity can affect a firm's productivity level. This is as an important addition to different, distinct literatures. To date, the innovation-productivity literature has been dominated by studies that report R&D investments and technological innovation activities as important determinants of productivity growth (Griffith et al., 2006; Griliches, 1998; Hall, 2011; Huergo and Jaumandreu, 2004; among others), leaving the impact of MI on organizational productivity understudied. Furthermore, this study adds to the recent dialogue on the relationship between management practices and the productivity-heterogeneity across countries and firms (e.g., Bloom et al., 2017; Bloom et al., 2012; Bloom and Van Reenen, 2007). These studies have provided important evidence in support of the influential role of managers' practices in explaining discrepancies in productivity, whilst the impact of the change of management practices on productivity of firms has not been explored yet. Regarding Birkinshaw et al.'s (2008) conceptualization, the change of management practices used to manage companies is framed as MI. Additionally, Damanpour (2014) notes that consequences of MI on organizational performance have not received enough scholarly attention. Mol and Birkinshaw (2009), similarly, call for the examination of the MI-performance association in a cross country setting. This research will assess the relationship between MI and firm productivity by building and using the largest cross-country dataset available in the MI literature.

The rest of this study is structured as follows. The theoretical foundation for the nexus between innovation, productivity, and exports is discussed in Section 4.2. In this section also the concept of management innovation is discussed and prior literature in this area is reviewed. Further, a theoretical explanation concerning management innovation as the antecedent of firm productivity and export activities is presented. This section will terminate by the presentation of central hypotheses of this study. Then, in Sections 4.3 and 4.4, the empirical investigation is conducted on a unique sample of companies, the majority of which are coming from developing, emerging countries. Finally,

Section 4.5 concludes with a discussion of empirical findings, implications, limitations and possible issues for future research.

4.2 Literature Review

4.2.1 Innovation, Productivity, Exports

Evidently, prior research findings have predominantly validated the existence of a superior productivity in exporters in comparison to non-exporters. Researchers have proposed two hypotheses concerning this productivity premium observed in exporting companies. The first hypothesis is based on learning-by-exporting effects. Accordingly, exporting benefits the firm by increasing productivity. Exporting has always been a fundamental channel for companies that enthusiastically pursue increased sales and thereby generation of profits (Golovko and Valentini, 2011). Finding foreign customers extends the company's market. This makes achieving higher productivity levels more possible thanks to the scale effect - since many costs, such as R&D, are largely fixed, such investment is recouped over a larger volume of products (Ganotakis and Love, 2010). This might bring better productivity and also stimulate executives to allocate more resources for R&D and innovation (Aw et al., 2008). Alternatively, it might be argued that exporting in addition to the abovementioned direct link can enhance the productivity of firms in an indirect way. Beginning to export is an opportunity to acquire knowledge about new technologies and learn best practices by interacting with foreign clients (Love and Ganotakis, 2013; Salomon and Jin, 2008). This leads to an improvement in product innovation, production capabilities, and human capital all of which can boost the productivity of exporting firms after foreign market entry (Tse et al., 2017). Whereas these mechanisms have been designed and theoretical arguments have been proposed in support of the positive impact of exporting on the subsequent productivity-growth, the empirical literature is not unanimous about this effect and reports mixed results. Some studies have found evidence supporting the positive link between exporting and productivity after internationalization (e.g., Love and Mansury, 2009; Van Biesebroeck, 2005). However, other studies have reported exporting has no clear effect (e.g., Arnold and Hussinger, 2005; Clerides et al., 1998). An explanation for this discrepancy in empirical findings

perhaps is that exporting is one of the influential factors on the productivity of firms, thus other channels that may have nothing to do with exposure to export markets such as simultaneous changes in management, ownership or strategy might lead to the change of productivity and profitability in companies (Love and Ganotakis, 2013; Silva et al., 2012).

Another hypothesis that has received much attention in the literature is based on the phenomenon of self-selection. In contrast to the impact of learning-by-exporting on the productivity of firms that views the gain of productivity after exports, this hypothesis suggests that exporting firms had been more productive before internationalization. Firms enjoying better productivity levels self-select into the entry to exports (Bernard and Jensen, 1999; Delgado et al., 2002; Helpman et al., 2004). These firms because of lower marginal costs and higher profit margins can cover those start-up costs inevitably incurred by companies that start exporting (Ganotakis and Love, 2012). The rationale behind this is that entering a foreign market has fixed sunk costs, i.e., irreversible costs, such as costs of acquiring information on the foreign market, establishing channels for distribution, and finding proper suppliers of goods and services (Castellani and Zanfei, 2007). Hence, exporters are supposed to be more productive than non-exporters not because of favourable impacts of exporting, but because "firms that internationalize are forced to become more efficient so as to enhance their survival characteristics" (Harris and Moffat, 2011, p.12). This line of reasoning is also backed with strong empirical evidence showing that exporters in comparison to non-exporters had been more productive before entering the foreign market (e.g., Baldwin and Gu, 2003; Bernard and Wagner, 2001; Clerides et al., 1998; Delgado et al., 2002; Girma et al., 2004). In a review of 54 emprical studies published between 1995 and 2006 concerning exporting, Wagner (2007) reports the presence of ubiquitous evidence in support of the self-selection process.[21]

The higher productivity of firms before they started exporting raises an important question about where this productivity advantage is sourced from. The early theoretical and empirical models that examined the link between productivity and exporting were based on the assumption that productivity of firms is exogenously determined. For instance, Melitz (2003) develops a model of

[2] Learning-to-export is of particular interest in the present study.

industry dynamics in which inter-firm heterogeneity in productivity arises from random technological shocks. Building on the Ricardian model of trade, Bernard et al. (2003) attribute the variation of exporting firms' productivity prior to internationalization to differences in the technology used between countries. Unlike these researchers, Yeaple (2005) models the productivity - export relationship in a way whereby the firm's own strategic decision for furthering organizational productivity is reflected. According to Yeaple's framework, firms are identical when born, however, the difference that exists in productivity of exporters and non-exporters are the outcome of their selections for hiring highly skilled workers or employing new technologies. These researchers have attempted to relate the heterogeneity in productivity to external factors, as a consequence, there is no room for the possibility of a firm's own intention of becoming an exporter driving it to take the necessary steps needed for improving its productivity level before exporting.

Despite the existence of an important shortcoming in theorizing about the relationship between the productivity of a firm and its export behaviours, outlined above, a key common element in those models that causes such discrepancy in productivity seems to be new technologies. At the firm level of analysis, new changes in the technologies that a company uses are conceptualized as technological innovation (Damanpour, 2014). Technological innovation, broadly classified into product and process innovation (Tether and Tajar, 2008), has long been identified as a key driver of productivity growth and a factor responsible for building a competitive position relative to other firms (Doraszelski and Jaumandreu, 2013). In terms of theoretical explanations, Hall (2011) argues that technological innovation efforts result in an efficient use of resources that in turn leads to the enhancement of productivity and the creation of sustainable competitive advantages for innovators. This view is also supported by vast empirical research in the domain of the innovation-productivity literature indicating that innovation and productivity are somehow correlated (Chudnovsky et al., 2006; Griliches, 1998; Hall et al., 2009; among others). Griffith et al. (2006) in a cross-country study, found that both product and process innovations have a substantial effect on the productivity of three out of four European countries. Morris (2018) using a panel data set of 43 countries both in manufacturing and services reports that introducing process and product innovations positively

influences productivity, whereas process innovation in services and product innovation in manufacturing has a greater impact. Foster et al. (2008) show that what causes discrepancies in productivity across firms is the outcome of demand shocks but not efficiency shocks. In other words, product innovation has a more important role than process innovation in productivity gains. Huergo and Jaumandreu (2004), however, demonstrate that process innovation is an important determinant in the enhancement of productivity for Spanish firms.

The preceding discussion highlights the importance of considering technological innovation activities in explaining the productivity distribution across firms. However, to solve the issue of exogeneity in the productivity-export models, some researchers theorize the productivity–export association considering the fact that an intentional investment for technological progress is essential as the "energy" for the growth (Beinhocker, 2007). In other words, endogenous models of export assume the investment in R&D projects, involvement in innovation activities, enhancement of productivity, and ultimately the entry to export markets are parts of a holistic plan driven by managers in companies. This approach entirely contrasts with the logic of models that attribute the variation of productivity before exporting to influences of exogenous factors that originate out of the firm's control. The effects of such deliberate investments prior to internationalization on the productivity-export association are called "learning-to-export". Accordingly, firms consciously undertake costs of R&D and introduce innovations prior to exporting aimed at becoming more productive, something required for overcoming the sunk costs of internationalization (Alvarez and López, 2005; Eliasson et al., 2012). As far as empirical investigation is concerned, developing a dynamic, structural model of exporting and R&D, Aw et al. (2011) quantify the relationship between export decision, R&D investment and endogenous improvement of productivity of Taiwanese electronics firms. They show each investment in R&D can enhance the future productivity that in turn reinforces the self-selection into exports. Unlike Aw and colleagues, Cassiman and Golovko (2011) examined the effect of innovation outputs, i.e., product innovation, as the proxy of innovation activities rather than the R&D investments in the innovation-productivity-exports association. The authors show that Spanish small and medium sized enterprises (SMEs) introducing product innovation prior to foreign market entry

are not only able to enter exporting thanks to productivity gains, but they can also directly seek demands in foreign markets and begin exporting due to product differentiation advantages.

Explaining the inter-firm differences of productivity by means of the firm's own decisions for technological changes have not been without criticisims, however. On the one hand, Bloom and Van Reenen (2007) notice that after controlling for the effects of technology on productivity, there is a substantial difference in productivity across firms and countries which current models have had relatively little to say about. On the other hand, those endogenous models have predominantly centered on the impact of technological innovation on productivity-growth, whilst commonly accepted typologies of innovation, such as the OECD's (2005) typology of innovation, are not only restricted to those observable changes in the technology of companies. It may be concluded that perhaps less tangible, under-represented types of innovation could be responsible for that unexplained part of the productivity variation across companies before the start of exporting. In the next section, an interesting type of innovation that could aid in closing that gap in understanding will be discussed.

4.2.2 Management Innovation: Definition and Level of Analysis

The term "management innovation" is a relatively new term in the management literature, but this concept has been interchangeably used by other overlapping conceptualizations such as organizational, administrative and managerial innovations for a long time (Damanpour, 2014). In fact, the management innovation literature has seen a resurgence in the last decade after Birkinshaw and colleagues' article in 2008 that conceptualized MI and provided a process for its invention and implementation (Volberda et al., 2014). Birkinshaw et al. (2008, p.825) define the concept of MI as " the invention and implementation of a management practice, process, structure or technique that is new to the state of the art and is intended to further organizational goals". In simple terms, MI focuses on the changes in what managers do and how they do it (Hamel, 2006). Therefore, it captures the changes in management practices, processes, or structure collectively viewed as ways through which a manager's work is done (Damanpour, 2014; Vaccaro et al., 2012). *Management practices* refers to what managers do on a daily basis to carry out organizational strategies – setting objectives

and associated procedures, dealing with stakeholders developing talent, for example (Vaccaro et al., 2012). *Management procedures* refers to standardized policies and mechanisms that govern the works of managers including rewards systems, management information systems (MIS), and control systems such as performance assessment (Burke and Litwin, 1992). *Organizational structure*, refers to the internal organization arrangement of people's relationships, communication, and decision-making authority (Fredrickson, 1986).

A variety of theoretical approaches have been proposed particularly for the study of why organizations introduce MI. Birkinshaw et al. (2008), for instance, identified four theoretical perspectives on MI- cultural, institutional, fashion, and rational. In the work of Sturdy (2004), however, five approaches were envisioned (psychodynamic, dramaturgical/rhetorical, political, cultural, and institutional). For parsimony, two competing perspectives that are more relevant to this research - institutional and rational - will be explained. The institutional perspective has roots in the need for the confirmation and accommodation of external pressures to gain both internal and external legitimacy and reputation (Abrahamson, 1996; Ansari et al., 2010; Staw and Epstein, 2000). Such pressures can be from regulators, parent organizations, and network members on executives' decisions to adopt widely accepted, popular management techniques (Damanpour, 2014; Volberda et al., 2013). In this perspective, the symbolic values outweigh technical values, therefore, improving the consequences of such organizational renewal on performance are dubious (Damanpour and Aravind, 2012). In contrast, the rational approach for the introduction of MI resists transient fashions and institutional pressures (Sturdy, 2004). Volberda et al. (2014) point out that the rational perspective rests on the role of change agents and human agency for improving organizational economic performance. They further note that, in this perspective, decisions made for the adoption of MI are appraised by a careful analysis of costs and benefits because the organization undergo changes in the pursuit of attaining better performance through increasing effectiveness and efficiency of internal organizational processes. In the same vein, Birkinshaw et al. (2008) note that the demand for MI is driven by internal change agents who find a *novel problem* in the organization - a perceived shortfall between the organization's current and potential performance. This study in line with Birkinshaw et

al. (2008) treats MI from the rational school. I assume the change in the nature of management in an organization is a decision of CEOs, themselves, with the goal of working more efficiently before internationalization through exports. This is consistent with the rationale of endogenous models of productivity-growth, emphasizing that growth needs intentional investments in technological progress, at least in some stages (Beinhocker, 2007).

Furthermore, " two equally valid viewpoints" reflect the magnitude of MI newness (Birkinshaw et al., 2008, p.828): "new to the state of the art", or new to the world, which the definition determines the level of analysis is the world and implies innovation without known precedents; "new to the organization", where MI is analyzed at the firm level. Novelty is usually viewed to the generating or adopting organization (Damanpour, 2014), as a consequence, innovation is considered as new to the firm (Battisti and Stoneman, 2010; Mol and Birkinshaw, 2009). Hence, in this research, the organizational renewal is defined as MI if it is "new to the state of the firm". Advantages of using the firm level definition are twofold: first, it makes the empirical test of various hypotheses possible; second, it allows drawing a larger sample of management innovators (Vaccaro et al., 2012).

4.2.3 Hypothesis Development: Management Innovation, Implications for Productivity and Exports

MI as a means for furthering organizational goals (Birkinshaw et al., 2008) has its costs as well as benefits. It is argued that executives make the decision for the change in the company's management nature quickly, even though, they should spend a great amount of time and energy for its full implementation (Damanpour, 2014). One reason for this is that MI generally follows a top-down process (Damanpour and Aravind, 2012). Of course, top managers have the authority to decide about and allocate resources for MI in companies (Damanpour and Schneider, 2006). Nevertheless, employees assume such organizational changes driven by top managers are coercive (Ford et al., 2008); and they typically show resistance toward managers' announced changes because of the fear of failure and sensitivity to uncertainties (Hon et al., 2014). Under these circumstances, this argument

can be made that those who work at the lower levels of the organizational hierarchy, whether middle managers or employees, are very likely to react negatively to the CEO's decision for the change (Birkinshaw et al., 2008; Heyden et al., 2018). This causes the implementation of MI to become more costly, tedious, and slower than technological types of innovation.

Despite the existence of those hurdles in the way of complete implementation of MI, companies tend to introduce it because of its unique characteristics and important implications for organizational performance. MI is a specific type of innovation that is rare since its full implementation is hard work (Tavassoli and Karlsson, 2015). It is introduced as a matter of necessity that causes it to be context-specific and non-substitutable (Volberda et al., 2013). Further, MI is also difficult -to- replicate by other companies due to its tacit nature (Battisti and Iona, 2009). Finally and most importantly, MI is valuable (Damanpour et al., 2009). MI is a valuable type of innovation thanks to its key beneficial role in the achievement of a superior performance, productivity through motivating employees and modifying manufacturing techniques.

One of the important characteristics of MI is that this type of innovation results in the attainment of organizations' soft goals, for instance, employees' higher health standards, increased participatory behaviour in social processes, and even enhanced happiness and satisfaction (Volberda et al., 2013). Such accomplishments in a firm, in turn, can strengthen employees' motivation in the work place and then boost individual and organizational productivity. Changing management practices, processes, or structures in a way that employees rather than disliking work feel it is interesting and enjoyable, or consider it as a place where they can meet their needs for growth and development, result in the enhanced willingness for expending more effort on the job (Evans, 1986; Grant, 2008). As far as empirical examination is concerned, Huselid (1995) found evidence suggesting that adopting a set of practices reinforcing employees' desired behaviours could arouse their motivation and then improve productivity of U.S. firms. He concluded that such psychologically based interventions could influence individual and organizational performance because it caused motivated employees to work both harder and smarter.

Another interrelated reason is that MI aids companies to be more productive than rivals because it modifies their manufacturing techniques. A better productivity level is achieved by increasing outputs and cutting down costs (Kafouros, 2005). MI facilitates this as the change of the nature of management within organizations is associated with manufacturing techniques that result in the creation of either superior outputs or cost-efficient inputs (e.g., Bloom et al., 2012; MacDuffie, 1995). The theoretical explanation for the MI-productivity association, however, has undergone very little empirical testing so far. The result of those few empirical studies suggest that MI causes the conversion of input to output to become more efficient, as a result, it enables managers to fulfil their ambitions, that is, how to produce "more with less" (e.g., Mol and Birkinshaw, 2009; Evangelista and Vezzani, 2010).

Given the significance of innovation in facilitating the productivity gain and then self-selection into exporting, scholars' attention has been particularly directed to the impact of R&D investments and related technological innovation activities, specifically, product and process innovation, in the innovation-productivity-export relationship. Meanwhile, the importance of MI in organizational performance, as noted above, support this notion that perhaps MI is the responsible factor for both productivity improvement and the export orientation of a firm. I argue beside introducing a new technological product or process, executives might delibrately decide to change the extant management arrangement of the organization before exporting. Such organizational changes cause the percived performance gap in the organization to be filled prior to foreign market entry; something increasing the odds of success in overcoming sunk costs of internationalization, and then activating the mechanism of the self-selection to exports. Thus, I expect:

Hypothesis 1: Management innovation will have a positive and indirect effect on exporting via productivity.

For empirical testing of Hypothesis 1, it, in turn, is sub-divided into two components, all of which must hold for Hypothesis 1 to be supported:

Hypothesis 1a: Management innovation is positively associated with productivity.

Hypothesis 1b: Productivity is positively associated with exporting.

4.3 Data and Method

4.3.1 Sample

This study employs cross-sectional data sets from the World Bank Enterprise Survey (WBES). The World Bank has conducted these surveys since 2000. The information is collected by private contractors on behalf of the World Bank from more than 130,000 firms in 135 countries. The WBES surveys companies that are formally registered and have more than five employees. This survey excludes companies whose shares are wholly owned by governments. Interviewees participating in these surveys are business owners and top managers chosen through stratified random sampling ensuring representativeness of the sample. This is important for the study of management innovation because business owners and top managers are very likely to be well aware of recent changes in management practices, processes, or structures in organizations (Vaccaro et al., 2012). As far as the validity and reliability of information is concerned, the WBES's datasets have been used by a number of earlier published articles in international business and innovation contexts (e.g., Krammer et al., 2018; Morris, 2018; Vendrell-Herrero et al., 2017).[31]

The WBES dataset is an appropriate, interesting setting to examine the relationship between MI, productivity, and exports for a number of reasons. First, the use of this dataset allows me to test MI's effects on productivity and then export behaviours of a large sample of companies most of which are from emerging, developing economies. Choosing this context is important regarding the fact that a large body of the innovation-export literature has been built by studies conducted in the context of advanced economies; as a result, we know less about export activities of innovative firms from emerging, developing countries. Moreover, research and published articles on MI have been relatively scarce (Crossan and Apaydin, 2010) let alone in the context of developing, emerging economies (Khosravi et al., 2019). To the best of my knowledge nobody has attempted to examine the impacts of MI on firms' productivity in a cross-country setting in which emerging, developing economies are dominant.

[3] See https://www.enterprisesurveys.org/ for further information.

Second, the WBES has a long questionnaire whose innovation section, in particular, contains useful questions capturing different innovation activities in companies, whilst the relevant question measuring MI has not been included in the questionnaire of every round of the WBES data collection. After reviewing the questionnaire of each round, it was revealed that the question specifically capturing MI activities of companies is only found in questionnaires of a number of countries surveyed in six rounds of the WBES data collection, from 2011 to 2016. In the present study, I employed information of a certain number of economies after completing the data clearing process discussed below.

The original sample of the WBES 2011, 2012, 2013, 2014, 2015, and 2016 totally includes observations of firms from 96 countries functioning both in manufacturing and services. I eliminated observations of 34 countries as the question related to measuring the MI activity was not found in their questionnaires. To calculate firms' real productivity in U.S. dollars, related data including the consumer price index (CPI) and exchange rate for each country were collected from the World Bank (WB) Indicators and annual average exchange rate from the Penn World Tables version 9.2, respectively. I matched the information from the WBES with the data gathered from the WB and Penn World Tables. The result of the match revealed that information of four countries, namely, Belarus, Georgia, Kosovo and Uzbekistan could not be included in the assessment because these four countries' data was not found either in the WB or Penn World Tables. Also, a number of firms did not declare information required for measuring productivity and exporting; therefore because of missing values their records were deleted from the sample. This led to the elimination of a huge number of firms operating in service industries. As a consequence, I focused on manufacturing and left the investigation of the MI-export relationship in services for future studies as very few observations provided by the WBES data sets were appropriate for conducting a large scale cross-national study only in services. More importantly, having a small sample of service enterprises relative to a large sample of manufacturing companies makes the comparison of results between these two groups impossible. Finally, to draw a clear distinction between manufacturing and services, information on firms labelled as "transportation" and "other manufacturing" in the classification of industries was

removed from the sample. Such elimination caused three countries were excluded from the sample. In total, 41 economies were excluded from the whole sample. The final sample that was obtained after those refinements comprises information on 14472 manufacturing companies grouped into 19 two-digit ISIC industry classifications collectively located in 55 countries.

Table 4.1 Distribution of firms in terms of countries, exports, and innovations

Country	No. firms	No. exporting firms	No.manag-ement innovators	No. product innovators	No.process innovators	Country	No. firms	No. exporting firms	No.manag-ement innovators	No. product innovators	No.process innovators
Armenia	32	10 (31)	4 (13)	10 (31)	4 (13)	Senegal	99	18 (18)	39 (39)	50 (51)	51 (52)
Bangladesh	1068	224 (21)	398 (37)	380 (36)	446 (42)	Tanzania	131	31 (24)	49 (37)	104 (79)	82 (63)
Bhutan	59	13 (22)	22 (37)	29 (49)	24 (41)	Tunisia	164	106 (65)	43 (26)	42 (26)	58 (35)
Cambodia	123	17 (14)	27 (22)	22 (18)	21 (17)	Uganda	86	18 (21)	53 (62)	67 (78)	62 (72)
India	4413	764 (17)	2024 (46)	2022 (46)	2087 (47)	Zambia	138	13 (9)	50 (36)	76 (55)	75 (54)
Indonesia	856	127 (15)	57 (7)	114 (13)	108 (13)	Zimbabwe	337	40 (12)	196 (58)	203 (60)	209 (62)
Jordan	144	66 (46)	23 (16)	47 (33)	40 (28)	**Africa**	**1025**	**239 (23)**	**468 (46)**	**594 (58)**	**591 (58)**
Kazakhstan	54	2 (4)	10 (19)	13 (24)	12 (22)	Bosnia	62	34 (55)	17 (27)	29 (47)	24 (39)
Kyrgyzstan	45	6 (13)	14 (31)	18 (40)	22 (49)	Bulgaria	65	25 (38)	20 (31)	27 (42)	16 (25)
Lao PDR	93	21 (23)	11 (12)	17 (18)	10 (11)	Croatia	80	41 (51)	28 (35)	40 (50)	35 (44)
Lebanon	57	35 (61)	17 (30)	27 (47)	21 (37)	Czech	36	26 (72)	12 (33)	21 (58)	19 (53)
Malaysia	347	169 (49)	94 (27)	45 (13)	114 (33)	Estonia	57	36 (63)	10 (18)	16 (28)	18 (32)
Mongolia	48	4 (8)	14 (29)	16 (33)	20 (42)	Hungry	32	14 (44)	5 (16)	9 (28)	8 (25)
Nepal	181	22 (12)	103 (57)	73 (40)	86 (48)	Latvia	18	13 (72)	5 (28)	5 (28)	6 (33)
Pakistan	123	22 (18)	28 (23)	46 (37)	41 (33)	Lithuania	45	27 (60)	10 (22)	18 (40)	9 (20)
Philippine	668	184 (28)	209 (31)	232 (35)	240 (36)	Moldova	43	5 (12)	16 (37)	24 (56)	25 (58)
Sri Lanka	206	24 (12)	69 (33)	46 (37)	82 (40)	Poland	35	16 (46)	14 (40)	22 (63)	13 (37)
Tajikistan	38	4 (11)	4 (11)	11 (29)	9 (24)	Romania	114	55 (48)	46 (40)	57 (50)	56 (49)
Thailand	276	62 (22)	25 (9)	30 (11)	38 (14)	Russia	384	47 (12)	139 (36)	179 (47)	159 (41)
Vietnam	478	132 (28)	97 (20)	166 (35)	178 (37)	Serbia	66	36 (55)	17 (26)	32 (48)	21 (32)
Asia	**9309**	**1908 (20)**	**3250 (35)**	**3364 (36)**	**3603 (39)**	Slovakia	29	16 (55)	8 (28)	11 (38)	11 (38)
Burundi	47	7 (15)	28 (60)	26 (55)	24 (51)	Slovenia	60	49 (82)	13 (22)	27 (45)	11 (18)
Congo	141	7 (5)	39 (28)	70 (50)	51 (36)	Sweden	266	201 (76)	174 (65)	203 (76)	166 (62)
Egypt	1334	216 (16)	101 (8)	283 (21)	221 (17)	Turkey	375	180 (48)	57 (15)	60 (16)	46 (12)
Ethiopia	93	16 (17)	39 (42)	46 (49)	47 (51)	Ukraine	235	30 (13)	26 (11)	67 (29)	40 (17)
Ghana	130	17 (13)	65 (50)	84 (65)	81 (62)	**Europe**	**2002**	**851 (43)**	**617 (31)**	**847 (42)**	**683 (34)**
Kenya	210	79 (38)	138 (66)	167 (167)	160 (76)	**Total**	**14472**	**3393 (23)**	**4819 (33)**	**5572 (39)**	**5552 (38)**
Malawi	81	16 (20)	33 (41)	41 (51)	41 (51)						
Mauritian	22	15 (68)	11 (50)	11 (50)	15 (68)	Asia %	64.3	13.2	22.5	23.2	24.9
Morocco	44	18 (41)	12 (27)	16 (36)	15 (34)	Africa %	21.8	4.4	6.6	9.4	8.7
Namibia	34	4 (12)	18 (53)	23 (68)	20 (59)	Europe %	13.8	5.9	4.3	5.9	4.7
Nigeria	70	13 (19)	38 (54)	52 (74)	54 (77)	**Total %**	**100**	**23.4**	**33.3**	**38.5**	**38.4**

*Figures reported in parentheses are percentage.

Table 4.1 shows the key descriptive statistics concerning innovation and export status of firms in the final sample. Accordingly, economies from Asia, Africa, and Europe constitute approximately

64%, 22%, and 14% of the whole sample, respectively. More than 20% of firms in manufacturing have announced they are engaged with export activities. As far as the introduction of MI is concerned, the proportion of management innovators in the sample of manufacturing is the smallest in comparison to product and process innovators. One reason for this is that MI, as compared to technological types of innovation, is more difficult to implement and use in companies (Damanpour, 2014). Process innovation, however, is more favorable for manufacturing firms. It has a percentage almost as equal as product innovation's around 38.4%. When it comes to product innovation, approximately 38.5% of manufacturing enterprises have engaged in the process of developing a new product; which is the highest proportion among various types of innovation.

Table 4.2 shows the distribution of firms by industries based on the ISIC classification. The Food industry has the greatest percentage (16.5%), whilst Recycling has the lowest proportion among sectors by providing 28 observations that construct only 0.2% of the sample.

Table 4.2 Distribution of firms by industry

ISIC	Definition	No.	Perc.	ISIC	Definition	No.	Perc.
15	Food products and beverage	2380	16.4	25	Rubber and plastics products	1127	7.8
16	Tobacco products	126	0.9	26	non-metallic mineral products	1206	8.3
17	Textiles	1096	7.6	27	Basic metal	614	4.2
18	Garments	1599	11	28	Fabricated metal	1328	9.2
19	Tanning and leather	333	2.3	29	Machinery and equipment	865	6
20	Wood	484	3.3	31	Electrical machinery and equipment	722	5
21	Paper and paper products	217	1.5	34	Motor vehicles	37	0.3
22	Publishing	484	3.3	36	Furniture	647	4.5
23	Coke, refined petroleum	48	0.3	37	Recycling	28	0.2
24	Chemicals and chemical products	1131	7.8		**Total**	**14472**	**100**

4.3.2 Measurements

This study aims to investigate the effects of MI on the export status of companies. However, rather than focusing on the direct channel, the indirect channel between MI and exporting is primarily going to be examined. In other words, I intend to empirically investigate if MI facilitates starting export activities through enhancing productivity and then activating the self-selection mechanism. Hence, the dependent variable is firms' export status, and the main independent variable is MI. Productivity is also both dependent and independent in different elements of the estimation.

Table 4.3 Summary statistics and variable description

Variables	Description	Mean	S.D.	Exporter		Non-exporter	
				Mean	S.D.	Mean	S.D.
EXPR	Dummy variable, whose value = 1 if the firm reports a positive amount of exports.	0.235	0.424	-		-	
MANIN	Dummy variable, whose value = 1 if the firm introduced a new or significantly improved organizational structures or management practices during the last three years.	0.334	0.471	0.42	0.49	0.3	0.46
PRODUCIN	Dummy variable, whose value = 1 if the firm introduced a new or significantly improved products or services during the last three years.	0.386	0.486	0.48	0.49	0.35	0.47
PROCESIN	Dummy variable, whose value = 1 if the firm introduced a new or significantly improved methods for the production or supply of products or services during the last three years.	0.385	0.486	0.48	0.49	0.35	0.47
FOREIGNOWN	Continuous variable ranging between 0 and 100, measuring the percentage of private foreign individuals, companies or organizations' ownership.	0.061	0.219	0.15	0.32	0.03	0.16
AGE	The number of years since the firm was established (expressed in logs).	20.18	15.87	23.84	19.67	19.05	14.31
SIZE	The size of the firm, measured by the number of permanent employees (expressed in logs).	129.1	392.1	332	667	75	227
CAPITAL INTENSITY	Fixed assets per worker (expressed in logs).	8.461	2.167	8.7	2.27	8.38	2.12
PRODUCTIVITY	Sales per worker (expressed in logs).	9.621	1.723	10.24	1.77	9.43	1.66

*All monetary values are converted to real US$ by using the consumer price index (CPI) from the World Bank Indicators and annual averaged exchange rate from the Penn World Tables version 9.2.

Dependent variable

Table 4.3 summarizes the operationalization of variables in the empirical analysis. The WBES's questionnaire has related information capturing exporting activities of firms. Respondents were asked in the last completed fiscal year what percentage of this establishment's sales were (a) national sales,

(b) indirect exports, (c) direct exports. The variable EXPR (export propensity) equals 1 if firms report positive amount of direct exports, and 0 otherwise. Noteworthy, this variable merely captures the export status of firms and it does not provide further information on the start of exporting.

Independent variable

In the WBES surveys, there is a header called "innovation" whose questions dichotomously (adopted or not-adopted) measure various innovation activities in companies. The question that measures the introduction of MI in firms is: "During the last three years, has this establishment introduced any new or significantly improved organizational structures or management practices?" The following two important advantages make this measure ideal for my research. First, it is in line with the conceptualization of MI used in this study. Second, because respondents provided information about the background of MI activities in companies - during the last three years – and the WBES captures the export status of firms for the last year, it can be argued that MI very likely had emerged in firms before the entry into export markets in the last year. Several prior studies have provided the same explanation to show a firm's innovative efforts take place before exporting (e.g., Ganotakis and Love, 2010; 2012; Roper and Love, 2002).

Control variables

Following prior studies carried out in the innovation-export literature, the effects of a number of factors on the export status were considered by including relevant control variables in empirical models. Impacts of product innovation (PRODUCIN) and process innovation (PROCESIN) were controlled by means of dummy variables as findings of a plethora of studies suggest that technological innovation has a significant effect on the entry into exports (e.g., Becker and Egger, 2013; Cassiman and Martinez-Ros, 2007; Love et al., 2016). Company size (SIZE), as the logarithm of the number of permanent employees, is controlled given that larger firms are more likely to start exporting than smaller firms (Bernard et al., 2007; Roper and Love, 2002). Although the impact of firm age on exports is still debated in the empirical literature, controlling its effects as a predictor of exporting has been recommended in the relevant literature (Love et al., 2016; Yiu et al., 2007). Therefore, firm age

(AGE) is included in empirical models as the logarithm of the number of years since companies were established. Moreover, the control variable (FOREIGNOWN) measures the percentage of private foreign individuals, companies or organizations' ownership. The existence of foreign owners in firms' capital structure is controlled as foreign investors meaningfully enhance managers' tolerance toward risk during uncertain, risky decision-making processes such as when they intend to make the strategic decision of internationalization through exports (Añón Higón and Driffield, 2011; Filatotchev et al., 2008).

4.3.3 Empirical Strategy and Models

To examine the relationship between MI and exporting, this research employs the mechanism proposed by Baron and Kenny (1986) for conducting an indirect (mediation) analysis. This procedure that has been widely applied by researchers in different areas of knowledge is also of interest to previous studies testing the indirect association between firms' innovation and exporting activities (e.g., Cassiman and Golovko, 2011; Wu, Q. et al., 2021). Accordingly, first, the variable (PRODUCTIVITY) (mediator) is regressed on MI (independent variable); next, the variable (EXPR) (dependent variable) is regressed on MI; last, the variable (EXPR) is regressed on both variables (MANIN) and (PRODUCTIVITY).

First, the relationship between productivity and MI is tested. In this study, productivity is defined as labor productivity calculated by the Cobb-Douglas production function:

$$Y_i = Ae^{\gamma} K_i^{\alpha} L_i^{1-\alpha} \quad (1)$$

Where Y measures output of firms (in this case total sales in the last fiscal year), A is a constant, γ includes a set of determinants of productivity such as product innovation (Foster et al., 2008), process innovation (Huergo and Jaumandreu, 2004), foreign ownership (Girma and Görg, 2004) as well as companies' age and size (Coad et al., 2016; Diaz and Sánchez, 2008) (similar to definitions in Table 4.3). K is a measure for physical capital (net book value after depreciation) and L denotes the number of permanent employees. Dividing equation (1) by the number of employees:

$$\left(\frac{Y_i}{L_i}\right) = Ae^{\gamma}\left(\frac{K_i}{L_i}\right)^{\alpha} \quad (2)$$

Transferring equation (2) in logarithmic form:

$$Log\ \left(\frac{Y_i}{L_i}\right) = Log(A) + \gamma + \alpha\ Log\left(\frac{K_i}{L_i}\right) \quad (3)$$

The logarithm of ratios of sales per worker and capital per worker are shown by variables (PRODUCTIVITY) and (CAPITAL INTENSITY) in Table 4.3, respectively. In the present study, I extend γ by adding the variable (MANIN). Thus Model (1) will be estimated where the variable X encompasses other determinants of productivity, namely, firms' product and process innovation, foreign ownership, the ratio of capital per worker, size, and age in addition to MANIN.

$$PRODUCTIVITY_i = f(\ MANIN_i, X_i) \quad \text{Model (1)}$$

Second, the association between MI, disregarding its direct or indirect impacts, and exporting is modeled through the following equation. The coefficient of MI in this model measures total effects of MI on the decision to export. Z includes control variables such as companies' product and process innovation, foreign ownership, size, and age.

$$EXPR_i = f(\ MANIN_i, Z_i) \quad \text{Model (2)}$$

Last, to examine the validity of my argument, that is, management innovation and exporting are basically linked through productivity; I need to examine the possibility of having a direct relationship by estimating Model (3). The simultaneous appearance of MI and productivity in this equation enables us to measure and examine the existence of the direct effect of changes in management practices, process, or structures on the entry to exports. Z comprises control variables, namely, companies' product and process innovation, foreign ownership, size, and age. It is worth mentioning that according to Hicks and Tingley's (2011) algorithm on conducting an indirect (mediation) analysis, productivity in the following model is the fitted value of productivity in Model (1).

$$EXPR_i = f(\widehat{PRODUCTIVITY_i}, MANIN_i, Z_i) \quad \text{Model (3)}$$

The previous three-step procedure is the general approach employed by researchers to examine indirect relationships. However, this approach does not really examine the effects of the indirect pathway investigated in this work, that is, MI influences a firm's export orientation through productivity. One well-established method which enables me to estimate the indirect effects is Sobel's (1982) product of coefficients. Accordingly, the effects of the indirect association between MI and exporting are tested by a product which is formed by multiplying of two estimated parameters for variables (MANIN) in Models 1 and (PRODUCTIVITY) in Model 3.

The previously mentioned steps allow me to determine through which theoretical channel between innovation and exports the MI-exports association can be explained. Taking those steps is necessary for understanding to what extent our argument that MI indirectly affects exporting is correct, although they do not provide enough information to answer this important question: is the purpose of changes in the nature of management within companies to enhance productivity in the readiness for exporting? In other words, is there any evidence in support of the learning-to-export hypothesis and then "conscious" self-selection?

To address these important questions, similar to the method used in the study of Cassiman and Golovko (2011) and Gkypali et al. (2018), the following procedure is added to the empirical strategy of this study. The sample of firms is divided into two sub-samples with respect to their export status. Then, Model (1) is re-estimated for each sub-sample. A positive coefficient for (MANIN) in the sub-sample of exporters may be considered as evidence in support of the existence of learning-to-export effects. The core notion of testing the learning-to-export effects in this manner is that though all firms pursue the goal of becoming more productive, they would not necessarily self-select into the export market after gaining higher productivity levels. In a very recent study, Gkypali et al. (2021) observe that UK SMEs may introduce novel production processes over the pre-export phase and even by obtaining the export productivity level (a sort of export threshold) become "export-capable" firms, nevertheless, they do not make the decision of selling in the foreign market. Hence, if a positive and significant link is observed between MI and productivity in the sub-sample of *exporting* firms, one may infer that MI has been deliberately introduced in companies aimed at improving organizational performance prior to the entry into exports (see Table 4.6 in results, Models 4 and 5).

4.4 Regression Results

The results of the ordinary least square (OLS) estimation (Model 1) in Table 4.4 show the adoption of MI might influence productivity of firms positively. When it comes to influences of other types of innovation, product innovation is not significantly associated with productivity of firms. Conversely, almost as equal as MI, productivity is positively affected by the introduction of new technological processes in companies.

Table 4.4 The determinants of productivity: ordinary least square (OLS) model

	(Model 1)
MANIN	0.0907***
	(0.028)
PRODUCIN	0.003
	(0.027)
PROCESIN	0.0903***
	(0.028)
FOREIGNOWN	0.414***
	(0.054)
CAPITAL INTENSITY	0.227***
	(0.005)
SIZE	0.155***
	(0.008)
AGE	0.0001
	(0.014)
_cons	6.226***
	(0.234)
Industry Dummy	Included
Country Dummy	Included
Year Dummy	Included
Obs.	14118
Adj. R-squared	0.432
Prob (F-Statistics)	0.000
Standard errors are in parenthesis	
*** p<0.01, ** p<0.05, * p<0.1	

Table 4.5 displays the estimation results of Model 2 and Model 3 examining the possibility of having the direct association versus indirect relationship between MI and the export decision. With respect to the results of estimations for Model 2, the significant coefficient of (MANIN) shows that

the implementation of MI increases the likelihood of being an exporter by 2.3%. Consistent with findings of prior studies, product innovation has a positive influence on the entry to foreign markets. Interestingly, process innovation has a strong, positive impact on firms' export status. Companies whose greater amounts of their capital belong to foreign owners are more likely to starts exporting. Moreover, larger and older companies are more likely to make the internationalization decision via exports.

Table 4.5 The export decision regression: probit model

	Total effect of management innovation	Direct effect of management innovation
	(Model 2)	(Model 3)
MANIN	0.023***	0.017**
	(0.008)	(0.008)
PRODUCIN	0.026***	0.027***
	(0.008)	(0.008)
PROCESIN	0.041***	0.035***
	(0.009)	(0.009)
FOREIGNOWN	0.198***	0.173***
	(0.015)	(0.016)
SIZE	0.108***	0.102***
	(0.002)	(0.002)
AGE	0.017***	0.016***
	(0.004)	(0.004)
PRODUCTIVITY		0.047***
		(0.007)
_cons	-3.518***	-5.336***
	(0.255)	(0.396)
Industry Dummy	Included	Included
Country Dummy	Included	Included
Year Dummy	Included	Included
Obs.	14118	14118
Pseudo R^2	0.297	0.30
Wald Test	4580.96	4617.87
Log Likelihood	-5405.28	-5386.82

Figures reported in the table are marginal effects (marginal effects at the mean).
Standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

As far as the direct and indirect channels are concerned, the significant positive coefficient of the variable (MANIN) after controlling for productivity's effects in Model 3 suggests that MI might

directly increase the likelihood of exporting by 1.7%. Also, with respect to the significance of (MANIN) in Model 1 and (PRODUCTIVITY) in Model 3 it is very likely that MI has an indirect impact on export activities via enhancing productivity. The conjecture regarding the existence of an indirect relationship between MI and exporting via productivity is strengthened when the indirect effects are examined by Sobel's (1982) multiplicative method. The product of (MANIN) in Model 1 (β=0.0907) and (PRODUCTIVITY) in Model 3 (β=0.047) yields a coefficient equal to 0.004, which is smaller than the direct effect. It is worth mentioning that as the issue of endogeneity between productivity and exporting might exist (Aw et al., 2008) and thus confound the initial findings represented in Table 4.4 and Column 2 Table 4.5, the test of hypotheses and comprehensive analysis of results will be fully discussed after testing the endogeneity issue in section 4.4.1.

Table 4.6 The determinants of productivity: ordinary least square (OLS) model

	Subsample of exporters (Model 4)	Subsample of non-exporters (Model 5)
MANIN	0.146**	0.052
	(0.057)	(0.031)
PRODUCIN	-0.028	0.004
	(0.056)	(0.028)
PROCESIN	0.041	0.072**
	(0.059)	(0.031)
FOREIGNOWN	0.232***	0.55***
	(0.080)	(0.086)
CAPITAL INTENSITY	0.220***	0.228***
	(0.019)	(0.009)
SIZE	0.030	0.14***
	(0.020)	(0.011)
AGE	-0.056*	-0.004
	(0.032)	(0.016)
_cons	8.154***	6.031***
	(0.643)	(0.531)
Industry Dummy	Included	Included
Country Dummy	Included	Included
Year Dummy	Included	Included
Obs.	3316	10802
R-squared	0.444	0.436
Prob (F-Statistics)	0.000	0.000

Standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

As mentioned earlier, to determine whether MI is a productivity enhancing activity for exports, i.e., evidence for learning-to-export, the effect of MI on productivity is estimated both for exporters and non-exporters in Models 4 and 5. Descriptive statistics of the sample show that while 1449 firms introduced MI and make the export decision, 3370 firms introduced MI but did not export. Furthermore, to examine whether the sample of exporters is dependent from non-exporters a t-test with unequal variances is run (Levene's hypothesis on the equality of variances was rejected). The results suggest that there is a significant difference between the mean of productivity of these two groups and thus they are independent from each other (t-value = -23.62). Table 4.6 Column 1 revels that there might be evidence in support of learning-to-export effects: the estimated coefficient of (MANIN) is positive and significant ($p < 0.05$). Thus, in accordance with my argument, it is likely executives change the nature of management within organizations in pursuit of closing the performance gap before the entry into overseas markets. The validity of this argument is strengthened when it is observed only for exporters productivity is enhanced through the introduction of MI. For non-exporters the impact of MI on productivity is not significant (Column 2). Interestingly, the significant parameter of process innovation in Column 2 indicates that non-exporters improve their productivity levels by means of some changes in production processes. It is worth mentioning that no clear evidence was found regarding learning-to-export effects of product innovation for the subsample of exporters.

4.4.1 Endogeneity

Another significant issue that needs to be tested is endogeneity. The common reasons that lead to the endogeneity issue in regressions are omitted variables, measurement errors, and simultaneity. Wooldridge (2013, p. 554) states that simultaneity occurs in a regression when "one or more of the explanatory variables is *jointly determined* with the dependent variable, typically through an equilibrium mechanism". In my study, the possibility of endogeneity through simultaneity is high. One reason for this is that the WBES does not have lagged variables to control for the reverse simultaneous causal association between productivity and exporting, known as learning-by-exporting

effects in the empirical literature (e.g., Love and Ganotakis, 2013; Salomon and Jin, 2008; Tse et al., 2017). Hence, it is very likely that productivity affects exports and vice versa. Moreover, the issue of endogeneity of productivity may stems from omitted variables. Indeed, there are important omitted variables which may influence a firm's export decision and productivity level, such as managerial capabilities, nonetheless, their effects cannot be controlled in the regression due to data unavailability. This research pays great attention to the issue of endogeneity since leaving it uncontrolled may result in inconsistent and biased estimates (Wooldridge, 2013), something leading hypotheses developed earlier are not convincingly supported or rejected (Jean et al., 2016). I tested for the endogeneity of productivity using the Wald test of exogeneity. The null hypothesis of this test is that there is no endogeneity for productivity. To test this hypothesis, it is necessary to find a variable which can be used as the instrument for the variable (PRODUCTIVITY), treated as endogenous variable in Model 3. The instrument chosen in this study is a dichotomous variable which captures the on-the-job training of employees within firms. This variable seems to be an appropriate instrument because prior researchers report that holding training programs for employees is significantly associated with higher productivity of firms (e.g., Dearden et al., 2006), and it is less likely to be connected with firms' export foreign market entry decision directly. After running a Probit model with endogenous regressors, it is revealed that the null hypothesis of exogeneity is rejected (χ^2 (1) = 5.05, p = 0.02). This finding suggests that productivity in Model 3 is not exogenous, thus I cannot assume productivity is fully generated in Model 1 and discount simultaneous impacts of exports in Model 3. In other words, I need to run a system of equations rather than estimating each model separately.

One method to estimate Model 1 and Model 3 in a system is Zellner's (1962) seemingly unrelated regression (SUR) framework. The underlying concept in the SUR framework is the simultaneous estimation of two or more equations with correlated error terms. Roodman (2011, p.168) points out that "equations in an SUR system seem unrelated in the sense that no endogenous (left – hand side) variables appear on the right side of other equations". Hence, with regard to this specification of SUR, it is not appropriate for the multi-equation system of this study where the dependent, endogenous variable (PRODUCTIVITY) in Model 1 appears in the right-hand side of

Model 3 as an explanatory variable. The alternative method that allows me to estimate the system of equations is the conditional mixed-process (CMP) technique developed by Roodman (2011). The CMP program is similar to SUR in terms of estimating a set of equations with correlated error terms. Meanwhile, in the CMP setup, unlike SUR, the simultaneous estimation of Models 1 and 3 is possible even if the explanatory, endogenous variable of productivity in Model 3 is produced in Model 1. For Model 1 and Model 3 in the CMP setting we have:

$$PRODUCTIVITY_i = f(\, MANIN_i, X_i) \quad \text{Model (1)}$$

$$EXPR_i = \, f(PRODUCTIVITY_i, MANIN_i, Z_i) \quad \text{Model (3)}$$

$$\varepsilon = (\varepsilon_1, \varepsilon_3)' \, \sim N \, (0, \Sigma)$$

$$\Sigma = \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}$$

Where ε_1 and ε_3 are error terms of Models 1 and 3, respectively. They are independently and identically distributed. Σ is the variance - covariance matrix of error terms. The value of rho (ρ) represents the correlation of error terms and measures the endogeneity of productivity in Model 3, which the actual value of the variable (PRODUCTIVITY). If ε_1 is uncorrelated with ε_3, productivity is only conditional on MI and other determinants, but not exports. Also, the significance of rho (ρ) represents "the proof of the goodness of this [statistical] approach" (Hewitt-Dundas et al., 2019, p.1316). In other words, where rho (ρ) is not significantly different from zero the error terms are not correlated and the models can be consistently estimated separately. On the other hand, where rho (ρ) is significantly different from zero it suggests that the error terms are correlated and thus joint estimation is required.

Table 4.7 indicates the results of the CMP program. First of all, the coefficient of Rho (ρ) is significant at 10%, although its small magnitude cannot significantly influence the direction of causality. Also, the significance of Rho (ρ) means the two models are correlated from error terms and the system of equations ought to be used for estimations. Therefore, using the CMP technique, where it is needed, allows me by controlling for the issue of endogeneity report estimations that are unbiased

and more consistent than previous results, in general (Roodman, 2011).

Table 4.7 The export decision regression: conditional mixed-process (CMP) technique

	Dependent variable (PRODUCTIVITY) (Model 1)		Dependent variable (EXPR) (Model 3)
MANIN	0.09***	PRODUCTIVITY	0.039***
	(0.028)		(0.006)
PRODUCIN	0.003	MANIN	0.014*
	(0.025)		(0.007)
PROCESIN	0.09***	PRODUCIN	0.022***
	(0.028)		(0.007)
FOREIGNOWN	0.414***	PROCESIN	0.029***
	(0.058)		(0.007)
CAPITAL INTENSITY	0.227***	FOREIGNOWN	0.144***
	(0.009)		(0.014)
SIZE	0.155***	SIZE	0.086***
	(0.009)		(0.002)
AGE	0.0001	AGE	0.014***
	(0.014)		(0.004)
_cons	7.542***	_cons	-5.388***
Industry Dummy	Included	Industry Dummy	Included
Country Dummy	Included	Country Dummy	Included
Year Dummy	Included	Year Dummy	Included
Obs.	14118	Wald test χ^2 (158)	18582.57
Rho (ρ)	-0.083*		

Figures of Model (3) are marginal effects (marginal effects at the mean).
Standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

Given the significant role of the CMP program in an accurate estimation of models consisting of endogenous variables, I test hypotheses of this study with respect to the outcomes of the CMP technique reported in Table 4.7. First of all, it should be noted that not much of a difference is observed between the estimated coefficients of Model 1 in Tables 4.7 (after controlling for the issue of endogeneity) and 4.4 (before controlling for the issue of endogeneity). One possible explanation for this is that though the error terms of these two models are correlated, represented by (ρ), they are not strongly correlated (significant at 10%). Consequently, productivity is, to a large extent, explained in Model 1 and learning-by-exporting effects and unobserved variables would not remarkably influence productivity of firms. The estimated coefficient of (MANIN) suggests that the introduction of MI is

positively and very significantly ($p < 0.01$) associated with productivity of firms, so Hypothesis 1a is supported. As far as control variables are concerned, unlike product innovation, process innovation positively and highly significantly influences a firm's productivity level. The results also suggest that productivity of firms enhances as the share of foreign owners in the capital structure of firms increases. Likewise, the ratio of fixed asset per employee (CAPITAL INTENSITY) significantly and positively influences a firm's productivity level. The age of a company does not affect its productivity, whilst its size has a significant positive effect.

Results in Column 1 Table 4.5 suggest that the introduction of MI in companies increases the probability of entering to exports by 2.3%. This positive impact might result from the two distinct channels, i.e., direct and indirect channels. The existence of a direct link between MI and exports is examined in Model 3 Table 4.7. According to the results, MI's impacts on exports are not restricted to the indirect channel through productivity gains and then self-selection. The significant positive coefficient of (MANIN) in Model 3 Table 4.7 suggests that there is a direct, albeit weak ($p<0.1$), association between MI and exporting. The magnitude of the estimated coefficient points out that introducing MI may increase the probability of exporting slightly by 1.4%.

As far as the indirect relationship is concerned, parameters estimated for MI in Models 1 and 2 and productivity in Model 3 show Baron and Kenny's (1986) conditions for the existence of an indirect relationship between MI and exporting through productivity are fulfilled: the results of estimation of Model 1 in Table 4.7 and Model 2 in Table 4.5 reveal the highly significant positive impact of MI on a firm's productivity and the export decision, respectively. Also, after including the variable (PRODUCTIVITY) as a determinant of exports in Model 3 in Table 4.7, i.e., self-selection, its estimated parameter is positive and highly significant. Thus, Hypothesis 1b is supported. Notably, based on Sobel's (1982) method for examining the indirect effects, the coefficient of (MANIN) in Column 1 Table 4.7 (β= 0.0907) multiplied by the coefficient of (PRODUCTIVITY) Column 2 Table 4.7 (β= 0.039) yields a product equal to 0.003, which is smaller than the direct effects of MI. In sum, as Hypotheses 1a and 1b have already been supported and all conditions for having an indirect relationship between MI and exporting through productivity are met, Hypothesis 1 is also supported.

4.5 Discussion and Conclusion

4.5.1 Implications for Theory and Practice

The international trade literature has been dominated by empirical studies highlighting the significant impact of a firm's superior productivity level on the self-selection into exports. Most of these studies attribute the heterogeneity of productivity between exporting and non-exporting firms, prior to internationalization, to technological innovations introduced in firms. As a consequence, the literature has been completely silent on the importance of other types of innovation, specifically MI, in the improvement of productivity of companies interested in starting export activities. In this study, I addressed this gap considering the recent findings suggest that MI plays a role that is as important as technological innovations for furthering organizational performance (see Walker et al., 2015).

In the present study, the underlying theoretical argument for the possible MI-exports association was based on the self-selection behaviour of a firm pursuing foreign market entry. In fact, the principal reason for the introduction of MI, that is, enhancing organizational efficiency (Birkinshaw et al., 2008), the intangible nature of this type of innovation (Damanpour, 2014), and the inability of MI to be directly traded and sold in markets (Battisti and Iona, 2009) support this notion that MI might have an indirect impact on the likelihood of a firm's export operation via productivity gains. I draw on three strands of the literature, namely; management innovation, innovation-productivity, and productivity-exports to explain how MI leads to the productivity premium of management innovators and thereby increases the probability of becoming exporters for them.

To conduct the empirical investigation, I built and used a comprehensive sample of over 14400 firms from 55 countries for the first time in the MI literature. The validity of my argument was tested by several regressions using this unique data set. First, I tested the association between the change in the nature of management and productivity of firms. I found evidence suggesting that the alteration in the nature of management has a significant positive influence on the productivity of companies. Next, I examined if the MI-exports nexus can be explained through productivity-growth and then the self-selection into exports. Findings, in general, were consistent with the underlying

argument and support this notion: MI and a firm's export decision are linked through productivity. Last, I examined the possibility of learning-to-export effects or a conscious self-selection. I found that, in this sample, firms are very likely to introduce MI in order to attain higher productivity levels with the aim of overcoming sunk costs of foreign market entry. It is worth noting that this finding explicitly reflects the rational school of the introduction of MI in firms and shows the compatibility of MI with the logic of endogenous models of exporting used in this study.

This study provides two important contributions to the literature, as well as an implication for managerial practice. First, this study connects management innovation and export literature that have been studied in isolation so far. The results of this study uncover the importance of the role of a less-considered type of innovation in the strategic decision of foreign market entry through exporting. Indeed, the general view of the innovation-export literature has focused on technological types of innovation (Chabowski et al., 2018), perhaps because capturing MI and determining its boundary in companies is more difficult than technological innovations (Volberda et al., 2014). This study adds to the literature by providing theoretical explanations and empirical examination of MI as an antecedent of the export strategy of companies. By doing so, I respond to the call of Cassiman and Golovko (2011) for the investigation of other productivity-enhancing activities and their interplays with the decision to start exporting.

Second, this study tests the MI-productivity link by means of a cross-country data set encompassing more than 14400 companies. MI is an old concept that has resurged recently by the work of Birkinshaw et al. (2008). Therefore, there is much more to learn about it, especially to what extent changes in management practices, processes, or structure are correlated with performance of an organization (Damanpour, 2014). Conducting an empirical examination on a large sample of firms from emerging and developing countries is an important addition not only for the MI literature to gain acceptance by showing the validity of the proposition that MI is a key factor improving organizational performance (e.g., Birkinshaw et al., 2008; Hamel, 2006), but also for the innovation-productivity literature dominated by studies investigating influences of technological innovations as well as the

recently-emerged management practices – productivity literature (e.g., Bloom et al., 2012; Bloom and Van Reenen, 2007).

The findings of this research carry directly a relevant implication for practice. Firms annually allocate substantial financial resources to develop new technological products and processes with the aim of creating competitive advantage and finding a way to international markets. While the results of my study are similar to the findings of prior studies affirms that the investment in technological changes is the most effective way of directly increasing the probability of exporting, the important insight of this study indicates that technological change is not the exclusive contributory factor for starting export activities. Findings of the present study illustrate that managers interested in extending their companies' scope of operation by starting export activities may rethink and innovate their management organization as improvements in this area can facilitate the foreign market entry procedure by enhancing organizational efficiency and effectiveness.

4.5.2 Future Research

The results of this study raise several questions and open potential new areas of research in the innovation-export literature. For instance, this study informs the literature by examining the relationship between MI and exporting in manufacturing enterprises. What the current literature needs is a comprehensive study examining and comparing the MI-exports association across manufacturing and service sectors. To date, almost all prior studies have dealt with innovation and exporting in manufacturing, therefore, our understanding is very little about the impacts of innovation on the export orientation of service firms; let alone MI's influences. This merits more attention because " in services, a company's management and innovation there in is more likely to provide competitive advantage than technological prowess" (Mol and Birkinshaw, 2009, p.1269). Moreover, companies in service sectors generally encounter lower internationalization barriers, especially if they perform in knowledge-based services, for instance accounting, advertising, legal services, etc. (Contractor et al., 2003). Therefore, future studies may replicate the investigation of the MI-exports association in services and contribute to the generalizability of the present study.

In addition, an important avenue for future research would be the empirical examination of the causal relationship established in this study between MI and exports by using longitudinal data. MI is a specific type of organizational change through which the organization's DNA is fundamentally changed (Birkinshaw et al., 2008). Therefore, the full implementation of such organizational change, in comparison to technological changes, takes a longer time (Damanpour and Aravind, 2012). This causes the impact of MI on organizational performance appears with time lags. Future studies may address the limitation of my study and instead of using cross-sectional data; designing and conducting longitudinal studies. This provides a more accurate picture of MI's effectiveness on productivity of companies interested in enhancing readiness prior to the self-selection into exports. Finally, one interesting area of research is to focus on the role of MI *after* the entry into export markets. What has been centered in this research is an investigation of MI's impacts on the possibility of a firm's involvement with export activities. Except for the few recent works, the young and burgeoning MI-export literature still needs studies that provide theoretical explanations and empirical evidence concerning the association between MI and export performance.

Chapter 5: Combinative Effects of Innovation Types and Export Survival

5.1 Introduction

The internationalization journey of firms often begins with exporting operations (Johanson and Vahlne, 1977). Exporting, the most common way of entering to global markets (Leonidou et al., 2010), is particularly important as it is a fundamental channel for boosting sales volume (Golovko and Valentini, 2011); improving productivity levels (Aw et al., 2007); upgrading technological knowledge (Love and Ganotakis, 2013; Salomon and Jin, 2010); and capturing fruits of innovative endeavors (Kafouros et al., 2008). Firms, in pursuit of taking these advantages, put a lot of effort into finding a way to international markets, although a considerable proportion fail to survive institutional and competitive pressures of the foreign market and make the decision to exit very rapidly (Bernard and Jensen, 2004b; Blum et al., 2013; Welch and Welch, 2009). Despite the importance of export survival - the period of continuous exporting by a firm - in obtaining superior productivity performance levels (Andersson and Lööf, 2009), little scholarly attention has been directed to exploring the determinants of a firm's export survival in international business (IB) research, to date (Couper et al., 2020; Choquette, 2019; Love and Máñez, 2019). The present study addresses this shortcoming and examines the consequences of innovative activities of firms, as one of the widely acknowledged contributory factors to the successful entry and expansion in foreign markets (Sousa et al., 2008), for their survivability by identifying following research needs in the extant literature.

Introducing technological innovations, e.g., new products or technological processes, or non-technological innovations, e.g., a new management arrangement or marketing method, helps firms to adjust their internal and external functions with the dynamic nature of environmental changes, safeguard their viability in competitive markets, and attain performance aspiration levels (Cefis and Marsili, 2005; Damanpour et al., 2018; Tether and Tajar, 2008). A firm's long-lasting survival in markets and superior performance, however, rather than depending on the introduction of a stand-alone type of innovation from either category, i.e., technological *or* non-technological, results from

the introduction of innovations from *both* categories (Damanpour, 1991; Klepper and Simons, 2000). The validity of this theoretical proposition has been tested by a large body of literature focusing on the empirical investigation of combinative effects of technological and non-technological innovations on performance (Ballot et al., 2015; Battisti and Stoneman, 2010; Camisón and Villar-López, 2014; Damanpour et al., 2009, among others); and survival of firms (e.g., Cefis and Marsili, 2019). Studies in the IB context, similarly, have examined combinative effects of innovations on export performance (e.g., Lewandowska et al., 2016; Radicic and Djalilov, 2019), but prior research reports export survival consequences of only technological innovations (e.g., Deng et al., 2014; Giovannetti et al., 2011; Love and Máñez, 2019; Sui and Baum, 2014). Hence, very little progress has been made in exploring the relationships between non-technological innovations, with particular interest for this study, management innovation (hereafter MI), defined as "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals" [1] (Birkinshaw et al., 2008, p.829) including export survival. This gap in the literature means that very little is also known about the effects of MI in combination with technological innovation and cumulative form on the longevity of export activities.

The paucity of knowledge on export survival consequences of different configurations of MI motivates the present study, which makes three contributions. First, this research enriches the debate on the role of innovation activities in the survivability of exporting firms by comparing and contrasting export survival consequences of a non-technological innovation, namely, MI when it is implemented at a point in time, cumulated over time, or combined with other innovation types. It is widely argued that MI is one of the important sources of a long-lasting competitive advantage (e.g., Birkinshaw and Mol, 2006; Hamel, 2006). Nonetheless, studies in line with the conventional mainstream of the literature have primarily focused on exploring the influences of technological innovations on firms' competitiveness and survival in the export market (e.g., Deng et al., 2014; Giovannetti et al., 2011; Love and Máñez, 2019; Sui and Baum, 2014). This research departs from these studies by investigating the impacts of MI and shows that the single, cumulative, and

[1] The level of analysis will be discussed later.

combinative forms of MI may have entirely different effects on unlocking its full potential in the creation of competitive advantage and, ultimately, lengthening the survival in foreign markets.

Second, grounded in the resource-based view of the firm (RBV), this study instead of having a "snapshot" view in a specific moment in time, furthers prior work investigating the innovation-export survival relationship by developing and testing the premise that inter-firm variation in export survival can be explained by the history (accumulation) of MI and technological innovation activities of exporting firms for securing their competitive position in the overseas market. The importance of this novel approach in the analysis of the innovation-export survival relationship can be found in Jones and Khanna's (2006) argument implying that "history matters" in IB research as

> "[h]istory allows us to examine long-run effects of phenomena of interest. If we confine ourselves to researching events in the recent past, we are ruling out the possibility of uncovering effects that only manifest themselves over the longer haul." (p.465)

In particular, viewing the background of an exporting firm's innovative efforts is worthwhile in that it contains rich information pertaining to incremental changes in the firm's system of attributes, i.e., the history of innovation activities; something creating its current competitive position (Nerkar and Roberts, 2004; Roberts and Amit, 2003). Although the review of the extant export literature reveals that studies have neglected the importance of history in the investigation of the effects of innovations on export survival, the present study by using a sample of 890 Spanish manufacturing firms demonstrates it plays a central role in clarifying the complex association between innovation activities of a firm and its duration of export operations.

Third, this study is among the earliest theoretical and empirical efforts to provide an examination of how the combinative outcomes of MI and technological innovations affect firms' export survival prospects. Though the export literature has historically viewed innovation from its technological dimensions, i.e., product and process innovations (Chabowski et al., 2018), technological innovation activities, *per se*, may reflect just a part of an exporting firm's innovative endeavors (Battisti and Stoneman, 2010). In fact, technological changes may not suffice for gaining competitiveness and then reaching success in the global marketplace unless they are coupled with

changes in the way the exporting firm is managed (Nassimbeni, 2001; Teece et al., 1997). According to the socio-technical system (STS) theory (Trist, 1981), outcomes of firms are optimized when changes introduced in the technical (operating) system, including products, processes, and technologies used to produce products, are accompanied with changes in the social (administrative) system, consisting of organizational structure, administrative processes, human resources, etc. (Crossan and Apaydin, 2010; Damanpour and Evan, 1984), that are collectively framed by MI (Birkinshaw et al., 2008). Using insights of the STS theory and RBV, the current study, unlike numerous studies in the export literature, takes into account the role of MI and advocates that firms introducing MI and technological innovations in combinations, that are flexible and less focused on one type over time, are more likely to stay competitive and thus survive for longer periods in the export market.

The remainder of this study is structured as follows: The next section introduces innovation types and develops hypotheses. The following section describes the specifications of the dataset and outlines the econometric technique used for the survival analysis. Thereafter, estimation results will be presented. Then, the conclusion section offers my final thoughts and discusses the results. The final section provides avenues for further research.

5.2 Literature Review

5.2.1 Innovation Typology

The literature indicates that different typologies have been proposed by researchers to facilitate the classification of innovations introduced by firms (e.g., Crossan and Apaydin, 2010; Gopalakrishnan and Damanpour, 1997; Tether and Tajar, 2008). To distinguish between export survival consequences of innovation activities and then examine their combinative effects, two pairs of typologies which are more relevant to the objectives of the present study are elucidated. The first typology that has been also widely employed by researchers in the export literature is product vs. process innovation. This system of classification was primarily used to study industrial innovations which are typically

outcomes of a firm's research and development (R&D) projects, thus product and process innovations are referred to as technological innovations (Damanpour et al., 2018). The second typology is technological vs. non-technological innovation. While technological innovations, i.e., product and process innovations, are pertinent to novelties in a firm's technology domain, non-technological innovations are related to alterations in its social structure (Evan, 1966). Based on this method of classification, management innovation is recognized as a non-technological type of innovation (Damanpour, 2014).

Technological Innovation

Product Innovation

Product innovation refers to new products and services introduced by a firm to meet an external user or a market needs, in other words for the benefit of the external world (Utterback and Abernathy, 1975). Firms by being involved in the procedure of developing a new product might be able to improve the quality of their products (Cho and Pucik, 2005) and serve better extant customers (Damanpour, 2010); something which allows them to benefit from the advantages of monopoly power, at least for a short period of time, and increase the price that buyers are willing to pay (Cohen and Klepper, 1996; Tavassoli and Karlsson, 2015). The change in a firm's product also enables it to finds new markets thanks to differentiation and quality advantages (Damanpour, 2010; James et al., 2013).

Process Innovation

Product innovation is a change in what a firms offers to markets, whereas process innovation is an alteration in the mode of creation and delivery of those offers (Bessant et al., 2005; Barras, 1986). Process innovations are defined as significant changes in tools, devices, and knowledge that mediate between inputs and outputs (Rosenberg, 1972; Ettlie and Reza, 1992). Process innovation, unlike product innovation, has an internal focus (Damanpour and Gopalakrishnan, 2001), therefore, it is less transparent and publicly available to a firm's rivals, which make it difficult to imitate and reverse engineer (James et al., 2013). Process innovation is driven within firms with the aim of increasing

productivity and flexibility as well as reducing cycle time and average costs of production (Leiblein and Madsen, 2009). As process innovation is "organization-specific", it is not assumed to be directly traded or licensed in markets in a disembodied form (Cohen and Klepper, 1996).

Non-technological Innovation

Management Innovation (MI)

MI, also called administrative innovation or organizational innovation (Damanpour, 2014), is defined as "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals" (Birkinshaw et al., 2008, p.829). Hamel (2006) simply conceptualizes this innovation type as the change in what managers do and how they do it. MI has similarities to process innovations for instance, it is firm-idiosyncratic (Volberda et al., 2013), inimitable (Damanpour and Aravind, 2012), and introduced a matter of necessity to enhance the effectiveness and efficiency of firms' internal operations and systems (Birkinshaw et al., 2008). However, unlike process innovation, MI is a renewal in a firm's social system through which its managerial procedures or administrative structure are overhauled (Damanpour, 2014). In this study, I use Birkinshaw et al.'s conceptualization, but following Vaccaro et al. (2012), in order to have a sizeable sample for testing hypothesis, the magnitude of newness is defined as the " state-of-the-firm".

5.2.2 History of Innovation Activities – Export Survival

Do innovations have a positive influence on firms' export survival prospects? A useful starting point for finding the answer to this important question is to review the literature on the resource based view of the firm (RBV). This widely used theoretical perspective assumes that sustained competitive advantage results from the heterogeneous distribution of rare, valuable, inimitable, and non-substitutable resources (or capabilities) across firms (Barney, 1991). The author argues that " [a] firm

is said to have *sustained competitive advantage* when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors *and* when those other firms are unable to duplicate the benefits of this strategy" (p.102). It is extensively argued that a firm's innovation capabilities are quite important in the emergence and sustainability of competitive advantage and, ultimately, long term survival in markets thanks to increased market share (e.g., Cefis and Marsili, 2005; Nelson and Winter, 1982; Teece et al., 1997; Zott, 2003). This argument is reinforced by empirical evidence demonstrating that innovators, thanks to possessing a superior competitive position, are more likely to neutralize competitive threats and survive for prolonged periods in domestic (e.g., Bayus and Agarwal, 2007; Christensen et al., 1998) as well as foreign markets (e.g., Sui and Baum, 2014). Whereas these studies account innovation as a source of sustainable competitive advantage, postponing the exit decision from markets, they ignore the effects of different types of innovation introduced by a firm over export time on its competitive position and survivability in the overseas market (Damanpour et al., 2009; Dierickx and Cool, 1989; Roberts and Amit, 2003).

A firm's capability to introduce technological innovations has an important role in the implementation of two general competitive strategies, namely, differentiation- and cost (efficiency)-based strategies (Peteraf and Barney, 2003; Porter, 1980). Researchers by distinguishing between different forms of technological innovations argue that product innovation is a useful means of facilitating the realization of a differentiation strategy in the export market, whilst process innovation makes the fulfillment of a cost (efficiency) strategy possible (e.g., Basile, 2001; Filipescu et al., 2013; Kyläheiko et al., 2011; Rodríguez and Rodríguez, 2005). Adhering to a differentiation strategy necessitates the firm creating innovative products or services that seem somehow unique for customers (Miller and Friesen, 1986). By introducing a new product which is different from what is currently available in the market, the firm would be able to meet the needs of customer groups better and provide superior benefits to them (Zott, 2003). This may enhance foreign customers' sense of loyalty to offerings of the exporting firm (Aulakh et al., 2000; Zou et al., 2003) and erect competitive barriers for entry (Miller and Friesen, 1986). In these circumstances, the likelihood of success and

long-run survival for subsequent entrants is markedly low (Christensen et al., 1998) which, in turn, aids the product innovator to secure its competitive position and continue exporting (Sui and Baum, 2014).

Though product innovators are able to climb the "quality ladder" and sustain or improve their market position (Roper and Love, 2002, p.1089), developing new products inevitably incurs back up expenditures, such as product design, extensive research, or marketing expenditures that means lead product differentiators are not typically low-cost manufacturers (Porter, 1980). Conversely, process innovators devote huge efforts to control and minimize production costs (Zott, 2003). Reducing costs of production, in turn, allows process innovators by implementing a cost (efficiency) strategy, to give consumers value comparable to that of other products with lower prices (Aulakh et al., 2000). Hence, exporting firms by introducing process innovation match with the most efficient rivals presenting low-cost products to the foreign market (Miller and Friesen, 1986) and thus survive in this market for a long duration (Love and Máñez, 2019).

Until recently it was thought that only those innovations introduced in a firm's technological domain effect its export entry decision and export performance. However, the findings of recent studies are illustrative of MI's significant role in commencing export activities (Chapter 4) and achieving outstanding export performance (Azar and Ciabuschi, 2017; Prange and Pinho, 2017). In fact, MI is acknowledged as a substantial source of gaining sustainable competitive advantage in todays' dynamic markets (Hamel, 2006; Heyden et al., 2018). MI, in comparison to technological innovation, is more systemic and complex (Damanpour, 2014). Thus, it entails firms possessing relevant idiosyncratic capabilities for its complete implementation (Battisti and Iona, 2009; Hollen et al., 2013) which were collectively coined by the term "management innovation capabilities" (Harder, 2011, p.52). Firms owning these capabilities are able to carry out competitive strategies successfully, particularly the service differentiation strategy, via changing the nature of the management within the firm (Barras, 1990; Gebauer, 2011). The export literature has so far focused on differentiation through product innovation, while there is a growing dialogue underscoring the importance of customer services provided by manufacturing firms in creating competitive advantage in the foreign market

(e.g., Kaleka and Morgan, 2017; Kaleka, 2011). A manufacturing firm's service differentiated position in the overseas market is characterized by product accessibility, superior pre- and post- sales support, timeliness, and reliability of delivery (Porter, 1980). Attaining a superior position in offering differentiated services vis-à-vis competitors, i.e., service advantage, depends on the extent to which the exporting firm is able to improve the quality of its services (Kaleka, 2011). That is something that necessitates exporting firms undergoing changes in their extant administrative system (Barras, 1990; Wischnevsky et al., 2011). The findings of qualitative studies demonstrate that changing the organizational structure from autonomous business units to a high degree of intra firm collaboration effectively facilitates the flow of required resources to support service development; or overhauling the decision making structure from a centralized to a decentralized one allows middle and lower-level managers to align better strategies of the firm with customers' complex services needs as these managers are typically more in communication with clients than senior managers (e.g., Neu and Brown, 2005; Oliva and Kallenberg, 2003). As a result of these changes, an exporting firm becomes able to improve the quality of the relationship between buyer and seller, increase service quality reputation, and leave a lasting impression that impacts customer satisfaction and repeat buying (Brown and Lam, 2008; Gebauer, 2008). Together these effects definitely help the firm venturing internationally to sustain its competitiveness and survive in the foreign market for longer periods.

The prior discussion elucidates how different innovation types aid an exporting firm to implement competitive strategies and endure its operations in international markets. Meanwhile, it should be noted that the effectiveness of competitive strategies on an exporting firm's survival in the international context is dependent upon different factors, particularly, the extent to which resources and capabilities enabling these strategies are imperfectly imitable by other firms (Autio et al., 2000; Barney, 1991). Barnett et al. (1994, p.12) in line with Barney highlight the significance of the history of a firm in achieving "inimitable" capabilities and stress that "[s]ome of the least imitable - and in that sense the most valuable - capabilities are those that can only come about over time through a gradual evolutionary process". Consistent with Barnett and colleagues' argument, prior research suggests that a firm's innovation capabilities have a cumulative nature and their development is a

function of experiences it gains over time from the introduction of innovations to the market (Nerkar and Roberts, 2004; Tavassoli and Karlsson, 2015). Hence, I expect that each innovation type which is continuously introduced over the exporting life of the firm, i.e., has a greater cumulative sum, would have a stronger impact on export survival prospects. This is because the accumulation of learning-to-do and learning-by-doing effects in a given innovation area may result in the evolution of the firm's relevant innovation capabilities through improving its knowledge base (Clausen et al., 2012). Theoretically, this allows the exporting firm by reducing the potential for imitability of capabilities to implement value-creating strategies in a way that are difficult to be emulated by competitors (Barney, 1991) and thus facilitate obtaining the satisfactory performance level necessary to defer the exit decision (Giarratana and Fosfuri, 2007; Nelson and Winter, 1982; Surdu et al., 2019). This discussion leads to my first hypothesis:

Hypothesis 1: The greater the cumulative sum of each innovation type, the longer a firm's export survival.

5.2.3 Combinative Effects of Innovation

The study adopts the operationalization of composite innovation variables developed by Roberts and Amit (2003). Although these conceptualizations have been employed by researchers to examine combinative consequences of innovation activities for organizational performance (e.g., Damanpour et al., 2009), to the best of my knowledge, this study is the first to use such variables to investigate combinative effects of innovations in the export context.

Focus on a specific type of innovation. Two reasons have been proposed by researchers advocating that firms rather than dispersing resources on developing various innovation types, should focus on a specific type of innovation. The first is based on the absorptive capacity concept. Accordingly, "prior knowledge permits the assimilation and exploitation of new knowledge" (Cohen and Levinthal, 1990, pp.135-6). The authors argue that the absorptive capacity of a firm is domain-specific, meaning that when the absorptive capacity of a firm is developed in one specific area the firm is more ready to accumulate additional knowledge in that area. This suggests that firms possessing a greater stock of

knowledge and experience concerning a particular innovation type tend to acquire the knowledge and capabilities required for improving that specific type of innovation (Henderson and Cockburn, 1994). Hence, as the involvement in innovation activities is generally a risky decision (Greve, 2003), firms by focusing on a particular innovation area in which they have already gained expertise can manage the risk of innovation activities and exploit successfully market opportunities earlier than rivals (Nerkar and Roberts, 2004). The second and interrelated reason was developed by Roberts and Amit (2003). They emphasize that firms have limited time and financial resources, so by employing all its resources in developing one type of innovation, the firm might be able to deepen its experience in a particular innovation activity and thereby introduce an innovation that might meet customers' needs better.

Despite the persuasiveness of these ideas, focusing on a single innovation type, either technological innovations or MI, seems to be disadvantageous to the effective operation and durable survival of firms in international markets. Based on the resource-based view of the firm, the firm would be able to gain competitive advantage in markets by employing resources/capabilities of different kinds in particular combinations (Barney, 1991). Thus, understandably, "winners in the global marketplace have been firms that can demonstrate timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competences" (Teece et al., 1997, p.515). This important assertion resonates with the cornerstone of the STS theory (Trist, 1981). Accordingly, changes in products, processes, or technologies of a firm, collectively representing the technical system, should be paired by changes in its organizational structure, administrative processes, or human resources, characterizing the social system (Trist, 1981). In fact, concentrating on a specific type of innovation would lead to the sub-optimization of the firm's outcomes as any changes in the technical system of an organization puts new constrains and barriers on the effective functioning of its social system and vice versa (Damanpour and Evan, 1984).

For instance, firms that introduce only process innovations over exporting time may be able to offer "low-price" products to the export market, however, because resources employed for efficiency

differ from those used for improving quality (Ulaga and Reinartz, 2011), low price products and services are typically followed by low quality (Kaleka and Morgan, 2017). Cefis and Marsili's (2005, 2012) findings demonstrate that process innovators by improving product quality via engaging with product innovation activities can slightly increase their market share and subsequently the odds of survival. However, these changes in the technical system of the exporting firm would not significantly trigger customers' willingness for repeat purchases of its low-cost, high-quality products and thus lengthen the duration of exports unless the firm gains an advantage through providing higher levels of service support for customers by changing the current managerial arrangement (Bowen et al., 1989; Brown and Lam, 2008). On the other hand, changes in the social system by introducing MI may lower the risk of exit by providing "high-quality" services for buyers (Cefis and Marsili, 2019). Nevertheless, upgrading the quality of customer services without introducing superior products is not only an infrequent combination among high-performing export ventures (Kaleka and Morgan, 2017), but it also may erode competitiveness as promoting the quality of products and services incurs significant expenses which in turn results in a higher price than rivals' if the firm does not undergo changes in the production processes (Zeithaml et al., 1996; Zeng et al., 2011).

The foregoing discussion shows that changes in social and technical systems are dependent on each other in relation to sustaining competitive advantage and reducing the hazard of the termination of export operations. Thus, the introduction of compositions of innovation types that are made up by a single type would lead to a partial renewal in the exporting firm's system of attributes and result in an imbalance between changes in its social and technical systems. Under this situation, the firm would not be able to protect its competitiveness and market share because the implementation of a certain competitive strategy by emphasizing the introduction of a specific type of innovation would not effectively impact foreign customers' value perceptions and the probability of purchase (Kaleka and Morgan, 2017; Tellis et al., 2009). Hence, I expect that

Hypothesis 2: Exporting firms with more focused innovative activity have shorter export survival.

Consistency in introduction of a similar composition of innovation types. The introduction of innovations is considered as an important adaptive strategy that a firm might choose to lessen the overseas market's uncertainties, cope with threats, and ultimately seize opportunities (Damanpour et al., 2009; Golovko and Valentini, 2011). These uncertainties stemming from unexpected changes in foreign customers' taste and preferences, institutional conditions, and economic situation entail entrant firms introducing different forms of innovations to offer the right product and service to the host country and subsequently alleviate the negative impact of uncertainty (Azar and Drogendijk, 2016; Rhee and Cheng, 2002). Roberts and Amit (2003, p.114) emphasize that in such turbulent environments "at different times, different innovation categories may be associated with more profitable opportunities for improvement". Therefore, when exporting firms are faced with these environmental changes they should alter the composition of innovation activities and fit products and services with consumer needs in order to maintain their market share and thus prolong export operations (Nummela et al., 2016). Reconfiguring the portfolio of innovation activities in a way that could meet consumer needs entails possessing a bundle of resources/capabilities, including innovation capabilities, however, from the RBV perspective, this bundle is not necessarily found in every exporting firm (Barney, 1991). If such a bundle is not already owned by the internationalizing firm, continually introducing a similar composition of innovations through the development of innovation capabilities currently owned (Cohen and Levinthal, 1990; Nerkar and Roberts, 2004) increases the degree of resource 'stickiness' and thus makes the procedure of the acquisition of new innovation capabilities time-consuming (Teece et al., 1997). As a result, the exporting firm is not capable of responding quickly to the export market that, in turn, causes it to miss business opportunities and subsequently withdraw from export operations due to unsatisfactory performance (Mudambi and Zahra, 2007; Zahra and Covin, 1994). Even if all innovation resources/capabilities already exist within an exporting firm, introducing a similar composition of innovation activities in ever-changing environments, such as international markets, causes the firm, unlike long-lived entrants, to fail to use other innovation capabilities and thus " [do] right things at the right time" (Al–Aali and Teece, 2014, p.106). Such a shortcoming constrains the firm adaptation with the host market environment and might increase the probability of exit because of poor performance, which results from a misfit of

products and services to changing consumer needs in the export market (Crick, 2004; Surdu et al., 2019). Thus, I expect that keeping the configuration of compositions of innovation types unchanged over time may constrain the adaptability of firms to the foreign market environment and reduce the probability of a long term survival. Hence, I propose that

Hypothesis 3: Exporting firms with greater consistency in the composition of innovation activity have shorter export survival.

5.3 Data and Method

5.3.1 Sample

The dataset used in this study to test the hypotheses is drawn from the yearly Spanish Survey of Business Strategies (ESEE, hereafter) from 2007 to 2016. This survey conducted and administered by Fundación Empresa Pública is financially sponsored by the Spanish Ministry of Industry. The Fundación has collected detailed information from the entire population of Spanish manufacturing firms with 200 or more employees since 1990. Firms whose size is between 10-200 employees, that constitute five percent of the population in 1990, were randomly sampled and surveyed. Spanish firms with less than 10 employees were basically removed from the survey project. In regard to the validity and reliability of information, the ESEE has been employed by a plethora of published studies in the innovation – export literature for empirical investigations (e.g., Cassiman and Golovko, 2011; Love and Máñez, 2019; Salomon and Jin, 2010; among others) [2].

This data set has a number of characteristics which make it appropriate to submit the conceptual framework and hypotheses to statistical testing. The data cover the history of innovation and export activities of Spanish firms over a ten-year period. Additionally, the ESEE provides a firm-level panel dataset that enables me to capture various innovation behaviors of exporting firms on a yearly basis. In particular, from 2007 onward, the ESEE has added a question which asks about MI activities of firms beside their technological innovations. This allows me to have a panel

[2] For more information please review the webpage of the ESEE in Fundacion SEPI: http://www.fundacionsepi.es/esee/en/epresentacion.asp.

encompassing necessary information for examining the effects of technological and, especially, non-technological types of innovation on firms' export survival over time.

The data set which is used in the present study is created in a multi-stage process. First, because this research aims to investigate the consequences of innovation activities for export survival of firms, I removed information of Spanish companies that did not have any experience in export activities during the study period. This left an initial sample of 1509 firms. Second, following Deng et al. (2014) and Girma et al. (2003), in order to prevent mixing influences of foreign market entry and exit, I exclude observations of 587 firms that resume exporting after leaving the export market, i.e., re-entry. Third, the observations of 32 firms that did not innovate over the entire investigation period or declare essential information for the survival analysis were deleted.[3] The final sample data set left for this study after the data cleansing procedure is an unbalanced panel, featuring 188 exits and 3865 observations that belong to 890 firms functioning in 20 distinct industries. Table 5.1 indicates the distribution of Spanish firms by industry.

Table 5.1 Distribution of firms by industry

NACE	Definition	No.	Perc.	NACE	Definition	No.	Perc.
1	Meat products	39	4.4	11	Nonmetal mineral products	48	5.4
2	Food and tobacco	98	11	12	Basic metal products	37	4.2
3	Beverage	21	2.4	13	Fabricated metal products	87	9.8
4	Textiles and clothing	39	4.4	14	Machinery and equipment	69	7.8
5	Leather, fur and footwear	22	2.5	15	Computer products, electronics and optical	23	2.6
6	Timber	14	1.6	16	Electric materials and accessories	41	4.6
7	Paper	47	5.3	17	Vehicles and accessories	50	5.6
8	Printing (before Printing and Edition)	24	2.7	18	Other transport equipment	24	2.7
9	Chemicals and pharmaceuticals	93	10.4	19	Furniture	26	2.9
10	Plastic and rubber products	63	7.1	20	Other manufacturing	25	2.8
					Total	**890**	**100**

[3] It is worth noting that the elimination of such a small number of firms is unlikely to have any implication for sample selection bias.

5.3.2 Modelling Procedure

To choose and employ appropriate statistical methods for the survival analysis, one important thing ought to be taken into account: the exit of a firm from the export market is an event that happens in continuous time (continuously) while it is represented in discrete time (interval censored data), in this study yearly. This justifies the use of the discrete time hazard model which was initially proposed by Allison (1982) and later developed by Jenkins (1995, 2005). Following Jenkins' (2005) explanations on discrete time specifications, I apply the logistic hazard model formulated as below, equation (1)

$$h_i(j, X_i) = \frac{1}{1 + \exp - (\alpha_j + \beta' X_i + u_i)} \quad (1)$$

Where h_i is the discrete-time (interval) hazard function to the exit of firm i from the export market, j indicates survival time in years (the period of continuous exporting by a firm), X_i is a vector of covariates (time-varying or constant over time) with coefficients β, u_i is unobserved heterogeneity referred to as "frailty"($u_i \sim N(0, \sigma_u^2)$), that is, unmeasured firm-specific (time-invariant) risk factors influencing the hazard after controlling for observed explanatory variables (the *X* vector), and α_j characterizes the baseline hazard function (that is the function of years a firm continuously exporting). Jenkins (2005) points out that α_j may differ for each year and its pattern of variation is characterized by applying some function of *j* (survival time). Thus, with respect to examples proposed by him concerning duration function specifications, I assume α_j is a first order polynomial function of survival time. Including survival time as a regressor which plays the role of the baseline hazard specification in discrete time hazard models is a practice suggested and used by a number of researchers (e.g., Manez et al., 2015; Singer and Willett, 1993). So, we can write equation (1), alternatively, as equation (2)

$$h_i(j, X_i) = \frac{1}{1 + \exp - (\alpha_j + \beta' X_i + z_1 j + u_i)} \quad (2)$$

Where z_1 is the coefficient of survival time estimated together with intercept and parameters in the coefficient β.

In the end, I examine the possible influences of unobserved heterogeneity. To do so, it is hypothesized the "rho" statistic – the ratio between the heterogeneity variance to the heterogeneity variance plus one – is equal to zero (H_0: ρ=0). Jenkins (2005) notes that where the null hypothesis cannot be rejected it indicates unobserved heterogeneity insignificantly impacts on coefficients estimated in models.

5.3.3 Variables

Dependent variable

The dependent variable for the survival analysis is not directly measured by the number of years a firm persistently exports, instead, similar to the practice used by Love and Máñez (2019), I define the binary variable (EXPORT EXIT) whose value becomes 1 if the firm stops exporting and drops out of the analysis, while it takes the value 0 as long as it continues exporting.

One important issue which needs to be considered for making this binary measure is right-censored survival data. To deal with this issue, firms that continued exporting at the end of the study period, i.e., 2016, were treated as right-censored (Cleves et al., 2016). For right-censored data the dependent binary variable is coded with the value of 0.

Independent variable

A plethora of prior studies have reported the positive association between innovation activities of a firm and its export operations (Love and Roper, 2015). Given the focus of the present study, three types of innovation activities, namely product innovation, process innovation, and management innovation, are included in estimations by using three different dummy variables PRODUCIN, PROCESIN, and MANIN, respectively. To test Hypothesis1, I use the cumulative sum of dummy variables, shown by MANT, PRODT, and PROCT. Accordingly, the maximum value of the

cumulative sum of each variable does not exceed 10, i.e., 1 per year. The reason for measuring these variables is that the data does not show the total number of innovations introduced in each type of innovation in a given year, which causes the actual *number* of innovations remains under-represented. The other important limitation regarding the cumulative form of innovations is caused by the issue of data unavailability on MI activities of firms before 2007. In fact, since I do not have the complete MI history of firms, which leads the dataset is constrained in a way that it extends over just ten years annual observations, my study is unable to capture the cumulative effects of innovations introduced before the start of the sample period, i.e., 2007, on export survival.

Combinative effects of different innovation types are measured by composite measures proposed by Roberts and Amit (2003) and later used by Damanpour et al. (2009). Though Roberts and Amit's initial mathematical formulas are accumulative over previous years, similar to Damanpour et al. (2009), measures used in the present study are annual with the same interpretation. The focus variable measures the extent to which innovation activities of an exporting firm have been centered on one type of innovation. It is computed through dividing product innovation ($producin_{it}$), process innovation ($procesin_{it}$), and management innovation ($manin_{it}$) introduced in each year by the total number of innovation types introduced in that specific year (inn_{it}). Then, the squares of three proportions across three types of innovation activities are summed:

$$Focus_{it} = \left(\frac{producin_{it}}{inn_{it}}\right)^2 + \left(\frac{procesin_{it}}{inn_{it}}\right)^2 + \left(\frac{manin_{it}}{inn_{it}}\right)^2$$

The value of focus is equal to 0.33 when the firm evenly devotes its innovation activities across three types and rises toward 1 if the firm concentrates on a single innovation type.

The consistency variable shows year-to-year changes in each innovation type's proportion of total innovative activity. This variable is computed by summing the squared change in the proportion of each type of innovation of total innovation activity. Then, the negative of the sum of these yearly changes is calculated:

$$Consistency_{it} = -[(\%\ producin_{it} - \%producin_{it-1})^2 + (\%\ procesin_{it} - \%procesin_{it-1})^2 + (\%\ manin_{it} - \%manin_{it-1})^2]$$

where $(\%producin_{it})$, $(\%procesin_{it})$, and $(\%manin_{it})$ are shares of product, process, and management innovations, respectively, of total innovation activities in year t. The value of consistency is equal to zero when the exporting firm devotes its innovation activities to all three types of innovation in an unchanged pattern between successive years. Meanwhile, larger negative value of consistency is realized when the firm's distribution of innovation activities becomes unstable.

To meet the objectives of this study and test empirically my conjectures, the empirical analysis proceeds as follows: the effects of MI and technological innovations on export survival of firms are empirically tested as a baseline. Then, theoretical arguments about the history of innovation, i.e., cumulative effects of innovation activities, are tested. Last, the conceptual model developed earlier on combinative effects of innovation activities is empirically examined.

Control variables

I control for multiple firm-level factors that possibly impact on export survival. According to the model specifications, the first variable which needs to be controlled in the survival analysis is (SURVIVAL TIME). Furthermore, the export literature has suggested that firms' resources are particularly important in the selection into exporting (Cassiman and Golovko, 2011) as well as lengthening the duration of export activities (Sui and Baum, 2014). In this study, two variables reflecting the level of resources owned by internationalizing firms are included in estimations. The first one is the size of exporting firms (SIZE). This is measured by the natural logarithm of exporting firms' total fixed assets (Deng et al., 2014). The second proxy that has been suggested by prior research is the productivity level a firm (Mishina et al., 2004). In this study, productivity of firms is measured by the total factor productivity (TFP) which is the residual from a Cobb-Douglas production function estimated by means of the method developed by Wooldridge (2009), (PRODUCTIVITY). Furthermore, studies highlight the importance of foreign ownership for the success in export operations, because foreign-owned companies probably have access to new technologies and better

market linkages (Mudambi and Zahra, 2007; Singh, 2009). As a result, (FOREIGOWN) measuring the percentage of foreign capital in Spanish firms' ownership structure is included in estimations. Last, because the start date of exports was not observed, with the aim of robustness, I include the dummy variable of (LEFT-CENSORED) in estimations whose value becomes 1 if the firm was incorporated before the first year of this study and it is already exporting in this year, i.e., 2007. This technique which has been applied by prior studies (e.g., Manez et al., 2015; Love and Máñez, 2019) will control for the left-censored data and thus may prevent downward bias in the time dependence' estimate. In fact, learning-by-exporting effects in previous unobserved periods may help the firm to better adapt with the foreign market and prolong export operations (Love and Máñez, 2019).

Table 5.2 Summary statistics and variable description

Variables	Description	Mean	S.D.	Min.	Max.
Surv.TIME	The period of continuous exporting by a firm.	5.066	2.632	0	10
EXPORT EXIT	Binary variable, whose value = 1 if the firm stops exporting.	0.048	0.215	0	1
MANIN	Dummy variable, whose value = 1 if the firm introduced a management innovation.	0.507	0.5	0	1
PRODUCIN	Dummy variable, whose value = 1 if the firm introduced a new or product innovation.	0.454	0.498	0	1
PROCESIN	Dummy variable, whose value = 1 if the firm introduced a process innovation.	0.796	0.402	0	1
MANT	The cumulative sum of MANIN.	2.48	2.259	0	10
PRODT	The cumulative sum of PRODUCIN.	2.322	2.424	0	10
PROCT	The cumulative sum of PROCESIN.	3.808	2.352	0	10
FOCUS	Discrete variable taking values 0.33, 0.5, and 1, measuring the degree to which a firm focuses on a single type of innovation.	0.683	0.281	0.33	1
CONSISTENCY	Continuous variable ranging between -2 and 0, measuring the degree to which a firm consistently introduces a similar composition of innovation types.	-0.252	0.445	-2	0
PRODUCTIVITY	Total factor productivity (TFP) (expressed in logs).	4.049	0.234	2	5.58
FOREIGNOWN	Continuous variable ranging between 0 and 1, measuring the percentage of foreign capital.	0.242	0.419	0	1
SIZE	The size of the firm, measured by total fixed assets (expressed in logs).	15.946	2.038	4.53	23.97
LEFT-CENSORED	Dummy variable, whose value = 1 if the exporting firm was incorporated before 2007.	0.963	0.188	0	1

*All monetary values are in EURO € converted to real values by using the consumer price index (CPI) from the World Bank Indicators.

Table 5.3 presents the correlation matrix for all the variables involved in empirical analyses of this study. The variable FOCUS correlates negatively with simple and cumulative forms of all innovation types. This may come from the design of this combinative measure. Furthermore, Surv.TIME is significantly and positively correlated with cumulative sum of innovation types. One possible explanation for this is that cumulative variables increase over time.

Table 5.3 Correlation coefficients

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) EXPORTEX	1.000													
(2) MANIN	-0.020	1.000												
(3) PRODUCIN	-0.042*	-0.049*	1.000											
(4) PROCESIN	-0.047*	-0.060*	-0.116*	1.000										
(5) MANT	-0.052*	0.561*	-0.025	0.002	1.000									
(6) PRODT	-0.083*	-0.022	0.610*	-0.059*	0.268*	1.000								
(7) PROCT	-0.087*	0.037*	-0.028	0.396*	0.490*	0.386*	1.000							
(8) FOCUS	0.064*	-0.579*	-0.510*	-0.444*	-0.335*	-0.326*	-0.223*	1.000						
(9) CONSISTEN.	-0.014	0.087*	0.059*	0.216*	0.071*	0.075*	0.145*	-0.215*	1.000					
(10) PRODUCT.	-0.128*	0.046*	0.011	0.122*	0.086*	0.065*	0.186*	-0.106*	0.065*	1.000				
(11) FOREIGN.	-0.089*	0.022	-0.048*	0.023	0.058*	-0.032*	0.063*	-0.007	-0.009	0.315*	1.000			
(12) SIZE	-0.146*	0.094*	0.098*	0.135*	0.170*	0.163*	0.233*	-0.190*	0.095*	0.639*	0.349*	1.000		
(13) LEFTCEN.	-0.052*	-0.027	0.032*	-0.010	-0.025	0.050*	0.005	0.003	-0.007	0.021	-0.066*	-0.021	1.000	
(14) Surv.TIME	-0.333*	0.006	-0.012	0.023	0.435*	0.417*	0.636*	-0.008	0.047*	0.138*	0.126*	0.168*	0.062*	1.000

* shows significance at the .05 level ; (N=3865).

5.4 Results

To begin with, I test the proportionality of hazard rates for all estimated coefficients in logit regressions (Han and Hausman, 1990). This test is important in that if the effects of an absolute difference in covariates do not imply proportionate differences in hazard at each t, i.e., the effects vary with survival time, the interpretation of estimates becomes convoluted and thus conclusions might be erroneous (Singer and Willett, 1993). For instance, in a non-proportional scaling, the effects of MI on the export survivability of firms in time *t* may differ from its effects in time *t+1*, which is difficult to explain theoretically. Hence, I perform a test based on time-dependent covariates suggested by Cox and Oakes (1972). Accordingly, models are estimated by adding all covariates, survival time (*j*), and the interaction terms between covariates and survival time. Then, the likelihood-ratio statistic is compared between main and interaction models (likelihood ratio test). The results show that the proportionality assumption is violated for the cumulative sum of all innovation types because interaction effects are different from zero. Thus, to improve the fit of the logit model with the data and control for non-proportionality, interaction terms of the cumulative sum of innovation types and survival time were included in models which have cumulative variables. Also, it should be noted that the logit model is suitable to analyze the duration of exports in my study because the specifications of this model do not impose proportionality assumptions (Sueyoshi, 1995).

Another issue that ought to be considered in estimations is the endogeneity between productivity and exports. The presence of the endogeneity may lead to biased and inconsistent estimates (Jean et al., 2016). One reason for the endogeneity is simultaneity which means one or more independent variables is jointly determined with the dependent variable (Wooldridge, 2013). The possibility of endogeneity due to simultaneity is high in this research: improving the productivity levels may allow the firm to self-select into exports and continue export activities (Bernard and Jensen, 1999; Cassiman and Golovko, 2011), at the same time, in the reverse causal direction; exporting positively affects productivity thanks to leaning-by-exporting effects (Clerides et al., 1998; García et al., 2012). Although Deng et al. (2014) claim that survival models consider past behaviors

of firms, including productivity, that would prevent the existence of the simultaneity and thus endogeneity, this argument is not sufficient to alleviate the endogeneity concern in my research. Thus, I report two sets of models in Table 5.4. In the first set (Models 1-3), I use Deng et.al's rational and assume the survival models spontaneously control for any spurious associations and endogeneity in the relation between productivity and exports that may arise from simultaneity. In the second set (Models 4-6), with the aim of controlling for these issues, I included 1-year lagged values of control variables instead (Hair et al., 2006; Jean et al., 2016).

The results of logit models for testing hypotheses are reported in Table 5.4. Model 1 shows the baseline estimates. The estimated coefficients for all three types of innovation, MANIN, PRODUCIN, and PROCESIN are negative but not significant. Although these coefficients are not statistically significant, a number of studies in the export survival literature also report the introduction of innovations in isolation do not significantly influence on the longevity of a firm's international business through exports (e.g., Giovannetti et al., 2011). However, in Model 4, the estimated parameter for PROCESIN is negative and significant (Model (4): β= -0.63, p <0.05), implying that the cost leadership strategy is more important for lengthening the duration of exports. One possible interpretation of this coefficient is that when process innovation has been introduced within firms, we expect a 0.63 decrease in the log-odds of the hazard of the determination of export activities.

Hypothesis 1 predicts the greater cumulative sum of innovation types, in other words continuously introducing innovations, would contribute to exporting firms' survival in the overseas market. Model 2 indicates, unlike my prediction, the greater cumulative introduction of innovation types would not reduce the hazard of the termination of export operations. Although estimated parameters for PRODT and PROCT are still insignificant in Model 5, the estimated coefficient for MANT is statistically significant and positive at a significance level of 10% (Model (5): β= 0.312, p <0.1). The same results can be observed in Models 3 and 6 that include combinative measures. This suggests that a greater cumulative sum of MI, i.e., continuous changes in management practices, processes, and structure over export time, might be counterproductive and reduces the probability of

exporting firms' survival, regardless of some combinative effects that might arise from certain compositions of innovation types. Thus, the data does not support Hypothesis 1. The magnitude of estimated coefficients for interaction terms of MANT and Surv.TIME across models shows that, in general, the effects of cumulative sum of MI do not considerably change; though by introducing compositions of innovation types the adverse impact of MANT is slightly mitigated over time (Model (3): β= -0.006; Model (6): β= -0.012).The interaction term of PRODT is statistically significant and similar to PROCT has a positive sign, suggesting that the effects of cumulative technological innovations on the termination of export operations decreases as time passes.

Table 5.4 The export survival regression: random effects logit model[1]

	Baseline (Model 1)	Cumulative effects (Model 2)	Combinative effects (Model 3)		Baseline (Model 4)	Cumulative effects (Model 5)	Combinative effects (Model 6)
MANIN	-0.172			MANIN	-0.182		
	(0.262)				(0.256)		
PRODUCIN	-0.077			PRODUCIN	-0.175		
	(0.291)				(0.280)		
PROCESIN	-0.503			PROCESIN	-0.630**		
	(0.321)				(0.312)		
MANT		0.244	0.385**	MANT		0.312*	0.458**
		(0.182)	(0.189)			(0.181)	(0.185)
PRODT		-0.092	0.057	PRODT		-0.159	-0.004
		(0.208)	(0.213)			(0.202)	(0.206)
PROCT		0.232	0.127	PROCT		0.179	0.092
		(0.161)	(0.163)			(0.161)	(0.162)
FOCUS			1.822***	FOCUS			1.985***
			(0.641)				(0.629)
CONSISTENCY			0.835**	CONSISTENCY			0.591*
			(0.361)				(0.347)
PRODUCTIVITY	-1.639**	-1.946**	-1.705**	$PRODUCTIVITY_{(t-1)}$	-1.033*	-1.160	-0.957
	(0.686)	(0.825)	(0.791)		(0.615)	(0.736)	(0.748)
FOREIGNOWN	-0.419	-0.483	-0.463	$FOREIGNOWN_{(t-1)}$	-0.201	-0.067	-0.098
	(0.544)	(0.712)	(0.710)		(0.397)	(0.483)	(0.482)
SIZE	-0.281***	-0.371***	-0.377***	$SIZE_{(t-1)}$	-0.102	-0.149	-0.135
	(0.097)	(0.122)	(0.123)		(0.077)	(0.094)	(0.095)
LEFT-CENSORED	-0.744	-0.764	-0.840	LEFT-CENSORED	-0.665	-0.719	-0.758
	(0.619)	(0.792)	(0.772)		(0.580)	(0.750)	(0.729)
Surv. Time	-1.465***	-3.038***	-3.095***	Surv. Time	-1.514***	-3.101***	-3.129***
	(0.120)	(0.273)	(0.278)		(0.121)	(0.275)	(0.278)
MANT × Surv. Time		0.007	-0.006	MANT × Surv. Time		0.001	-0.012
		(0.033)	(0.034)			(0.033)	(0.034)
PRODT × Surv. Time		0.228***	0.208***	PRODT × Surv. Time		0.244***	0.223***
		(0.042)	(0.043)			(0.042)	(0.043)
PROCT × Surv. Time		0.020	0.043	PROCT × Surv. Time		0.016	0.035
		(0.042)	(0.043)			(0.042)	(0.043)
_cons	10.917***	13.365***	11.406***	_cons	6.306***	7.436**	5.146
	(2.772)	(3.536)	(3.520)		(2.433)	(3.081)	(3.170)
Obs.	3863	3863	3863	Obs.	3862	3862	3862
Industry Dummy	Included	Included	Included	Industry Dummy	Included	Included	Included
Rho (ρ)	47.24***	59.17***	51.72***		43.06***	57.50***	49.10***

[1]Standard errors are in parenthesis*; *** p<0.01, ** p<0.05, * p<0.1;* [1] Negative coefficients should be interpreted as a decrease in the hazard.

In addition, I predicted that focusing on a single innovation type over exporting life of a firm might adversely affect its export survival prospects. In support of Hypothesis 2, the estimated parameter for this indicator (FOCUS) is positive and significant (Model (3): β= 1.822, p < 0.01; Model (6): β= 1.985, p < 0.01), which suggests that focusing on one innovation type leads to a 1.985 increase in the log-odds of the hazard of the termination of exporting. This result confirms my contention that successful companies which survive in export markets for long periods have a balanced approach to the introduction of innovation types over export time. Moreover, it is expected that if the composition of an exporting firm' innovation types remain unchanged; it may reduce the likelihood of export survival. The significance and sign of the variable (CONSISTENCY) are as expected (Model (3): β= 0.835, p < 0.05; Model (6): β= 0.591, p < 0.1). Thus, Hypothesis 3 is also supported, albeit weakly.

The control variables included in estimations also show some significant results. As regards firm resources, the estimated coefficient for (PRODUCTIVITY), in accordance with my expectations, is significant and has a negative sign across the first three models. This suggests that as the productivity level of an exporting firm increases, the hazard of termination of export operations decreases. Similarly, the second proxy for firm resources (SIZE) also has a negative and significant coefficient. This indicates that owning more resources in terms of tangible assets allows firms to continue international activities through exports for longer periods. When it comes to lagged variables, despite the significant and negative coefficient of the lagged value of PROUDCITIVTY in Model 4 (β= -1.033, p < 0.1); none of lagged values of PRODUCTIVITY and SIZE in the other two models have a statistically significant relationship with export survival. As far as foreign ownership is concerned, the estimated coefficient for (FOREIGNOWN) has a negative sign that corresponds to predictions while it is not statistically significant in any estimation. Finally, with the aim of capturing the effects of export activities in unobserved periods on survivability and thus increasing the robustness of empirical findings; I controlled for left-censored observations by the dummy variable of (LEFT-CENSORED) and compared results reported in Table 5.4 with models excluding the dummy. It was revealed that left-censored data cannot impact on the duration dependence coefficient

(Surv.Time) through downward bias, irrespective of controlling or not controlling for changes in an exporting firm's status (Manez et al., 2015).[4] [1]

The last row of Table 5.4 shows the result of Rho (ρ) statistic. The high significance of this statistic in three models implies the variance of unobserved heterogeneity is not equal to zero. This suggests that there are unobserved variables that should be included in the survival analysis to reduce bias in the estimated coefficients presented in Table 5.4 (Jenkins, 2005). According to his explanation, these omitted variables are either intrinsically unobservable such as the variation of export managers' abilities across firms, or observable but not available in the dataset, for instance, the use of supports offered by trade and investment promotion agencies. Consequently, controlling for the effects of these variables to decrease bias in estimates is practically impossible in my study.

5.5 Discussion and Conclusion

Despite the importance of firm export survival in capturing the fruits of the internationalization journey (Andersson and Lööf, 2009), scant attention has been paid to the understanding of antecedents of a prolonged survival in international markets. In pursuit of expanding this underdeveloped strand of the export literature, the present study, based on valuable insights of the resource-based view of the firm and socio-technical system theory, examined the export survival consequences of innovation activities. In particular, using conceptualizations developed by Roberts and Amit (2003), I tested whether the introduction of certain configurations of innovation types over export time would allow internationalizing firms to protect their competitive position and subsequently lengthen survival prospects. This examination on a sample of 890 Spanish exporters has important findings outlined and discussed below.

The findings of this study show that although exporting firms might put a lot of effort into the introduction of MI, an *ad hoc* MI at a point in time by them may not contribute to their survival. Furthermore, having a greater accumulation of MI over exporting life, i.e., continuously overhauling

[4] The insignificance of the coefficient LEFT-CENSORED is very surprising for me as nearly all firms take the value 1 for this dummy variable.

the managerial arrangement of the firm, is detrimental for a firm's export survival. One reason for this is that as MI is generally a top-down process (Damanpour and Aravind, 2012), middle managers and employees who are the main executors of organizational renewal "often experience intense confusion, perceiving executive initiatives as replete with multiple and unclear mandates" (Lüscher and Lewis, 2008, p.222). As a result, altering management practices, processes and structure repeatedly over export time may increase middle managers' and employees' ambiguities concerning new ways of working, which leads to failure in delivering expected contributions of MI to competitive strategies because of inconsistencies between what top managers strategize and what employees implement (Heyden et al., 2018). Also, I observed that although product innovation, neither separately nor cumulatively, influence the exporting firm's survival prospects, there is some evidence which shows the separate form of process innovation might contribute to a long-lasting export survival.

The results of my research also suggest that MI and technological innovations might be effective if they are introduced in compositions of different innovation types. This can be inferred from the combinative effects of innovation types indicating that emphasizing on the introduction of a specific type of innovation over export time would not assist internationalizing firms to gain competitive advantage that is, in turn, heightening the probability of the foreign market exit. Coupled with this finding concerning the negative impact of introducing a single innovation type on survivability, the data reveals that continuously introducing a similar composition of innovation types over export time may also adversely influence firms' survival prospects in the foreign market, suggesting that compositions of innovation activities should be dynamic in changing environments such as export markets.

My study makes three contributions to the literature. First, researchers have striven to explore the role of innovation in export survival, though, consistent with the main stream of the literature, they have provided valuable insights pertaining to the effects of technological types of innovation (e.g., Deng et al., 2014; Giovannetti et al., 2011; Love and Máñez, 2019; Sui and Baum, 2014). Thus, the effects of non-technological innovations, particularly MI, on exporting firms' competitiveness and survival have been largely underexplored. Considering the central role of MI in gaining sustainable

competitive advantage (Birkinshaw and Mol, 2006; Hamel, 2006), this study takes into account the effects of MI and furthers the extant literature on the innovation-export survival relationship by providing a detailed comparison of export survival consequences of three forms of this innovation type. This is an important addition to the extant literature as the results of this research are illustrative of noticeable differences between the influences of each form of MI on the survivability of firms in the export market: while single and cumulative forms of MI are ineffective and disadvantageous for the export survival of a firm, respectively, its combination with technological types of innovation is advantageous for the viability in the international market.

Second, while studies have recently started the investigation of the consequences of technological and non-technological innovation activities for export operations (e.g., Azar and Ciabuschi, 2017; Radicic and Djalilov, 2019), they ignore the fact innovation capabilities have a cumulative nature that causes a firm's innovation performance in the current year to be a function of innovations introduced in previous years (Nerkar and Roberts, 2004; Roberts and Amit, 2003). Unlike prior work, my study in pursuit of offering an interesting and unexplored avenue to analyze the innovation-export link considers the history of innovation activities of exporting firms and pushes forward studies that examine the effects of technological as well as non-technological innovations by showing important empirical evidence suggesting that the rich history of non-technological innovation activities, specifically MI, is not only beneficial to survival, but it shortens the longevity of a firm's international business through exports.

Third, extensive research in the innovation literature has argued that non-technological innovation has a role as critical as technological innovation in the optimal operation of firms (see Walker et al., 2015), and emerging area in the export literature demonstrates introducing these two innovation types in combination results in higher export performance levels (e.g., Lewandowska et al., 2016). While some exiting IB literature investigates export survival consequences of innovation activities (Deng et al., 2014; Sui and Baum, 2014; Love and Máñez, 2019), none of it has explored combinative effects of technological and non-technological innovations, specifically MI, for export survival. The present study addresses this gap in our knowledge and extends the export literature by

providing theoretical explanations and empirical examinations on combinative effects of management and technological innovations on the persistency of export operations.

The results of my work has implications for managerial practice by offering insights on the conditions under which different innovation activities would be effective in lengthening export activities. Although managers should consider MI as an important organizational change that enables the firm to provide superior services for foreign clients, they ought to be aware of the fact that MI's true implementation has a complex and time consuming process that causes extra, even creative, changes in managerial arrangement may become counterproductive and reduces the probability of the successful protection of competitive position in the export market. Furthermore, the results of my study show that the potential benefits of different innovation types for the export duration are realized when the exporting firm fights with inertia both in the market-side and intrafirm activities, i.e., tries to keep the balance in the introduction of different modes of innovation.

5.5.1 Avenues for Future Research

This study offers promising avenues for future research. I have framed out my ideas in the perspective of manufacturing firms. Meanwhile, there are significant differences between the nature and pattern of innovation behaviors of manufacturing and services that cause the prevailing views in manufacturing firm not to be applicable in the context of services industries (Barras, 1990; Wischnevsky et al., 2011). Also, in terms of export operations, services, particularly those functioning in hi-tech industries, encounter lower internationalization barriers than manufacturing companies (Contractor et al., 2003). Despite the existence of such important differences, surprisingly, little attention has been paid to the role of innovation in service firms' export survival. Future studies may address this void in our understanding and determine to what extent innovations matter for the business longevity of services in international markets.

In the present work, I focused on two sets of contrasting types of particular interest, i.e., technology vs. non-technology and product vs. process. Studies in the innovation-export literature

have recently offered valuable insights on how a firm's incremental, process-based, versus radical, product-based, innovations would affect its export orientation (Saridakis et al., 2019), scope of export (Love et al., 2016), and export performance (Azar and Ciabuschi, 2017; Silva et al., 2017). Future research might pursue the opportunity unearthed in my study by theoretically explaining and empirically testing consequences of introducing incremental and radical innovations on export survival.

Last, internationalizing firms, of course, do not exist in a vacuum, isolated from any external influences. IB scholars have recognized and extensively explained the role of several cultural and institutional factors in the variation of firms' international performance and survival. Nevertheless, there is a paucity of knowledge concerning the possible impacts of such factors on the relationship between innovation and export survival. I call for future researchers to extend my work by building an integrative framework including environmental factors. For instance, how intellectual property rights regimes might influence export survival consequences of innovation activities can form an interesting topic for future research.

Chapter 6: Learning-by-Exporting: The Moderating Role of Management Innovation

6.1 Introduction

It has been widely acknowledged that cultivating valuable innovations increasingly relies on externally sourced knowledge (e.g., Chesbrough, 2003; Kafouros and Buckley, 2008; Love et al., 2014). Exporting, in particular, plays a crucial role in providing such inflows as it allows firms to gain access to diverse and new external portfolios of knowledge and ideas from different markets and cultures. *Inter alia*, The World Bank (1997, p.74) emphasizes "participating in export markets brings firms into contact with international best practices and fosters learning". Accordingly, a substantial body of literature has found that exporting produces more innovation output (e.g., Alvarez and Robertson, 2004; Criscuolo et al., 2010; Salomon and Shaver, 2005), owing to what has been labeled "learning-by-exporting" in practitioner as well as academic outlets. This research aims to further understanding of the relationship between exporting and innovation by addressing the following gaps in the extant literature.

Scholars have increasingly been concerned with how and whether exporting affects firms' innovativeness (Crespi et al., 2008; D'Angelo et al., 2020; Love and Ganotakis, 2013; Salomon and Shaver, 2005; Tse et al., 2017; among others). Building on the premise that exporting exposes firms to a wide variety of knowledge sources and insights that would otherwise be unavailable to them in the home market. This stream of scholarship tests the export-innovation link and reports the critical role of exporting in fostering technological innovations. The pioneering researchers' predominant focus on technological innovations as output of exporting, however, has left an open question of how exporting may influence non-technological innovations, particularly of interest, management innovation (hereafter MI), referred to as "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals" [1] (Birkinshaw et al., 2008, p.829).

[1] To empirically test hypotheses of the present study, the level of newness is defined as "new to the firm".

Furthermore, the literature on learning-by-exporting suggests that firms do not equally learn from export activities. Prior studies have offered valuable insights on the sources of this heterogeneity by examining the moderating impacts of firms' technological capabilities, specifically absorptive capacity (Cohen and Levinthal, 1990), (e.g., D'Angelo et al., 2020; García et al., 2012; Salomon and Jin, 2010) as well as industry conditions (Salomon and Jin, 2008). Although these studies have considerably advanced understanding of which factors cause the discrepancy of learning-by-exporting outcomes across firms, knowledge of how the implementation of MI within firms may lead to the inter-firm differences in learning-by-exporting effects has remained very limited.

The present work addresses these two gaps in knowledge and endeavors to make two contributions accordingly. First, this research enriches understanding of the export-innovation association by providing theoretical explanations and empirical examination of how exporting may stimulate MI activities within firms. The investigation of such a link is meaningful in that it is extensively argued that exporting is not only a great opportunity for obtaining and learning valuable technological insights, but it also gives access to better and more efficient and effective management styles by which exporting companies are managed (e.g., Battisti and Iona, 2009; Bloom et al., 2012; Silva et al., 2012). This study theorizes how exporting may fuel MI activities of firms and submits its theoretical arguments to a unique longitudinal sample of Spanish manufacturing firms with data between 2007 and 2016.

Second, this research seeks to inform the debate on the origins of the variance in learning consequences of export activities by advancing and testing carefully the premise that the implementation of MI moderates the link between exporting and patenting. Exploring the moderating effects of MI is of interest for theoretical and practical reasons. It would be interesting for scholars since against the prevailing wisdom that overwhelmingly assumes the level of learning from export markets is determined by the amounts of resources allocated on absorptive capacity, often represented by research and development (R&D) investments (see Lewin et al., 2020), this study recognizes the contributory role of a non-R&D based mechanism, that is, MI and thus demonstrates firms possessing similar absorptive capacity endowments still differ in their ability to learn from exporting. It also

matters to practitioners because given the fact that exporting is inevitably a hazardous, resource-consuming process which exposes firms to several risks and uncertainties (Hitt et al., 1997), it seems to be somewhat worthwhile to them to know whether and how introducing initiatives in firms' managerial arrangements helps them to benefit more from and capitalize fully on foreign activities.

The rest of this research is organized as follows. The next section reviews the related literature on learning-by-exporting and develops the hypotheses. The third section describes the sample and research methodology. The fourth section presents empirical findings. The final section discusses findings and concludes.

6.2 Literature Review and Hypothesis Development

"Learning-by-exporting" broadly refers to a phenomenon whereby a firm can attain higher performance levels after entering into the export market (Golovko and Valentini, 2014). The two related aspects of firm performance that have been well researched in the learning-by-exporting literature are productivity and innovativeness.

Previous research suggests that exporting firms are significantly more productive than non-exporting firms (e.g., Bernard et al., 2007). Some firms become more productive before starting export operations due to learning-to-export efforts (Wagner, 2007). The underlying argument here is that because entering into export markets incurs start-up costs, firms may make a strategic decision to improve their managerial arrangements (first empirical chapter) or invest in inputs to upgrade technology or to diminish costs of production (Bustos, 2011; Cassiman and Golovko, 2011) in the anticipation of boosting their efficiency to bear such costs and self-select into exporting. In contrast, it is argued that productivity of firms may be enhanced after the foreign market entry thanks to the learning process in export markets (e.g., Clerides et al., 1998; Bernard and Jensen, 1999). This notion is supported by ample evidence implying that exports increase productivity of services (e.g., Love and Mansury, 2009) as well as manufacturing firms (e.g., García et al., 2012; Gkypali et al., 2021; Van Biesebroeck, 2005).

Although these attempts have significantly contributed to knowledge of the learning-by-exporting phenomenon, using productivity as the outcome of learning is not without criticism. Salomon and Jin (2008) stress that examining the relationship between exports and productivity is an indirect test of the learning-by-exporting hypothesis. Indeed, productivity is quite heterogeneous across firms, even in the same industry (Bloom and Van Reenen, 2007), and it is affected by several factors other than exporting. Hence, a number of scholars employ an alternative measure which better captures learning effects, i.e., innovation (Calantone et al., 2002), and thus offer important insights on how exporting influences firms' innovation performance (D'Angelo et al., 2020; Love and Ganotakis, 2013; Salomon and Jin, 2010; Tse et al., 2017; among others). The reason proposed by this strand of the learning-by-exporting literature - also applied to *ex post* productivity growth - is that entering into export markets exposes the firm to valuable external knowledge flows in the foreign market that do not necessarily exist in the home market. Therefore, exporting firms explore a broad learning opportunity that may extend their knowledge base and subsequently contribute to their future technological initiatives including new products (e.g., Salomon and Shaver, 2005), new processes (e.g., Fassio, 2018), and patenting (e.g., Salomon and Jin, 2010).

As noted earlier, starting overseas operations may be very beneficial for firms since they can gain novel knowledge and information that is difficult to find in the domestic market. One type of knowledge a firm can acquire through exports is market knowledge. As the exporting firm interacts with foreign buyers, it gradually accumulates important information about their tastes and preferences which may be entirely different from what it faces in the home market (Clerides et al., 1998). Hence, the firm by utilizing valuable information received from the foreign buyers can introduce new products and services which better serve their needs (Love and Ganotakis, 2013).

Exporting is also an opportunity to acquire and accumulate more sophisticated knowledge such as technological knowledge. An exporting firm can use the operational, technical assistance of foreign buyers and receive some technical feedback on products it supplies to them (Salomon and Jin, 2010). The learning outcome of technological knowledge seems to be somewhat different from simply product or service modifications sourced from market knowledge. Technological knowledge is

essential for invention and contributes to idea generation in the firm whose outcomes appear in the form of patents (Afuah, 2003, p.62).

Despite the exposure of all exporting firms to such market-related and technological related knowledge flows, studies report that there exists a significant variance in learning outcomes of export activities. Borrowing the insights of the resource-based view of the firm (Barney, 1991), a number of studies attribute such heterogeneity to the unequal distribution of learning capabilities across firms and show that firms replete with technological learning capabilities, i.e., have greater absorptive capacity (Cohen and Levinthal, 1990), stand to learn more from exporting (e.g., García et al., 2012; Salomon and Jin, 2010). However, using a sample of Spanish exporters, Salomon and Jin (2008) observe that industry conditions influence learning from exporting in that exporters functioning in technologically lagging industries (in which Spain lags the global technology frontier) experience greater learning-by-exporting effects than those in technologically leading industries (in which Spain is at, or near, the global technology frontier).

In sum, though previous research offers us valuable insights on the relationship between a firm's exporting activities and innovativeness, the literature is silent on two important issues. First, research on innovation outcomes of export activities is predominantly centered on technological initiatives, such as product and process innovations or patenting. This means that the relationship between exports and MI is to a large extent underexplored. Secondly, although it is argued that the effective use of new stock of knowledge obtained from international markets for pioneering new innovations requires the development of a new set of management practices, processes, or structure (e.g., Heij et al., 2020; Sirmon et al., 2011), little scholarly attention has been directed to advancing knowledge of how MI might influence the link between exporting and technological initiatives. My research departs from prior work by addressing these two shortcomings in the extant learning-by-exporting literature.

6.2.1 Learning-by-Exporting and Management Innovation

Acquiring new knowledge is not only a necessity for technological initiatives, but it is also essential for the process of MI (Mol and Birkinshaw, 2014). Mol and Birkinshaw (2009) recognize three main sources of knowledge and ideas that by complementing managers' existing stock of knowledge encourage the implementation of MI within firms. The authors argue that new knowledge inputs may come from internal sources (anyone inside the legal boundaries of the firm), market sources (customers, suppliers, competitors, and consultants), and professional sources (industry bodies, professional associations, and trade fairs).

But how do export activities influence the introduction of MI? As articulated earlier, exporting "translates into a larger exposure to external sources of knowledge" and " the firm can take the advantage of different knowledge inputs to foster innovation" (Shearmur et al., 2015, p.458). I posit that export operations can play a vital role in shaping management innovation behaviours of a firm by improving the diversity of market and professional sources of knowledge, in particular. In fact, the participation in international markets necessitates a firm to compete against a greater number of competitors including global multinational enterprises, other exporting firms, and domestic companies. This situation exposes an exporting firm to wider and more diverse management approaches and techniques, which can be considered as an opportunity for discovering and acquiring new information on management methods by means of forming horizontal linkages to competitors or utilizing spillovers (Roper et al., 2008). Also, market sources of knowledge may be improved via forward linkages to foreign customers who may have a totally different spectrum of preferences relative to domestic buyers (Joshi and Sharma, 2004; Zaheer, 1995). For instance, exporting firms may obtain knowledge of new management practices when a foreign buyer asks them by implementing such practices to make sure technical specifications of their products comply with its quality standards (e.g., Guler et al., 2002). Furthermore, exporting is an opportunity to gain technical and professional knowledge via trade and industry associations, professional societies, and standard bodies which may not be available in the firm's home market (Salomon and Jin, 2010). Such professions may be important for boosting management innovative capacity of firms since they

provide special avenues in which the exchange of information among members is facilitated (Rosenkopf et al., 2001).

The above discussion suggests that exporters, in comparison to non-exporters, may enjoy access to a much wider variety of market and professional knowledge sources. Hence, though it is argued that engaging with innovation activities, specially MI, is a risky decision with uncertain consequences (Damanpour and Aravind, 2012; Love et al., 2014), exporting firms are more likely to introduce MI successfully as they discover more management practices that have worked in other settings (Mol and Birkinshaw, 2009). Also, they are more likely to find something useful from the achieved 'pool of knowledge' from exporting, which by complementing and combining with the internal sources of knowledge helps, the successful implementation of MI (Leiponen and Helfat, 2010). Therefore, I expect that

Hypothesis 1: Exporting is positively associated with management innovation.

6.2.2 Leaning-by-Exporting: The Moderating Effects of Management Innovation

Despite the usefulness of market and technological knowledge in improving technological innovation activities of exporting firms, the transformation of knowledge into innovations is not easy work and may face several difficulties. One problematic issue that has been neglected in the learning-by-exporting literature is the "stickiness" of knowledge (Szulanski, 1996; Von Hippel, 1994). The stickiness of knowledge means the transfer of knowledge within a firm's boundary is costly, slow, and uncertain (Alavi and Leidner, 2001; Kogut and Zander, 1993), something which eventually means that "firms do not necessarily know all that they know" (Szulanski, 2000, p.11).

Organizational knowledge transfer is referred to as "the process through which organizational actors - teams, units, or organizations - exchange, receive, and are influenced by the experience and knowledge of others" (Van Wijk et al., 2008, p.832). This process is considered as one of the most important antecedents of a firm's organizational learning (Huber, 1991) and absorptive capacity (Cohen and Levinthal, 1990) because " knowledge is of little value if not supplied to the right people

at the right time" (Teece, 2000, p.38). Effective knowledge transfer is essential for value creation and performance improvement (Chen and Huang, 2007). For instance, Lew Platt, the former CEO of Hewlett Packard (HP), highlights the vital role of knowledge transfer in obtaining superior performance when he expresses that "[i]f only HP knew what HP knows, we would be three times more productive!" (cited in Teece, 2000). Also, the better transfer of knowledge enhances individual and organizational learning and improves a firm's degree of innovativeness (Riege, 2005). One reason for such a relationship is that because knowledge is not homogenously spread across a firm's members, when the transfer of an individual or team's existing knowledge is occurs, it seems to be something new for others, which leads to potentially new products and services (Hargadon and Sutton, 1997).

Although it is argued that the issue of knowledge stickiness constrains organizational learning, given the focus of the current research, it is worthwhile to understand how it may hamper learning-by-exporting. Szulanski (1996), who develops an eclectic model on the origins of knowledge stickiness, argues that knowledge may have important attributes which cause its diffusion within firms to be difficult. Accordingly, the process of knowledge sharing between individuals is not easy work when knowledge is complicated and difficult to understand, i.e., has tacit components. The writer Szulanski (1996) further asserts that when knowledge is new and its usefulness has not been proven to the firm's members, it is less likely to be shared and applied by knowledge recipients. As I explain below, knowledge and information acquired from export markets might be sticky, i.e., difficult to transfer, since it is both complex and unproven.

Firms operating in international markets are exposed to two new different external areas of knowledge, i.e., technological and market knowledge. Researchers, however, argue that foreign technological knowledge is considerably different from the available technological knowledge in the home market in terms of characteristics and sophistication (Kafouros and Forsans, 2012). New advanced foreign technological knowledge deals with "the specific and the particular", consists of "innumerable small increments" and may be well tacit (Rosenberg, 1976, p.78), suggesting its understanding may be difficult. Likewise, it is argued that market knowledge is also complicated

since the issue of the liability of foreignness, such as cultural differences and unfamiliarity with local environments (Zaheer, 1995), increases the complexity of the interpretation and assimilation of that knowledge (Lewin et al., 2020). In addition to the complex nature of foreign external knowledge, it might also be unproven. Internationalization offers firms opportunities to access that knowledge which is unavailable, i.e., rare, in the home market (Barney, 1991), therefore, exporting firms' workers are likely to be not fully convinced about its effectiveness and usefulness in their own workplace. In sum, the debate implies that the intra-firm transfer of market and technological knowledge, considering its idiosyncratic characteristics, is not easy and thus its conversion into "organizational learning" (fostering innovations) in an appropriate way would face difficulties.

But what is the role of MI in the transfer of new technological and market knowledge within exporting firms? Prior work provides key ideas by suggesting that the integration, diffusion, and utilization of new knowledge require firms introducing novel changes in their managerial arrangement (e.g., Heij et al., 2020; Khanagha et al., 2013; Whittington et al., 1999). For instance, (Bloom and Van Reenen, 2010) state that for new knowledge to be integrated and shared more effectively, a set of new human resource management practices, such as incentive pay plans, job flexibility, and team-based work structures may be required. In the present work, I take note of these valuable insights offered by previous scholars and make it the core argument of my research. That is, the introduction of new managerial practices, processes, or structure helps firms by facilitating the sharing of knowledge gained from export activities and so they experience higher learning-by-exporting effects. To clarify how the introduction of MI assists the dissemination of foreign knowledge within firms, it is worthwhile taking a closer look at the outcomes of MI.

Based on the rational perspective of the introduction of MI, firms deliberately undergo novel changes in their managerial arrangements in pursuit of improving organizational performance (Birkinshaw et al., 2008). Volberda et al. (2013) assert that one of the distinguishing characteristics of MI is that it not only allows firms to achieve 'hard' performance goals, such as productivity or profitability growth, but it also makes the realization of "soft" performance objectives possible. For example, studies suggest that the implementation of MI may increase employees' motivation and

satisfaction (e.g., Hamel, 2006; Mele and Colurcio, 2006), and upgrades the firm's environment so that it facilitates social interactions (e.g., Vaccaro et al., 2012, 2013). In the present work, I focus on these two soft outcomes of MI and show they have important implications for overcoming difficulties of foreign knowledge sharing within exporting firms.

Enhancing employees' willingness to undertake their tasks and duties in the workplace by the implementation of MI would contribute to the process of technological and market knowledge sharing within exporting firms. The theoretical underpinning of the relationship between MI and motivation is the core notion of expectancy theory (Vroom, 1964): individuals do a certain job based on the expectation that the job is followed by the achievement of specific outcomes. Accordingly, introducing new changes in management practices, processes, or structure, for instance in reward or compensation systems, may be considered as an effective external motivator since it causes employees feel the new managerial system of the firm is designed in a way that better performers are better compensated. Under these situations, employees may devote more effort to the interpretation and codification of foreign knowledge, which is complex, and then support the transfer of that to other individuals in the organization in the anticipation of obtaining more valuable outcomes (Bartol and Srivastava, 2002; Foss et al., 2011). On the other hand, motivating employees by means of MI may also reduce the adverse effects of not the invented-here syndrome [2] (Katz and Allen, 1982) and subsequently help to the effective transmission of new foreign, unproven knowledge since motivated workers may have a greater tendency for accepting the application of new knowledge (Szulanski, 1996). In line with theoretical explanations, the importance of improving the managerial arrangement of the firm in enhancing intra-firm knowledge sharing has been well documented by the empirical literature. Studies demonstrate that the introduction of new management practices, processes, e.g., reward or compensation systems, or structure, e.g., autonomy in job design, plays an important role in facilitating the flows of knowledge within firms in that it can externally incentivize employees via

[2] Based on this attitude-based behaviour, as individuals are typically reluctant towards knowledge with an external source, they might even irrationally reject that knowledge which is actually valuable to the firm's operations (Antons and Piller, 2015).

participating in knowledge sharing activities leverage that knowledge held by them (e.g.,Cabrera et al., 2006; Foss et al., 2009; Minbaeva, 2008).

Facilitating individuals' engagement in social processes by upgrading a firm's environment is an important outcome of MI that helps to transfer foreign knowledge within exporting firms. The introduction of novelties in management practice, processes, or structure, for instance new changes in the organizational form, may lead to the creation of an environment in which the amount of distance between a firm's employees is reduced by providing more opportunities for dialogue and face-to-face interactions between members of the firm (Argote et al., 2003; Damanpour and Aravind, 2012; Volberda et al., 2013). Shaping such an environment would be a necessity for the intra-firm transfer of market and technological knowledge gained from export markets, in particular. (Szulanski, 1996, 2000) stresses that when new knowledge is unproven and has tacit components, such as new market and technological knowledge, its successful diffusion across a firm's boundary necessitates having numerous interactions and easy communications between individuals within the organization. Similarly, Zander and Kogut (1995) emphasize the transfer of knowledge, particularly tacit technological information or knowhow, is less likely to occur in the absence of frequent interactions and continuous communication between the source and recipients of knowledge. Hence, one may infer that implementing novel changes in the managerial arrangements of exporting firms may be important for sharing foreign knowledge in that it facilitates communication and social interaction, which results in an increase in the amount of information and knowledge transferred among individuals (Brown and Eisenhardt, 1995; Tsai, 2002). This theoretical argument is empirically validated by studies demonstrating that the managerial arrangement of firms is able to promote intra-firm knowledge sharing processes by providing more opportunities for close interactions and communication (e.g., Chen and Huang, 2007; Minbaeva et al., 2012; Pertusa-Ortega et al., 2010).

The discussion above explicates how MI, driven within firms aimed at improving the efficiency and effectiveness of internal mechanisms (Birkinshaw et al., 2008), aids to knowledge sharing activities of exporting firms. The implementation of MI helps the realization of two important soft targets which can play a crucial role in the effective, successful intra-firm transfer of market and

technological knowledge gained from export markets. First, MI improves employees' motivation level to participate in knowledge sharing processes. Second, MI facilitates employees' engagement in knowledge sharing by upgrading the firm's environment. As a result, theoretically, through these two mechanisms the introduction of MI should increase the flows of new knowledge and information within exporting firms, which in turn, causes individual learning to be converted into organizational learning more appropriately (Barkema and Vermeulen, 1998). Therefore, I expect that exporting firms with MI, in comparison to exporting firms without MI, may attain higher levels of learning-by-exporting, whose outcome may appear through superior technological innovativeness. Thus, I propose that

Hypothesis 2: All else equal, exporting firms implementing management innovation will experience higher learning-by-exporting effects than exporting firms that do not implement management innovation.

6.3 Data and Method

6.3.1 Sample

The empirical analysis of the study is based on the Encuesta Sobre Estrategias Empresariales (ESEE) data over the period 2007-2016. This dataset is collected by surveys conducted by the Fundacion SEPI (National Bureau of Industrial Activity Foundation), with the financial support of the Spanish Ministry of Industry. The Fundacion surveys a stratified sample of Spanish manufacturing firms with more than 10 employees. The use of the ESEE dataset by a plethora of published papers in the innovation-export literature (Cassiman and Golovko, 2011; Love and Máñez, 2019; Salomon and Jin, 2010; among others) indicates this dataset is reasonably accurate and reliable.

The ESEE dataset offers a good setting to test the theoretical framework of this research for two important reasons. First, a considerably large number of firms have been involved with export operations over the period of my research. Second, this dataset provides an interesting setting to empirically examine various hypotheses in the relationship between exports and innovations because

it contains useful longitudinal data regarding firms' different innovation activities, including MI. The survey question capturing MI was added to the questionnaire from 2007 onward, allowing me to trace MI activities of firms over a ten-year period.

The initial sample of firms is an unbalanced sample which includes 734 firms in 2007 and 1324 firms in 2016, functioning in 20 distinct industries with 15,870 firm-year observations. By removing missing information for some variables, the final sample size is reduced to 8887 firm-year observations. Table 6.1 shows the industry breakdown with the number of firms.

Table 6.1 Distribution of firms by industry (year=2007)

NACE	Definition	No.	Perc.	NACE	Definition	No.	Perc.
1	Meat products	24	3.3	11	Nonmetal mineral products	38	5.2
2	Food and tobacco	75	10.2	12	Basic metal products	35	4.8
3	Beverage	19	2.6	13	Fabricated metal products	77	10.5
4	Textiles and clothing	45	6.1	14	Machinery and equipment	58	7.9
5	Leather, fur and footwear	16	2.2	15	Computer products, electronics and optical	16	2.2
6	Timber	14	1.9	16	Electric materials and accessories	33	4.5
7	Paper	35	4.8	17	Vehicles and accessories	48	6.5
8	Printing (before Printing and Edition)	18	2.5	18	Other transport equipment	22	3
9	Chemicals and pharmaceuticals	69	9.4	19	Furniture	23	3.1
10	Plastic and rubber products	49	6.7	20	Other manufacturing	20	2.7
					Total	**734**	**100**

6.3.2 Variables

Dependent variables

The questionnaire of the ESEE has a section which focuses on Spanish firms' innovation activities and asks respondents about different innovation types. It also captures MI activities of firms and operationalizes the introduction of this innovation type within firms by a dummy variable. Accordingly, when a firm implements MI in a given year, the dependent variable (MANIN) is equal to 1 and 0 otherwise.

Following prior work in the learning-by-exporting literature (e.g., Salomon and Jin, 2008, 2010), the variable used for the operationalization of learning outcomes of exporting is the dichotomous variable of (PATENT APPLICATION), which takes the value of 1 if the firm completes at least one patent application in a given year, 0 otherwise. The ESEE's dataset includes rich information regarding product innovation, process innovation, or patent applications, while the last one is chosen for this research. Compared to dichotomous variables of product and process innovations, which are purely quantitative measures, the dummy variable of patent application also reflects the quality of technological innovation (Hagedoorn and Cloodt, 2003). Brouwer and Kleinknecht (1999) differentiate between "imitative" and "true" innovations and assert that when a firm completes an application for patent protection it shows the firm has introduced 'true' innovations, incorporating novel and unique elements of knowledge worthwhile for patenting. In fact, the creation of a patent application is not costless, and even if it is granted, it incurs extra costs to the applicant firm such as patent issuance and maintenance fees (James et al., 2013; Sherry and Teece, 2004). Thus, the use of patent application may help prevent magnifying innovation activities' output of firms and avoid major problems with the validity of the findings (Hagedoorn and Cloodt, 2003).

Independent variables

I use two different measures to capture export activities of Spanish firms. Grossman and Helpman (1991, p.518) state that exporting "tangible commodities facilitates the exchange of intangible ideas". The participation in the export market is an opportunity to gain access to diverse sources of knowledge and information which are not necessarily available to firm in the home market. Hence, the variable determining whether firms participate in the foreign market and are exposed to such sources of knowledge is export status (EXPORT STATUS), which equals to 1 if the firm exported in that year, 0 otherwise.

The other explanatory variable used to capture export operations of a firm is export intensity (EXPORT INTENSITY), measuring the value of exports as a fraction of total sales in a given year, (expressed as a percentage). It is widely argued that the success of firms in learning-by-exporting is

dependent upon the depth or intensity of export activities (e.g., Andersson and Lööf, 2009; Tse et al., 2017). In fact, firms with a greater percentage of export intensity are not only dealing with a larger number of foreign buyers, but also at a greater extent (Filipescu et al., 2013). Thus, these firms thanks to having more interactions with foreign partners have an opportunity to acquire more information and knowledge from the overseas operation (Eriksson and Chetty, 2003).

Moderator variable

The moderator variable for testing hypothesis 2 is the dummy variable of management innovation (MANIN). This variable takes the value 1 if the firm introduced MI in a given year and 0 otherwise. An important issue which should be emphasized is that MI is a gradual process and its full implementation, in comparison to technological innovations, is more drown out and resource-consuming (Damanpour, 2014). As a result, it is anticipated that MI's effects may emerge with delay (Mol and Birkinshaw, 2009). Therefore, I use one and two period(s) lagged values of the variable (MANIN) as the moderator to ensure MI has been truly implemented within firms.

Control variables

To capture the impacts of learning-by-exporting across models more accurately, the effects of a number of factors are controlled in regressions. Studies in the MI literature emphasize that because incumbent firms are more complex than new firms, they are more likely to implement MI to overcome internal complexities (e.g., Damanpour, 2014). In contrast, previous research suggests that younger firms, compared to incumbents, are more likely to introduce radically new patentable technological innovations (e.g., Acs et al., 2009). Hence, the first control variable is firm age (AGE), which is the number of years since the firm was established (expressed in logs). The other control variable is the firm's resources proxied by (1) the variable size (SIZE), representing a firm's total fixed assets (expressed in logs); and (2) the variable productivity (PRODUCTIVITY), measured by the total factor productivity (TFP), which is the residual of the Cobb-Douglas production function computed by means of Wooldridge's (2009) method. I control for firm size since prior research reports that larger firms are more inclined to implement MI (e.g., Mol and Birkinshaw, 2009) and the

positive correlation between the size of a firm and its technological innovations has been well documented (e.g., Camisón-Zornoza et al., 2004). Furthermore, owning more slack resources, more productive firms are expected to afford the resource-consuming procedure of introducing MI or technological initiatives (Castellani and Fassio, 2019). Additionally, it is argued that firms owned by foreigners may be provided by new information and knowledge that can be utilized in the introduction of innovations (Golovko and Valentini, 2014). I control for the impact of foreign ownership on innovation activities by the variable (FOREIGNOWN), which is the fraction of foreign capital in the firm's capital structure.

Specifically for hypothesis 1, which tests the export-MI link, the effects of two technological innovation types are controlled. Studies in the innovation literature suggest that the introduction of product and process innovations stimulate the implementation of MI through the lagged or sequential pattern of innovation activities (e.g., Damanpour and Gopalakrishnan, 2001). Therefore, the dummy variable of process innovation (PROCESIN) is included in the regression, which takes the value 1 when the firm implements process innovation, 0 otherwise. Likewise, the dummy variable of product innovation (PRODUCIN) is included in the model, which takes the value of 1 when the firm launches a new product, 0 otherwise.

Specifically for hypothesis 2, which tests the moderating effects of MI on the export-patent applications nexus, I account for the influence of R&D activities by the variable (R&D INTENSITY), measuring the value of R&D expenditures as a fraction of total sales in a given year (expressed as a percentage). A firm's involvement in R&D is important in that (1) it provides the firm direct input for fostering technological initiatives (Veugelers and Cassiman, 1999); (2) it is considered as a key element of the firm's absorptive capacity (Cohen and Levinthal, 1990), which plays a crucial role in the investigation of learning-by-exporting effects (e.g., Salomon and Jin, 2010).

6.3.3 Modelling Procedure

The choice of the econometric model to examine empirically the hypotheses developed in this research is complicated by the concern of endogeneity between innovation and exports. This issue

merits great attention since leaving it uncontrolled may result in inconsistent and biased estimates (Wooldridge, 2013), something leading hypotheses are not convincingly supported or rejected (Jean et al., 2016). One possibility leading to biases is omitted variables. In fact, there exist several time-invariant factors affecting a firm's innovation and exports strategies, such as managerial skills or managerial know-how. They cannot be modelled due to the unavailability of the relevant data. In these situations, when the parameter for exports is computed, it may not reflect the pure impact of learning-by-exporting. Another possibility which results in biased estimations is the simultaneity issue or reverse causal effects from innovations, either MI or technological innovations, to exports. This reverse relationship is particularly attributed to the export readiness activities in the pre-export phase, i.e., learning-to-export effects (e.g., Eliasson et al., 2012; Gkypali et al., 2021).

One effective solution proposed by scholars to handle the issue of endogeneity is the instrumental variable (IV) approach (e.g., Bascle, 2008). This technique enables the researcher to effectively control for simultaneity and omitted variables biases in estimations (Li et al., 2021) if the variable chosen as the instrument is uncorrelated with the error term but is correlated with the endogenous variable(s), in our case the variables (EXPORT STATUS) and (EXPORTINTENSITY) (Semadeni et al., 2014). In this research, I generate a variable that captures variations in gross domestic production (dGDP) (change in GDP of Spain at time t compared with t-1) and use it as the instrument for exporting. Prior studies have shown that macroeconomic conditions, approximated by the indicator of (GDP), can significantly impact on and drive export activities of firms (e.g., Bernard and Jensen, 2004a; Cassiman and Golovko, 2011; Roper and Love, 2002). Positive (negative) changes in GDP may encourage (discourage) firms to enter the foreign market and thus influence the intensity of export activities. Thus, the variable (dGDP) seems to be a quite relevant instrument to exporting particularly in the present work where the period of research coincides with the great global economic recession (2007-2010) and later economic growth, which may exert considerable effects on export operations of firms. The review of the literature indicates that previous researchers investigating the exports-innovation relationship have also used a macro-level variable as an instrument for a firm-level endogenous variable. For instance, Monreal-Pérez et al. (2012) in the study of the effects of

innovation on the export status of Spanish firms address the issue of endogeneity of innovation by employing the state's total financial investments in research and development (R&D) as an instrument for innovation activities at the firm level.

It is worth noting that the variable chosen as the instrument should satisfy the relevance and exclusion conditions (Semadeni et al., 2014). In other words, (dGDP) is a good instrumental variable if it is correlated with the endogenous variables, i.e., (EXPORT STATUS) and (EXPORT INTENSITY), but not with the second stage error terms, i.e., with the main dependent variable (PATENT APPLICATION) (Caldera, 2010; Hennart et al., 2019). The variable (dGDP) meets the relevance condition because it is a determinant of the endogenous variables and strongly associated with them (see Tables 6.4 and 6.5). As far as the exclusion condition is concerned, the proposed instrument is weakly correlated with the dependent variable (0.012), thus one may infer that the instrument also satisfies the exclusion condition.

Although binary choice models, such as Probit models, are commonly used by researchers to model dichotomous dependent variables, the IV technique cannot be performed and interpreted in a straightforward manner in the context of maximum likelihood (ML). For instance, Crescenzi and Gagliardi (2018) stress that one important shortcoming of the ML approach that would be particularly concerning in my case is that any misspecification in the first stage of the IV technique, which is performed in this approach, causes estimators become inconsistent. In addition, Crescenzi et al. (2016) point out that for the interpretation of non-linear models, such as Probit models, results should be converted into marginal effects, and when it is done, slop coefficients are quite similar to linear estimates. Hence, the alternative estimation strategy that has been widely employed by researchers to apply the IV technique and model binary dependent variables is the linear probability model (LPM), running regressions in the ordinary least squares (OLS) framework (e.g., Caldera, 2010; Golovko and Valentini, 2014). Thus, first and second stages of the IV regression are estimated by means of the LPM, which also provides more consistent estimates in the second stage (Angrist, 2001). In the first stage regression, the endogenous variable is regressed on the instrumental variable and other covariates,

$$EXPORT_{it-1} = f(\, dGDP, X_{it-1}; \beta_1 \,) \qquad (1)$$

where X_{it-1} is a set of variables including all control variables, mentioned earlier, besides year and industry dummies, β_1 is the vector of parameters to be estimated.

The next step is to plug predicted values of dependent variables in the second stage of the estimation

$$MANIN_{it} = f(\, \widehat{EXPORT}_{it-1}, Z_{it-1};\ \beta_2) \qquad (2)$$

$$PATENTAPPLICATION_{it} = f(\, \widehat{EXPORT}_{it-1}, Z_{it-1};\ \beta_3) \qquad (3)$$

where Z_{it-1} is a set of variables, β_2 and β_3 are vectors of parameters to be estimated.

Another important issue that needs to be clarified is the method by which the second hypothesis is empirically examined. My argument regarding this hypothesis posits that the effects of learning-by-exporting for firm implementing MI are greater than firms do not implement MI. To test this theoretical argument by means of statistical models explained earlier, I perform a split-sample analysis (Jaccard and Turrisi, 2003), separating management innovators from non-management innovators. This popular method of testing moderating effects in the learning-by-exporting literature (e.g., García et al., 2012; Golovko and Valentini, 2014; Salomon and Jin, 2008, 2010) is also well-suited to my research. Based on Venkatraman's (1989) suggestions on plausible methods of testing moderating effects, when the researcher hypothesizes that the effects of certain strategies differs across different environments, this shows the strength of moderation and can be examined by means of the subgroup analysis. Hence, if MI plays a moderating role in the relationship between exporting and patenting, I expect to observe, for the group of management innovators, exporting positively impacts on patenting.

The prior discussion on the empirical strategy of this research shows that MI is the outcome of exporting, in the meantime, it may also moderate the impacts of exporting on patenting. With respect to these two roles of MI, one may raise an issue regarding the conceptual inconsistency of this study. Although it is better to investigate the role of MI as an outcome of exporting and its moderating impacts in two separate studies, given the initial objective of the present thesis, that is exploring the role of MI in pre- and post-export phases, and shortcomings in the learning-by-exporting literature, explained in Chapter 2, different roles of MI are examined in one empirical chapter.

6.4 Results

Tables 6.2 and 6.3 illustrate descriptive statistics and correlations.

Table 6.2 Descriptive statistics and correlations (whole sample)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) PATENT APPLICATION$_{(t)}$	1.000										
(2) MANIN$_{(t)}$	0.105*	1.000									
(3) EXPORTINTENSITY$_{(t-1)}$	0.060*	0.055*	1.000								
(4) EXPORT STATUS$_{(t-1)}$	0.026*	0.068*	0.284*	1.000							
(5) AGE$_{(t-1)}$	0.066*	0.013	0.105*	0.114*	1.000						
(6) SIZE $_{(t-1)}$	0.175*	0.219*	0.240*	0.203*	0.114*	1.000					
(7) R&D INTENSITY$_{(t-1)}$	0.176*	0.114*	0.104*	0.056*	0.017	0.123*	1.000				
(8) FOREIGNOWN $_{(t-1)}$	-0.007	0.089*	0.190*	0.119*	0.054*	0.393*	-0.01	1.000			
(9) PRODUCTIVITY$_{(t-1)}$	0.100*	0.157*	0.224*	0.155*	0.104*	0.657*	0.012	0.342*	1.000		
(10) PRODUCIN $_{(t-1)}$	0.195*	0.202*	0.080*	0.076*	0.071*	0.202*	0.273*	0.030*	0.121*	1.000	
(11) PROCESIN $_{(t-1)}$	0.109*	0.306*	0.089*	0.066*	0.027*	0.263*	0.152*	0.089*	0.208*	0.329*	1.000
Mean	0.07	0.26	27.9	0.78	3.26	4.49	1.04	0.18	3.98	0.23	0.42
S.D.	0.25	0.44	29.38	0.27	0.67	1.35	2.85	0.37	0.24	0.42	0.49
Maximum	1	1	99.9	1	4.87	9.57	49.59	1	5.58	1	1
Minimum	0	0	0	0	0	0.69	0	0	2	0	0

* shows significance at the .05 level, (N=8887)

Table 6.3 Descriptive statistics and correlations (split by management innovation$_{(t)}$), * shows significance at the .05 level

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Management Innovators (N=2339)								
(1) PATENT APPLICATION$_{(t)}$	1.000							
(2) EXPORTINTENSITY$_{(t-1)}$	0.052*	1.000						
(3) EXPORT STATUS$_{(t-1)}$	0.013	0.236*	1.000					
(4) AGE$_{(t-1)}$	0.079*	0.102*	0.130*	1.000				
(5) SIZE$_{(t-1)}$	0.185*	0.217*	0.161*	0.148*	1.000			
(6) R&D INTENSITY$_{(t-1)}$	0.213*	0.094*	0.041	0.002	0.109*	1.000		
(7) FOREIGNOWN$_{(t-1)}$	-0.056*	0.156*	0.106*	0.071*	0.393*	-0.026	1.000	
(8) PRODUCTIVITY$_{(t-1)}$	0.077*	0.189*	0.105*	0.167*	0.645*	-0.027	0.358*	1.000
Mean	0.11	31.62	0.68	3.31	5.04	1.6	0.25	4.05
S.D.	0.31	30.15	0.21	0.73	1.41	3.32	0.42	0.24
Maximum	1	99.9	1	4.87	9.47	46.7	1	5.58
Minimum	0	0	0	0	1.94	0	0	2
Non-Management Innovators (N=6547)								
(1) PATENT APPLICATION$_{(t)}$	1.000							
(2) EXPORTINTENSITY$_{(t-1)}$	0.056*	1.000						
(3) EXPORT STATUS$_{(t-1)}$	0.021	0.296*	1.000					
(4) AGE$_{(t-1)}$	0.057*	0.105*	0.112*	1.000				
(5) SIZE$_{(t-1)}$	0.140*	0.240*	0.205*	0.099*	1.000			
(6) R&D INTENSITY$_{(t-1)}$	0.134*	0.102*	0.054*	0.023	0.097*	1.000		
(7) FOREIGNOWN$_{(t-1)}$	0.006	0.199*	0.118*	0.045*	0.380*	-0.017	1.000	
(8) PRODUCTIVITY$_{(t-1)}$	0.090*	0.229*	0.158*	0.078*	0.647*	0.004	0.324*	1.000
Mean	0.05	27.45	0.82	3.28	4.31	0.82	0.17	3.95
S.D.	0.21	29.23	0.28	0.62	1.29	2.62	0.36	0.24
Maximum	1	99.9	1	4.84	9.13	49.59	1	5.12
Minimum	0	0	0	0	0.69	0	0	2.44

Table 6.4 Determinant of management innovation: linear probability model (LPM)

Dependent Variable $MANIN_{(t)}$	(Model 1)	(Model 2)
$EXPORTSTATUS_{(t-1)}$	-0.504	
	(0.687)	
$EXPORTINTENS_{(t-1)}$		0.005*
		(0.003)
$AGE_{(t-1)}$	0.001	-0.024*
	(0.036)	(0.014)
$SIZE_{(t-1)}$	0.076***	0.034***
	(0.026)	(0.012)
$FOREIGNOWN_{(t-1)}$	0.047	-0.003
	(0.034)	(0.020)
$PRODUCIN_{(t-1)}$	0.036**	0.055***
	(0.016)	(0.015)
$PROCESIN_{(t-1)}$	0.072***	0.107***
	(0.013)	(0.012)
$PRODUCTIVITY_{(t-1)}$	0.025	-0.022
	(0.039)	(0.037)
_cons	0.329	0.070
	(0.397)	(0.146)
Year Dummy	Included	Included
Industry Dummy	Included	Included
Obs.	8807	8798
First-stage		
dGDP	0.026***	0.061***
	(0.009)	(0.009)
F-statistic	7.95	43.42

Robust standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

Table 6.4 reports the results of estimations for the first hypothesis of this research. As anticipated the instrument (dGDP) is positively and highly significantly correlated with the instrumented variables of interest. However, the strength of the IV technique is confirmed only in Model 2 with regard to the F-statistic of the first stage (the last line of Table 6.4) which is well above the value of ten from the "rule of thumb" (Staiger and Stock, 1997). In line with my expectations, firms' size has a significant positive effect on MI. Moreover, the introduction of process innovation (PROCESIN) and product innovation (PRODUCIN) in the previous period would stimulate the implementation of MI in the

current period. In contrast to my predictions, the calculated parameter for the variable (AGE) in Model 2 is negative, and estimated coefficients of other control variables are not statistically significant. Finally, computed coefficients of dependent variables indicate that the mere participation in export markets (EXPORT STATUS) does not affect the implementation of MI, though the depth of the export activities (EXPORT INTENSITY) positively impacts on the introduction of MI (Model (2): β=0.005, $p < 0.1$). Thus, I found evidence in support of hypothesis 1.

Table 6.5 presents the results of estimations for the second hypothesis of this study. Because the moderator variable (MANIN) has one- and two- period(s) lagged values, two sets of models with respect to each lag have been reported in Table 6.5. The results of the first stage regression show that the instrumental variable (dGDP) is significantly and positively correlated with the regressor of interest across models. Furthermore, the outcome of the F-test reveals that, in general, the IV technique is valid and the chosen instrument does not suffer from the weak instrument bias. For both sets of models, except Model 6, the variable (FOREIGNOWN) has significant negative effects on patenting. In contrast, consistent with the systematic relationship between R&D and technological innovations, the estimated coefficient for (R&D INTENSITY) is positive across models, except Model 9. Likewise, as predicted, the estimated coefficients for the variable (SIZE) are consistently positive and significant across models. The rest of control variables, however, have mixed effects on the propensity of introducing a patentable innovation in the current year.

As far as the effects of independent variables are concerned, the empirical results illustrate that the support for the learning-by-exporting argument is only found in Model 9, where the variable (EXPORT INTENSITY) of the previous period significantly and positively influences on current technological innovation. The rest of regressions show that exporting has either insignificant or even negative impacts on introducing technological initiatives.

Table 6.5 The moderating effects of management innovation: linear probability model (LPM)

Dependent variable PATENTAPPLI.$_{(t)}$	MANIN$_{(t-1)}$				MANIN$_{(t-2)}$			
	MI	Non-MI	MI	Non-MI	MI	Non-MI	MI	Non-MI
	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)	(Model 8)	(Model 9)	(Model 10)
EXPORT STATUS $_{(t-1)}$	-0.274	-0.598*			0.064	-0.803**		
	(0.599)	(0.308)			(0.462)	(0.349)		
EXPORTINTENSITY$_{(t-1)}$			0.003	-0.003			0.008**	0.002
			(0.004)	(0.002)			(0.004)	(0.002)
AGE $_{(t-1)}$	0.027	0.041***	0.008	0.026***	0.016	0.042***	0.002	0.012
	(0.021)	(0.016)	(0.016)	(0.009)	(0.022)	(0.016)	(0.017)	(0.011)
SIZE $_{(t-1)}$	0.062***	0.053***	0.037**	0.040***	0.049***	0.061***	0.031*	0.012*
	(0.017)	(0.013)	(0.019)	(0.009)	(0.014)	(0.014)	(0.016)	(0.007)
FOREIGNOWN$_{(t-1)}$	-0.093***	-0.043***	-0.094***	-0.034	-0.065***	-0.043**	-0.072**	-0.036**
	(0.031)	(0.016)	(0.026)	(0.021)	(0.021)	(0.018)	(0.030)	(0.016)
R&D INTENSITY $_{(t-1)}$	0.013***	0.008***	0.008**	0.006**	0.008***	0.010***	0.005	0.007***
	(0.004)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)
PRODUCTIVITY$_{(t-1)}$	-0.034	0.046*	-0.039	0.053*	-0.044	0.056*	-0.138**	0.002
	(0.049)	(0.027)	(0.044)	(0.027)	(0.035)	(0.031)	(0.067)	(0.022)
_cons	0.337	0.175	0.127	-0.236**	0.139	0.290	0.392	-0.079
	(0.528)	(0.195)	(0.179)	(0.094)	(0.346)	(0.236)	(0.271)	(0.085)
Year Dummy	Included	Included	Included	Included	Included	Included	Included	Included
Industry Dummy	Included	Included	Included	Included	Included	Included	Included	Included
Obs.	2302	6468	2300	6462	2306	6463	2303	6458
First-stage								
dGDP	0.017**	0.016***	0.051***	0.035***	0.017**	0.015***	0.086***	0.053***
	(0.007)	(0.004)	(0.017)	(0.008)	(0.007)	(0.004)	(0.02)	(0.01)
F-statistic	5.76	12.88	9	16.48	5.66	13.61	17.38	23.52

Robust standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

With respect to the second hypothesis of this research which examines the moderating role of MI, the subgroup analysis suggests that the two-period lag of (MANIN) may moderate the relationship between exporting and innovation, suggesting the implementation of MI aids firms to experience higher learning-by-exporting effects. In line with prediction, the estimated coefficient for the variable (EXPORT INTENSITY) is positive and significant for the group of management innovators (Model (9): β=0.001, $p < 0.05$). Furthermore, I conduct a z-test (Paternoster et al., 1998) from Model 9 to Model 10 and find that the null hypothesis of the equality of coefficients is rejected at the significance level of 10%. Hence, I found evidence in support of the second hypothesis of this research. Another important finding which confirms the validity of the theoretical arguments regarding the contributory role of MI in the learning-by-exporting process is that exporting activities of firms that do not implement management innovation are found to be detrimental for patenting (Model (4): β= -0.598, $p < 0.1$; Model (8): β= -0.803, $p < 0.05$). Such substantial differences between the two groups of exporters in terms of learning-by-exporting effects imply that, as it is anticipated, MI has strong moderating impacts. In the meantime, it is worth noting that evidence in support of the second hypothesis of the present study was only found in Models 9 and 10 where there is a significant difference between management innovators and non-management innovators in terms of the effect of (EXPORT INTENSITY) on patenting. However, the other indicator of exporting, that is, (EXPORT STATUS) is not associated with patenting of exporting firms for management innovators in other estimated models, suggesting the prior finding implying on the moderating effects of MI is valid under certain circumstances.

6.4.1 Robustness Check

I performed an additional test to assess and verify the strength of findings regarding the moderating effects of MI, but with the *count* variable of (PATENT APPLICATION) which takes non-negative integer values. Econometricians propose that the suitable statistical method to analyze such a count variable is a Poisson model (e.g., Greene, 2003). However, Poisson regressions assume explanatory variables are uncorrelated with unobserved effects (Cameron and Trivedi, 1986), which, as stated

earlier, is less likely in this study. Moreover, I found evidence illustrative of the over-dispersed distribution of patent counts. This means that the distributional assumption of Poisson models concerning the equality of the variance and mean of the dependent variable was not verified in the data. Though it is proposed that performing a fixed-effects negative binomial regression might be a solution for controlling for unobserved effects as well as over-dispersion of the dependent variable (Hausman et al., 1984), there is an important debate on why a fixed-effects negative binomial model is not a true fixed-effects model and thus its results might lead to invalid conclusions (see Allison and Waterman, 2002).

The alternative statistical method applied by studies to model count variables, which also enables the researcher to address the endogeneity concern, is the panel dynamic generalized method of moments (GMM) technique (e.g., Lahiri et al., 2019). This technique which was performed by prior work for the empirical investigation of the learning-to-export (e.g., Faustino and Matos, 2015) and learning-by-exporting (e.g., Tse et al., 2017) hypotheses is able to provide consistent, unbiased results in the presence of different sources of endogeneity including omitted variables and simultaneity (see Ullah et al., 2018). The GMM regression controls for endogeneity via "internally transferring the data", a procedure through which past values of a variable is subtracted from its present value (Roodman, 2009, p.86). The advantage of the GMM model is that because it uses internal instruments, there is no need to find external instrumental variables, which is difficult and sometimes impossible (Li et al., 2021). GMM techniques are generally classified into two groups: difference estimation (Arellano and Bond, 1991); and GMM system estimation (Blundell and Bond, 1998). The system GMM is favored over the difference approach for the present study because: (1) this model can perform better when the sample time is small; and (2) this technique is preferred when variables exhibit a high persistency (Roodman, 2009). Noticeably, the descriptive statistics of the dependent variable (PATENT APPLICATION) is indicative of persistent behaviour of this variable – the correlation between (PATENT APPLICATION) and its lagged values is relatively strong ($\rho \geq 0.7$). This implies that the realization of the dependent variable in the current period might be

influenced by its realization in the previous year, suggesting a dynamic relationship between explanatory variables and the dependent variable.

Before conducting a system GMM, it is important to determine the specifications of the model. Following Salomon and Shaver's (2005) approach, the export variables of interest, i.e., (EXPORT INTENSITY) or (EXPORT STATUS), and all other explanatory variables are treated as predetermined. Thus, the lagged form of these variables can be considered as candidates of standard, exogenous instruments in the GMM estimation. Control variables of (AGE) and dummies are assumed as strict exogenous variables. The one-step GMM model is chosen for the regression as the standard errors of two-step estimation are generally downward biased in finite samples (Salomon and Shaver, 2005). Furthermore, I use robust standard errors in pursuit of controlling for potential heteroscedasticity or serial autocorrelation. Lags of variables are also determined during the implementation of the GMM to ensure the validity of the model is verified by means of the following statistical tests. For Model 9, for example, lagged values of variables were specified from 2 to 3. To avoid the proliferation of instruments, the option *collapse* was used.

The validity of the GMM's estimation output is appraised by conducting several tests. One key assumption of this statistical method is the autocorrelation of error terms (Roodman, 2009), therefore, the AR(1) and AR(2) statistics showing the Arellano-Bond test for serial correlation in the error terms are reported. Li et al. (2021) points out that researchers employing the system GMM should expect a large *p* value for the AR(2) test, otherwise lagged variables may be correlated with the error term. Moreover, to evaluate whether instruments are exogenous, Hansan's *J* statistic is reported. Li and colleagues state that when the test turns out to be insignificant, it shows internally-generated instruments by the GMM are exogenous and thus the econometric model is valid.

Table 6.6 presents the results of the GMM estimates for the second hypothesis. First of all, it should be noted that the results reported at the Table 6.6 demonstrate the validity of the GMM model is verified. The AR (2) test across models yields a *p* value greater than 0.1, suggesting no evidence for the existence of serial correlations in residuals. Also, none of statistics for Hansen's *J* test is significant, indicating that subsets of GMM's instruments are exogenous.

Table 6.6 The moderating effects of management innovation: generalized method of moments (GMM)

Dependent variable PATENTAPPLI.$_{(t)}$	MANIN$_{(t-1)}$				MANIN$_{(t-2)}$			
	MI	Non-MI	MI	Non-MI	MI	Non-MI	MI	Non-MI
	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)	(Model 8)	(Model 9)	(Model 10)
EXPORT STATUS$_{(t-1)}$	-0.295	0.210			-0.149	0.104		
	(2.157)	(0.292)			(4.081)	(0.620)		
EXPORTINTEN.$_{(t-1)}$			0.078	-0.008			0.056*	-0.070
			(0.056)	(0.086)			(0.032)	(0.051)
PATENTAPPLI.$_{(t-1)}$	0.244**	0.320	0.215	0.334*	0.499***	0.605***	0.498***	0.564***
	(0.115)	(0.222)	(0.130)	(0.201)	(0.107)	(0.115)	(0.096)	(0.092)
R&DINTENSITY$_{(t-1)}$	0.352	0.072	0.639	0.090	0.513	-0.456	0.783*	-0.021
	(0.415)	(0.110)	(0.608)	(0.132)	(0.393)	(0.556)	(0.419)	(0.206)
AGE$_{(t-1)}$	0.388	0.338	-0.391	0.255	1.584*	0.240*	0.857	0.562*
	(0.974)	(0.252)	(1.115)	(0.641)	(0.952)	(0.144)	(0.759)	(0.329)
SIZE$_{(t-1)}$	-0.879	0.345	-0.498	0.820	-2.873	0.550	-1.082	-1.317
	(4.118)	(0.654)	(3.157)	(1.029)	(2.549)	(0.824)	(1.577)	(1.106)
FOREIGNOWN$_{(t-1)}$	0.447	-2.751	-1.775	-1.041	-1.232	0.510	-0.628	0.091
	(2.069)	(2.220)	(4.946)	(1.298)	(4.377)	(2.208)	(5.019)	(1.952)
PRODUCTIVITY$_{(t-1)}$	5.942	-2.307	10.288	-3.603	-0.571	-4.066	-3.651	8.056
	(12.014)	(2.987)	(18.107)	(4.294)	(4.406)	(5.980)	(4.448)	(6.873)
_cons	-20.917	6.792	-40.210	10.707	7.222	13.005	12.670	-25.751
	(35.952)	(9.583)	(64.363)	(12.788)	(16.956)	(20.245)	(16.794)	(22.126)
Obs.	1435	5605	1433	5600	1444	5615	1441	5612
Year Dummy	Included	Included	Included	Included	Included	Included	Included	Included
Industry Dummy	Included	Included	Included	Included	Included	Included	Included	Included
AR(1) (*p*-value)	0.15	0.05	0.1	0.06	0.15	0.16	0.12	0.14
AR(2) (*p*-value)	0.32	0.34	0.89	0.13	0.33	0.26	0.16	0.5
Hansen (*J*) test (*p*-value)	6.18(0.62)	28.47(0.84)	3.84(0.78)	10.84(0.76)	10.11(0.51)	12.92(0.19)	8.76 (0.52)	3.47(0.24)

Standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

Models 3 to 6 (Table 6.6) show the results of moderating effects of MI with a one-period lag. I did not find any evidence in support of my conjectures. Models 7 to 10 represent the results of the moderating effects of MI with two lags. I found support for hypothesis 2 in Model 9 where the estimated coefficient of (EXPORT INTENSITY) is positive and significant at 10% for the group of management innovators. The results suggest that MI can moderate the exports-patent applications link by facilitating intra-firm knowledge sharing, but its effects appear in the following years' export activities particularly because the implementation of MI is a gradual process and takes a lot of time (Mol and Birkinshaw, 2009). Furthermore, I conducted a *z*-test (Paternoster et al., 1998) from Model 9 to Model 10 to test the equality of coefficients. The *z* score is equal to 2.33, rejecting the null hypothesis of the equality of coefficients at the significance level of 1%.

6.5 Discussion and Conclusion

An extensive research has been conducted in recognizing the phenomenon of learning-by-exporting by examining the role of technological innovations. This means that there is a dearth of scholarship on recognizing the role of non-technological innovation, particularly of interest MI, in the learning-by-exporting literature. The present study has sought to generate fresh insights into the role of MI by the fine-grained examination of two conjectures: (i) exporting encourages firms to introduce novel changes in their managerial arrangements; (ii) the implementation of MI enhances the learning-by-exporting effects. To test the validity of theoretical arguments, I used a unique panel data set of Spanish manufacturing firms over a ten-year period. It is worth noting that I paid careful attention to the issue of endogeneity of exporting and chose a powerful econometric method, namely, the IV technique to report unbiased, more reliable estimations. The results of empirical examinations are discussed and outlined as follows.

The data suggests that exporting positively influences the likelihood of the introduction of MI. This finding confirms this notion that exporters because of gaining access to a wide variety of ideas and knowledge on more effective management practices, processes, structure are more likely to

overhaul the existing managerial arrangement. However, what emerges from empirical evidence is that what contributes to the implementation of initiatives in the firm's administration is the depth of export activities, i.e., export intensity. One possible explanation for the significant positive effects of export intensity is that because the managerial system of a firm is intangible and not visible to other firms (Damanpour, 2014), the greater involvement with export operations and thus more interactions with foreign buyers and trade partners may facilitate gaining some insights on their management practices, processes, organizational structure, or technique.

Furthermore, the results of my research show that the implementation of MI amplifies the learning-by-exporting effects. However, the moderating effects of MI on the relationship between exporting and patenting appear with delay because the full implementation of MI is resource - and time - consuming (Tavassoli and Karlsson, 2015). The unanticipated but interesting finding that appeared through the process of examining the moderating effects of MI is that the participation in export markets may adversely influence patenting for the group of non-management innovators. The transformation of foreign knowledge into innovations, for several reasons explained earlier, is not easy work. It is also known as a risky process with uncertain outcomes (Love et al., 2014). Hence, to be successful, the process of developing new technological initiatives should receive significant managerial attention (Ahuja et al., 2008). On the other hand, operating internationally exposes firms to higher levels of complexities, risks, and uncertainties such as financial risks, e.g. exchange rate fluctuations, and political uncertainties, e.g., changes in trade regulations and laws (Lewin et al., 2020). Functioning in such an uncertain environment necessitates managers directing their full attention into monitoring unexpected changes threatening overseas operations of firms. Under these situations, it is inferred that firms should own enough "managerial bandwidth" to engage in both innovation and export activities simultaneously. Thus, one possible interpretation for the negative effects of exporting is that whereas management innovators by adopting new managerial practices, processes, or structure increase the managerial bandwidth to the extent that allows them to address both activities, non-management innovators lack that adequate managerial bandwidth which causes them patenting and exporting to be trade-offs.

The contributions of this research to the learning-by-exporting literature are twofold. First, though under the banner of learning-by-exporting effects the positive effects of exporting on the introduction of technological innovations have been well documented (D'Angelo et al., 2020; Golovko and Valentini, 2014; Love and Ganotakis, 2013; Salomon and Shaver, 2005; among others), the study of the influences of exporting on non-technological innovations, in particular MI, have surprisingly received quite little scholarly attention. This research departs from prior work by focusing on the role of exporting in MI activities of firms and adds to that stream of the learning-by-exporting literature investigating the effect of exporting on firms' innovation performance by providing theoretical explanations and empirical examination on the export-MI association. Exploring the relationship between exporting and MI is of importance because it can complement knowledge of how exporting activities impact on innovation performance of firms.

Second, scholars have directed great attention into examining the contingencies that influence the effectiveness of exporting in fostering technological initiatives (e.g., D'Angelo et al., 2020; García et al., 2012; Salomon and Jin, 2010); whereas very little progress has been made in exploring the impacts of MI activities of firms on the nexus between exporting and patenting. This study endeavors to fill this gap in knowledge and extends the literature by offering a detailed theoretical discussion as well as careful empirical examination of the moderating effects of MI. This examination is important in that unlike the conventional understanding which attributes the variation of learning-by-exporting to the unequal distribution of absorptive capacity capabilities across firms, it shows, given the same level of absorptive capacity, firms still differentially learn from the overseas operations. This study found that such discrepancy can be explained by the introduction of novelties in managerial arrangements of firms because it facilitates the intra-firm transferring of market and technological knowledge that has been acquired from the export market, something leading to the improvement of organizational learning (producing innovations).

The results of this research also carry an important implication for managers who keep asking the question of how it is possible to maximize the effects of learning-by-exporting. This study

suggests that the most valuable thing that a firm can achieve through exporting, that is, foreign knowledge (Teece, 2000) is currently held by employees within the firm's boundary. However, the full economic potential of this valuable asset is unlocked when mangers by a significant departure from the traditional method of management try to manage employees in a new way.

6.5.1 Limitations and Directions for Future Research

One rich research agenda for future studies is that rather than focusing on firm-level sources of the variation of learning-by-exporting outcomes, explores the effects of environmental contingencies by looking at the role of institutions, for instance. This merits great attention given the fact that the greater ambiguity in and weak quality of the host market's environment make the codification and interpretation of experiences and knowledge more difficult, and ultimately hampers learning from international operations (Sun et al., 2012). This would be an interesting profitable avenue for future research since by investigating the role of environmental contingencies it may provide additional answers on the question of why firms do not equally learn from exporting.

This study, of course, is not without limitations. Although I did my best to be comprehensive and control for motivators of MI by including control variables in the regression model testing the relationship between exporting and MI, the data did not allow me to control for other influential factors. For instance, scholars widely argue that the full implementation of MI is a complex process and it involves internal change agents, e.g., managers or employees, as well as external change agents, e.g., academics or consultants (e.g., Birkinshaw et al., 2008; Volberda et al., 2013). To control for the key role of internal and external change agents in the export-MI association, future research may consider using primary data, collected by surveys, rather than secondary datasets.

Furthermore, because theoretical arguments and conjectures were tested among Spanish manufacturing firms, I am so cautious about the generalizability of findings to other contexts. This means that there exists an opportunity for future research that by examining these relationships in other contexts and industries contribute to the generalizability of empirical findings that emerged from a single context.

Chapter 7: Discussion and Conclusion

7.1 Summary of Studies and Significant Findings

This thesis examines the role of management innovation at two distinct phases of export operations by asking and answering three questions, as set out in Table 7.1.

Study 1 focused on the pre-export phase and explored the relationship between management innovation and the firm's decision to start exporting. This study argued that higher productivity of exporters in comparison to non-exporters before taking up exports can be explained by earlier management innovation decisions. This theoretical argument was submitted to a comprehensive sample consisting of firms from 55 countries, most of which are emerging and developing economies. The findings of this research showed that management innovation can influence firms' export status directly and indirectly, i.e., via productivity growth and then self-selection into the export market. However, after correcting for the issue of endogeneity, it was observed that management innovation mainly affects export status via the indirect channel. Moreover, this study found evidence in support of the *learning-to-export* hypothesis: firms that address the internationalization goal through exports deliberately implement management innovation in order to fill performance gaps before internationalization.

Study 2 sought to recognize the effects of management innovation activities on the export survival of Spanish firms at the post-export stage. This research developed and empirically tested hypotheses regarding cumulative and combinative configurations of management innovation and compared the results of the empirical investigation with the export survival consequences of management innovation in its individual form. The findings of this study revealed that management innovation in isolation does not significantly impact the longevity of export activities. Unanticipatedly, management innovation cumulatively is detrimental for export operations survival prospects. Nevertheless, management innovation is effective in the creation of competitive advantage

and contributes to prolonged survival in the international business environment when it is coupled with technological innovations.

Study 3 centered on the phenomenon of learning-by-exporting. This research theoretically discussed that the heterogeneous effects of learning-by-exporting across firms at the actual phase of export activities can be predicted by management innovation. The empirical analysis on a sample of Spanish exporters confirms the validity of the core argument of this study and showed that management innovation positively moderates the export-technological innovativeness relationship. The results further demonstrated that for firms without management innovation exporting is disadvantageous for technological innovation activities, corroborating prior findings regarding the moderating impacts of management innovation.

Table 7.1 Synopsis of literature gaps, research questions, and findings

Research Gap	**Research Question**	**Key Findings**
The effects of management innovation on firms' export status	**1:** How does management innovation influence exporting?	Management innovation positively influences the decision to exports. Its effects go through productivity gains and activating the self-election mechanism into the export market.
The effects of management innovation and its different configurations on firms' export survival	**2:** How do different configurations of management innovation affect firms' export survival?	While individual and cumulative forms of management innovation do not affect and adversely impacts on export survival, respectively, its combination with technological innovations positively affects survival.
The effects of management innovation on the exports-technological innovativeness link	**3:** How do the effects of learning-by-exporting vary by the implementation of management innovation?	The introduction of management innovation has a positive moderating effect on the relationship between exporting and patenting.

Table 7.2 presents a summary of hypotheses tested in the three empirical studies of this thesis.

Table 7.2 Summary of hypotheses

Study	Hypotheses	Support
1	**H 1**: Management innovation will have a positive and indirect effect on exporting via productivity.	Supported
	H 1a: Management innovation is positively associated with productivity.	Supported
	H 1b: Productivity is positively associated with exporting.	Supported
2	**H 1:** The greater the cumulative sum of each innovation type, the longer a firm's export survival.	Not supported
	H 2: Exporting firms with more focused innovative activity have shorter export survival.	Supported
	H 3: Exporting firms with greater consistency in the composition of innovation activity have shorter export survival.	Supported
3	**H 1:** Exporting is positively associated with management innovation.	Supported
	H 2: All else equal, exporting firms implementing management innovation will experience higher learning-by-exporting effects than exporting firms that do not implement management innovation.	Supported

7.2 Implications for Theory and Practice

The completion of this thesis displays a threefold contribution to the innovation-exports literature and an important implication for practice.

Contribution 1: Beyond technological innovations – how management innovation matters to exporting

The literature is replete with a myriad of studies documenting the critical role of innovation in firms' strategic decision of starting export activities in the pre-export phase. Nonetheless, the weakness of this scholarship is that it has paid minimal attention to exploring the effects of management innovation (see: Chabowski et al., 2018; Love and Roper, 2015). A vast literature investigating the innovation-export relationship has overwhelmingly highlighted the importance of a firm's technological innovations or R&D activities in the internationalization through exports. Unlike prior work, this thesis approached innovation activities of firms from the angle of management innovation

and added to the long debate on the role of innovation in the firm's export orientation by offering theoretical explanations and empirical evidence on how management innovation influences exports. Drawing upon important insights from management innovation, productivity, and export literature, this thesis established a conceptual link between these three distinct streams of the literature and showed that most of management innovation's effects on the export status of firms goes through productivity improvements, and thus activating a self-selection mechanism. Recognizing the effects of management innovation is of interest to scholarship not only because it clarifies the role an under-represented type of innovation in the export literature, but also complements the understanding of how innovation, in its full sense of the term, influences export strategies of firms.

Contribution 2: Different configurations of management innovation have dissimilar export survival consequences

Though innovation includes technological as well as non-technological types, previous theoretical and empirical work centers on investigating the effects of technological innovations on the export survival of firms. As a result, the role of non-technological innovation, particularly of interest, management innovation in the survivability of exporting firms remains somewhat muted in the literature. This dissertation addressed this gap in knowledge and informs the debate on the innovation-export survival relationship by comparing and contrasting export survival consequences of different configurations of management innovation. Borrowing important insights from the resource-based view of the firm (RBV) (Barney, 1991) and socio-technical system theory (Trist, 1981), this research proposed and empirically examined untested conjectures regarding cumulative and combinative forms of management innovation and showed that management innovation aids the endurance of export activities of firms once it is introduced in combination with technological types of innovation. Meanwhile, it was observed that the single form, as the baseline, and the cumulative form of management innovation are ineffective in and even, unexpectedly, harmful to the longevity of business in the export market, respectively. This finding is an important addition to scholarship,

because counter to the prevailing wisdom which emphasizes that the implementation of management innovation leads to the firm's long-lasting competitiveness and survival (e.g., Hamel, 2006; Volberda et al., 2013), it points to the fact that neglecting the importance of complementarity between technological and non-technological innovation types causes the great potential of management innovation in the creation of competitive advantage to remain locked in the international business environment.

Contribution 3: The key role of management innovation in the heterogeneity of learning-by-exporting effects

The tenet of the learning-by-exporting literature is that exporting provides a vehicle for learning and thus improves performance *after* foreign market entry at the post-export phase. However, some exporters are found to be better at learning about available knowledge and ideas in the international market. The role of firms' absorptive capacity in shaping such heterogeneity has typically been the focus of pioneering scholars (e.g., D'Angelo et al., 2020; Salomon and Jin, 2010; Xie and Li, 2015), nonetheless, the existing literature tells us little regarding the effects of management innovation activities. This research redressed this shortcoming in understanding and extended prior studies by exploring sources of the variation of learning-by-exporting effects by providing evidence indicative of the moderating role of management innovation. To explain theoretically, this research focused on the issue of "knowledge stickiness" (Von Hippel, 1994) and reasoned that the implementation of novelties in managerial arrangements enables firms by overcoming this problem to make the intra-firm transfer of foreign knowledge easier, improve organizational learning, and ultimately attain higher innovation performance levels. Understating the effects of management innovation as a moderator is important as it shifts scholarly attention which has been traditionally directed to the notion of absorptive capacity, often represented by R&D activities, to the importance of the internal firm's non-R&D based mechanisms in learning from the international market.

Practical implication: Management innovation helps the realization of export-related goals

In addition to the theoretical contributions that emerged from the three empirical studies conducted in this thesis, the findings of this thesis also carry an important practical implication for managers. The prevalent view is that developing new products or processes is one of the most important prerequisites of success in the implementation of internationalization strategies and achievement of strategic objectives concerning exporting. The findings of this thesis, however, reveal that new changes within the nature of management within firms, i.e., management innovation, also play a critical role in achieving export-related ambitions at pre-export and post-export phases. Management innovation assists firms in making export commencement decisions. Under certain conditions, management innovation leads to exporters' long-term survival, and also makes taking full advantage of the hazardous journey of internationalization through exports possible. Hence, it is advisable that managers who wish to achieve their ambitions regarding export operations should adopt novel practices, processes, organizational structures, or techniques and attempt by overcoming the difficulties of the departure from traditional management methods improve the firm's quality of management. This, of course, necessitates managers devoting more time and energy to combating with inertia in intra-organizational activities and thus systematically investing in management innovation alongside technological innovations. As emphasized by two practitioners (Feigenbaum and Feigenbaum, 2005, p.96) "the systematization of management innovations will be a critical success factor for 21st century companies".

7.3 Limitation and Directions for Future Research

This thesis has notable empirical and theoretical limitations that provide opportunities for future research.

One limitation is that the data used in the studies did not allow the empirical examination of theoretical arguments and conjectures regarding the management innovation-export relationship in the context of services. This merits attention because management innovation may play a more

pronounced role than technological progress in the creation of competitive advantage of businesses operating in service industries (Mol and Birkinshaw, 2009), and services usually face fewer internationalization barriers (Contractor et al., 2003). Most importantly, trade in services is growing considerably. This is evidenced by the fact that the value of exports in services now accounts for about 25% of the world's total exports and it is anticipated to increase to 33% by 2040 (Côté et al., 2020). Thus, it will be beneficial for future research to focus more on service sector exporting and by the empirical examination of the proposed relationships in services contribute to the generalizability of the findings of this thesis.

Another limitation is that while management innovation is truly a complex and multifaceted phenomenon, due to data unavailability, it was operationalized by dichotomous variables viewing the level of newness relative to the focal innovative firm. Future work has the opportunity to investigate further the role of management innovation in firms' export activities by exploring the impact of the state of the art management innovations, which have no direct precedent, on export performance. Also, future studies may examine how introducing initiatives in each facet of management innovation, i.e., practices, processes, structure, or techniques (Birkinshaw et al., 2008), influence export activities separately.

In addition to the foregoing empirical limitations, this thesis has an inherent theoretical limitation. This thesis did not consider the impact of industry- and macro-level contingencies in the theorization of the association between management innovation and exports. This provokes research initiatives given the fact that industry- and macro-level factors may exert significant effects on the outcome of firms' management innovation activities (see Volberda et al., 2014). This is specially the case for an exporting firm because operating in multiple markets exposes the firm to several environmental contingencies that may influence the effectiveness of management innovation activities. Hence, future research could extend conceptual frameworks presented in this thesis and offer a more comprehensive view on the role of management innovation by including industry- and macro-level contingencies.

7.4 Conclusion

The aim of this thesis was to examine the role of management innovation at the pre-export and post-export stages. The theoretical discussion and empirical analyses offered by this thesis implies that management innovation plays a vital role in furthering a firm's goal at these two distinct phases of export activities. By exploring the effects of management innovation this thesis offsets the dearth of research on the role of non-technological innovations where the literature has predominately centered on the effects of technological innovations. Nevertheless, there is still a lot to learn about the effects of non-technological innovations, particularly, management innovation, on firms' export activity.

Finally, this thesis has generated considerable insights into a research area where to date little study has been previously conducted. By doing so, this thesis has made important contributions toward a better understanding of how management innovation matters to the export performance of firms.

8 List of References

Abrahamson, E. 1996. Management fashion. *Academy of Management Review*. **21**(1), pp.254-285.

Acs, Z.J., Braunerhjelm, P., Audretsch, D.B. and Carlsson, B. 2009. The knowledge spillover theory of entrepreneurship. *Small Business Economics.* **32**(1), pp.15-30.

Afuah, A. 2003. *Innovation management: Strategies, implementation, and profits.* 2nd ed. New York: Oxford University Press.

Ahuja, G., Lampert, C.M. and Tandon, V. 2008. Moving beyond Schumpeter: Management research on the determinants of technological innovation. *Academy of Management Annals.* **2**(1), pp.1-98.

Al–Aali, A. and Teece, D.J. 2014. International entrepreneurship and the theory of the (Long–Lived) international firm: A capabilities perspective. *Entrepreneurship Theory and Practice.* **38**(1), pp.95-116.

Alavi, M. and Leidner, D.E. 2001. Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly.* **25**(1), pp.107-136.

Albornoz, F., Fanelli, S. and Hallak, J.C. 2016. Survival in export markets. *Journal of International Economics.* **102**, pp.262-281.

Allison, P.D. 1982. Discrete-time methods for the analysis of event histories. *Sociological Methodology.* **13**, pp.61-98.

Allison, P.D. and Waterman, R.P. 2002. Fixed–effects negative binomial regression models. *Sociological Methodology.* **32**(1), pp.247-265.

Alvarez, R. and López, R.A. 2005. Exporting and performance: Evidence from Chilean plants. *Canadian Journal of Economics.* **38**(4), pp.1384-1400.

Alvarez, R. and Robertson, R. 2004. Exposure to foreign markets and plant-level innovation: Evidence from Chile and Mexico. *The Journal of International Trade & Economic Development.* **13**(1), pp.57-87.

Andersson, M. and Lööf, H. 2009. Learning-by-exporting revisited: The role of intensity and persistence. *Scandinavian Journal of Economics.* **111**(4), pp.893-916.

Angrist, J.D. 2001. Estimation of limited dependent variable models with dummy endogenous regressors: Simple strategies for empirical practice. *Journal of Business & Economic Statistics.* **19**(1), pp.2-28.

Añón Higón, D. and Driffield, N. 2011. Exporting and innovation performance: Analysis of the annual Small Business Survey in the UK. *International Small Business Journal.* **29**(1), pp.4-24.

Ansari , S., Reinecke, J. and Spaan, A. 2014. How are practices made to vary? Managing practice adaptation in a multinational corporation. *Organization Studies.* **35**(9), pp.1313-1341.

Ansari, S.M., Fiss, P.C. and Zajac, E.J. 2010. Made to fit: How practices vary as they diffuse. *Academy of Management Review.* **35**(1), pp.67-92.

Antons, D. and Piller, F.T. 2015. Opening the black box of "not invented here": Attitudes, decision biases, and behavioral consequences. *Academy of Management Perspectives.* **29**(2), pp.193-217.

Arellano, M. and Bond, S. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies.* **58**(2), pp.277-297.

Argote, L., McEvily, B. and Reagans, R. 2003. Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management Science.* **49**(4), pp.571-582.

Armbruster, H., Bikfalvi, A., Kinkel, S. and Lay, G. 2008. Organizational innovation: The challenge of measuring non-technical innovation in large-scale surveys. *Technovation.* **28**(10), pp.644-657.

Arnold, J.M. and Hussinger, K. 2005. Export behavior and firm productivity in German manufacturing: A firm-level analysis. *Review of World Economics.* **141**(2), pp.219-243.

Aulakh, P.S., Kotabe, M. and Teegen, H. 2000. Export strategies and performance of firms from emerging economies: Evidence from Brazil, Chile, and Mexico. *Academy of Management Journal.* **43**(3), pp.342-361.

Autio, E., Sapienza, H.J. and Almeida, J.G. 2000. Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal.* **43**(5), pp.909-924.

Aw, B.Y., Roberts, M.J. and Winston, T. 2007. Export market participation, investments in R&D and worker training, and the evolution of firm productivity. *The World Economy.* **30**(1), pp.83-104.

Aw, B.Y., Roberts, M.J. and Xu, D.Y. 2008. R&D investments, exporting, and the evolution of firm productivity. *American Economic Review.* **98**(2), pp.451-456.

Aw, B.Y., Roberts, M.J. and Xu, D.Y. 2011. R&D investment, exporting, and productivity dynamics. *American Economic Review.* **101**(4), pp.1312-1344.

Ayllón, S. and Radicic, D. 2019. Product innovation, process innovation and export propensity: Persistence, complementarities and feedback effects in Spanish firms. *Applied Economics.* **51**(33), pp.3650-3664.

Azar, G. and Ciabuschi, F. 2017. Organizational innovation, technological innovation, and export performance: The effects of innovation radicalness and extensiveness. *International Business Review.* **26**(2), pp.324-336.

Azar, G. and Drogendijk, R. 2016. Cultural distance, innovation and export performance. *European Business Review.* **28**(2), pp.176-207.

Azari, M.J., Madsen, T.K. and Moen, Ø. 2017. Antecedent and outcomes of innovation-based growth strategies for exporting SMEs. *Journal of Small Business and Enterprise Development.* **24**(4), pp.733-752.

Baldwin, J.R. and Gu, W. 2003. Export-market participation and productivity performance in Canadian manufacturing. *Canadian Journal of Economics.* **36**(3), pp.634-657.

Ballot, G., Fakhfakh, F., Galia, F. and Salter, A. 2015. The fateful triangle: Complementarities in performance between product, process and organizational innovation in France and the UK. *Research Policy.* **44**(1), pp.217-232.

Barkema, H.G. and Vermeulen, F. 1998. International expansion through start-up or acquisition: A learning perspective. *Academy of Management Journal.* **41**(1), pp.7-26.

Barnett, W.P., Greve, H.R. and Park, D.Y. 1994. An evolutionary model of organizational performance. *Strategic Management Journal.* **15**(S1), pp.11-28.

Barney, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management.* **17**(1), pp.99-120.

Baron, R.M. and Kenny, D.A. 1986. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology.* **51**(6), pp.1173-1182.

Barras, R. 1986. Towards a theory of innovation in services. *Research Policy.* **15**(4), pp.161-173.

Barras, R. 1990. Interactive innovation in financial and business services: The vanguard of the service revolution. *Research Policy.* **19**(3), pp.215-237.

Barrios, S., Görg, H. and Strobl, E. 2003. Explaining firms' export behaviour: R&D, spillovers and the destination market. *Oxford Bulletin of Economics and Statistics.* **65**(4), pp.475-496.

Bartol, K.M. and Srivastava, A. 2002. Encouraging knowledge sharing: The role of organizational reward systems. *Journal of Leadership & Organizational Studies.* **9**(1), pp.64-76.

Bascle, G. 2008. Controlling for endogeneity with instrumental variables in strategic management research. *Strategic Organization.* **6**(3), pp.285-327.

Basile, R. 2001. Export behaviour of Italian manufacturing firms over the nineties: The role of innovation. *Research Policy.* **30**(8), pp.1185-1201.

Battisti, G. and Iona, A. 2009. The intra-firm diffusion of complementary innovations: Evidence from the adoption of management practices by British establishments. *Research Policy.* **38**(8), pp.1326-1339.

Battisti, G. and Stoneman, P. 2010. How innovative are UK firms? Evidence from the fourth UK community innovation survey on synergies between technological and organizational innovations. *British Journal of Management.* **21**(1), pp.187-206.

Bayus, B.L. and Agarwal, R. 2007. The role of pre-entry experience, entry timing, and product technology strategies in explaining firm survival. *Management Science.* **53**(12), pp.1887-1902.

Becchetti, L. and Rossi, S.P. 2000. The positive effect of industrial district on the export performance of Italian firms. *Review of Industrial Organization.* **16**(1), pp.53-68.

Becker, S.O. and Egger, P.H. 2013. Endogenous product versus process innovation and a firm's propensity to export. *Empirical Economics.* **44**(1), pp.329-354.

Beinhocker, E.D. 2007. *The origin of wealth: Evolution, complexity, and the radical remaking of economics.* London: Random House.

Beleska-Spasova, E., Glaister, K.W. and Stride, C. 2012. Resource determinants of strategy and performance: The case of British exporters. *Journal of World Business.* **47**(4), pp.635-647.

Bernard, A.B., Eaton, J., Jensen, J.B. and Kortum, S. 2003. Plants and productivity in international trade. *American Economic Review.* **93**(4), pp.1268-1290.

Bernard, A.B. and Jensen, J.B. 1999. Exceptional exporter performance: Cause, effect, or both? *Journal of International Economics.* **47**(1), pp.1-25.

Bernard, A.B. and Jensen, J.B. 2004a. Entry, expansion, and intensity in the US export boom, 1987–1992. *Review of International Economics.* **12**(4), pp.662-675.

Bernard, A.B. and Jensen, J.B. 2004b. Why some firms export. *Review of Economics and Statistics.* **86**(2), pp.561-569.

Bernard, A.B., Jensen, J.B., Redding, S.J. and Schott, P.K. 2007. Firms in international trade. *Journal of Economic Perspectives.* **21**(3), pp.105-130.

Bernard, A.B. and Wagner, J. 2001. Export entry and exit by German firms. *Weltwirtschaftliches Archiv/ Review of World Economics.* **137**(1), pp.105-123.

Bessant, J., Lamming, R., Noke, H. and Phillips, W. 2005. Managing innovation beyond the steady state. *Technovation.* **25**(12), pp.1366-1376.

Beugelsdijk, S., van Witteloostuijn, A. and Meyer, K.E. 2020. A new approach to data access and research transparency (DART). *Journal of International Business Studies.* **51**(6), pp.887-905.

Birkinshaw, J., Hamel, G. and Mol, M.J. 2008. Management innovation. *Academy of Management Review.* **33**(4), pp.825-845.

Birkinshaw , J.M. and Mol, M.J. 2006. How management innovation happens. *MIT Sloan Management Review.* **47**(4), pp.81-88.

Bleaney, M. and Wakelin, K. 2002. Efficiency, innovation and exports. *Oxford Bulletin of Economics and Statistics.* **64**(1), pp.3-15.

Bloom, N., Brynjolfsson, E., Foster, L., Jarmin, R.S., Patnaik, M., Saporta-Eksten, I. and Van Reenen, J. 2017. What drives differences in management? *NBER WP 23300.*

Bloom, N., Genakos, C., Sadun, R. and Van Reenen, J. 2012. Management practices across firms and countries. *Academy of Management Perspectives.* **26**(1), pp.12-33.

Bloom, N., Manova, K., Van Reenen, J., Sun, S.T. and Yu, Z. 2021. Trade and management. *The Review of Economics and Statistics.* **103**(3), pp.443-460.

Bloom, N. and Van Reenen, J. 2007. Measuring and explaining management practices across firms and countries. *The Quarterly Journal of Economics.* **122**(4), pp.1351-1408.

Bloom, N. and Van Reenen, J. 2010. Why do management practices differ across firms and countries? *Journal of Economic Perspectives.* **24**(1), pp.203-224.

Blum, B.S., Claro, S. and Horstmann, I.J. 2013. Occasional and perennial exporters. *Journal of International Economics.* **90**(1), pp.65-74.

Blundell, R. and Bond, S. 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics.* **87**(1), pp.115-143.

Blyde, J., Iberti, G. and Mussini, M. 2018. When does innovation matter for exporting? *Empirical Economics.* **54**(4), pp.1653-1671.

Bortoluzzi, G., Kadic-Maglajlic, S., Arslanagic-Kalajdzic, M. and Balboni, B. 2018. Innovativeness as a driver of the international expansion of developing markets' firms: Evidence of curvilinear effects. *International Marketing Review.* **35**(2), pp.215-235.

Boso, N., Story, V.M., Cadogan, J.W., Micevski, M. and Kadić-Maglajlić, S. 2013. Firm innovativeness and export performance: Environmental, networking, and structural contingencies. *Journal of International Marketing.* **21**(4), pp.62-87.

Bowen, D.E., Siehl, C. and Schneider, B. 1989. A framework for analyzing customer service orientations in manufacturing. *Academy of Management Review.* **14**(1), pp.75-95.

Bratti, M. and Felice, G. 2012. Are exporters more likely to introduce product innovations? *The World Economy.* **35**(11), pp.1559-1598.

Braymen, C., Briggs, K. and Boulware, J. 2011. R&D and the export decision of new firms. *Southern Economic Journal.* **78**(1), pp.191-210.

Brouwer, E. and Kleinknecht, A. 1999. Innovative output, and a firm's propensity to patent: An exploration of CIS micro data. *Research Policy.* **28**(6), pp.615-624.

Brown, S.L. and Eisenhardt, K.M. 1995. Product development: Past research, present findings, and future directions. *Academy of Management Review.* **20**(2), pp.343-378.

Brown, S.P. and Lam, S.K. 2008. A meta-analysis of relationships linking employee satisfaction to customer responses. *Journal of Retailing.* **84**(3), pp.243-255.

Burke, W.W. and Litwin, G.H. 1992. A causal model of organizational performance and change. *Journal of Management.* **18**(3), pp.523-545.

Bustos, P. 2011. Trade liberalization, exports, and technology upgrading: Evidence on the impact of MERCOSUR on Argentinian firms. *American Economic Review.* **101**(1), pp.304-340.

Cabrera, A., Collins, W.C. and Salgado, J.F. 2006. Determinants of individual engagement in knowledge sharing. *The International Journal of Human Resource Management.* **17**(2), pp.245-264.

Calantone, R.J., Cavusgil, S.T. and Zhao, Y. 2002. Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management.* **31**(6), pp.515-524.

Caldera, A. 2010. Innovation and exporting: Evidence from Spanish manufacturing firms. *Review of World Economics.* **146**(4), pp.657-689.

Cameron, A.C. and Trivedi, P.K. 1986. Econometric models based on count data. Comparisons and applications of some estimators and tests. *Journal of Applied Econometrics.* **1**(1), pp.29-53.

Camisón-Zornoza, C., Lapiedra-Alcamí, R., Segarra-Ciprés, M. and Boronat-Navarro, M. 2004. A meta-analysis of innovation and organizational size. *Organization Studies.* **25**(3), pp.331-361.

Camisón, C. and Villar-López, A. 2014. Organizational innovation as an enabler of technological innovation capabilities and firm performance. *Journal of Business Research.* **67**(1), pp.2891-2902.

Carboni, O.A. and Medda, G. 2018. R&D, export and investment decision: Evidence from European firms. *Applied Economics.* **50**(2), pp.187-201.

Cassiman, B. and Golovko, E. 2011. Innovation and internationalization through exports. *Journal of International Business Studies.* **42**(1), pp.56-75.

Cassiman, B., Golovko, E. and Martínez-Ros, E. 2010. Innovation, exports and productivity. *International Journal of Industrial Organization.* **28**(4), pp.372-376.

Cassiman, B. and Martinez-Ros, E. 2007. Product innovation and exports: Evidence from Spanish manufacturing. *IESE Working Paper, mimeo.* (Available from http://www.eco.uc3m.es/temp/agenda/Cassiman.pdf).

Castellani, D. 2002. Export behavior and productivity growth: Evidence from Italian manufacturing firms. *Weltwirtschaftliches Archiv.* **138**(4), pp.605-628.

Castellani, D. and Fassio, C. 2019. From new imported inputs to new exported products. Firm-level evidence from Sweden. *Research Policy.* **48**(1), pp.322-338.

Castellani, D. and Zanfei, A. 2006. *Multinational firms, innovation and productivity.* Cheltenham: Edward Elgar Publishing.

Castellani, D. and Zanfei, A. 2007. Internationalisation, innovation and productivity: How do firms differ in Italy? *The World Economy.* **30**(1), pp.156-176.

Cavusgil, S.T. and Knight, G. 2015. The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization. *Journal of International Business Studies.* **46**(1), pp.3-16.

Cefis, E. and Marsili, O. 2005. A matter of life and death: Innovation and firm survival. *Industrial and Corporate Change.* **14**(6), pp.1167-1192.

Cefis, E. and Marsili, O. 2019. Good times, bad times: Innovation and survival over the business cycle. *Industrial and Corporate Change.* **28**(3), pp.565-587.

Chabowski, B., Kekec, P., Morgan, N.A., Hult, G.T.M., Walkowiak, T. and Runnalls, B. 2018. An assessment of the exporting literature: Using theory and data to identify future research directions. *Journal of International Marketing.* **26**(1), pp.118-143.

Chandler, A. 1962. *Strategy and structure*. Cambridge, MA: MIT Press.

Chen, C.-J. and Huang, J.-W. 2007. How organizational climate and structure affect knowledge management—The social interaction perspective. *International Journal of Information Management.* **27**(2), pp.104-118.

Chesbrough, H.W. 2003. *Open innovation: The new imperative for creating and profiting from technology*. Boston: Harvard Business Press.

Cho, H.J. and Pucik, V. 2005. Relationship between innovativeness, quality, growth, profitability, and market value. *Strategic Management Journal.* **26**(6), pp.555-575.

Choquette, E. 2019. Import-based market experience and firms' exit from export markets. *Journal of International Business Studies.* **50**(3), pp.423-449.

Christensen, C.M., Suárez, F.F. and Utterback, J.M. 1998. Strategies for survival in fast-changing industries. *Management Science.* **44**(12-part-2), pp.S207-S220.

Chudnovsky, D., López, A. and Pupato, G. 2006. Innovation and productivity in developing countries: A study of Argentine manufacturing firms' behavior (1992–2001). *Research Policy.* **35**(2), pp.266-288.

Cirera, X., Marin, A. and Markwald, R. 2015. Explaining export diversification through firm innovation decisions: The case of Brazil. *Research Policy.* **44**(10), pp.1962-1973.

Clausen, T., Pohjola, M., Sapprasert, K. and Verspagen, B. 2012. Innovation strategies as a source of persistent innovation. *Industrial and Corporate Change.* **21**(3), pp.553-585.

Clerides, S.K., Lach, S. and Tybout, J.R. 1998. Is learning by exporting important? Micro-dynamic evidence from Colombia, Mexico, and Morocco. *The Quarterly Journal of Economics.* **113**(3), pp.903-947.

Cleves, M., Gould, W. and Marchenko, Y. 2016. *An introduction to survival analysis using Stata.* 3rd ed. College Station, TX: Stata Press.

Coad, A., Segarra, A. and Teruel, M. 2016. Innovation and firm growth: Does firm age play a role? *Research Policy.* **45**(2), pp.387-400.

Cohen, W.M. and Klepper, S. 1996. Firm size and the nature of innovation within industries: The case of process and product R&D. *The Review of Economics and Statistics.* **78**(2), pp.232-243.

Cohen, W.M. and Levinthal, D.A. 1989. Innovation and learning: the two faces of R & D. *The Economic Journal.* **99**(397), pp.569-596.

Cohen, W.M. and Levinthal, D.A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly.* **35**(1), pp.128-152.

Contractor, F.J., Kundu, S.K. and Hsu, C.-C. 2003. A three-stage theory of international expansion: The link between multinationality and performance in the service sector. *Journal of International Business Studies.* **34**(1), pp.5-18.

Côté, C., Estrin, S. and Shapiro, D. 2020. Expanding the international trade and investment policy agenda: The role of cities and services. *Journal of International Business Policy.* **3**(3), pp.199-223.

Couper, C., Reuber, A.R. and Prashantham, S. 2020. Lost that lovin'feeling: The erosion of trust between small, high-distance partners. *Journal of International Business Studies.* **51**(3), pp.326-352.

Cowton, C.J. 1998. The use of secondary data in business ethics research. *Journal of Business Ethics.* **17**(4), pp.423-434.

Cox, D.R. and Oakes, D. 1972. *Analysis of survival data.* London: Champan and Hall.

Crescenzi, R. and Gagliardi, L. 2018. The innovative performance of firms in heterogeneous environments: The interplay between external knowledge and internal absorptive capacities. *Research Policy.* **47**(4), pp.782-795.

Crescenzi, R., Nathan, M. and Rodríguez-Pose, A. 2016. Do inventors talk to strangers? On proximity and collaborative knowledge creation. *Research Policy.* **45**(1), pp.177-194.

Crespi, G., Criscuolo, C. and Haskel, J. 2008. Productivity, exporting, and the learning-by-exporting hypothesis: Direct evidence from UK firms. *Canadian Journal of Economics.* **41**(2), pp.619-638.

Crick, D. 2004. UK SMEs' decision to discontinue exporting: An exploratory investigation into practices within the clothing industry. *Journal of Business Venturing.* **19**(4), pp.561-587.

Criscuolo, C., Haskel, J.E. and Slaughter, M.J. 2010. Global engagement and the innovation activities of firms. *International Journal of Industrial Organization.* **28**(2), pp.191-202.

Crossan, M.M. and Apaydin, M. 2010. A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies.* **47**(6), pp.1154-1191.

Cuervo-Cazurra, A., Andersson, U., Brannen, M.Y., Nielsen, B.B. and Rebecca Reuber, A. 2016. From the Editors: Can I trust your findings? Ruling out alternative explanations in international business research. *Journal of International Business Studies.* **47**(8), pp.881-897.

D'Angelo, A., Ganotakis, P. and Love, J.H. 2020. Learning by exporting under fast, short-term changes: The moderating role of absorptive capacity and foreign collaborative agreements. *International Business Review.* **29**(3), p101687.

Damanpour, F. 1991. Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal.* **34**(3), pp.555-590.

Damanpour, F. 2010. An integration of research findings of effects of firm size and market competition on product and process innovations. *British Journal of Management.* **21**(4), pp.996-1010.

Damanpour, F. 2014. Footnotes to research on management innovation. *Organization Studies.* **35**(9), pp.1265-1285.

Damanpour, F. and Aravind, D. 2012. Managerial innovation: Conceptions, processes and antecedents. *Management and Organization Review.* **8**(2), pp.423-454.

Damanpour, F. and Evan, W.M. 1984. Organizational innovation and performance: The problem of" organizational lag". *Administrative Science Quarterly.* **29**(3), pp.392-409.

Damanpour, F. and Gopalakrishnan, S. 2001. The dynamics of the adoption of product and process innovations in organizations. *Journal of Management Studies.* **38**(1), pp.45-65.

Damanpour, F., Sanchez-Henriquez, F. and Chiu, H.H. 2018. Internal and external sources and the adoption of innovations in organizations. *British Journal of Management.* **29**(4), pp.712-730.

Damanpour, F. and Schneider, M. 2006. Phases of the adoption of innovation in organizations: Effects of environment, organization and top managers *British Journal of Management.* **17**(3), pp.215-236.

Damanpour, F., Walker, R.M. and Avellaneda, C.N. 2009. Combinative effects of innovation types and organizational performance: A longitudinal study of service organizations. *Journal of Management Studies.* **46**(4), pp.650-675.

Damijan, J.P., Kostevc, Č. and Polanec, S. 2010. From innovation to exporting or vice versa? *The World Economy.* **33**(3), pp.374-398.

Davis, D.R. 1995. Intra-industry trade: A Heckscher-Ohlin-Ricardo approach. *Journal of International Economics.* **39**(3-4), pp.201-226.

De Vaus, D. 2001. *Research design in social science.* London: Sage.

Dearden, L., Reed, H. and Van Reenen, J. 2006. The impact of training on productivity and wages: Evidence from British panel data. *Oxford Bulletin of Economics and Statistics.* **68**(4), pp.397-421.

Delgado, M.A., Farinas, J.C. and Ruano, S. 2002. Firm productivity and export markets: A non-parametric approach. *Journal of International Economics.* **57**(2), pp.397-422.

Deng, Z., Guo, H., Zhang, W. and Wang, C. 2014. Innovation and survival of exporters: A contingency perspective. *International Business Review.* **23**(2), pp.396-406.

Dhanaraj, C. and Beamish, P.W. 2003. A resource-based approach to the study of export performance. *Journal of Small Business Management.* **41**(3), pp.242-261.

Di Cintio, M., Ghosh, S. and Grassi, E. 2017. Firm growth, R&D expenditures and exports: An empirical analysis of Italian SMEs. *Research Policy.* **46**(4), pp.836-852.

Diaz, M.A. and Sánchez, R. 2008. Firm size and productivity in Spain: A stochastic frontier analysis. *Small Business Economics.* **30**(3), pp.315-323.

Dierickx, I. and Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science.* **35**(12), pp.1504-1511.

Dohse, D. and Niebuhr, A. 2018. How different kinds of innovation affect exporting. *Economics Letters.* **163**, pp.182-185.

Doraszelski, U. and Jaumandreu, J. 2013. R&D and productivity: Estimating endogenous productivity. *Review of Economic Studies.* **80**(4), pp.1338-1383.

Eliasson, K., Hansson, P. and Lindvert, M. 2012. Do firms learn by exporting or learn to export? Evidence from small and medium-sized enterprises. *Small Business Economics.* **39**(2), pp.453-472.

Eriksson, K. and Chetty, S. 2003. The effect of experience and absorptive capacity on foreign market knowledge. *International Business Review.* **12**(6), pp.673-695.

Esteve-Pérez, S. and Rodríguez, D. 2013. The dynamics of exports and R&D in SMEs. *Small Business Economics.* **41**(1), pp.219-240.

Ettlie, J.E. and Reza, E.M. 1992. Organizational integration and process innovation. *Academy of Management Journal.* **35**(4), pp.795-827.

Evan, W.M. 1966. Organizational lag. *Human Organization.* **25**(1), pp.51-53.

Evangelista, R. and Vezzani, A. 2010. The economic impact of technological and organizational innovations. A firm-level analysis. *Research Policy.* **39**(10), pp.1253-1263.

Evans, M.G. 1986. Organizational behavior: The central role of motivation. *Journal of Management.* **12**(2), pp.203-222.

Falk, M. and de Lemos, F.F. 2019. Complementarity of R&D and productivity in SME export behavior. *Journal of Business Research.* **96**, pp.157-168.

Fassio, C. 2018. Export-led innovation: The role of export destinations. *Industrial and Corporate Change.* **27**(1), pp.149-171.

Faustino, H.C. and Matos, P.V. 2015. Exports, productivity and innovation: New firm level empirical evidence. *Applied Economics.* **47**(46), pp.4918-4933.

Feigenbaum, A.V. and Feigenbaum, D.S. 2005. What quality means today: Leadership and management innovation must drive a comprehensive ethos of excellence. *MIT Sloan Management Review.* **46**(2), pp.96-97.

Fernández-Mesa, A. and Alegre, J. 2015. Entrepreneurial orientation and export intensity: Examining the interplay of organizational learning and innovation. *International Business Review.* **24**(1), pp.148-156.

Filatotchev, I., Liu, X., Buck, T. and Wright, M. 2009. The export orientation and export performance of high-technology SMEs in emerging markets: The effects of knowledge transfer by returnee entrepreneurs. *Journal of International Business Studies.* **40**(6), pp.1005-1021.

Filatotchev, I. and Piesse, J. 2009. R&D, Internationalization and growth of newly listed firms: European evidence. *Journal of International Business Studies.* **40**(8), pp.1260-1276.

Filatotchev, I., Stephan, J. and Jindra, B. 2008. Ownership structure, strategic controls and export intensity of foreign-invested firms in transition economies. *Journal of International Business Studies.* **39**(7), pp.1133-1148.

Filipescu, D.A., Prashantham, S., Rialp, A. and Rialp, J. 2013. Technological innovation and exports: Unpacking their reciprocal causality. *Journal of International Marketing.* **21**(1), pp.23-38.

Flor, M. and Oltra, M.J. 2005. The influence of firms' technological capabilities on export performance in supplier-dominated industries: The case of ceramic tiles firms. *R&D Management.* **35**(3), pp.333-347.

Ford, J.D., Ford, L.W. and D'Amelio, A. 2008. Resistance to change: The rest of the story. *Academy of Management Review.* **33**(2), pp.362-377.

Foss, N.J., Laursen, K. and Pedersen, T. 2011. Linking customer interaction and innovation: The mediating role of new organizational practices. *Organization Science.* **22**(4), pp.980-999.

Foss, N.J., Minbaeva, D.B., Pedersen, T. and Reinholt, M. 2009. Encouraging knowledge sharing among employees: How job design matters. *Human Resource Management.* **48**(6), pp.871-893.

Foster, L., Haltiwanger, J. and Syverson, C. 2008. Reallocation, firm turnover, and efficiency: Selection on productivity or profitability? *American Economic Review.* **98**(1), pp.394-425.

Fredrickson, J.W. 1986. The strategic decision process and organizational structure. *Academy of Management Review.* **11**(2), pp.280-297.

Fryges, H., Vogel, A. and Wagner, J. 2015. The impact of R&D activities on exports of German business services enterprises: First evidence from a continuous treatment approach. *The World Economy.* **38**(4), pp.716-729.

Ganotakis, P. and Love, J.H. 2010. R&D, product innovation, and exporting: Evidence from UK new technology based firms. *Oxford Economic Papers.* **63**(2), pp.279-306.

Ganotakis, P. and Love, J.H. 2012. Export propensity, export intensity and firm performance: The role of the entrepreneurial founding team. *Journal of International Business Studies.* **43**(8), pp.693-718.

García, F., Avella, L. and Fernández, E. 2012. Learning from exporting: The moderating effect of technological capabilities. *International Business Review.* **21**(6), pp.1099-1111.

Gashi, P., Hashi, I. and Pugh, G. 2014. Export behaviour of SMEs in transition countries. *Small Business Economics.* **42**(2), pp.407-435.

Gebauer, H. 2008. Identifying service strategies in product manufacturing companies by exploring environment–strategy configurations. *Industrial Marketing Management.* **37**(3), pp.278-291.

Gebauer, H. 2011. Exploring the contribution of management innovation to the evolution of dynamic capabilities. *Industrial Marketing Management.* **40**(8), pp.1238-1250.

Genc, E., Dayan, M. and Genc, O.F. 2019. The impact of SME internationalization on innovation: The mediating role of market and entrepreneurial orientation. *Industrial Marketing Management.* **82**, pp.253-264.

Ghauri, P.N. and Grønhaug, K. 2010. *Research methods in business studies.* 4th ed. Essex: Pearson Education.

Giarratana, M.S. and Fosfuri, A. 2007. Product strategies and survival in Schumpeterian environments: Evidence from the US security software industry. *Organization Studies.* **28**(6), pp.909-929.

Giovannetti, G., Ricchiuti, G. and Velucchi, M. 2011. Size, innovation and internationalization: A survival analysis of Italian firms. *Applied Economics.* **43**(12), pp.1511-1520.

Girma, S. and Görg, H. 2004. Outsourcing, foreign ownership, and productivity: Evidence from UK establishment-level data. *Review of International Economics.* **12**(5), pp.817-832.

Girma, S., Görg, H. and Hanley, A. 2008. R&D and exporting: A comparison of British and Irish firms. *Review of World Economics.* **144**(4), pp.750-773.

Girma, S., Greenaway, A. and Kneller, R. 2004. Does exporting increase productivity? A microeconometric analysis of matched firms. *Review of International Economics.* **12**(5), pp.855-866.

Girma, S., Greenaway, D. and Kneller, R. 2003. Export market exit and performance dynamics: A causality analysis of matched firms. *Economics Letters.* **80**(2), pp.181-187.

Gkypali, A., Love, J. and Roper, S. 2021. Export status and SME productivity: Learning-to-export versus learning-by-exporting. *Journal of Business Research.* **128**, pp.486-498.

Gkypali, A., Love, J.H. and Roper, S. 2018. Export status and SME productivity: Learning-to-export versus learning-by-exporting. *ERC Research Paper 71.* UK: Enterprise Research Center (ERC).

Golovko, E. and Valentini, G. 2011. Exploring the complementarity between innovation and export for SMEs' growth. *Journal of International Business Studies.* **42**(3), pp.362-380.

Golovko, E. and Valentini, G. 2014. Selective learning-by-exporting: Firm size and product versus process innovation. *Global Strategy Journal.* **4**(3), pp.161-180.

Gopalakrishnan, S. and Damanpour, F. 1997. A review of innovation research in economics, sociology and technology management. *Omega.* **25**(1), pp.15-28.

Grant, A.M. 2008. Does intrinsic motivation fuel the prosocial fire? Motivational synergy in predicting persistence, performance, and productivity. *Journal of Applied Psychology.* **93**(1), pp.48-58.

Greenaway, D., Gullstrand, J. and Kneller, R. 2005. Exporting may not always boost firm productivity. *Review of World Economics.* **141**(4), pp.561-582.

Greene, W.H. 2003. *Econometric analysis* .5th ed. Upper Saddle River, NJ: Prantice Hall.

Greve, H.R. 2003. A behavioral theory of R&D expenditures and innovations: Evidence from shipbuilding. *Academy of Management Journal.* **46**(6), pp.685-702.

Griffith, R., Huergo, E., Mairesse, J. and Peters, B. 2006. Innovation and productivity across four European countries. *Oxford Review of Economic Policy.* **22**(4), pp.483-498.

Griliches, Z. 1998. Introduction to" R&D and Productivity: The Econometric Evidence". In: Griliches, Z. ed. *R&D and productivity: The econometric evidence.* Chicago, IL: University of Chicago Press, pp.1-14.

Grossman, G.M. and Helpman, E. 1991. Trade, knowledge spillovers, and growth. *European Economic Review.* **35**(2-3), pp.517-526.

Guler, I., Guillén, M.F. and Macpherson, J.M. 2002. Global competition, institutions, and the diffusion of organizational practices: The international spread of ISO 9000 quality certificates. *Administrative Science Quarterly.* **47**(2), pp.207-232.

Gunday, G., Ulusoy, G., Kilic, K. and Alpkan, L. 2011. Effects of innovation types on firm performance. *International Journal of Production Economics.* **133**(2), pp.662-676.

Hagedoorn, J. and Cloodt, M. 2003. Measuring innovative performance: Is there an advantage in using multiple indicators? *Research Policy.* **32**(8), pp.1365-1379.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R. 2006. *Multivariate data analysis.* Upper Saddle River, NJ: Pearson Prentice Hall.

Halfpenny, P. 1982. *Positivism and sociology: Explaining social life.* London: Allen & Unwin.

Hall, B.H. 2011. Innovation and productivity. *NBER Working Paper No. 17178.*

Hall, B.H., Lotti, F. and Mairesse, J. 2009. Innovation and productivity in SMEs: Empirical evidence for Italy. *Small Business Economics.* **33**(1), pp.13-33.

Hamel, G. 2006. The why, what, and how of management innovation. *Harvard Business Review.* **84**(2), pp.72-84.

Han, A. and Hausman, J.A. 1990. Flexible parametric estimation of duration and competing risk models. *Journal of Applied Econometrics.* **5**(1), pp.1-28.

Harder, M. 2011. *Internal antecedents of management innovation.* Copenhagen: Doctoral School of Economics and Management, Copenhagen Business School.

Hargadon, A. and Sutton, R.I. 1997. Technology brokering and innovation in a product development firm. *Administrative Science Quarterly.* **42**(4), pp.716-749.

Harris, R. and Li, Q.C. 2008. Exporting, R&D, and absorptive capacity in UK establishments. *Oxford Economic Papers.* **61**(1), pp.74-103.

Harris, R. and Moffat, J. 2011. R&D, innovation and exporting. *SERC Discussion Paper 73, March*. London: Spatial Economics Research Center (SERC).

Hausman, J.A., Hall, B.H. and Griliches, Z. 1984. Econometric models for count data with an application to the patents-R&D relationship. *Econometrica.* **52**(4), pp.909-938.

Heij, C.V., Volberda, H.W., Van den Bosch, F.A. and Hollen, R.M. 2020. How to leverage the impact of R&D on product innovation? The moderating effect of management innovation. *R&D Management.* **50**(2), pp.277-294.

Helpman, E., Melitz, M.J. and Yeaple, S.R. 2004. Export versus FDI with heterogeneous firms. *American Economic Review.* **94**(1), pp.300-316.

Hennart, J.-F., Majocchi, A. and Forlani, E. 2019. The myth of the stay-at-home family firm: How family-managed SMEs can overcome their internationalization limitations. *Journal of International Business Studies.* **50**(5), pp.758-782.

Henderson, R. and Cockburn, I. 1994. Measuring competence? Exploring firm effects in pharmaceutical research. *Strategic Management Journal.* **15**(S1), pp.63-84.

Hewitt-Dundas, N., Gkypali, A. and Roper, S. 2019. Does learning from prior collaboration help firms to overcome the 'two-worlds' paradox in university-business collaboration? *Research Policy.* **48**(5), pp.1310-1322.

Heyden, M.L., Sidhu, J.S. and Volberda, H.W. 2018. The conjoint influence of top and middle management characteristics on management innovation. *Journal of Management.* **44**(4), pp.1505-1529.

Hicks, R. and Tingley, D. 2011. Causal mediation analysis. *The Stata Journal.* **11**(4), pp.605-619.

Hitt, M.A., Hoskisson, R.E. and Kim, H. 1997. International diversification: Effects on innovation and firm performance in product-diversified firms. *Academy of Management Journal.* **40**(4), pp.767-798.

Hollen, R.M., Van Den Bosch, F.A. and Volberda, H.W. 2013. The role of management innovation in enabling technological process innovation: An inter-organizational perspective. *European Management Review.* **10**(1), pp.35-50.

Hon, A.H., Bloom, M. and Crant, J.M. 2014. Overcoming resistance to change and enhancing creative performance. *Journal of Management.* **40**(3), pp.919-941.

Huber, G.P. 1991. Organizational learning: The contributing processes and the literatures. *Organization Science.* **2**(1), pp.88-115.

Huergo, E. and Jaumandreu, J. 2004. Firms' age, process innovation and productivity growth. *International Journal of Industrial Organization.* **22**(4), pp.541-559.

Huselid, M.A. 1995. The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal.* **38**(3), pp.635-672.

Ito, K. and Lechevalier, S. 2010. Why some firms persistently out-perform others: Investigating the interactions between innovation and exporting strategies. *Industrial and Corporate Change.* **19**(6), pp.1997-2039.

Jaccard, J. and Turrisi, R. 2003. *Interaction effects in multiple regression.* 2nd ed. Iowa City, IA: Sage.

James, S.D., Leiblein, M.J. and Lu, S. 2013. How firms capture value from their innovations. *Journal of Management.* **39**(5), pp.1123-1155.

Jean, R.-J.B., Deng, Z., Kim, D. and Yuan, X. 2016. Assessing endogeneity issues in international marketing research. *International Marketing Review.* **33**(3), pp.483-512.

Jenkins, S.P. 1995. Easy estimation methods for discrete-time duration models. *Oxford Bulletin of Economics and Statistics.* **57**(1), pp.129-138.

Jenkins, S.P. 2005. Survival analysis. *Unpublished manuscript, Institute for Social and Economic Research, University of Essex, Colchester, UK.* **42**, pp.54-56.

Johanson, J. and Vahlne, J.-E. 1977. The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies.* **8**(1), pp.23-32.

Jones, G. and Khanna, T. 2006. Bringing history (back) into international business. *Journal of International Business Studies.* **37**(4), pp.453-468.

Joshi, A.W. and Sharma, S. 2004. Customer knowledge development: Antecedents and impact on new product performance. *Journal of Marketing.* **68**(4), pp.47-59.

Kafouros, M. 2005. R&D and productivity growth: Evidence from the UK. *Economics of Innovation and New Technology.* **14**(6), pp.479-497.

Kafouros, M.I. and Buckley, P.J. 2008. Under what conditions do firms benefit from the research efforts of other organizations? *Research Policy.* **37**(2), pp.225-239.

Kafouros, M.I., Buckley, P.J., Sharp, J.A. and Wang, C. 2008. The role of internationalization in explaining innovation performance. *Technovation.* **28**(1-2), pp.63-74.

Kafouros, M.I. and Forsans, N. 2012. The role of open innovation in emerging economies: Do companies profit from the scientific knowledge of others? *Journal of World Business.* **47**(3), pp.362-370.

Kaleka, A. 2011. When exporting manufacturers compete on the basis of service: Resources and marketing capabilities driving service advantage and performance. *Journal of International Marketing.* **19**(1), pp.40-58.

Kaleka, A. and Morgan, N.A. 2017. Which competitive advantage (s)? Competitive advantage–market performance relationships in international markets. *Journal of International Marketing.* **25**(4), pp.25-49.

Katz, R. and Allen, T.J. 1982. Investigating the Not Invented Here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R & D Project Groups. *R&D Management.* **12**(1), pp.7-20.

Khanagha, S., Volberda, H., Sidhu, J. and Oshri, I. 2013. Management innovation and adoption of emerging technologies: The case of cloud computing. *European Management Review.* **10**(1), pp.51-67.

Khosravi, P., Newton, C. and Rezvani, A. 2019. Management innovation: A systematic review and meta-analysis of past decades of research. *European Management Journal.* **37**(6), pp.694-707.

Kimberly, J.R. 1981. Managerial innovation. *Handbook of organizational design.* New York: Oxford University Press, pp.84 -104.

Klepper, S. and Simons, K.L. 2000. The making of an oligopoly: Firm survival and technological change in the evolution of the US tire industry. *Journal of Political Economy.* **108**(4), pp.728-760.

Kogut, B. and Zander, U. 1993. Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies.* **24**(4), pp.625-645.

Kotabe, M. and Kothari, T. 2016. Emerging market multinational companies' evolutionary paths to building a competitive advantage from emerging markets to developed countries. *Journal of World Business.* **51**(5), pp.729-743.

Krammer, S.M., Strange, R. and Lashitew, A. 2018. The export performance of emerging economy firms: The influence of firm capabilities and institutional environments. *International Business Review.* **27**(1), pp.218-230.

Kyläheiko, K., Jantunen, A., Puumalainen, K., Saarenketo, S. and Tuppura, A. 2011. Innovation and internationalization as growth strategies: The role of technological capabilities and appropriability. *International Business Review.* **20**(5), pp.508-520.

Lachenmaier, S. and Wößmann, L. 2006. Does innovation cause exports? Evidence from exogenous innovation impulses and obstacles using German micro data. *Oxford Economic Papers.* **58**(2), pp.317-350.

Lahiri, A., Pahnke, E.C., Howard, M.D. and Boeker, W. 2019. Collaboration and informal hierarchy in innovation teams: Product introductions in entrepreneurial ventures. *Strategic Entrepreneurship Journal.* **13**(3), pp.326-358.

Lefebvre, É., Lefebvre, L.A. and Bourgault, M. 1998. R&D-Related Capabilities as Determinants of Export Performance. *Small Business Economics.* **10**(4), pp.365-377.

Leiblein, M.J. and Madsen, T.L. 2009. Unbundling competitive heterogeneity: Incentive structures and capability influences on technological innovation. *Strategic Management Journal.* **30**(7), pp.711-735.

Leiponen, A. and Helfat, C.E. 2010. Innovation objectives, knowledge sources, and the benefits of breadth. *Strategic Management Journal.* **31**(2), pp.224-236.

Leonidou, L.C., Katsikeas, C.S. and Coudounaris, D.N. 2010. Five decades of business research into exporting: A bibliographic analysis. *Journal of International Management.* **16**(1), pp.78-91.

Lewandowska, M.S., Szymura-Tyc, M. and Gołębiowski, T. 2016. Innovation complementarity, cooperation partners, and new product export: Evidence from Poland. *Journal of Business Research.* **69**(9), pp.3673-3681.

Lewin, A.Y., Massini, S. and Peeters, C. 2020. Absorptive capacity, socially enabling mechanisms, and the role of learning from trial and error experiments: A tribute to Dan Levinthal's contribution to international business research. *Journal of International Business Studies.* **51**(9), pp.1568-1579.

Li, J., Ding, H., Hu, Y. and Wan, G. 2021. Dealing with dynamic endogeneity in international business research. *Journal of International Business Studies.* **52**(3), pp.339-362.

Liu, X. and Buck, T. 2007. Innovation performance and channels for international technology spillovers: Evidence from Chinese high-tech industries. *Research Policy.* **36**(3), pp.355-366.

Love, J.H. and Ganotakis, P. 2013. Learning by exporting: Lessons from high-technology SMEs. *International Business Review.* **22**(1), pp.1-17.

Love, J.H. and Máñez, J.A. 2019. Persistence in exporting: Cumulative and punctuated learning effects. *International Business Review.* **28**(1), pp.74-89.

Love, J.H. and Mansury, M.A. 2009. Exporting and productivity in business services: Evidence from the United States. *International Business Review.* **18**(6), pp.630-642.

Love, J.H. and Roper, S. 2015. SME innovation, exporting and growth: A review of existing evidence. *International Small Business Journal.* **33**(1), pp.28-48.

Love, J.H., Roper, S. and Vahter, P. 2014. Learning from openness: The dynamics of breadth in external innovation linkages. *Strategic Management Journal.* **35**(11), pp.1703-1716.

Love, J.H., Roper, S. and Zhou, Y. 2016. Experience, age and exporting performance in UK SMEs. *International Business Review.* **25**(4), pp.806-819.

Lüscher, L.S. and Lewis, M.W. 2008. Organizational change and managerial sensemaking: Working through paradox. *Academy of Management Journal.* **51**(2), pp.221-240.

MacDuffie, J.P. 1995. Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world auto industry. *Industrial and Labor Relations Review.* **48**(2), pp.197-221.

MacGarvie, M. 2006. Do firms learn from international trade? *Review of Economics and Statistics.* **88**(1), pp.46-60.

Manez, J.A., Rochina-Barrachina, M.E., Sanchis-Llopis, A. and Sanchis-Llopis, J.A. 2015. The determinants of R&D persistence in SMEs. *Small Business Economics.* **44**(3), pp.505-528.

Máñez, J.A., Rochina-Barrachina, M.E. and Sanchis-Llopis, J.A. 2015. The dynamic linkages among exports, R&D and productivity. *The World Economy.* **38**(4), pp.583-612.

Mele, C. and Colurcio, M. 2006. The evolving path of TQM: Towards business excellence and stakeholder value. *International Journal of Quality & Reliability Management.* **23**(5), pp.464-489.

Melitz, M.J. 2003. The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica.* **71**(6), pp.1695-1725.

Miller, D. and Friesen, P.H. 1986. Porter's (1980) Generic Strategies and Performance: An Empirical Examination with American Data:Part I: Testing Porter. *Organization Studies.* **7**(1), pp.37-55.

Minbaeva, D.B. 2008. HRM practices affecting extrinsic and intrinsic motivation of knowledge receivers and their effect on intra-MNC knowledge transfer. *International Business Review.* **17**(6), pp.703-713.

Minbaeva, D.B., Mäkelä, K. and Rabbiosi, L. 2012. Linking HRM and knowledge transfer via individual-level mechanisms. *Human Resource Management.* **51**(3), pp.387-405.

Mishina, Y., Pollock, T.G. and Porac, J.F. 2004. Are more resources always better for growth? Resource stickiness in market and product expansion. *Strategic Management Journal.* **25**(12), pp.1179-1197.

Mol, M.J. and Birkinshaw, J. 2009. The sources of management innovation: When firms introduce new management practices. *Journal of Business Research.* **62**(12), pp.1269-1280.

Mol, M.J. and Birkinshaw, J. 2014. The role of external involvement in the creation of management innovations. *Organization Studies.* **35**(9), pp.1287-1312.

Monreal-Pérez, J., Aragón-Sánchez, A. and Sánchez-Marín, G. 2012. A longitudinal study of the relationship between export activity and innovation in the Spanish firm: The moderating role of productivity. *International Business Review.* **21**(5), pp.862-877.

Morris, D.M. 2018. Innovation and productivity among heterogeneous firms. *Research Policy.* **47**(10), pp.1918-1932.

Mudambi, R. and Zahra, S.A. 2007. The survival of international new ventures. *Journal of International Business Studies.* **38**(2), pp.333-352.

Nassimbeni, G. 2001. Technology, innovation capacity, and the export attitude of small manufacturing firms: A logit/tobit model. *Research Policy.* **30**(2), pp.245-262.

Nelson, R.R. and Winter, S.G. 1982. *An evolutionary theory of economic change.* Cambridge, MA: Belknap Press.

Nerkar, A. and Roberts, P.W. 2004. Technological and product-market experience and the success of new product introductions in the pharmaceutical industry. *Strategic Management Journal.* **25**(8-9), pp.779-799.

Neu, W.A. and Brown, S.W. 2005. Forming successful business-to-business services in goods-dominant firms. *Journal of Service Research.* **8**(1), pp.3-17.

Nummela, N., Saarenketo, S. and Loane, S. 2016. The dynamics of failure in international new ventures: A case study of Finnish and Irish software companies. *International Small Business Journal.* **34**(1), pp.51-69.

OECD. 2005. *Oslo Manual, Guidelines for collecting and interpreting innovation data*. Paris: OECD Publishing.

Oliva, R. and Kallenberg, R. 2003. Managing the transition from products to services. *International Journal of Service Industry Management.* **14**(2), pp.160-172.

Oura, M.M., Zilber, S.N. and Lopes, E.L. 2016. Innovation capacity, international experience and export performance of SMEs in Brazil. *International Business Review.* **25**(4), pp.921-932.

Özçelik, E. and Taymaz, E. 2004. Does innovativeness matter for international competitiveness in developing countries?: The case of Turkish manufacturing industries. *Research Policy.* **33**(3), pp.409-424.

Paternoster, R., Brame, R., Mazerolle, P. and Piquero, A. 1998. Using the correct statistical test for the equality of regression coefficients. *Criminology.* **36**(4), pp.859-866.

Pertusa-Ortega, E.M., Zaragoza-Sáez, P. and Claver-Cortés, E. 2010. Can formalization, complexity, and centralization influence knowledge performance? *Journal of Business Research.* **63**(3), pp.310-320.

Peteraf, M.A. and Barney, J.B. 2003. Unraveling the resource-based tangle. *Managerial and Decision Economics.* **24**(4), pp.309-323.

Pla-Barber, J. and Alegre, J. 2007. Analysing the link between export intensity, innovation and firm size in a science-based industry. *International Business Review.* **16**(3), pp.275-293.

Popper, K. 1959. *The logic of scientific discovery.* London: Hutchinson.

Porter, M. 1980. *Competitve strategy.* New York: Free Press.

Posner, M.V. 1961. International trade and technical change. *Oxford Economic Papers.* **13**(3), pp.323-341.

Prange, C. and Pinho, J.C. 2017. How personal and organizational drivers impact on SME international performance: The mediating role of organizational innovation. *International Business Review*. **26**(6), pp.1114-1123.

Radicic, D. and Djalilov, K. 2019. The impact of technological and non-technological innovations on export intensity in SMEs. *Journal of Small Business and Enterprise Development.* **26**(4), pp.612-638.

Ren, S., Eisingerich, A.B. and Tsai, H.-T. 2015. How do marketing, research and development capabilities, and degree of internationalization synergistically affect the innovation performance of small and medium-sized enterprises (SMEs)? A panel data study of Chinese SMEs. *International Business Review.* **24**(4), pp.642-651.

Rhee, J.H. and Cheng, J.L. 2002. Foreign market uncertainty and incremental international expansion: The moderating effect of firm, industry, and host country factors. *Management International Review*. **42**(4), pp.419-439.

Riege, A. 2005. Three-dozen knowledge-sharing barriers managers must consider. *Journal of Knowledge Management.* **9**(3), pp.18-35.

Roberts, M.J. and Tybout, J.R. 1997. The decision to export in Colombia: An empirical model of entry with sunk costs. *The American Economic Review*. **87**(4), pp.545-564.

Roberts, P.W. and Amit, R. 2003. The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organization Science.* **14**(2), pp.107-122.

Rodil, Ó., Vence, X. and del Carmen Sánchez, M. 2016. The relationship between innovation and export behaviour: The case of Galician firms. *Technological Forecasting and Social Change.* **113**, pp.248-265.

Rodríguez, J.L. and Rodríguez, R.M.G. 2005. Technology and export behaviour: A resource-based view approach. *International Business Review.* **14**(5), pp.539-557.

Romer, P.M. 1990. Endogenous technological change. *Journal of Political Economy.* **98**(5, Part 2), pp.S71-S102.

Roodman, D. 2009. How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*. **9**(1), pp.86-136.

Roodman, D. 2011. Fitting fully observed recursive mixed-process models with cmp. *The Stata Journal.* **11**(2), pp.159-206.

Roper, S., Du, J. and Love, J.H. 2008. Modelling the innovation value chain. *Research Policy*. **37**(6-7), pp.961-977.

Roper, S. and Love, J.H. 2002. Innovation and export performance: Evidence from the UK and German manufacturing plants. *Research Policy*. **31**(7), pp.1087-1102.

Rosenberg, N. 1972. *Technology and American economic growth.* New York: Harper Torch Books.

Rosenberg, N. 1976. *Perspectives on technology.* New York: Cambridge University Press.

Rosenkopf, L., Metiu, A. and George, V.P. 2001. From the bottom up? Technical committee activity and alliance formation. *Administrative Science Quarterly.* **46**(4), pp.748-772.

Salomon, R. and Jin, B. 2008. Does knowledge spill to leaders or laggards? Exploring industry heterogeneity in learning by exporting. *Journal of International Business Studies.* **39**(1), pp.132-150.

Salomon, R. and Jin, B. 2010. Do leading or lagging firms learn more from exporting? *Strategic Management Journal.* **31**(10), pp.1088-1113.

Salomon, R. and Shaver, J.M. 2005. Learning by exporting: New insights from examining firm innovation. *Journal of Economics & Management Strategy.* **14**(2), pp.431-460.

Saridakis, G., Idris, B., Hansen, J.M. and Dana, L.P. 2019. SMEs' internationalisation: When does innovation matter? *Journal of Business Research.* **96**, pp.250-263.

Saunders, M., Lewis, P. and Thornhill, A. 2007. *Research methods for business students.* 4th ed. Essex: Pearson Education.

Semadeni, M., Withers, M.C. and Certo, S.T. 2014. The perils of endogeneity and instrumental variables in strategy research: Understanding through simulations. *Strategic Management Journal.* **35**(7), pp.1070-1079.

Shearmur, R., Doloreux, D. and Laperrière, A. 2015. Is the degree of internationalization associated with the use of knowledge intensive services or with innovation? *International Business Review.* **24**(3), pp.457-465.

Sherry, E.F. and Teece, D.J. 2004. Royalties, evolving patent rights, and the value of innovation. *Research Policy.* **33**(2), pp.179-191.

Silva, A., Afonso, O. and Africano, A.P. 2012. Learning-by-exporting: What we know and what we would like to know. *The International Trade Journal.* **26**(3), pp.255-288.

Silva, G.M., Styles, C. and Lages, L.F. 2017. Breakthrough innovation in international business: The impact of tech-innovation and market-innovation on performance. *International Business Review.* **26**(2), pp.391-404.

Singer, J.D. and Willett, J.B. 1993. It's about time: Using discrete-time survival analysis to study duration and the timing of events. *Journal of Educational Statistics.* **18**(2), pp.155-195.

Singh, D.A. 2009. Export performance of emerging market firms. *International Business Review.* **18**(4), pp.321-330.

Sirmon, D.G., Hitt, M.A., Ireland, R.D. and Gilbert, B.A. 2011. Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management.* **37**(5), pp.1390-1412.

Small, M.L. 2011. How to conduct a mixed methods study: Recent trends in a rapidly growing literature. *Annual Review of Sociology.* **37**, pp.57-86.

Sobel, M.E. 1982. Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology.* **13**, pp.290-312.

Sousa, C.M., Martínez-López, F.J. and Coelho, F. 2008. The determinants of export performance: A review of the research in the literature between 1998 and 2005. *International Journal of Management Reviews.* **10**(4), pp.343-374.

Staiger, D. and Stock, J.H. 1997. Instrumental variables regression with weak instruments. *Econometrica.* **65**, pp.557-586.

Staw, B.M. and Epstein, L.D. 2000. What bandwagons bring: Effects of popular management techniques on corporate performance, reputation, and CEO pay. *Administrative Science Quarterly.* **45**(3), pp.523-556.

Sterlacchini, A. 1999. Do innovative activities matter to small firms in non-R&D-intensive industries? An application to export performance. *Research Policy.* **28**(8), pp.819-832.

Sterlacchini, A. 2001. The determinants of export performance: A firm-level study of Italian manufacturing. *Review of World Economics.* **137**(3), pp.450-472.

Sturdy, A. 2004. The adoption of management ideas and practices: Theoretical perspectives and possibilities. *Management Learning.* **35**(2), pp.155-179.

Styles, C. and Ambler, T. 1994. Successful export practice: The UK experience. *International Marketing Review.* **11**(6), pp.23-47.

Sueyoshi, G.T. 1995. A class of binary response models for grouped duration data. *Journal of Applied Econometrics.* **10**(4), pp.411-431.

Sui, S. and Baum, M. 2014. Internationalization strategy, firm resources and the survival of SMEs in the export market. *Journal of International Business Studies.* **45**(7), pp.821-841.

Sun, P., Mellahi, K. and Wright, M. 2012. The contingent value of corporate political ties. *Academy of Management Perspectives.* **26**(3), pp.68-82.

Surdu, I., Mellahi, K. and Glaister, K.W. 2019. Once bitten, not necessarily shy? Determinants of foreign market re-entry commitment strategies. *Journal of International Business Studies.* **50**(3), pp.393-422.

Szulanski, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal.* **17**(S2), pp.27-43.

Szulanski, G. 2000. The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational Behavior and Human Decision Processes.* **82**(1), pp.9-27.

Tan, A., Brewer, P. and Liesch, P.W. 2007. Before the first export decision: Internationalisation readiness in the pre-export phase. *International Business Review.* **16**(3), pp.294-309.

Tavassoli, S. 2018. The role of product innovation on export behavior of firms: Is it innovation input or innovation output that matters? *European Journal of Innovation Management.* **21**(2), pp.294-314.

Tavassoli, S. and Karlsson, C. 2015. Persistence of various types of innovation analyzed and explained. *Research Policy.* **44**(10), pp.1887-1901.

Teece, D.J. 2007. Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal.* **28**(13), pp.1319-1350.

Teece. D.J. 2010. Business Models, Business Strategy and Innovation. *Long Range Planning.* **43**(2), pp.172-194.

Teece, D.J. 2000. Strategies for managing knowledge assets: The role of firm structure and industrial context. *Long Range Planning.* **33**(1), pp.35-54.

Teece , D.J., Pisano, G. and Shuen, A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal.* **18**(7), pp.509-533.

Tellis, G.J., Yin, E. and Niraj, R. 2009. Does quality win? Network effects versus quality in high-tech markets. *Journal of Marketing Research.* **46**(2), pp.135-149.

Tether, B.S. and Tajar, A. 2008. The organisational-cooperation mode of innovation and its prominence amongst European service firms. *Research Policy.* **37**(4), pp.720-739.

The World Bank. 1997. *World development report: The state in a changing world.* New York: Oxford University Press.

Tomiura, E. 2007. Effects of R&D and networking on the export decision of Japanese firms. *Research Policy.* **36**(5), pp.758-767.

Trist, E. 1981. The evolution of socio-technical systems. *Occasional Paper.* **2**, pp.1-67.

Tsai, W. 2002. Social structure of "coopetition" within a multiunit organization: Coordination, competition, and intraorganizational knowledge sharing. *Organization Science.* **13**(2), pp.179-190.

Tse, C.H., Yu, L. and Zhu, J. 2017. A multimediation model of learning by exporting: Analysis of export-induced productivity gains. *Journal of Management.* **43**(7), pp.2118-2146.

Ulaga, W. and Reinartz, W.J. 2011. Hybrid offerings: How manufacturing firms combine goods and services successfully. *Journal of Marketing.* **75**(6), pp.5-23.

Ullah, S., Akhtar, P. and Zaefarian, G. 2018. Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data. *Industrial Marketing Management.* **71**, pp.69-78.

Utterback, J.M. and Abernathy, W.J. 1975. A dynamic model of process and product innovation. *Omega.* **3**(6), pp.639-656.

Vaccaro, I.G., Jansen, J.J., Van Den Bosch, F.A. and Volberda, H.W. 2012. Management innovation and leadership: The moderating role of organizational size. *Journal of Management Studies.* **49**(1), pp.28-51.

Vaccaro, I.G., Volberda, H.W. and Van Den Bosch, F.A. 2013. *Handbook of Organizational and Managerial Innovation.* Cheltenham: Edward Elgar Publishing, pp. 138–162.

Van Biesebroeck, J. 2005. Exporting raises productivity in sub-Saharan African manufacturing firms. *Journal of International Economics.* **67**(2), pp.373-391.

Van Wijk, R., Jansen, J.J. and Lyles, M.A. 2008. Inter-and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies.* **45**(4), pp.830-853.

Van Witteloostuijn, A. 2016. What happened to Popperian falsification? Publishing neutral and negative findings: Moving away from biased publication practices. *Cross Cultural & Strategic Management.* **23**(3), pp.481-508.

Véganzonès-Varoudakis, M.-A. and Plane, P. 2019. Innovation, exports, productivity and investment climate; a study based on Indian manufacturing firm-level data. *Applied Economics.* **51**(41), pp.4455-4476.

Vendrell-Herrero, F., Gomes, E., Mellahi, K. and Child, J. 2017. Building international business bridges in geographically isolated areas: The role of foreign market focus and outward looking competences in Latin American SMEs. *Journal of World Business.* **52**(4), pp.489-502.

Venkatraman, N. 1989. The concept of fit in strategy research: Toward verbal and statistical correspondence. *Academy of Management Review.* **14**(3), pp.423-444.

Vernon, R. 1966. International trade and international investment in the product cycle. *Quarterly Journal of Economics.* **80**(2), pp.190-207.

Veugelers, R. and Cassiman, B. 1999. Make and buy in innovation strategies: Evidence from Belgian manufacturing firms. *Research Policy.* **28**(1), pp.63-80.

Volberda, H.W., Van Den Bosch, F.A. and Heij, C.V. 2013. Management innovation: Management as fertile ground for innovation. *European Management Review.* **10**(1), pp.1-15.

Volberda, H.W., Van Den Bosch, F.A. and Mihalache, O.R. 2014. Advancing management innovation: Synthesizing processes, levels of analysis, and change agents. *Organization Studies.* **35**(9), pp.1245-1264.

Von Hippel, E. 1994. "Sticky information" and the locus of problem solving: Implications for innovation. *Management Science.* **40**(4), pp.429-439.

Vroom, V.H. 1964. *Work and motivation.* New York: Wiley.

Wagner, J. 2007. Exports and productivity: A survey of the evidence from firm-level data. *The World Economy.* **30**(1), pp.60-82.

Wakelin, K. 1998. Innovation and export behaviour at the firm level. *Research Policy.* **26**(7), pp.829-841.

Walker, R.M., Chen, J. and Aravind, D. 2015. Management innovation and firm performance: An integration of research findings. *European Management Journal.* **33**(5), pp.407-422.

Wang, C. and Kafouros, M.I. 2009. What factors determine innovation performance in emerging economies? Evidence from China. *International Business Review.* **18**(6), pp.606-616.

Wang, Y., Cao, W., Zhou, Z. and Ning, L. 2013. Does external technology acquisition determine export performance? Evidence from Chinese manufacturing firms. *International Business Review.* **22**(6), pp.1079-1091.

Welch, C.L. and Welch, L.S. 2009. Re-internationalisation: Exploration and conceptualisation. *International Business Review.* **18**(6), pp.567-577.

Welch, L.S. and Wiedersheim-Paul, F. 1980. Initial exports–a marketing failure? *Journal of Management Studies.* **17**(3), pp.333-344.

Whittington, R., Pettigrew, A., Peck, S., Fenton, E. and Conyon, M. 1999. Change and complementarities in the new competitive landscape: A European panel study, 1992–1996. *Organization Science.* **10**(5), pp.583-600.

Williamson, O.E. 1975. *Markets and hierarchies: Some elementary considerations.* New York: The Free Press.

Wischnevsky, J.D., Damanpour, F. and Mendez, F.A. 2011. Influence of environmental factors and prior changes on the organizational adoption of changes in products and in technological and administrative processes. *British Journal of Management.* **22**(1), pp.132-149.

Wooldridge, J.M. 2009. On estimating firm-level production functions using proxy variables to control for unobservables. *Economics Letters.* **104**(3), pp.112-114.

Wooldridge, J.M. 2013. *Introductory econometrics: A modern approach.* Mason, OH: Nelson Education.

Wu, Q., Dbouk, W., Hasan, I., Kobeissi, N. and Zheng, L. 2021. Does gender affect innovation? Evidence from female chief technology officers. *Research Policy.* **50**(9), p104327.

Wu, L., Wei, Y. and Wang, C. 2021. Disentangling the effects of business groups in the innovation-export relationship. *Research Policy.* **50**(1), p104093.

Xie, Z. and Li, J. 2015. Demand heterogeneity, learning diversity and innovation in an emerging economy. *Journal of International Management.* **21**(4), pp.277-292.

Xie, Z. and Li, J. 2018. Exporting and innovating among emerging market firms: The moderating role of institutional development. *Journal of International Business Studies.* **49**(2), pp.222-245.

Yang, C.-H., Chen, J.-R. and Chuang, W.-B. 2004. Technology and export decision. *Small Business Economics.* **22**(5), pp.349-364.

Yeaple, S.R. 2005. A simple model of firm heterogeneity, international trade, and wages. *Journal of International Economics.* **65**(1), pp.1-20.

Yi, J., Wang, C. and Kafouros, M. 2013. The effects of innovative capabilities on exporting: Do institutional forces matter? *International Business Review.* **22**(2), pp.392-406.

Yiu, D.W., Lau, C. and Bruton, G.D. 2007. International venturing by emerging economy firms: The effects of firm capabilities, home country networks, and corporate entrepreneurship. *Journal of International Business Studies.* **38**(4), pp.519-540.

Zaheer, S. 1995. Overcoming the liability of foreignness. *Academy of Management Journal.* **38**(2), pp.341-363.

Zahra, S.A. and Covin, J.G. 1994. Domestic and international competitive focus, technology strategy and company performance: An empirical analysis. *Technology Analysis & Strategic Management.* **6**(1), pp.39-54.

Zander, U. and Kogut, B. 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization Science.* **6**(1), pp.76-92.

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. 1996. The behavioral consequences of service quality. *Journal of Marketing.* **60**(2), pp.31-46.

Zellner, A. 1962. An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American Statistical Association.* **57**(298), pp.348-368.

Zeng, F., Yang, Z., Li, Y. and Fam, K.-S. 2011. Small business industrial buyers' price sensitivity: Do service quality dimensions matter in business markets? *Industrial Marketing Management.* **40**(3), pp.395-404.

Zhao, H. and Li, H. 1997. R&D and export: An empirical analysis of Chinese manufacturing firms. *The Journal of High Technology Management Research.* **8**(1), pp.89-105.

Zott, C. 2003. Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. *Strategic Management Journal.* **24**(2), pp.97-125.

Zou, S., Fang, E. and Zhao, S. 2003. The effect of export marketing capabilities on export performance: An investigation of Chinese exporters. *Journal of International Marketing.* **11**(4), pp.32-55.