Tesis Doctorales Orkestra
ISSN 2254-3767

Orkestra
BASQUE INSTITUTE
OF COMPETITIVENESS
DEUSTO FOUNDATION

Antecedents and Outcomes of Export-Oriented Entrepreneurship

José L. González-Pernía

Tesis Doctoral

TDIVC-002

Antecedents and outcomes of export-oriented entrepreneurship

Antecedents and outcomes of export-oriented entrepreneurship

Dissertation submitted in part fulfilment of the requirements for the degree of Doctor of Philosophy in Business Competitiveness and Economic Development of University of Deusto (European PhD Degree).

PhD Candidate:

José L. González-Pernía

Supervisor:

Dr. Iñaki Peña-Legazkue

San Sebastián, November 4th 2011

Deusto
University of Deusto

Doctoral Programme in Business Competitiveness and Economic Development

To Nathalia Sofia

Contents

List of Tables

List of Figures

Foreword 1

The thesis contributes to the international entrepreneurship literature which is at the crossroads of two fields: entrepreneurship and internationalization. The candidate demonstrates a clear understanding of the complexities of both internationalization and entrepreneurship. He also demonstrates with his thesis that he has a good understanding of the emergence and importance for science and practice of international entrepreneurship and that he is well aware what the relevant issues, developments and challenges are for this field.

Regarding the specific research that the Candidate has done several strengths can be identified in the thesis. The Candidate clearly explains the scientific and practical relevance of his research pointing at the emergence and increase of international new ventures and how this challenges existing international business theories and how these international ventures can make a potential valuable economic contribution. Furthermore, it is a strength of the thesis that it clearly builds on the current knowledge base or the foundation of existing literature. Starting from what already has been done in prior studies the candidate has been able to identify and address some relevant research gaps. He notes correctly, for example, that the current literature has paid limited attention to environmental determinants of export-oriented entrepreneurship, while such influences may be of particular importance especially since it is always suggested that developments in the environment (such as increased globalization and advances in ICT) are at the heart of the emergence of international entrepreneurship as the Candidate also notices. Since the role of the environment remains underexplored in current studies, the Candidate makes a contribution by analyzing the impact of some potential determinants at the environmental or aggregate level. At the same time when investigating environmental influences, however, the Candidate also takes into account potential influences at the individual and firm-level, clearly building on the large amount of research that has already been done regarding individual

and firm-level determinants in the field of international entrepreneurship. The Candidate also addresses an important gap by analyzing the relationship between new venture internationalization and productivity and correctly notes that the current literature on export and productivity has mainly focused on large firms and has not taken into account new venture exporters. Finally, the Candidate also fills an important gap by analyzing the impact of export-oriented entrepreneurship on regional economic growth, acknowledging that few studies have yet analyzed the impact of the performance of export of new ventures beyond the impact that such behavior has on the performance of the firm itself.

By identifying and addressing relevant gaps, as specified above, the Candidate has been able to make a clear contribution to earlier studies, and, in my opinion, not only in the field of international entrepreneurship. In fact, by combining different streams of literature the Candidate makes a significant contribution to the broader field of economics and business. To give some examples, the candidate combines the ideas of "learning advantage of newness" from the international entrepreneurship literature with the literature on export and productivity; and the literature on antecedents of international entrepreneurship with the economic literature on knowledge spillovers. By doing this the Candidate's thesis makes a contribution that reaches much further than the field of international entrepreneurship only.

The Candidate has developed several unambiguous hypotheses derived from the literature. These hypotheses are tested by means of several empirical studies. In these studies the Candidate makes use of several datasets and combines data from various sources. The candidate is well aware of various measurement issues and discusses these in his thesis.

With respect to the empirical analysis the Candidate demonstrates ability in making appropriate choices regarding which method to use given the nature of the data. The Candidate demonstrates that he is able to operate a wide range of

different methods and models, such as multilevel modeling, panel estimations and logit models.

The combination of identifying relevant gaps from the literature and of making use of advanced models and data at different levels makes that this thesis provides a relevant and novel scientific contribution.

Jolanda Hessels

Erasmus School of Economics

October 2011

Foreword 2

The submitted dissertation is the integrated version of a thesis examining the internationalization of entrepreneurs through export using Spanish data. The main contribution of the thesis is empirical. The content is three-fold with a first essay on the individual and contextual determinants of the export behavior among entrepreneurs. In a second essay, the candidate explores the effect of export behavior on the firm total factor productivity. A third essay consists in examining the effect of export behavior on regional economic growth.

The thesis is very well structured. Ideas are clearly expressed. More importantly, I consider without any doubt that the thesis is fulfilling expected scientific standards for a dissertation. The candidate develops original contributions; these contributions are well grounded on our current, forefront, scientific knowledge of the internationalization behavior (by firms or entrepreneurs, according to the observation unit); references are adequate. Data and methods are sufficiently described and motivated. Some part of the dataset has been collected through an original survey. I personally appreciate a lot the way the candidate makes sense of his empirical results through careful interpretation leading to new knowledge, with concern for the business and policy maker. That being, the candidate is aware of the limits of his contributions and always keeps a critical point of view on his research exercise. As a whole, I consider that the submitted dissertation is of very high value.

Marcus DEJARDIN

FUNDP-University of Namur and Université Catholique de Louvain

October 2011

Acknowledgements

This research owes its existence to many people who have supported me throughout my academic formation as a researcher. First of all, the research work I present here would not be possible without the advice and guidance of my supervisor, Iñaki Peña-Legazkue, who has been a faithful mentor from whom I have learned in many ways. More than a supervisor, I consider him as a friend for all the professional and personal insight he has shared with me. I am indebted to Yovanni Castro-Nieto who not only encouraged me to study abroad and provided me with the means to begin the doctoral programme at University of Deusto, but also has helped me whenever I have needed it. I would also like to thank Victor Urcelay-Yarza and the former ESTE Faculty which supported me with a scholarship during the development of the doctoral courses. I have to thank the Basque Institute of Competitiveness for supporting me in the development of this dissertation during the last four years. I specially thank Roy Thurik and his team which helped me with my research work and made me feel at home while I was a visiting student at Erasmus University Rotterdam. In particular, I thank Jolanda Hessels and Marcus Dejardin for their insightful comments as external reviewers of this dissertation. This work has also benefited from the comments of colleagues, conference participants and friends. Finally, I would not have completed this great journey without the support of my family in Venezuela, and my girlfriend - Amaya - and close friends in the Basque Country - Reinaldo, Venus, Igor, Arantza, Amarilys, Jorge, José Mari, Mireya, Cristina, Carolina, Patxi, Konsu, Ferran, Andreina, Maribel and Raquel - from which I have received considerable encouragement. To all of them, thank you very much.

José L. González-Pernía

San Sebastian, October 2011

Abstract

This dissertation investigates why some early-stage entrepreneurs are export-oriented, and the effects that export orientation causes on their new ventures and the regional economy. To address these issues, I draw on several literature streams and propose three sets of hypotheses. The first group of hypotheses deals with the external determinants of the export-oriented behaviour of early-stage entrepreneurs and their new ventures. Although a rich body of the literature on international entrepreneurship has been focused on the antecedents of internationalisation of new ventures, the role of the environment or context on the export-oriented behaviour of entrepreneurs remains unclear (Oviatt & McDougall, 2005a; Rialp, Rialp, & Knight, 2005; Zahra & George, 2002b). Therefore, an objective of this dissertation is to distinguish between factors at the individual/firm level and factors at the aggregate level, and to analyse how the latter contribute to explain the early exporting phenomenon. In particular, apart from the individual and firm-specific factors suggested in the literature to explain why some entrepreneurs export and others do not, the present study shows that the export-oriented behaviour of early-stage entrepreneurs is related to a higher presence of foreign firms (through inward foreign direct investment) in their regional environments, as well as to a higher availability of external knowledge in their industrial environments. Accordingly, context-related factors matter.

The second set of hypotheses analyses the effects of exporting on new venture productivity, for which the main argumentation relies on the organisational learning literature. While internationalised new ventures face a high risk of failure due to their liability of newness and smallness, they also benefit from some "learning advantages" (Autio, Sapienza & Almeida, 2000) which may compensate the aforementioned liabilities, and thereby positively influence firm productivity. Much of the previous studies on exporting and productivity have mostly focused on established businesses (Wagner, 2007). Thus, this part of the research sheds

light on how exporting and productivity are related in the case of new ventures, filling a gap in the extant literature. More specifically, it is revealed that exporting new ventures are more productive than non-exporting new ventures, and that export-oriented new ventures which decide to enter foreign markets very early in their life cycles achieve higher rates of productivity growth than those which decide to delay foreign market entry.

The last set of hypotheses is addressed at the impact of export-oriented entrepreneurship on regional economic growth. Although export-oriented new ventures and the field of international entrepreneurship have received considerable attention by scholars during the last decades (Coviello, McDougall, & Oviatt, 2011), their potential economic impact has not been sufficiently analysed yet (Zahra & George, 2002b). Considering the relationship between exports and economic growth suggested by the literature on economic development (Giles & Williams, 2000a), it is argued that export-oriented entrepreneurship enhances economic growth more than general (domestic-oriented) entrepreneurship, by serving both domestic and foreign markets. Consistent with this view and earlier findings at the country level (Hessels & van Stel, 2010), this part of the study provides evidence that higher levels of export-oriented entrepreneurship are related with higher rates of economic growth at the regional level.

All these issues are integrated into a cohesive, consistent manuscript that follows a unique conceptual framework that will be explained in the first chapter of the integrated document. The second chapter develops the theoretical insights supporting the hypotheses proposed in this research. The third chapter describes the data and methodology used to empirically test the hypotheses. The fourth chapter presents and discusses the results obtained from the empirical analysis. Finally, the integrated document is accompanied by a chapter that groups the conclusions and implications derived from the results of this dissertation.

Chapter 1:

Introduction

1.1 Background

Scholars have often argued that entrepreneurs face serious disadvantages in competing with incumbent firms in the market due to the liability of smallness and liability of newness of their young (usually small) ventures (Aldrich & Auster, 1986; Stinchcombe, 1965). While new firms often lack the knowledge and routines needed to successfully operate in the new areas in which they act, small firms often lack the resources needed to achieve cost advantages through economies of scale and scope. As a consequence, it is believed that younger firms are at a disadvantage in comparison with larger and older firms, because such liabilities make them suffer from legitimacy constraints and limited strategic options

Based on these arguments, the traditional stage theory of internationalisation have long time suggested that new ventures are reluctant to design and implement internationalisation strategies because international expansion is a process that requires resources and knowledge about foreign markets, and thereby firms must begin with sales in their domestic market and sell to foreign markets only once they have been consolidated (Johanson & Vahlne, 1977, 1990). However, descriptive evidence found at the beginning of the nineties challenged this conventional wisdom on internationalisation by showing that new ventures are not

excluded from global markets (Jolly, Alahuhta, & Jeannet, 1992; McDougall, 1989; Oviatt, McDougall, Simon, & Shrader, 1993).

During the last two decades, studies from different countries have shown that an increasingly larger number of young firms sells abroad early in their life cycle and enter several foreign markets at a rapid pace (Bell, 1995; Knight & Cavusgil, 1996; McDougall & Oviatt, 2000; Ø. Moen, 2002; Oviatt & McDougall, 1997, 1999; Pla-Barber & Escribá-Esteve, 2006; Turnbull, 1987). These international new ventures not only operate in their home market, but also behave proactively and implement accelerated internationalisation strategies to enter unexplored niches in the global marketplace (Shrader, Oviatt, & McDougall, 2000). Several authors have suggested that the underlying forces behind this phenomenon, known as international entrepreneurship, are the rise of globalisation and new market conditions, the generation of new technologies and developments in the areas of production, communications, and logistics, the existence of people with more international experience, the signing of free trade agreements, among others (Campbell, 1996; Madsen & Servais, 1997; Oviatt & McDougall, 1994).

The emergence of international new ventures has captured the interest of academics and policy makers (Acs, Dana, & Jones, 2003; Autio, 2005; Coviello, et al., 2011; Dana & Wright, 2003; Oviatt & McDougall, 2005b; Wright, Westhead, & Ucbasaran, 2007; Zahra, 2005). One of the most relevant academic contributions in this regard has been that of Oviatt & McDougall (1994). Their seminal work contributes with a pioneering framework to understand the phenomenon of international entrepreneurship by placing it at the nexus of international business theories and entrepreneurship theories. They argue that the main assumption behind the stage theory of internationalization was that firms accumulate knowledge and resources as they gain experience in the domestic market, and that, because of this assumption, this theory suggested that new ventures cannot enter foreign markets until they are able to overcome their

liabilities of newness and smallness. Oviatt & McDougall (1994) shifted the unit of analysis to the entrepreneur, and thus stated that new ventures may possess the knowledge and resources needed to compete in foreign markets because of the entrepreneur's experience and the use of alternative governance structures.

By highlighting the role of the entrepreneur and his/her new venture's unique resources, Oviatt & McDougall's (1994) work generated a "creative tension" in the field of international business studies that has inspired new ideas in the increasing body of the literature on international entrepreneurship (Autio, 2005). While theoretical studies have proposed improved conceptual frameworks that provide new insights into the phenomenon of international new ventures and its consequences (Keupp & Gassmann, 2009; Sapienza, Autio, George, & Zahra, 2006; Zahra & George, 2002b), most empirical studies analyse the various influences of individual and firm-specific characteristics (Andersson & Evangelista, 2006; Bloodgood, Sapienza, & Almeida, 1996; Dhanaraj & Beamish, 2003; Harveston, Kedia, & Davis, 2000; Hollenstein, 2005; Orser, Spence, Riding, & Carrington, 2010).

Despite the existence of a rich body of the literature on international entrepreneurship (Jones, Coviello, & Tang, 2011; Keupp & Gassmann, 2009; Rialp, Rialp, & Knight, 2005; Zahra & George, 2002b), the process of early internationalisation still represents an important challenge for entrepreneurs in the current Society because this phenomenon is not completely understood yet and there are knowledge gaps. Accordingly, a variety of studies still continues proposing research agendas to improve the knowledge in the field (Autio, 2005; Coviello, et al., 2011; Jones, et al., 2011; Keupp & Gassmann, 2009; Oviatt & McDougall, 2005b; Rialp, Rialp, & Knight, 2005; Zahra, 2005; Zahra & George, 2002b). The present study is aimed at contributing to this still emerging field.

1.2 Research problem

With the aim of laying the foundations for entrepreneurship as a research field, Low & MacMillan (1988) suggest the fundamental purpose of entrepreneurship research is "to explain and facilitate the role of new enterprise in furthering economic progress" (p. 141). This general end of entrepreneurship research delineates the boundaries within which the goal of a specific research in this field should be framed. That is, not only the antecedents of an entrepreneurial phenomenon are a relevant subject of analysis, but also its consequences. In the same line of Shane and Venkataraman's (2000) view of general entrepreneurship, international entrepreneurship, as a scholarly discipline, should examines how, by whom (i.e., antecedents) and with what effects (i.e., consequences) entrepreneurial opportunities are discovered, evaluated and exploited internationally by individuals or organisations. Likewise, Low & MacMillan (1988) point out the multilevel nature of the entrepreneurial phenomenon according to which scholars should consider both individual/firm level and aggregate level perspectives in their research work.

Existing research has contributed empirically to the stream of the literature in international entrepreneurship by complementing earlier qualitative findings based on case studies (e.g., McDougall, Oviatt, Shrader, & Simon, 1993a, 1993b; Oviatt, et al., 1993) with the quantitative analysis of the determinants at the individual and firm-specific level (e.g., Westhead, Wright, & Ucbasaran, 2001). Although this rich body of the literature has provided rich insights into the antecedents of the internationalisation of new ventures (Keupp & Gassmann, 2009; Zahra & George, 2002b), the role of the environment or context on the export-oriented behaviour of entrepreneurs remains not completely clear (Cumming, Sapienza, Siegel, & Wright, 2009; Oviatt & McDougall, 2005a; Rialp, Rialp, & Knight, 2005; Zahra & George, 2002b). Indeed, neither the influence of the environment on early internationalisation, nor the impact of early

internationalisation in terms of how it creates value at different levels of analysis (i.e., outcomes of international entrepreneurship) have been sufficiently analysed (Keupp & Gassmann, 2009; Sapienza, et al., 2006; Zahra & George, 2002b).

This dissertation is aimed at contributing to the literature by analysing certain unexplored antecedents that lead entrepreneurs to adopt an international behaviour during the early-stage period of their new ventures, as well as certain unexplored consequences of such behaviour at the firm and regional level. This purpose is summarised in the following research questions:

- How the environment can influence the early international expansion of entrepreneurs and their new ventures?
- What specific environmental antecedents do facilitate entrepreneurs and their new ventures to engage in early international expansion?
- What consequences does early international expansion imply for the entrepreneur's new venture?
- How the age at the moment of international expansion does affect the consequences of international activities?
- What are the consequences of international expansion by new ventures for the Society?
- How international expansion by new ventures can benefit the Society?

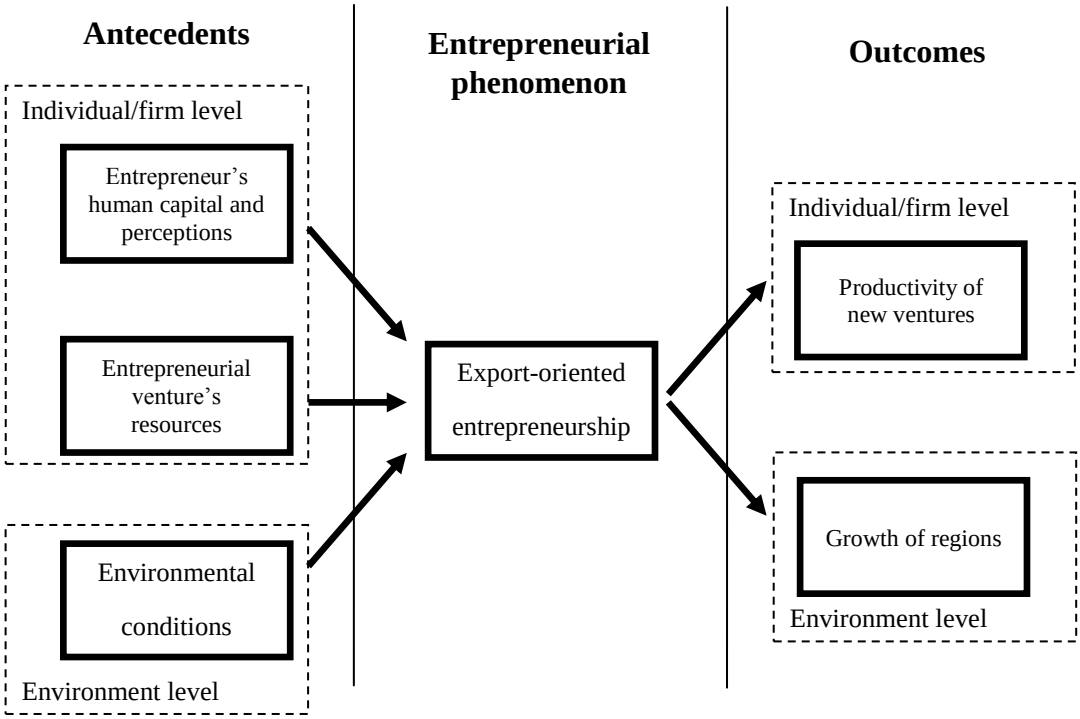
These research questions represent the foundations the conceptual framework of this dissertation.

1.3 Conceptual framework

The present study extends the stream of the literature on international entrepreneurship by examining what environmental factors – in addition to individual and firm-specific ones - drive entrepreneurs and new ventures to engage in exporting activities at an early stage, and how such behaviour towards foreign markets generates certain outcomes at the firm level (i.e. in terms of firm

productivity) and at the environment level (i.e., in terms of regional economic growth). Although there are several alternative strategies for internationalisation, the focus of this study is on exporting because this is the most common mode of entry into foreign markets for entrepreneurs and new ventures engaging in early international expansion (Knight & Cavusgil, 2004). Even for new ventures in high tech industries (Bell, 1995), exporting is the preferred way to reach international markets. By connecting the antecedents and outcomes of the export-oriented behaviour of new ventures, an integrated conceptual framework taking into account different levels of analysis is offered to explain the role of export-oriented entrepreneurship. In this way, I respond to calls for research on international entrepreneurship that integrates different approaches (Rialp, Rialp, & Knight, 2005; Rialp, Rialp, Urbano, & Vaillant, 2005), and includes multilevel analysis (Cumming, et al., 2009) to support and test new theoretical propositions and empirical hypotheses. Figure 1 exhibits the conceptual framework of this dissertation, which will be described in the following Sub-subsections.

Figure 1: Conceptual framework of the dissertation



Source: Own elaboration

1.3.1 Antecedents of export-oriented entrepreneurship

The emergence of international new ventures that from inception use resources and sell goods or services in multiple foreign markets has challenged traditional theories explaining the internationalisation of a firm as a stage process (Oviatt & McDougall, 1994). Different factors have been identified to explain this phenomenon, including individual-related factors (Andersson & Evangelista, 2006; Bloodgood, et al., 1996; Harveston, et al., 2000; Orser, et al., 2010), and organisation-related factors (Bloodgood, et al., 1996; Dhanaraj & Beamish, 2003; Hollenstein, 2005). However, despite the fact that the environment has been emphasised as a promising area for future research in entrepreneurship (Lundström & Halvarsson, 2006), and notwithstanding the importance of the environment to new venture internationalisation (Coviello, 2006; Johanson & Vahlne, 2003; Ø. Moen, 2002), most empirical studies fail to include environmental variables in the analysis of the determinants of international entrepreneurship, and the few studies that have included environmental variables are based on aggregate data (De Clercq, Hessels, & van Stel, 2008). As a result, little is known about the role of the environment on the early internationalisation of new ventures (Cumming, et al., 2009; Oviatt & McDougall, 2005a; Rialp, Rialp, & Knight, 2005; Zahra & George, 2002b).

In view of that, the present study is aimed at contributing to the extant literature on international entrepreneurship by analyzing how the environment influences the export-oriented behaviour of early-stage entrepreneurs. In particular, apart from some individual and firm-specific level factors, two environmental level conditions are particularly likely to affect the ability of early-stage entrepreneurs to exploit opportunities internationally.[1] The first one is the exposure to foreign organisations and other domestic organisations that carry out international

[1] In this way I follow Low & MacMillan (1988), who suggest that the entrepreneurial phenomenon (i.e., entrepreneurial entry and the subsequent actions and growth) cannot be understood without considering variables at different levels of analysis.

activities, as measured by the intensity of inward and outward FDI flows in the environment, which can have an influence on entrepreneurs' export-oriented behaviour through the lens of neo-institutional theory (DiMaggio & Powell, 1983). The second one is the availability of external knowledge, as measured by the accumulated stock of technological knowledge in the environment, which can be considered a critical external resource according to resource dependence theory (Pfeffer & Salancik, 2003), and from which the entrepreneur can benefit to reach foreign markets.

Since early-stage entrepreneurs and their new ventures usually face high levels of uncertainty (Stinchcombe, 1965), they are likely to do what they observe in order to justify their behaviour; and as a result, they may become isomorphic with other organisations in the same environment according to neo-institutional theorists (DiMaggio & Powell, 1983). Following this logic, the exposure to inward or outward FDI in the geographical or industrial environment within which the entrepreneur is embedded will positively affect his or her propensity to engage in international activities such as exporting. De Clecq, Hessels & van Stel (2008) provide evidence in favour of this argument by showing that the percentage of export-oriented entrepreneurial activity is positively related to the intensity of inward and outward FDI at the country level in developed economies. However, their findings cannot be applied at the individual or firm level since it would imply a bias of ecological fallacy, and therefore the impact of FDI on the export-orientation of new ventures deserves further research.

On the other hand, early-stage entrepreneurs often rely on external resources due to the typically small size of their new ventures (Aldrich & Auster, 1986). In particular, knowledge is an essential resource in the process of internationalisation (Casillas, Moreno, Acedo, Gallego, & Ramos, 2009). Due to the existence of spillovers, early-stage entrepreneurs can access the knowledge generated by third-party organisations sharing the same environment (Audretsch, 1998), and such

external resource may enable them to build superior competitive advantages with which to compete or operate in foreign markets (van Beers & van der Panne, 2011). Therefore, the extent to which a region or industry generates new knowledge helps to increase the stock of available knowledge and the capacity of the entrepreneurs and new ventures embedded in such regional or industrial environment to export. Although knowledge has been recognised as a foreign location advantage for new ventures (Oviatt & McDougall, 1994), the emphasis given in the international entrepreneurship literature - as well as in the strategic literature in general (Sarkar, Echambadi, Agarwal, & Sen, 2006) - is on knowledge possessed by the firm. Few empirical studies focus on the impact that knowledge from external sources has on new venture internationalisation (Fernhaber, McDougall-Covin, & Shepherd, 2009), which leaves room for further research on this issue.

The goal of this part of the study is therefore to determine how regional and industrial differences in FDI and accumulated knowledge affect the export-oriented behaviour of early-stage entrepreneurs. In this way, the research raises the question: (how) does the exposure to environments with high levels of FDI and accumulated knowledge affect the export-oriented behaviour of early-stage entrepreneurs?

This dissertation sheds light on this issue by analyzing the propensity of Spanish early-stage entrepreneurs to engage in export-oriented activities. More specifically, I use data on individual and firm-specific factors provided by the Global Entrepreneurship Monitor (GEM) project and data on regional and industrial levels of FDI flows and accumulated knowledge provided by other secondary sources in Spain over the period 2005-2009. Overall, the sample is made up of 5,794 early-stage entrepreneurs whose businesses have been operated for no more than 42 months.

1.3.2 Outcomes of export-oriented entrepreneurship at the firm level

In exploring the outcomes of export-oriented entrepreneurship at the firm level, I focus on the analysis of productivity in order to understand the linkage between the resources used (i.e. inputs) and performance obtained (i.e. outputs) by new ventures that enter foreign markets.

The impact of exporting on productivity has been a subject of continuous debate among scholars since the mid-nineties (Wagner, 2007). Findings show that firms which export outperform their non-exporting counterparts in different performance measures, including productivity indicators (Bernard & Jensen, 1995). However, several authors argue that productivity differences do not arise after exporting, but rather, such differences already exist before entering international markets (Bernard & Jensen, 1999; Bernard & Wagner, 1997; Greenaway & Kneller, 2004). In other words, the existence of productivity growth patterns which are superior to those obtained by non-exporting firms specifically as a consequence of exporting activity seems to be unclear, and is something which has been questioned in the literature.

Although there is a rich body of literature on exporting and productivity, many of the studies that have analysed this issue have focused only on established businesses (i.e., on large, mature organisations). In contrast, the present study has been motivated by the subsequent performance of new ventures that have chosen to export. While internationalised new ventures face high risk of failure as they suffer from a liability of smallness (Aldrich & Auster, 1986) and a liability of newness (Stinchcombe, 1965), they may also benefit from important advantages, such as the recently discovered learning advantages of newness (Autio, George, & Alexy, 2011; Autio, Sapienza, & Almeida, 2000; Sapienza, et al., 2006), which may compensate for or even overcome the above-mentioned liabilities. Given that learning is a key factor with regard to improving the use of resources, the export-

oriented behaviour of new ventures – which seemingly have some advantages to learn – can have a significant impact on productivity.

The purpose of this part of the research is to explore this issue by examining productivity differences and changes between exporting and non-exporting new ventures. I draw on notions from international business, entrepreneurship and organisational learning literature to understand how exporting affects the productivity of new ventures. Furthermore, an additional aim of this research is to uncover the influence that the "timing" of exporting has on productivity performance. That is, I also contrast the productivity differences and changes between early and late exporting new ventures.

In general, the impact of early internationalisation on new venture performance needs to be explored further since traditional and new theories of internationalisation do not explicitly address the outcomes of internationalisation processes in their frameworks (Autio, 2005). Moreover, findings in this regard are scarce and mixed (Zahra & George, 2002b). For instance, while early international behaviour may lead to increasing growth, it also may decrease a firm's chances of survival (Sapienza, et al., 2006). Thus, the present study seeks to shed light on this relevant issue and fill a gap in the extant literature by analysing one of the outcomes of early internationalisation, namely productivity. To this end, I address the following research questions: How does exporting affect the productivity and productivity growth of new ventures; and more specifically, how do new ventures which export early in their life cycles differ from those which export late in terms of productivity and productivity growth?

In order to answer these questions, I use a production function model under a longitudinal setting, and estimate the differences in productivity between exporting and non-exporting new ventures, as well as between early and late exporting new ventures. I also analyse the evolution of such differences over time to understand the effect of exporting on productivity growth. Overall, I use an

unbalanced panel of 297 observations corresponding to a sample of 79 new ventures that were set up on the premises of a network of Business Innovation Centres (BICs) in the Basque Country, Spain, during the period 2000 to 2005. All these new ventures share the fact that they are innovative or have a technological orientation.

1.3.3 Outcomes of export-oriented entrepreneurship at the regional level

Finally, I analyse the outcomes of export-oriented entrepreneurship in terms of its impact at the regional level. Economic growth is inextricably linked to the concept of competitiveness, which represents the ability of a Society to sustainably improve the living standards of its citizens in terms of real income and job opportunities for those willing to work (OECD, 1990). Competitive societies achieve economic growth and ensure their level of well-being by producing more goods and services that satisfy not only the domestic demand (Backman & Gainsbrugh, 1949), but also international markets (Fagerberg, 1996). Entrepreneurship, understood as the creation of new ventures (Low & MacMillan, 1988), plays an important role in attaining economic growth for competitive societies because it acts as a spillover mechanism through which the knowledge not exploited by incumbents can be transferred to the market (Acs, Braunerhjelm, Audretsch, & Carlsson, 2009), creating thus additional value from a resource that would otherwise remain unexploited (Audretsch & Keilbach, 2008). Using existing knowledge, entrepreneurs identify opportunities linked to the needs of the market, and exploit them in the form of new ventures that solve such needs and eventually contribute to economic progress through the introduction of new goods and services, the creation of jobs and the improvement of productivity. Nonetheless, the role of entrepreneurship in enhancing economic wealth varies across different types of such phenomenon. Not all entrepreneurial initiatives equally contribute to competitiveness and economic growth (Autio, 2007; Stam &

van Stel, 2009; Wong, Ho, & Autio, 2005). In particular, considering the relationship between exports and economic growth suggested by the empirical literature on export-led growth (Giles & Williams, 2000a, 2000b), export-oriented entrepreneurship is expected to enhance economic growth by serving both domestic and foreign markets.

Although export-oriented new ventures and the field of international entrepreneurship have received considerable attention by scholars during the last decade (Oviatt & McDougall, 2005b), the potential economic impact of new ventures that from inception sell to foreign markets has not been sufficiently analysed yet. Recently, Hessels and van Stel (2010) examined the role of export-oriented entrepreneurship at the national aggregate level. Their findings reveal that this kind of entrepreneurial activity is a relevant driver of economic growth in developed countries, but not in developing ones. However, to the best of my knowledge, no studies have been carried out on the impact of export-oriented entrepreneurship at the regional level. Despite the increasing impact of globalisation, regions have emerged as an essential and active unit of the economic development process (Scott & Storper, 2003). Moreover, regions are influential environments fostering entrepreneurship (Feldman, 2001). This is especially true for knowledge-based entrepreneurship since proximity to knowledge sources matters (Audretsch, 1998; Audretsch & Feldman, 1996) and may influence the process through which opportunities are recognised and exploited (Shane & Venkataraman, 2000). Besides, regions as spatial units of observation within a country also differ culturally and economically from each other, and such differences may encourage or discourage people to venture in entrepreneurial activity and compete internationally. For that reason, the aggregate impact of entrepreneurship in its different dimensions should be measured at the regional level too.

I analyse the impact of export-oriented entrepreneurship on regional growth in Spain by using data provided by the GEM project and the Spanish Institute of Statistics (INE by its Spanish acronyms), for 17 NUTS-2 level Spanish regions over a period of six years (2003-2009).

1.4 Contributions

The study generates several noteworthy contributions. First, by analyzing the impact of some environmental factors on the export-oriented behaviour of early-stage entrepreneurs, this research fills a gap in the extant literature with respect to how external factors affects new venture internationalisation (Oviatt & McDougall, 2005a; Zahra & George, 2002b). Previous studies have mainly focused on individual and firm-specific factors influencing the international orientation of entrepreneurial ventures. And although some studies have analysed the impact of environment on early internationalisation (Acedo & Casillas, 2007; Fernhaber & Li, 2010; Fernhaber, McDougall, & Oviatt, 2007), it is no clear how these factors can exert an impact along with individual and firm-specific factors. This research reveals that, after controlling for individual and firm-specific factors, the influence of FDI on the export-oriented behaviour of early-stage entrepreneurs is significant when it is analysed across regions, but no when it is analysed across industries. This suggest that policies attracting FDI may serve as tools for regional governments to encourage entrepreneurs to become export-oriented, in addition to other benefits widely analysed in the literature of FDI. Likewise, this research also reveals that external knowledge, as estimated by the accumulation of research and development (R&D) activities, has an impact on the export-oriented behaviour of early-stage entrepreneurs, though such impact takes place at the industrial level but not at the regional level. Consequently, the knowledge accumulated in the geographical environment is not as relevant as the technological level of the industrial context in which the entrepreneur is

embedded. Thus, in order to generate more export-oriented new ventures, entrepreneurship should be promoted in knowledge-based industries.

Second, the study also contributes by uncovering the productivity outcomes of early exporting for new ventures. Most studies in international entrepreneurship have analysed the antecedents of early internationalisation without taking into account what outcomes generate such behaviour (Zahra & George, 2002b). Only few studies have analysed the outcomes of early internationalisation, but they concentrate on the profitability and export growth subsequent to the international entry (Autio, et al., 2000). And while productivity differences associated with export status have been analysed on established organisations (Wagner, 2007), to the best of my knowledge no studies have analysed the impact of early exporting on the productivity of new ventures. This study has filled this gap by showing that despite the fact that exporting new ventures outperform their non-exporting counterparts in terms of productivity, new ventures entering international markets through exports are not necessarily more productive than non-exporting new ventures at the moment of foreign market entry. These differences in productivity arise over time since exporting new ventures experience higher rates of productivity growth in the subsequent periods. Moreover, the findings reveal that new ventures that decide to export at a very early age (i.e. within two years of their inception) have a higher productivity growth than those that delay their first international sale until they have gained some experience in the domestic market.

Third, the analysis of the outcomes of the export-oriented behaviour of new ventures is not limited to new ventures themselves, but also to the economy. Some studies has provided evidence on the positive impact of export-oriented new venture on economic growth at the national aggregate level (Hessels & van Stel, 2010). The present research expands such evidence and shows that the extent to which entrepreneurial activity at the regional level is export-oriented also positively influences regional economy growth. Moreover, this part of the

research adds to the extant literature on entrepreneurship by analyzing the role of entrepreneurial activity with different levels of foreign customers (i.e., between 1-25%, between 26-75% or between 75-100% of customers located abroad) on economic growth, under a longitudinal and regional context. The results show that the impact of export-oriented entrepreneurship is stronger as the entrepreneurial activity is engaged in substantially higher levels of exporting activity (i.e., 25% or more customers abroad). Implications derived from these results suggest the development of trade policies for export promotion at the regional level, using government programmes which not only encourage entrepreneurs to become exporters, but also help them increase their commitment to foreign customers in terms of exports intensity.

1.5 Structure of the dissertation

The study is divided into five parts. After this introductory first section which constitutes the conceptual framework for an integrative model that collects the antecedents and outcomes of new ventures' export-oriented behaviour that are worthy of further empirical investigation, the second part gets into the theoretical insights supporting the model, and outlines the hypotheses to be empirically tested. The third part consists on the description of data and the explanation of the methodology used in the empirical analysis, while the fourth part presents and discusses the results. Finally, the last part summarises the conclusions and implications derived from this investigation.

Chapter 2:

Theory and hypotheses

Following the conceptual framework described at the end of the previous chapter, I now propose three sets of hypotheses related to the antecedents of export-oriented entrepreneurship with a particular emphasis on the role of FDI and external knowledge at the aggregate industry or regional level; the outcomes of export-oriented entrepreneurship in terms of productivity at the firm level; and the outcomes of export-oriented entrepreneurship in terms economic growth at the regional level.

2.1 Influence of the environment on export-oriented entrepreneurship: The role of FDI and external knowledge

Extant literature on organisation studies has demonstrated that the external environment of a firm can affect its outcomes (Keats & Hitt, 1988; Naman & Slevin, 1993; Robinson, 1999; Yasai-Ardekani, 1989). The environment may facilitate or constrain organisational behaviours (Bouchikhi, 1993), since it provides firms with the means needed for growth and competition (Wan & Hoskisson, 2003). Moreover, it is suggested that firms in general are a reflection of the environment in which they are embedded (Meyer & Rowan, 1991; Whitley, 1999).

Similarly to other economic actors, early-stage entrepreneurs and their new ventures are influenced by their environmental context (Autio & Acs, 2010; Edelman & Yli-Renko, 2010; McDougall, Covin, Robinson, & Herron, 1994;

Sarkar, et al., 2006; Sine & David, 2003; Woolley & Rottner, 2008). The impact of the environment on entrepreneurs is particularly important because their young - usually small - organisations lack legitimacy due to fact that they are new (Stinchcombe, 1965) and possess limited resources (Aldrich & Auster, 1986). Consequently, they have little control over external conditions (Pfeffer & Salancik, 2003), which makes them more dependent on the environment than established organisations (Gnyawali & Fogel, 1994).

The environment includes the set of institutions and resources that shape the actions of organisations and individuals operating within it (Wan & Hoskisson, 2003). Institutions refer to all rules, conventions and beliefs representing a social reality, which can be taken for granted, supported by public opinion or imposed by law (DiMaggio & Powell, 1983; Meyer & Rowan, 1991).[2] Resources refer to the pool of assets, factors and inputs needed by firms to produce goods and services, as well as to survive and grow, and they can be naturally-endowed (e.g., land and other natural resources), technically-advanced (e.g., infrastructures and financial capital), or knowledge-based (e.g., human capital and technologies) (Wan & Hoskisson, 2003).[3]

[2] The influence of institutions as a relevant external force affecting the behaviour of economic actors has been formalized by the neo-institutional theorists (DiMaggio & Powell, 1983, 1991; Meyer & Rowan, 1991), who provide a distinctive approach for understanding the organisation-environment relation under a perspective of socialized, collectively shared behaviours rather than the merely sum of organisational (or individual) behaviours. For entrepreneurship research, neo-institutional theory has been helpful in explaining the external forces driving entrepreneurial activity, and the resulting variation across different environmental contexts (Bruton, Ahlstrom, & Han-Lin, 2010).

[3] The recognition of resources as a relevant external element for economic actors has been emphasized by both the resource dependence theory (Pfeffer & Salancik, 2003) and economic growth theories (Romer, 1986; Solow, 1956), the latter under the label of production inputs. Although the organisation-environment relation according to growth theories primarily implies that the efficiency with which resources are employed causes an impact on performance across the different level units of the economy, it implicitly implies that the sum of resources available in the environment determine business activities at the organisational (or individual) level. In contrast, the organisation-environment relation under a resource dependence perspective suggests that organisations are dependent on resources coming from the environment, and that such dependence

Evidence shows that entrepreneurs' behaviour, decisions and performance are conditioned by institutionalised aspects and critical resources available in the environment. For instance, Autio & Acs (2010) show that variation in entrepreneurial growth aspirations across countries is explained by the institutionalised conditions that regulate intellectual property protection. In contrast, Sarkar et al. (2006) demonstrate that the external knowledge milieu (i.e., the availability of abundant knowledge resources in the industry environment) improves the entrepreneurial venture's chance of survival. Thus, it is reasonable to think that the export-oriented behaviour of early-stage entrepreneurs cannot be completely understood without considering institutional elements and external resources of the environment affecting their new ventures.

However, as Castrogiovanni (1991) argues, the environment (i.e., institutions and resources) can be "everything else" external to the firm; and given that "[i]t is impossible to examine everything" (p. 543), he suggests choosing specific environmental elements that are relevant to the particular phenomenon under analysis. Accordingly, rather than exhaustively examining the environment, I focus on certain specific institutions and resources that are relevant for export-oriented entrepreneurs. In particular, I argue that the level of exposure to (foreign and domestic) firms engaged in international activities is linked to the generation of new institutionalised practices that induce early-stage entrepreneurs to enter foreign markets, whereas the level of technological knowledge available in the environment constitutes a critical external resource that facilitates such export-oriented behaviour.

---

makes them develop power relations with others to obtain the resources they need. A different perspective linked to the dependence upon resources implies that the abundance or scarcity of resources in the environment may force organisations (or individuals) within it to act driven by opportunity or necessity reasons, respectively. This view has been useful in entrepreneurship research for explaining the variation in entrepreneurial activity across national environments as a U-shaped function of the resources linked to the level of economic development (Wennekers, van Stel, Carree, & Thurik, 2010; Wennekers, van Stel, Thurik, & Reynolds, 2005).

Prior to the elaboration of the hypotheses concerning the impact of the intensity of inward and outward FDI flows and technological external knowledge, I briefly describe some basic theoretical elements on the role of institutional forces and external resources upon which I draw later in order to guide my argumentation.

2.1.1 How can institutional forces affect organisational behaviour?

From a neo-institutional point of view, the behaviour of an organisation and its individuals is not independent from the environment because it tends to incorporate the practices and procedures which have been institutionalised by the organisational structures prevailing in its location or industry. By conforming to institutions or, in North's words, "the rules of the game in a society" (1990, p. 3), firms gain legitimacy and consequently increase the chance of survival (Meyer & Rowan, 1991). For instance, the involvement of an organisation in research and development activities may be viewed as an institutionalised fact resulted from the influence of the collection of R&D activities carried out by other organisations in the same environment (i.e., location or industry), which undertake such activities in order to achieve superior performance and ensure survival. This is especially true when firms lack experience, since adaptation through the imitation of the practices institutionalised by other firms taken by other firms operating in the same environment helps reducing the uncertainty derived from the lack of experience (Cyert & March, 1963; DiMaggio & Powell, 1983; Haunschild & Miner, 1997).

Such adaptation to the institutional environment involves a process by which an organisation eventually resembles other organisations that face the same environmental conditions (DiMaggio & Powell, 1983). That is, firms within a certain location or industry have a tendency to become similar over time because of their desire to fit with their institutional environment by imitating other firms, either to learn from others' experience and achieve specific outcomes or just to seek social acceptance and justify their actions (Haunschild & Miner, 1997). This

phenomenon is defined by DiMaggio & Powell (1983) as institutional isomorphism, and it parallels the concept of inter-organisational imitation proposed by Haunschild & Miner (1997), and by which the adoption of a given practice by one or more organisations increases the likelihood that such practice will be adopted by other organisations. The concept of isomorphism is also related to Strang & Soule's (1998) idea of "diffusion" in the field of organisational studies, by which a particular practice is spread across firms within a shared environment due to a process of contagion, mimicry, or social learning, among others.

According to DiMaggio & Powell (1983), institutional isomorphism can be coercive, normative or mimetic. Coercive isomorphism occurs when a firm incorporates the practices of other firms in the immediate environment as a response to their formal and informal pressures. Normative isomorphism occurs when a firm reproduces structured activities or routines implemented by other firms in the immediate environment due to the diffusion of practices which has been standardised as organisational norms by professionals (e.g., managers, consultants, and other professional staff). Finally, mimetic isomorphism occurs when a firm mimics other firms in the immediate environment in order to face the uncertainty resulted from the lack of experience and legitimacy.

The latter sort of isomorphism implies imitation and learning, and it emerges from three types of imitation (Haunschild & Miner, 1997): frequency-based imitation, or the imitation of very common practices implemented by other organisations (e.g., majority of firms operating in the same environment); trait-based imitation, or the imitation of practices carried out by other organisations with certain characteristics (e.g., foreign firms operating in the same environment); and outcome-based imitation, or the imitation of practices that seemingly cause a specific impact on other organisations (e.g., firms in the same environment that experience a high growth performance).

As a consequence of their short history, early-stage entrepreneurs and their new ventures face high levels of uncertainty (Stinchcombe, 1965) to which they may respond by learning from the experience of others or by doing what they observe in the environment (Haunschild & Miner, 1997). Therefore, compared to older organisations, new ventures are more likely to be involved in mimetic isomorphism through the different types of imitation described above.

2.1.2 How can external resources affect organisational behaviour?

From a resource dependence perspective, organisations are dependent on the environment because they need external resources to achieve desired results; and given that valuable resources are scarce, such dependence makes them compete and establish power relations with other firms in order to ensure survival and enhance autonomy. Thus, firms strive to acquire control over resources that minimize their dependence on other firms, as well as control over resources that maximize the dependence of other firms on them (Pfeffer & Salancik, 2003). This is why some firms establish alliances with other firms, locate close to their suppliers, or follow customers overseas (Hessels & Terjesen, 2010).[4]

Alternatively, this perspective conceptualises the environment as a source of resources, which can provide (or not provide) organisations with the raw materials (i.e., naturally-endowed resources), financial capital (i.e., technically-advanced resources), or technology (i.e., knowledge-based resources) they need to successfully operate. This means that the actions taken by both existing and new organisations operating in a given environment are influenced by the availability of resources within that environment (Aldrich, 1979; Castrogiovanni, 1991; Dess

[4] Although the aim of resource dependence theory is to explain why firms develop power relations based on resource exchanges with others (e.g., agreements or alliances) and the consequences of these relations, it also provides useful insights to understand the importance of external resources for firms.

& Beard, 1984; Pfeffer & Salancik, 2003; Randolph & Dess, 1984; Staw & Szwajkowski, 1975).[5]

For instance, the lack of external resources constrains the range of alternative options a firm can choose to define its goals, strategies, and organisational structures (Castrogiovanni, 1991). Accordingly, when external resources are scarce, competition increases and the effort devoted to survival become higher (Dess & Beard, 1984; Pfeffer & Salancik, 2003). In contrast, the abundance of external resources provides organisations with increased access to critical means, which allows them to devote efforts to growth rather than to survival (Castrogiovanni, 1991). Moreover, firms operating in a munificent environment will enjoy certain competitive advantages over firms operating in other environments with lesser availability of external resources and favourable conditions (Porter, 1990, 1998b).

The access to resources is central to entrepreneurial success (Bhide, 2000). However, early-stage entrepreneurs and their new businesses are usually resource-constrained (Aldrich & Auster, 1986). A typical entrepreneur does not control all the resources needed to introduce new goods and services into the market because most of these resources come from external sources (Venkataraman, 1997). Hence, in comparison with established organisations which often have better access to resources because of their past performance, one can expect that entrepreneurs and their new ventures are more reliant on external resources. Not surprisingly, entrepreneurs are known by their ability to identify and exploit opportunities that are exogenously created (Shane & Venkataraman, 2000), that

[5] Scholars have often referred to the availability of external resources as environmental munificence (Dess & Beard, 1984; Pfeffer & Salancik, 2003; Randolph & Dess, 1984; Staw & Szwajkowski, 1975). However, it is worthy to mention that some authors include both institutions and resources in the concept of environmental munificence (Wan & Hoskisson, 2003). Here, I try to avoid the use of the term munificence because of its potential ambiguity (Castrogiovanni, 1991), though when I use it, I do so to refer exclusively to the availability of resources in the environment, and I distinguish it from the institutional environment.

is, opportunities that are linked to the availability of resources in the environment. Thus, if the environment provides the appropriate external resources, entrepreneurs are likely to gain access to means they need in order to start and expand their new ventures.

2.1.3 FDI exposure and entrepreneurs' export-oriented behaviour

It is commonly believed that the primary benefits from FDI in host environments are the productivity gains derived from the better knowledge, skills, or technologies that spill over from foreign firms to local ones through different channels, such as the commercial linkages between foreign firms and local suppliers or sub-contractors, the training of local labour force that later on can move to local firms, or the diffusion effects that lead local firms to copy technologies introduced by foreign firms they observe (Blomström & Kokko, 1998; Caves, 2007; Görg & Greenaway, 2004).[6] However, in addition to productivity spillovers, foreign firms or MNEs conducting FDI activities in a given environment can also have an impact on the behaviour of local firms through the lens of neo-institutional theory, since the former act as role models with specific traits which are likely to be imitated by the latter in order to enhance legitimacy and reduce the uncertainty associated with changes in that environment (Cyert & March, 1963; DiMaggio & Powell, 1983). In particular, as foreign firms usually exploit their unique assets to export from the host environments in which they are established (Görg & Greenaway, 2004), I argue that early-stage entrepreneurs and their new ventures can learn how to penetrate export markets by mimicking foreign firms they observe (through inward FDI activities) in the same location or industry.

[6] Behind this idea is the assumption that foreign firms possess superior knowledge-based assets (e.g. management and marketing know-how, breaking technologies, or efficient production systems) the returns of which is difficult to be fully appropriated by them (Kogut & Zander, 1993; Liu, 2008)

The role mimetic isomorphism may induce early-stage entrepreneurs to consciously expand their businesses towards international markets when they are exposed to other firms which create competitive pressures (Gaba, Pan, & Ungson, 2002) or serve as role models (Fernhaber & Li, 2010; Lu, 2002) by carrying out international activities in the same environment. In this way, foreign firms represent a source of mimetic isomorphism for entrepreneurs and their new ventures. Of course, foreign firms must adapt to the institutionalised rules of host environments; however, they may introduce new practices that potentially change existing institutionalised structures, and these changes are likely to encourage or force local organisations to adopt a favourable behaviour towards foreign markets, especially new ventures which, due to their little experience, tend to do what they observe to achieve social legitimacy. Consistent with this view, the presence of foreign firms, either in the same location or in the same industry, results in more local firms engaged in international expansion (Aitken, Hanson, & Harrison, 1997; Barrios, Görg, & Strobl, 2003; Greenaway, Sousa, & Wakelin, 2004), including new ventures created as a result of entrepreneurial activity (De Clercq, et al., 2008). This relationship can be seen as a mimetic reaction by which local firms seek to mitigate uncertainty and gain legitimacy (Guillen, 2002; Henisz & Delios, 2001).

The imitation of foreign firms by new ventures is reinforced by certain spillovers derived from FDI activities that foster the mimetic process. First, due to a demand-pulling effect, new ventures may become suppliers of intermediate goods or sub-contractors for foreign firms located in the same environment (Barbosa & Eiriz, 2009). Such commercial linkages between foreign firms and local new ventures allows the latter to have a close observation of the international activities carried out by the former, as well as to reduce uncertainty through the access to the knowledge needed for a successful international expansion (e.g., how to adapt the product to the preferences of foreign customers, what regulatory arrangements must be taken into account in overseas markets, or, in general, what costs and

benefits are associated to international activities) (Aitken, et al., 1997; Blomström & Kokko, 1998; De Clercq, et al., 2008; Görg & Greenaway, 2004).

Second, exporting involves a fixed cost in order to physically reach overseas markets (Blomström & Kokko, 1998; Görg & Greenaway, 2004), and foreign firms can reduce such entry costs for all new ventures (i.e., without any type of linkage requirement) either through the enhancement of transport infrastructures (De Clercq, et al., 2008), the creation of new distribution channels (Görg & Greenaway, 2004), the reduction of trade barriers by means of lobbying power (Blomström & Kokko, 1998), and other market access spillovers.

Third, in order to exploit their competitive advantages, foreign firms require skilled employees which are generally acquired by investing in training of local labour force (Fosfuri, Motta, & Rønde, 2001). However, foreign firms cannot completely lock in their skilled employees, and as a result the effects of such training investments can be spread among local firms (Gershenberg, 1987). Thus, new ventures can hire former employees in foreign firms or MNEs, and use the knowledge and experience they gained while working for foreign firms to export. These training effects may also arise if former employees in foreign firms, which will probably have an international orientation, decide to start a new venture (De Clercq, et al., 2008).

Finally, the entry of foreign firms in a given environment is likely to increase the level of competition, and force local firms to become more efficient or exit the market if they are not productive enough (Blomström & Kokko, 1998). Although such competitive pressures mainly lead to productivity gains, they may also create incentives for entrepreneurs to expand the geographical scope of their new ventures (De Clercq, et al., 2008), and increase the speed of entry in international markets (Gaba, et al., 2002).

All these FDI spillover effects can take place alone or simultaneously. In any case, they are likely to facilitate the imitation of foreign firms' export activities by new ventures. The more foreign firms in the environment, the more chances have early-stage entrepreneurs and their new ventures to observe and imitate foreign firms' export activities. Accordingly, inward FDI flows in the environment in which the entrepreneur is embedded will positively affect his or her propensity to engage in exporting. As the environment that is relevant to the entrepreneur can be analysed at the regional or industry level, I propose the following hypotheses:[7]

H1.1a: Early-stage entrepreneurs located in **regions** with a higher exposure to **inward** FDI flows are more likely to be export-oriented.

H1.1b: Early-stage entrepreneurs operating in **industries** with a higher exposure to **inward** FDI flows are more likely to be export-oriented.

Imitation effects leading to international expansion of new ventures are not limited to the exposure to inward FDI or foreign firms located in the location or industry. A new venture can also imitate the international activities of other domestic organisations sharing its environment (Blomström & Kokko, 1998). For instance, Henisz & Delios (2001) demonstrate that, when firms face uncertainty as a result of the lack of experience, foreign entry decisions are influenced by prior international activities of other domestic firms from the immediate environment, which provide information and legitimacy for entering export markets through a mimetic behaviour. Other studies also show evidence that a firm is more likely to

[7] Indeed, reviews of the empirical literature suggest that spillovers from inward FDI can operate between industries within a region and within an industry across regions (Blomström & Kokko, 1998; Caves, 2007).

be exporter in environments where other domestic firms perform international activities (Barrios, et al., 2003; Clerides, Lach, & Tybout, 1998; Guillen, 2002; Martin, Swaminathan, & Mitchell, 1998). Thus, inward FDI flows can also have a positive impact on early stage entrepreneurs' decisions to export.

Actually, domestic firms engaged in overseas investments or domestic MNEs have similar spillover effects as foreign MNEs (Blomström & Kokko, 1998), and such spillovers may as well ease the imitation of an export-oriented behaviour by local new ventures (De Clercq, et al., 2008). First, if commercial linkages exist, when domestic MNEs have to adapt their products to a given foreign market, local new ventures that serve as suppliers are forced to adapt their production processes to meet that foreign market's preferences as well (Blomström & Kokko, 1998). This requirement makes such new ventures able to acquire relevant knowledge that helps them reduce uncertainty in order to export (Aitken, et al., 1997).

Second, as domestic MNEs usually produce abroad, they become an indirect export channel for new ventures that supply intermediate inputs to foreign subsidiaries of domestic MNEs (Blomström & Kokko, 1998). This can be the case of Nokia's suppliers in Finland, which became increasingly international as the Finnish telecommunications MNE grew and outsourced parts of the production. Finnish suppliers delivered customised products and services in electronic manufacturing automation and precision directly to assemblers worldwide instead of delivering them to Nokia (E. Moen & Lilja, 2005).

Third, the effects of labour training from domestic firms with international activities can also favour local new ventures' ability to export, since employees who worked or were trained in foreign subsidiaries of domestic MNEs may either return to the home environment and be hired by other local firms (Cantwell & Hodson, 1991), or to start a new venture and use their international experience and knowledge to enter foreign markets through exports (De Clercq, et al., 2008).

Apart from the effects that parallel inward FDI spillovers, the establishment of domestic firms in foreign countries may familiarise foreign customers with the range of products and services offered by other firms in the home environment. That is, overseas investments in production plants, distribution channels, or other international activities carried out by a domestic firm are likely to publicise its home environment in the foreign markets where it is established, which in turn increases the reputation of local new ventures from that home environment in those foreign markets (Blomström & Kokko, 1998). For instance, Japanese, German or Swedish products are viewed as high quality products regardless of whether the manufacturer is a new firm or not, because MNEs from these countries have a long tradition of international presence. Furthermore, even some regions in these countries are well-known worldwide due to their MNEs. Just to give an example, Bavaria and Baden-Württemberg in Germany are recognised because of their automotive industry firms (e.g., BMW, Porsche or Mercedes), while Stockholm region in Sweden is recognised because of its design industry firms (e.g., IKEA's design offices).

For all aforementioned reasons, I expect that outward FDI activities will also positively influence the adoption of an export-oriented behaviour by early-stage entrepreneurs and their new ventures. Thus, I propose the following hypotheses:

H1.2a: Early-stage entrepreneurs located in **regions** with a higher exposure to **outward** FDI flows are more likely to be export-oriented.

H1.2b: Early-stage entrepreneurs operating in **industries** with a higher exposure to **outward** FDI flows are more likely to be export-oriented.

Although inward and outward FDI may both positively influence the export-oriented behaviour of early-stage entrepreneurs and their new ventures, the extent to which each of them do so may differ. The literature on FDI spillovers mainly focuses on the effects of foreign firms or MNEs in host environments (i.e., inward FDI), arguing that they have superior knowledge and skills than domestic firms. Domestic firms involved in overseas activities (i.e. outward FDI), however, can also have superior knowledge in both home and host environments. Then, why should inward FDI and outward FDI have a different influence on new ventures' propensity to export? There are indeed several reasons for this to happen.

First, local firms might be not aware of the international activities of other domestic firms in the same region or industry because they are used to the presence of their peers in that regional or industrial environment. In contrast, when a foreign firm or MNEs enters a new market, its presence is easily perceived by local firms in that market because it represents a change in the environment. Thus, while they might ignore what other domestic firms do abroad, local firms in general and early-stage entrepreneurs in particular are likely to become conscious of the international activities performed by foreign firms sharing the same environment.

Second, due to the impact of inward FDI activities on the local development in terms of job creation and ownership structure changes, the local media might tend to give more extensive coverage to the establishment of new foreign firms in the home market than to the establishment of domestic firms in foreign markets. As a result, foreign firms or MNEs operating in a given environment are likely to become more visible to local economic actors in that environment, such as early-stage entrepreneurs, than other domestic firms carrying out overseas investments.

Finally, foreign firms and MNEs generally face a liability of foreignness when they operate in their host markets (Zaheer & Mosakowski, 1997). In order to overcome such liabilities and gain legitimacy, they are willing to learn the rules of

the game - especially those related to rules taken for granted or supported by public opinion - by hiring local managers, and cooperating with local partners which have access to market knowledge (Kostova & Zaheer, 1999) and relevant networks (Johanson & Vahlne, 2009) in the host market.

The easier recognition of the presence of foreign firms, which can be reinforced by the potential extensive coverage of the local media, as well as the willingness of foreign firms to cooperate with local firms make it possible that early-stage entrepreneurs imitate and benefit from inward FDI activities more than from outward FDI activities in order to access the export market. Following these arguments, one can expect that the influence of inward FDI on export-oriented behaviour of early-stage entrepreneurs is stronger than that of outward FDI. Thus:

H1.3a: The positive influence of the **regional** exposure to **inward** FDI flows on the export-oriented behaviour of early-stage entrepreneurs is higher than the positive influence of the **regional** exposure to **outward** FDI flows.

H1.3b: The positive influence of the **industry** exposure to **inward** FDI flows on the export-oriented behaviour of early-stage entrepreneurs is higher than the positive influence of the **industry** exposure to **outward** FDI flows.

2.1.4 External knowledge and entrepreneurs' export-oriented behaviour

As previously suggested, the abundance of resources in the environment allows early-stage entrepreneurs to gain access to the means they need to start and

expand their new ventures. Nonetheless, among the different kinds of resources available in the environment, external knowledge is a markedly important driver for starting, surviving and growing a business (Acs, et al., 2009; Agarwal, Audretsch, & Sarkar, 2007; Sarkar, et al., 2006). Above all, knowledge, be it internal or external, is a critical resource for individuals and organisations to discover or create new opportunities that can be subsequently exploited (Shane & Venkataraman, 2000). For that reason, while management theories has long viewed external knowledge as a source of innovation and competitive advantage (Cohen & Levinthal, 1990), the literature on entrepreneurship considers external knowledge as the fundamental source of entrepreneurial opportunities for knowledge-generating organisations as well as for third-party organisations and individuals (Acs, et al., 2009; Venkataraman, 1997).

Apart from the individual knowledge, an entrepreneur can access the knowledge available in the environment to formulate strategies and take decisions with regard to a business opportunity because, due to the existence of spillover effects, knowledge is a resource that usually becomes disseminated across different economic actors sharing the same environment (Audretsch, 1998), specially geographically close environments (Audretsch & Feldman, 1996). Central to the existence of spillovers is the fact that organisations cannot fully appropriate the returns on the new knowledge they create (Audretsch, 1998). Individuals with a given endowment of new knowledge gained from their current employers can move to other organisations or start their own businesses in order to appropriate the returns of such knowledge (Acs, et al., 2009; Audretsch, 1995). Likewise, organisations can develop the capacity to absorb knowledge and ideas generated by others (Cohen & Levinthal, 1990), and thus they can also appropriate some returns on external new knowledge. According to this line of thinking, evidence shows that smaller firms, as those typically started up by entrepreneurs, rely on external sources of knowledge to introduce innovations in the market, suggesting that such external resource may spill over from existing firms conducting R&D

activities or universities and other research institutions (Acs, Audretsch, & Feldman, 1994). This means that, even if an economic actor does not have control over external resources (Pfeffer & Salancik, 2003), as it may be the case with entrepreneurs and their new ventures, he or she can capitalise on a munificent environment in terms of knowledge. Thus, entrepreneurs may be able to profit from the external knowledge generated by third-party organisations without having to pay for it in a formal market.

Knowledge plays an important role for internationalisation because it can generate differentiation or cost advantages for both traditional MNEs (Kogut & Zander, 1993) and new ventures engaged in international activities (Oviatt & McDougall, 1994). For instance, knowledge allows creating innovative products and services that can be commercialised beyond national borders, providing organisations with competitive advantages for achieving success in foreign markets even early in the business life cycle (Bloodgood, et al., 1996). Not surprisingly, the existence of international new ventures was first identified in knowledge-intensive industries (Jolly, et al., 1992; Knight & Cavusgil, 2004; Oviatt, et al., 1993). In such environments with knowledge munificence, new ventures are not only able to outperform purely domestic firms but also to challenge incumbents in international markets because they may benefit from certain advantages derived from the superior access to knowledge spillovers (Gilbert, McDougall, & Audretsch, 2008).

For organisations sharing the same environment, the availability of external knowledge can also represent a source of competitive advantage to outperform organisations in other environments (Porter, 1990), and thereby to develop business activities across borders. In this way, entrepreneurs in highly knowledge-endowed environments are likely to be more oriented towards foreign markets because the high availability of external knowledge may enhance their ability to identify internationally exploitable opportunities, and the capacity of their new

ventures to develop world-class technologies. In contrast, entrepreneurs in environments with low levels of knowledge are less likely to be involved in international activities because in those environments their new ventures lack globally sustainable competitive advantages and capabilities for successfully operating in foreign markets, and they may at best develop local competitive advantages that dissipate in foreign markets.

Similar to the impact of FDI, the availability of knowledge in the environment can be analysed at the industrial and regional level. In particular, one can expect that the potential for new entrepreneurial opportunities across borders increases as the regional or industrial knowledge base is expanded. Therefore:

H1.4a: Early-stage entrepreneurs located in **regions** with a higher stock of knowledge per firm are more likely to be export-oriented.

H1.4b: Early-stage entrepreneurs operating in **industries** with a higher stock of knowledge per firm are more likely to be export-oriented.

2.2 The impact of export-oriented entrepreneurship at the firm level: Productivity of new ventures

Firm-level data from different countries reflect that exporting firms outperform their non-exporting counterparts in a wide range of performance measures (Aw & Hwang, 1995; Bernard & Jensen, 1995; Clerides, et al., 1998; Delgado, Fariñas, & Ruano, 2002; Requena Silvente, 2005). Two non-mutually exclusive theoretical reasons explain these differences when it comes to productivity (Bernard & Jensen, 1999; Bernard & Wagner, 1997). Firstly, as internationalisation involves high sunk costs and more complex competition, only more efficient firms are able

to become exporters. That is, firms with a strong position in domestic markets in terms of efficiency can reasonably cope with the obstacles of entering foreign markets; so productivity differences are consequently the result of a "self-selection mechanism". Secondly, exporting is expected to help firms become more efficient due to a "learning-by-exporting effect". Certainly, the exposure to foreign markets provides firms with additional information and technology which may be used as valuable knowledge to improve production processes.

Table 1 summarises the main empirical studies on exporting and productivity. In disentangling the causal relation between these two variables, many scholars have found clear empirical evidence of the existence of a self-selection mechanism, while less evidence (i.e. negative or no impact at best) has been provided to support the idea that exporting causes certain learning effects (Arnold & Hussinger, 2005; Aw & Hwang, 1995; Bernard & Jensen, 1999, 2004; Bernard & Wagner, 1997; Breau & Rigby, 2008; Delgado, et al., 2002; Wagner, 2002). Significant results on learning-by-exporting effects have been mostly found in studies conducted in low income countries (Alvarez & López, 2005; Blalock & Gertler, 2004; Kraay, 1999), where firms seemingly have much more to learn from exporting than firms located in more technologically advanced economies. In developed countries, however, the evidence found by some scholars is conditional on certain factors. For instance, Castellani (2002) found that productivity growth is related to export intensity in Italian manufacturing firms, while Baldwin & Gu's (2003) results based on Canadian manufacturing plants suggest that the effects of exporting on productivity growth are stronger for young and domestic-controlled plants.

Wagner (2007) argues these results cannot be considered as stylised facts due to the different approaches used in the literature. In this sense, Table 1 also shows that there is a notable diversity in the methods employed in the extant literature on exporting and productivity. I indeed consider that these results are representative

only of the samples on which most studies are based. In particular, I note that the large body of literature on exporting and productivity has been mostly focused on established businesses, and there are some reasons to believe that different results are to be obtained in the case of new ventures.

Table 1: Key empirical literature on exporting and productivity

Study		Country (Sample / Period)	Methodology	Main results
No evidence on learning by exporting	Arnold & Hussinger (2005)	Germany (389 manufacturing firms / 1992-2000)	Semi parametric estimation of productivity; probit and OLS models; panel data; fixed effects; matching	Higher productivity of exporters Self-selection of exporters Absence of learning from exporting
	Aw & Hwang (1995)	Taiwan (2,832 manufacturing firms / 1986)	Translog production function; Cross-sectional data	Higher productivity of exporters Self-selection of exporters Absence of learning from exporting
	Bernard & Jensen (1999)	USA (50-60,000 manufacturing plants / 1984-92)	Linear probability with fixed effects	Higher productivity of exporters Self-selection of exporters Absence of learning from exporting
	Bernard & Jensen (2004)	USA (50-60,000 manufacturing plants / 1983-92)	Semi parametric estimation of productivity; OLS models; Panel data	Self-selection of exporters Absence of learning from exporting, and lower productivity growth of exporters when considering them as a whole (i.e. new exporters, continuers and stoppers)
	Bernard & Wagner (1997)	Germany (7,624 manufacturing plants / 1978-92)	OLS models; Panel data	Higher productivity of exporters Self-selection of exporters Absence of learning from exporting, and lower productivity growth of exporters
	Breau & Rigby (2008)	USA (50,420 manufacturing plants / 1987, 92 and 97)	Probit and OLS models using cross-sectional data	Higher productivity of exporters Self-selection of exporters Absence of learning from exporting

	Study	Country (Sample / Period)	Methodology	Main results
No evidence on learning by exporting	Delgado, et al. (2002)	Spain (1,766 manufacturing firms / 1991-96)	Nonparametric estimation of productivity distributions	Higher productivity of exporters Self-selection of exporters Inconclusive evidence on learning from exporting
	Wagner (2002)	Germany (353 manufacturing firms / 1978-89)	Panel data; Matching	Higher productivity of exporters Absence of learning from exporting
Evidence on learning by exporting	Alvarez & López (2005)	Chile (4,934 manufacturing plants / 1990-96)	Probit and OLS models using cross-sectional data	Higher productivity of exporters Self-selection of exporters Learning from exporting
	Baldwin & Gu (2003)	Canada (All manufacturing plants / 1990-96)	Panel data; OLS, fixed-effects and GMM models.	Higher productivity of exporters Self-selection of exporters Learning from exporting, especially in young and domestic-controlled plants.
	Blalock & Gertler (2004)	Indonesia (20,108 manufacturing plants / 1990-96)	Translog production function; Panel data	Higher productivity of exporters Learning from exporting
	Castellani (2002)	Italy (2,898 manufacturing firms / 1989-94)	Cross-sectional data	Higher productivity of exporters Learning associated with export intensity

Study		Country (Sample / Period)	Methodology	Main results
Evidence on learning by exporting	Clerides, et al. (1998)	Colombia (All manufacturing firms / 1981-90), Mexico (2,800 manufacturing firms / 1986-90), Morocco (All manufacturing firms / 1984-91)	FIML of costs functions; Panel data	Higher productivity of exporters No learning from exporting in Colombia and Mexico, and some learning from exporting in Morocco
	Girma, Greenaway & Kneller (2004)	UK (8,992 manufacturing firms / 1989-99)	Panel data; Matching	Higher productivity of exporters Self-selection of exporters Some learning from exporting
	Greenaway & Kneller (2004)	UK (11,225 manufacturing firms / 1989-2002)	Panel data; Matching	Higher productivity of exporters Self-selection of exporters Some learning from exporting when using an unmatched sample Absence of learning from exporting when using a matched sample
	Kraay (1999)	China (2,105 firms / 1988-92)	Dynamic panel	Higher productivity of exporters Learning from exporting

Source: Own elaboration based on Girma, et al. (2004)[8]

[8] A more detailed survey of the empirical literature on export and productivity is provided in Wagner (2007)

On the one hand, unlike established firms, young firms do not have enough time to develop high levels of productivity or to acquire new knowledge about foreign markets before their first international entry (Baldwin & Gu, 2003). Notwithstanding, some of them do successfully internationalise their sales early in their life cycle at a rapid pace (Shrader, et al., 2000). On the other hand, learning effects from exporting are expected to operate differently in new ventures and established firms, since the former neither use the same learning modes than the latter, nor they have the same level of inertia or repertoire of established routines that shape what and how they learn (Autio, et al., 2011; Zahra, Sapienza, & Davidsson, 2006). Accordingly, in this study I revise the existing literature on exporting and productivity, complementing it with organisational learning literature to outline testable hypotheses. These hypotheses concern not only the existence of differences between exporting new ventures and non-exporting new ventures in the initial productivity levels at foreign market entry and the subsequent productivity growth thereafter, but also the effect of age at foreign market entry on productivity growth.

2.2.1 Initial productivity differentials between exporting and non-exporting new ventures: Is there a self-selection mechanism?

As previously mentioned, many scholars argue that firms need to be efficient before they become exporters in order to overcome barriers to entry into foreign markets and to survive against global competitors. This idea suggests that exporting firms have to accumulate certain resources and gain some experience and knowledge through consolidation in domestic markets before choosing to sell to foreign markets, which is consistent with the stages model of internationalisation (Johanson & Vahlne, 1977, 1990). Empirical evidence supports this view by showing that established firms becoming new exporters are more productive than their non-exporting counterparts, and that such initial productivity differentials are present years before entering foreign markets

(Arnold & Hussinger, 2005; Aw & Hwang, 1995; Bernard & Jensen, 1999; Bernard & Wagner, 1997; Breau & Rigby, 2008; Delgado, et al., 2002).

At least two mechanisms explain why exporting firms might achieve high levels of productivity before entering foreign markets.[9] Firstly, productive firms in domestic markets are more likely to export than less successful ones because their entrepreneurs/managers are aware that they can satisfy the additional demands of selling abroad. In this case, a high productivity level before the first international sale acts as an incentive to approach foreign markets. Secondly, as internationalisation can be seen as a strategic choice, once the decision to sell abroad is made, the forward-looking nature of the firm leads to an improvement in productivity through a "conscious process" in order to overcome the obstacles of entering foreign markets (Alvarez & López, 2005). In this case, the strategic commitment to approach foreign markets acts as an incentive to increase the productivity level before the first international sale.

The manner in which these productivity differentials arise among new ventures may not be as evident as it is among established firms. Due to their young age, new (and, almost always, small) ventures can expect to suffer from a lack of knowledge and resource constraints that lead them to face a high risk of failure. This has been largely described in the literature as liability of newness (Stinchcombe, 1965) and liability of smallness (Aldrich & Auster, 1986), respectively. At first glance, such liabilities would suggest the prevalence of low initial levels of productivity among new ventures at or near to their inception, challenging the existence of a self-selection mechanism of more productive new ventures progressing to exporting new ventures.

[9] In both cases, the underlying assumption is that selling abroad involves additional costs of transportation, distribution and logistics, as well as putting a lot of effort into adapting to host countries.

However, the main underlying arguments behind new models of internationalisation of new ventures, compared to traditional models for established firms, emphasise the role of the entrepreneur's human capital and the means by which new ventures can access strategic resources through alternative governance structures (Oviatt & McDougall, 1994). These elements may provide exporting new ventures with productivity advantages over non-exporting ones at the moment of their first international sale even if their life cycle history is short. For instance, the entrepreneur's previous industry-specific or international experience, either of which is associated with exporting new ventures[10], may lead to increased levels of productivity since the kind of human capital involved enables entrepreneurs to cope better with problems, as well as to identify what is needed to produce goods and to serve markets using inputs in a more efficient way than other entrepreneurs without such experience and knowledge. Similarly, exporting new ventures can usually tolerate high costs of internationalisation by controlling, rather than by owning, foreign resources through strategic alliances. This means that they are able to use relatively less of their own capital input to produce the same level of output as new ventures without such alternative governance structures.[11] Accordingly, I formulate a new hypothesis as follows:

H2.1: At international entry, new ventures selling to foreign markets will show a higher initial productivity level than those selling only to domestic markets.

[10] The entrepreneur's experience is mainly important, if not crucial, for the recognition and exploitation of opportunities (Shane & Venkataraman, 2000); prior experience as an employee or when self-employed – especially in international markets – may influence the decision to export as a way of exploiting business opportunities abroad.

[11] Accessing strategic assets through alliances may reduce the costs of capital; however, it also may raise the price of other inputs in the production function (i.e. intermediate inputs). In the latter case, the gains in productivity from the use of alternative governance structures would be low.

2.2.2 Differentials in productivity growth between exporting and non-exporting new ventures: Are there learning effects from exporting?

Exporting is expected to increase productivity due to a learning process based on the knowledge, technology and operational efficiencies gained from exposure to international markets. These learning-by-exporting effects, while not completely demonstrated for established firms (Bernard & Jensen, 1999; Bernard & Wagner, 1997), may be important for young ventures which are immersed in an evolutionary process of growth and development, and which use different learning modes to those of their older counterparts (Zahra, et al., 2006). Theoretically, some of the sources of productivity growth derived from exporting are due to the access to new knowledge, the development of economies of scale, and the complexity associated with competition in foreign markets. Below, I describe these mechanisms in more detail.

Access to new knowledge through exporting

Since information is not equally distributed across market agents (Hayek, 1945), the discovery of new ways of organising and improving productivity depends on the information held thereof. Literature on exporting and learning suggests that selling in foreign markets allows firms to access new information that would be otherwise inaccessible; that is, exporting provides access to diverse knowledge inputs that are not available in the domestic market (Salomon & Shaver, 2005). This statement is supported by the idea that trade involves not only a purchase and sale transaction, but also an exchange of knowledge which can be potentially important across borders (Grossman & Helpman, 1991). For instance, firms gain information through exporting because foreign customers may provide some technical expertise or suggest new product designs, models and patterns (Castellani, 2002; Evenson & Westphal, 1995; Rhee, Ross-Larson, & Pursell, 1984), as well as new ways to improve manufacturing processes (Grossman &

Helpman, 1991). Likewise, competitors and suppliers in foreign markets may provide access to new knowledge too (e.g., through familiarity with managing best practices and technology advancements), which helps to improve productivity. Accordingly, foreign markets may be considered a source of additional information enhancing productivity that exporting new ventures are more likely to discover, access and exploit than domestic new ventures.

Increased competition and the complexity of foreign markets

The exposure to international markets implies dealing with a more intense level of competition than in the domestic market (McKinsey-Global-Institute, 1993). In order to survive in such competitive environments, firms need to develop learning processes and to take advantage of them to improve productivity faster than those that sell domestically and face no international competition. The idea that international markets are very competitive and demanding is, however, criticised. For instance, nowadays purely domestic firms in developed countries face high competition from foreign firms too (Bernard & Wagner, 1997). Besides, competition in developing foreign countries may be not nearly as fierce as in local markets of developed countries (Blalock & Gertler, 2004). In any case, selling abroad inevitably entails high levels of complexity and uncertainty since competitive, cultural and institutional forces in foreign markets are different from the rules prevailing in the domestic market (Sanders & Carpenter, 1998; Shenkar, 2001). Although this variety of conditions obviously limits foreign market entry, one of the post-entry implications of this fact is that exporting firms must be willing to improve their efficiency, responsiveness and coordination to cope with the complexity of foreign markets and to remain exporters (Bartlett & Ghoshal, 1987; Sanders & Carpenter, 1998). Indeed, exporting firms are likely to enhance productivity because when it comes to responding efficiently to new environmental changes, the complexity derived from exposure to different

conditions in foreign markets provides greater flexibility and, therefore, greater ability when it comes to adapting the production processes.

Exporting and economies of scale

Exporting represents a potential avenue for continued growth, as well as a natural expansion of the market which allows firms to yield certain economies of scale (Bernard & Wagner, 1997; Castellani, 2002; Porter, 1986).[12] Economies of scale result in cost advantages which are driven by selling goods and services to a broader market, provided that the increase in the level of inputs needed to satisfy the production is lower than the increase in the level of output. This is especially true when there are some quasi-fixed inputs (e.g., initial investment of capital), the costs of which can be spread over an increasing number of additional output units. However, although the exploitation of economies of scale is most commonly found in manufacturing – and usually capital-intensive – industries, cost advantages derived from international expansion may be present in service industries too (Katrishen & Scordis, 1998). In this way, selling to foreign markets leads to economies of scale not only due to the more efficient use of fixed costs, or the greater capacity of bulk buying of raw materials at a relatively reduced price, but also to the allocation of advertisement costs over a greater number of output units (Campbell & Verbeke, 1994), the access to a wider range of financial sources at lower rates of interest, and the efficiencies gained through the specialisation of managers as the scale of the business increases (Dunning, 1989). New ventures expanding towards foreign markets can thus improve productivity through the exploitation of economies of scale.

For the aforementioned reasons, I expect to see significant differences in productivity growth between exporting and non-exporting new ventures. In particular, the notion of learning-by-exporting effects suggests that firms absorb relevant new knowledge and skills from foreign markets, which together with the

[12] Feder (1982) also uses these arguments to explain export-led growth at macro level.

potential economies of scale associated to a bigger market, help firms improve their relative productivity following the international entry. This leads me to propose the following hypothesis:

H2.2: After international entry, new ventures that sell to foreign markets will experience a higher growth in productivity than those that only sell to domestic markets.

2.2.3 Age at foreign market entry and productivity growth due to exporting: Is the timing for international entry important?

Internationalisation involves adapting to and learning from new markets, as well as unlearning from prior knowledge bases or markets (Autio, et al., 2000; Casillas, Acedo, & Barbero, 2010). While adaptation consists in generating new routines and changing old ones, learning and, by the same token, unlearning are path-dependent processes through which firms learn on the basis of what they already know (Cohen & Levinthal, 1990; Zahra & George, 2002a). In both cases, organisational age is a critical factor that can determine how routines and knowledge of new markets – in which a firm has little or no previous experience – are acquired, accumulated and used for achieving intended ends. That is, younger firms differ from older ones in the way they adapt and learn (Autio, et al., 2011; Autio, et al., 2000; Hannan & Freeman, 1984; Zahra, et al., 2006). I consider that such differences may affect the way in which exporting improves productivity. Accordingly, younger and older firms are subject to different subsequent effects arising from their choice to enter (new) foreign markets. Some previous research has explored this issue in the context of manufacturing industries. For instance, using longitudinal data, Baldwin & Gu (2003) distinguished between younger and older Canadian manufacturing plants to analyse the effects of exporting on

productivity. Their results showed that the relationship between export participation and labour productivity growth was stronger for younger plants. However, these authors did not explain the mechanism whereby younger organisations may develop higher levels of productivity growth. I can find a possible explanation for this phenomenon in the work of Autio, et al. (2000), who provide evidence that younger firms (possessed of fewer cognitive, political and relational barriers to learning) might benefit from some learning advantages in international markets because they are able to absorb foreign knowledge more rapidly than their older counterparts. The rationality behind this view is supported by the fact that younger firms usually have low levels of structural inertia (Hannan & Freeman, 1984) and learn through less time-consuming processes (Zahra, et al., 2006). I develop these ideas further and relate them to productivity growth in the following sections.

The firm's age, structural inertia and adaptation:

Evolutionary theories suggest that organisations must be able to reproduce their structures to continually produce goods and services of a certain quality in order to ensure a reliable and measurable performance (Hannan & Freeman, 1984). This reproducible character consists of using nearly the same organisational structure every day so that activities are repeated on a regular and consistent basis to reduce uncertainty and gain legitimacy – an intangible resource that is important for survival and growth (Zimmerman & Zeitz, 2002). Hannan & Freeman (1984) hold that reproducibility is obtained through institutionalisation and implementation of standardised routines, which is a process that takes time and requires the accumulation of experience. In this way, as firms gain experience in the market, they learn and assimilate the knowledge needed to create collections of reproducible routines (Zollo & Winter, 2002).[13] However, once routines have

[13] This fact can be evidenced in the well-known learning curve concept, according to which production costs decline over time due to the repetition of the same set of operations or actions.

been established, the costs associated with switching to a set of new routines or with changing the existing ones rise. In addition to such costs is the fact that building and maintaining a given organisational structure involve mobilising resources that are difficult to recover once they have been invested (Hannan & Freeman, 1984). As a result, accumulated experience leads to organisational routinisation, which in turn generates continuity of behavioural patterns and resistance to change. More specifically, experience of repeating habitual routines reinforces existing practices within the organisation and causes structural inertia, which means that the firm responds relatively slowly to new changes in the environment and becomes less able to access new resources, produce new products, and adapt to new markets (Hannan & Freeman, 1984; Nelson & Winter, 1982).

Given that experience is gained from years of operation, the intensity of inertial forces varies over the life cycle of the firm (Hannan & Freeman, 1984). Thus, firms accumulate experience through the development of established routines as they get older. Such repertoires of routines and practices make their structures reproducible but increasingly difficult to modify over time. Consequently, the older the firm is, the less likely it will be to adapt to new changes because of the structural inertia caused by old routines. In contrast, younger ventures apparently have fewer established routines than older firms. They indeed have little (if any) prior experience that biases their actions. Hence, they can be expected to have low levels of structural inertia, making them flexible and adaptable to new conditions.

The firm's age and learning modes:

New young ventures also differ from established old firms in the way they learn. For instance, Zahra, et al. (2006) argue that there is a tendency for younger firms to choose more improvised, unplanned methods of learning (e.g. improvisation and learning by doing), whereas older firms usually rely more on deliberate, planned processes to learn (e.g. experimentation). Thus, the intensity of a certain

type of learning varies with the life cycle of the firm; and this is important because using different learning modes means not only that younger and older firms may differ in knowledge-based decision making, but also that the effects of their choices may be different even if they make the same choices (Zahra, et al., 2006).

This link between learning processes and organisational age is due mainly to the availability of resources. Firms apply the solutions that have been successful in the past (Cyert & March, 1963); however, if the solution to a new problem is outside the repertoire of established routines, older firms typically have more experience and resources than younger firms to solve the problem by employing complex rational tools and formal plans such as experimentation (Zahra, et al., 2006). The solutions obtained through these highly planned learning processes, though more accurate, require the investing of substantial time and effort. Accordingly, these modes of learning may slow down the process of knowledge creation and assimilation, especially if certain contingencies occur or the information needed is incomplete (Eisenhardt & Tabrizi, 1995).

Conversely, younger firms do not possess abundant resources to spend time on planning despite the potential benefits it might offer (Delmar & Shane, 2003). In fact, they prefer to concentrate their efforts on more direct, real-time actions that demonstrate the existence of the business to stakeholders (Carter, Gartner, & Reynolds, 1996). Thus, due to their limited experience, resources and time, younger firms usually rely on improvised methods of learning to intuitively respond to the threats and opportunities of their current environment (Zahra, et al., 2006). Consistent with this view, Busenitz & Barney (1997) found that entrepreneurs involved in the start-up process of a new young venture tend to be overconfident in decision making, and to generalise the results obtained from non-robust methods and tools. "[W]ithout these biases and heuristics many decisions would never be made [by entrepreneurs]" (p. 25). In other words, entrepreneurs

apply intuition as their preferred way of thinking (Allison, Chell, & Hayes, 2000), and this behavioural pattern enables very young firms to rapidly improvise and take action with incomplete information, ambiguity and uncertainty. Although this type of learning may lead to biased solutions which are obviously not as rigorous as those obtained through planned methods, it offers faster responses because intuition and improvisation take place in short time, without waiting for additional information and resources.

Early exporting and productivity

Improving productivity involves changing certain processes and learning new ones in such a way that inputs are used in a more efficient, relatively different way. Thus, the ability to change and speed of learning are important factors which influence the rate of productivity growth. As I have highlighted in the discussion above, younger firms can be expected to be more adaptable to new conditions and also to be more disposed to learning through less time-consuming methods than older firms. These patterns suggest a potential relationship between the age of a firm and its productivity growth. In particular, I explain here how organisational age at foreign market entry may determine the intensity of productivity gains derived from exporting.

International expansion activities, such as exporting, require the firm to make a considerable effort in adapting to multiple constituent demands (regarding, for example, distribution systems, regulatory environments, national or regional culture, customers' tastes, etc.) (Zahra & George, 2002b). In order to satisfy such demands, entering foreign markets involves not only learning new routines but also unlearning some of the old ones beforehand as suggested by Autio, et al. (2000). Therefore, I argue that increases in productivity attributable to export activity depend on the degree to which the firm has a structure that is easy to modify such that it meets the new environmental conditions of foreign markets. However, adaptation to new environmental conditions may be particularly

difficult if constituent demands differ from established routines (Oliver, 1991), that is, if the firm has many established routines that must be unlearned .

When a firm decides to enter foreign markets after it has gained certain domestic experience, it is likely to have some inertial forces or, at least, a repertoire of established routines some of which must be adapted or unlearned to fit the new marketplace. In addition, since firms tend to solve new problems according to the set of solutions that have been successfully proven in the past (Cyert & March, 1963), older firms in international markets might behave as if they were in their domestic market, without adapting their routines and learning modes to rapidly respond to the new environmental conditions. This represents a barrier to learning that may hinder the rate of productivity growth resulting from the access to new knowledge from foreign markets. Obviously, strengthening the position in the domestic marketplace before exporting for the first time will unquestionably help firms to gain experience in producing and selling better products efficiently to existing customers. However, this kind of experience may reinforce habitual routines and make the adaptation to (new) foreign markets more difficult in the future (King & Tucci, 2002; Miller & Chen, 1994). Even though the experience gained in the domestic market provides older firms with some advantages over their younger counterparts (Stinchcombe, 1965), these advantages cannot be perfectly replicated in other environments.[14]

In contrast, when a firm internationalises its sales early in its life cycle, it has few established routines to unlearn due to its short history. Accordingly, as Autio, et al. (2000) argue, younger firms possess certain "learning advantages" when it comes to getting adapted to new foreign markets. In line with this idea, Zahra, Ireland, & Hitt (2000, p. 928) assert that the "[e]arly exposure to international

[14] Because the repertoire of routines reflects the values of people within the organisation, and people are, in turn, influenced by the environment where they grew up or live (Hofstede, 1983), the advantages derived from established routines might be useful only in the environment where these were developed.

markets speeds learning". Early contact with foreign markets is indeed a kind of experience that constitutes a way of building an international "identity" (Autio, et al., 2000; Brush, 1992a); and the reasoning behind this assertion is that adaptation to new conditions at early stages helps to instil openness-to-change as an imprinting value (Hannan, 1998), which in turn self-reinforces the ability to adapt to new changes in the future. Furthermore, as younger firms tend to use improvised modes of learning, those firms selling abroad from their inception or not long after are likely to be more flexible and get faster solutions to new problems.[15] This suggests that younger firms are more likely than older ones to absorb new knowledge derived from foreign markets and thus improve productivity relatively faster.

To sum up, the arguments above support the idea that the choice of entering foreign markets early or late affects productivity growth after the first exporting activity. In particular, those new ventures that internationalise their sales early in their life cycles will learn from international exposure – and consequently improve productivity – faster than those that delay their entry into foreign markets. Therefore, I predict that early exporting new ventures develop higher levels of productivity growth over time than late exporting ones.

H2.3: New ventures that start selling to foreign markets very early in their life cycle will experience a higher growth in productivity than those that delay their foreign market entry until some years after inception.

[15] Certainly, in order to obtain rapid responses, strategic decision makers avoid highly planned tools when the environment is uncertain and unpredictable (Eisenhardt, 1989), such as can be the case where foreign markets are concerned.

2.3 The impact of export-oriented entrepreneurship at the regional level: Regional economic growth

The literature on international trade suggests that exports have a positive impact on economic growth (Feder, 1982; Giles & Williams, 2000a, 2000b). Different reasons have been proposed for explaining the evidence found in previous studies of export-led growth. The simplest explanation is that, as the contribution to growth made by domestic consumption is limited to the size of regional (or national) markets, sales to foreign markets represents an additional consumption demand which increases the amount of real output produced in an exporting economy (Giles & Williams, 2000a). A more elaborate explanation has to do with the fact that export activities are associated with more productive firms (Bernard & Jensen, 1999; Bernard & Wagner, 1997)[16] or goods with high productivity levels (Minondo, 2010). Thus, export-led growth at the aggregate level may be the result of both the accumulation of within-firm productivity gains from export participation, or the reallocation of resources from comparatively less productive non-exporters to more productive exporters (Bernard & Jensen, 2004; Roberts & Tybout, 1991).

Despite the fact that the advantages derived from international trade accrue mainly to exporting firms, exports can also have an indirect economic impact because purely domestic firms usually benefit from the exposure to their export-oriented counterparts as a result of intra-national knowledge spillovers (Branstetter, 2001). For instance, new procedures or technological advancements acquired abroad by exporting firms can be copied by non-exporting firms in the domestic market, and thus the benefits of that knowledge in terms of productivity can become spread among non-exporting firms as well (Aitken, et al., 1997). Likewise, closely related to the exploitation of economies of scale, business expansion towards

[16] Exporting may lead to increases in productivity because international trade implies access to new knowledge sources, increased competition, and economies of scale. How these mechanisms work at firm level has been explained above in Sub-subsection 2.2.2.

foreign markets fosters the specialisation of production and management activities through the division of labour into (more efficient) specific tasks (Dunning, 1989), which not only leads to productivity gains as the scale of the exporting firm increases, but also to an increased demand of intermediate inputs from local suppliers (Barbosa & Eiriz, 2009). In this way, non-exporting firms may have an economic impact at the aggregate level as a consequence of the export activities of other firms.

After World War II and until recently, large multinational companies have been at the core of international trade and economic growth (Audretsch, 2007), and this was essentially due to their superior ability to gain returns from exploiting their unique resources across foreign countries. Nowadays, multinational companies still benefit from the advantages of international trade and undoubtedly make a great contribution to the economy (Cummings et al., 2010). However, as previously mentioned, large evidence exists that international markets are not longer an exclusive domain of large established corporations, but also a domain of an increasing number of new ventures which dare to exploit business opportunities globally very early in their life cycles, challenging both domestic and foreign incumbents (Bell, 1995; Knight & Cavusgil, 1996; McDougall & Oviatt, 2000; Oviatt & McDougall, 1997, 1999; Shrader, et al., 2000; Turnbull, 1987).

Below, I explain the emergence of entrepreneurship as a driving force of growth and the economic impact of its export orientation.

2.3.1 The role of entrepreneurial activity in the economy

During the last decade, the analysis of entrepreneurial activity and economic growth has attracted the attention of an increasing number of scholars and policy-makers (Audretsch, 2004; Carree & Thurik, 2003; Sternberg & Wennekers, 2005; Wennekers & Thurik, 1999). While scholars have strived to provide evidence of the impact of entrepreneurship on economic growth, policy makers have

promoted entrepreneurship based on the belief that this is a driving force for economic growth.

Nowadays, it is well known that economic growth does not result solely from increases in labour or capital, as suggested by neoclassical growth models (Solow, 1956), neither it comes automatically from investments in knowledge generation activities, as suggested by endogenous growth models (Romer, 1986). As shown by Audretsch & Keilbach (2004c), a significant amount of the variance in economic performance at the aggregate level which is not explained by traditional growth models depends, to a large extent, on entrepreneurial activity.

Table 2 presents a list of empirical studies at the country and regional level supporting Audretsch & Keilbach's (2004c) study. For instance, Stel, et al. (2005) provide evidence the influence of entrepreneurship on economic growth at country level, suggesting that it has a positive impact in rich economies but not in poor economies. In the same way, Stam & van Stel (2009) provide evidence that entrepreneurial activity has a positive impact on economic growth in rich and transition economies, but not in poor economies; however, they also found that high-growth entrepreneurs have a positive impact on economic growth in transition economies only. In contrast, Wong, Ho & Autio (2005) only provide evidence on the positive impact of high-growth entrepreneurship on economic growth at the country level. Likewise, Hessels & van Stel (2010) found that apart from the entrepreneurial activity in general, export-oriented entrepreneurship has a positive impact on economic growth in rich countries but not in poor countries.

Table 2: Empirical literature on the impact of entrepreneurial activity on economic growth

Study	Sample / Observations	Dependent variable	Measurement of entrepreneurship	Sector	Key findings
Evidence at the country level					
Hessels & van Stel (2010)	34 countries / 80 observations	Growth of real GDP (2005/2004 to 2008/2007)	TEA rate, and Export-oriented TEA rate (2002 to2005)	All private sectors	General entrepreneurship causes economic growth in both developed and developing countries, whereas export-oriented entrepreneurship cause economic growth in rich countries but not in poor countries
Stam & van Stel (2009)	36 countries / 36 observations	Growth of GDP (2002/2001 to 2005/2004)	TEA rate corresponding to overall young business entrepreneurs, high-growth young business entrepreneurs, and medium-growth young business entrepreneurs (2002)*	All private sectors	The relationship between the rate of young business entrepreneurs and economic growth is positive in rich and transition countries, but it becomes non-significant in poor countries. The rate of entrepreneurs with a medium-growth young business is positively related to growth in developed and transition countries, while the rate of entrepreneurs with a high-growth young business is positively related to growth only in transition countries
van Stel, Carree & Thurik (2005)	36 countries / 36 observations	Growth of GDP (2003/2002)	TEA rate (2002)	All private sectors	While the relationship between entrepreneurship and economic growth is positive in rich countries, it becomes negative in poor countries
Wong, Ho & Autio (2005)	37 countries / 37 observations	5-year average growth of GDP per employee (1998/1997 – 2003/2002)	TEA rate, high potential TEA, necessity TEA, and opportunity TEA (2002)	All private sectors	High potential entrepreneurship is related to labour productivity growth as measured by the growth of GDP per employee
Evidence at the regional level					
Audretsch, Bönte & Keilbach (2008)	310 West-German counties / 310 observations	Latent variable based on the level of average labour productivity and average capital productivity in the manufacturing sector (2000)	Cumulative number of start-ups (1998 to 2000) per capita	High-tech and ICT sectors	Innovation efforts increases technical knowledge and knowledge based entrepreneurship, while these, in turn, improve regional economic performance
Audretsch & Keilbach (2004a)	327 West-German counties / 327 observations	Labour productivity (1992)	Cumulative number of start-ups (1989 to 1992) per thousand inhabitants	All private sectors, as well as high-tech and ICT sectors	Entrepreneurship in general and knowledge based-entrepreneurship, in particular, enhance regional labour productivity

Study	Sample / Observations	Dependent variable	Measurement of entrepreneurship	Sector	Key findings
Audretsch & Keilbach (2004b)	327 West-German counties / 327 observations	Growth in labour productivity (2000/1992)	Cumulative number of start-ups (1989 to 1992) per capita	All private sectors, as well as high-tech and ICT sectors	Entrepreneurship in general and knowledge based-entrepreneurship, in particular, enhance growth of regional labour productivity
Audretsch & Keilbach (2004c)	327 West-German counties / 327 observations	Gross added value (1992)	Cumulative number of start-ups (1989 to 1992) per thousand inhabitants	All private sectors, as well as high-tech and ICT sectors	Entrepreneurship in general and knowledge based-entrepreneurship, in particular, improve regional output in addition to the contribution of production inputs
Audretsch & Keilbach (2008)	440 German counties / 440 observations	Gross added value of manufacturing sectors (2000)	Cumulative number of start-ups (1998 to 2000) per thousand inhabitants	All private sectors, as well as high-tech and ICT sectors	Entrepreneurship in general and knowledge based-entrepreneurship, in particular, improve regional output in addition to the contribution of production inputs
González-Pernía, Peña-Legazkue & Vendrell-Herrero (2011)	17 Spanish regions / 85 observations	GDP per employee (2000 to 2004)	Latent variable based on TEA rate and net firm entry (2004 to 2006)	All private sectors	Growth of GDP per employee is higher in regions with high levels of both innovation and entrepreneurial capabilities than in regions with low innovation capability and/or low entrepreneurial capability

Notes: * These indicators refer to the part of TEA rate corresponding to owners/managers of a business with less than 42 months old (baby business initiatives), excluding those entrepreneurs whose business is less than 3 months old (nascent initiatives).

At the regional level, González-Pernía, Peña-Legazkue & Vendrell-Herrero (2011) provides evidence that the regional effort in knowledge creation has a positive impact on economic growth when the region is also highly entrepreneurial. Finally, in a series of studies, Audretsch & Keilbach (2004a, 2004b, 2004c, 2008) and Audretsch, Bönte & Keilbach (2008) analyse the impact of entrepreneurship in overall industries, as well as in high-tech and ICT industries, on the economic growth of German regions using different approaches. In all cases, the evidence is positive.

Behind the empirical evidence briefly summarised above there are several explanations. For instance, entrepreneurial activity is expected to generate wealth in the economy by introducing new combinations of knowledge (Schumpeter, 1934) that results in the creation of markets for novel products (Casson & Wadeson, 2007), as well as highly skilled jobs (van Stel & Storey, 2004). Likewise, new business formation derived from entrepreneurial activity is linked to increased competition (Porter, 1998a) and productivity improvements within existing industries (Callejón & Segarra, 1999). What is more, from an evolutionary economics perspective, diversity and selection are two mechanisms through which an economy changes (Nelson & Winter, 1982), and entrepreneurial activity can be seen as a source of diversity which drives economic growth through the selection and exploitation of new business opportunities that have been recognised from existing knowledge.

As knowledge is characterised by the uncertainty of its economic value (Arrow, 1962), different economic agents are expected to perceive the value of a given piece of knowledge in very different ways according to their own experience and knowledge corridor (Shane, 2000). When an individual discovers that a particular piece of knowledge has a high economic value and decides to exploit it through a new venture, he or she contributes to the economy by generating value from the knowledge that would otherwise have remained non-commercialised (Acs, et al., 2009). In this way, entrepreneurial activity functions as a mechanism for spreading knowledge in the Society, and constitutes a vehicle linking general knowledge and economic knowledge (Audretsch & Keilbach, 2004b).

Knowledge is thus a necessary, but not sufficient, condition for economic growth. For knowledge to have an impact, it must be introduced in the market in form of new methods, products and services. Entrepreneurial activity plays a significant role in enhancing economic growth through the exploitation of knowledge. As a result, regions with similar levels of knowledge investment may experience

different rates of economic growth as a result of the variance in entrepreneurial activity. In line with this view, I propose the following hypothesis:

H3.1: Regions with higher levels of general entrepreneurial activity exhibit higher rates of economic growth.

2.3.2 Entrepreneurial activity, exports and economic growth

In general, entrepreneurial activity is viewed as a source of economic growth. However, its actual economic impact is not a function of the numbers of individuals who become entrepreneurs (Shane, 2009). Different types of entrepreneurial activity are indeed expected to exert a different influence on economic growth (Carree & Thurik, 2003). For instance, Wong et al. (2005) provides evidence that, while general entrepreneurial activity does not guarantee economic development, the segment of high-growth entrepreneurs makes a significant contribution to economic performance. Stam &van Stel (2009) support this view with similar findings showing a significant relationship between growth-oriented entrepreneurship and economic growth in most developed countries. Other type of entrepreneurial activity with a likely stronger influence on economic growth is export-oriented entrepreneurship. Entrepreneurs who decide to grow through exporting are expected to enhance economic growth by serving both domestic and foreign markets. Consistent with this view, Hessels & van Stel (2010) found a significant relationship between export-oriented entrepreneurship and economic growth in developed countries.

Exporting as an internationalisation activity involves a process of adapting to and learning from new markets. While adaptation consists in generating new routines and changing old ones, learning is a path-dependent process through which firms learn on the basis of what they already know (Cohen & Levinthal, 1990; Zahra &

George, 2002a). In particular, as argued by Autio, et al. (2000), new (young) ventures (possessed of fewer cognitive, political and relational barriers to learning) might benefit from some learning advantages in international markets because they are able to absorb foreign knowledge more rapidly than their older counterparts. The rationality behind this idea is supported by the fact that very young firms usually have low levels of structural inertia (Hannan & Freeman, 1984) and learn through less time-consuming processes (Zahra, et al., 2006).

As described above in section 2.2.2, the exposure to international markets provides firms with some sources of productivity growth, namely the access to new knowledge, the influence of competitive pressures, and the development of economies of scale or the specialisation of the production. I believe that exporting-oriented new ventures have a greater impact on economic growth, not only because they may benefit from learning advantages to increase productivity at the firm level when they get involved in international trade, but also because productivity at the aggregate level may increase through the reallocation of resources from (less productive) domestic firms to (more productive) exporting firms (Bernard & Jensen, 2004); or through the generation of knowledge spillovers that make it possible that technological and operational efficiencies gained by exporting-firms from the exposure to international markets are shared with other firms in the (intra-national) domestic market (Branstetter, 2001).

Regarding the last point, most of the knowledge acquired from foreign markets is translated into experience and firm specific skills (Johanson & Vahlne, 1977), a kind of knowledge which is usually complex and tacit. In contrast to codified knowledge, which is easily replicated and transferred in the distance, tacit knowledge is linked to people, and better transferred on face-to-face basis (Polanyi, 1958; von Hippel, 1994). Hence, geographic proximity is important for knowledge spillovers to emerge and have an effect on economic agents located in the same region (Audretsch, 1998). Interactions between export-oriented and

domestic new ventures are likely to be stronger – and more effective in terms of transferring productivity-related knowledge – within a region (or among neighbour regions) than across regions located in opposite ends of a country. Thus, the impact of export-oriented entrepreneurship on economic growth should be more relevant at the regional level. Accordingly, I propose the following hypothesis:

H3.2: In addition to the impact of general entrepreneurial activity, regions with higher prevalence of export-oriented entrepreneurial activity exhibit higher rates of economic growth.

One could reasonably argue that the benefits derived from selling to foreign markets depend on the extent (degree) of exports. Low levels of export intensity may represent sporadic sales which are not part of the firm's strategy, but the result of unsolicited orders (Bilkey & Tesar, 1977; Czinkota, 1982). While firms with a small percentage of total sales achieved abroad have contact with a few number of foreign customers who provide limited access to new knowledge, more internationally engaged firms accumulate new knowledge from a broader flow of sources. Therefore, the former ones are presumably less able to take advantage of export activities than the former ones, for which export activities are an ordinary and substantial part of the firm's activities.

In agreement with these ideas, Fryges & Wagner (2008) related productivity to export sales ratio, and found that higher export intensity is related to higher productivity growth. In the same way, I argue that the impact of export-oriented entrepreneurship on economic growth varies according to the level of commitment to foreign markets. This leads to propose the last hypothesis of the present study as follows:

H3.3: Regions with higher prevalence of export-oriented entrepreneurial initiatives that sell to a substantially high proportion of foreign customers (more than 25% or more than 75%) exhibit higher rates of economic growth.

Chapter 3:

Methodology

Given the integrative nature of this research which not only analyses some of the antecedents and outcomes of export-oriented entrepreneurship, but also does so by including different units and levels of analysis, I rely on several methodologies and datasets to test the three groups of hypotheses outlined in the previous chapter. In what follows I describe the methods and data used in each block.

3.1 Methods and data on the antecedents of export-oriented entrepreneurship

3.1.1 Empirical model

Building on the extant literature, the model on the antecedents of export-oriented entrepreneurship starts from the idea that there are differences in export-oriented behaviour among early-stage entrepreneurs that cannot be solely explained by individual and firm-specific factors. Therefore, I use a multilevel modelling approach to analyse the influence of certain environmental factors in addition to individual and firm-specific factors. According to Luke (2004), "[a] multilevel model is a statistical model applied to data collected at more than one level in order to elucidate relationships at more than one level." Thus, "[t]he goal of a multilevel model is to predict values of some dependent variable based on a function of predictor variables at more than one level."(p. 7 and 9)

I have data consisting of early-stage entrepreneurs grouped into regions or industries. Thus, I consider individual and firm-specific variables related to the entrepreneur and his or her entrepreneurial venture, respectively, to be measured and modelled at level-1; and environmental variables related to the regional or industrial context to be measured and modelled at level-2. The form of this multilevel model can be seen in the following system of equations:

$$\text{Level-1:} \quad \log\left[p_{ij/k} / \left(1 - p_{ij/k}\right)\right] = \beta_{0j/k} + \beta_{1j/k} X_{ij/k} \tag{1}$$

$$\text{Level-2:} \quad \beta_{0j/k} = \gamma_{00} + \gamma_{01} W_{j/k} + u_{0j/k}$$

$$\beta_{1j/k} = \gamma_{10}$$

The level-1 part of the model is similar to a typical logit regression[17], where $p_{ij/k}$ is the probability that the early-stage entrepreneur i in region j / industry k is involved in the start-up process of an export-oriented new venture or is the owner/manager of an export-oriented business that is less than 42 months old; $\beta_{0j/k}$ is the intercept in region j / industry k; $X_{ij/k}$ is the vector of individual and firm-specific control variables measured at level-1; and $\beta_{1j/k}$ is the effect of such variables.

The level-2 part of the model indicates that the level-1 intercept, $\beta_{0j/k}$, is a function of level-2 predictors, where γ_{00} is the mean value of the level-1 dependent variable once controlled for the effect of explanatory variables at level 2; $W_{j/k}$ is the vector of environmental explanatory variables measured at level-2 that correspond to regions j / industries k; γ_{01} is the effect of such variables; and $u_{0j/k}$ is the random effect that capture the variability of the dependent variable across regions j /

[17] For a logit regression the error term, ε_{ij}, is assumed to be logistic-distributed with mean zero and constant variance $\pi^2/3$. Hence, it is not shown in equation (1).

industries *k*. The level-2 part of the model also indicates that the effect of level-1 control variables, $\beta_{1j/k}$, is an aggregate constant measured by γ_{10}, which represents the mean effect of the level-1 control variables across regions *i* / industries *j*.

Instead of representing the model through a system of equations, I can substitute the level-2 part into the level-1 part and obtain a mixed effect model as follows:

$$\log\left[p_{ij/k}/\left(1-p_{ij/k}\right)\right]=\gamma_{00}+\gamma_{10}X_{ij/k}+\gamma_{01}W_{j/k}+u_{0j/k} \quad (2)$$

The model shows how each region or industry analysed in the study has a different intercept measuring its specific average rate of export-oriented entrepreneurs, because according to the hypotheses outlined above I consider that the prevalence of early-stage entrepreneurs involved in export-oriented activities in a given region or industry depends on the specific conditions of such environment, which are captured by the random effect. In contrast, the model has constant slopes across the level-2 units because I do not have theoretical reasons to think that the effect of predictors at level-1 varies across level-2 units.[18] In other words, I assume that the effect of individual and firm-specific predictors on the probability of being export-oriented is the same across regions and industries.

3.1.2 Database

I created a dataset including individual and firm-specific variables, as well as regional and industrial variables explaining the export-oriented behaviour of early-stage entrepreneurs. The main source I used for individual and firm-specific data was the Spanish Global Entrepreneurship Monitor (GEM) project. The GEM project is an international research consortium focused on entrepreneurship that annually conducts a standardised study in more than forty countries since the end

[18] Apart from that, a preliminary empirical analysis of the data indicates no heterogeneity of slopes among level-2 units (i.e., regions or industries).

of the nineties (see Reynolds et al., 2005 for more details). Spain joined the project in 1999 on the basis of a nationally representative sample. However, the representativeness of the sample has been expanded to a regional level since 2003, and nowadays all Spanish regions are covered with own representative samples of adult population (18-64 years old). I obtained Spanish GEM data at the individual and firm level from years 2005 to 2009, and gathered them in a merged dataset. This dataset was complemented with data on FDI flows and accumulated knowledge at the regional (NUTS-2 regions) and industrial (NACE Rev. 2 sections) level from the Secretary for Foreign Trade of the Spanish Ministry of Industry, Tourism and Trade, and the Spanish Institute of Statistics (Instituto Nacional de Estadística, INE by its Spanish acronym), respectively.

The unit of analysis is the early-stage entrepreneur (nascent and new entrepreneur), which refers to an individual that either is involved in starting a new venture or is the owner/manager of a business that is less than 42 months old (Reynolds, et al., 2005). In this way, I focus on phases near to the entrepreneur's firm inception in order to analyse the export-oriented behaviour as an early internationalisation activity, similarly to previous studies (De Clercq, et al., 2008). The sample consists of 5,794 early-stage entrepreneurs from all 17 autonomous communities of Spain, as well as from 17 out of 21 aggregate industries representing all economic activities.[19] Thus, the sample is representative of the Spanish population of entrepreneurs across regions and sectors.

[19] The following activities were excluded: Agriculture, forestry and fishing (NACE Rev.2 section A); Public administration and defence, compulsory social security (NACE Rev.2 section O); Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use (NACE Rev.2 section T); and Activities of extraterritorial organisations and bodies (NACE Rev.2 section U).

3.1.3 Measurement of variables

Dependent variable

Export orientation: A dichotomous variable measures whether the early-stage entrepreneur has an export-oriented behaviour based on the propensity of his or her new venture to serve foreign customers (*Export*). If 1% or more of the customers of the entrepreneur's new venture are located abroad, this variable takes the value one (1); otherwise, it takes the value zero (0). Consistent with the view that the phenomenon of international entrepreneurship implies that the internationalisation behaviour is embedded in the start-up process (Fletcher, 2004; Oviatt & McDougall, 1994), my measure of export-oriented behaviour corresponds to entrepreneurs who are currently involved in the start-up process of a new venture which sells goods or services to some foreign customers or entrepreneurs who have recently gone through this process.

Independent variables

Exposure to FDI: Two types of FDI activities can be distinguished in a given environment. While inward FDI refers to direct investments in productive assets of an economy made by foreign investors, outward FDI refers to direct investments in productive assets of a foreign country made by domestic investors. In both cases, the investment must imply a lasting interest for the investor in order to be considered as FDI. A lasting interest means a long-term strategic relation in which the investor has a significant degree of control over the management decisions of the acquired asset, which is usually evidenced when the investor has an ownership stake of at least 10% of the voting power over the acquired asset (OECD, 2008). I operationalised the exposure to FDI as the gross flow of inward (*Inward FDI*) or outward FDI (*Outward FDI*) in thousand Euros per firm in the region *j* or industry *k* in which the early-stage entrepreneur *i* operates. This measure refers only to new investments that take place in the form of equity

participation[20], and it excludes the investments by foreign securities holding companies which operate in Spain for tax purposes. Given that both inward and outward FDI flows are subject to a high level of stochastic disturbance, I use an average measure over five years (from 2005 to 2009). Data for this variable were obtained from the Secretary for Foreign Trade of the Spanish Ministry of Industry, Tourism and Trade.

Stock of technological knowledge: The stock of technological knowledge refers to the amount of knowledge resources generated and accumulated over time that is ready for commercial exploitation by economic actors. R&D activities are one of the most important source of knowledge (Audretsch, 1998). Therefore, based on the methodology proposed by Soete & Patel (1985), I construct this variable by averaging the past flows of R&D investment at the regional or industrial level.[21] The operationalised measure is the stock of technological knowledge (*R&D stock*) in thousand Euros per firm in the region *j* or industry *k* in which the early-stage entrepreneur *i* operates. Similarly to the measurement of FDI exposure, I use an average measure over five years (from 2005 to 2009). Data for the calculation of this variable come from the Statistics about R&D activities provided by the INE.

[20] Other components of FDI are reinvested earnings and inter-firm loans. However, the data source I use only provides information on equity participation.

[21] Soete & Patel (1985) assume that R&D investments in a given year take an average period of 5 years to be completely incorporated in the stock of technological capital, in such a way that nothing is incorporated in the stock during the year in which the investment was made, 20% is incorporated in the first year following the investment, 30% is incorporated both in the second year and in the third year following the year of the investment, and the remaining 20% is incorporated in the fourth year following the investment. Apart from that, they also take into account the depreciation of the knowledge accumulated in previous years due to the obsolescence that takes place with the passage of time by assuming an annual depreciation rate of 15%. Accordingly, the stock of technological knowledge per firm is estimated as follows:

$$R\&Dstock/Firm_{\ t} = \frac{(1-0.15)\ R\&Dstock_{t-1}+0.2\ R\&D_{t-1}+0.3\ R\&D_{t-2}+0.3\ R\&D_{t-3}+0.2\ R\&D_{t-4}}{Firms_t}$$

where *R&Dstock/Firm* denotes the stock of technological knowledge per firm, *R&D* denotes the flows of R&D investment, and *Firm* is the total number of existing firms in at the aggregate unit of analysis.

Control variables

Most studies on the determinants of international entrepreneurship take into account individual and firm-specific variables to explain early internationalisation (Andersson & Evangelista, 2006; Bloodgood, et al., 1996; Dhanaraj & Beamish, 2003; Harveston, et al., 2000; Hollenstein, 2005; Orser, et al., 2010; Westhead, et al., 2001). I control for some of these variables which have been found to be important in the extant literature.

Individual control variables: As an entrepreneurial behaviour that involves more risk than merely starting a business, the export-oriented behaviour of an early-stage entrepreneur may be influenced by his or her demographic characteristics and human capital (Federico, Kantis, Rialp, & Rialp, 2011; Westhead, et al., 2001), as well as by his or her perceptions (Acedo & Jones, 2007).

Three demographic variables are added to the analysis as controls. First, I include a gender dummy to capture whether the early-stage entrepreneur is male or female (*Male*). As it has been suggested in the entrepreneurship literature, men and women involved in entrepreneurial activity usually have different business goals (Brush, 1992b; Verheul, van Stel, & Thurik, 2006). Female entrepreneurs are particularly more concerned with quality of life and the balance between economic and non economic goals than men are. That is, women are more likely to deliberately choose not to pursue firm growth in return for other goals (Cliff, 1998). Accordingly, female entrepreneurs are expected to be less export-oriented than their male counterparts (Orser, et al., 2010). Second, I also include a count variable for age in number of years (*Age*) to capture how old the early-stage entrepreneur is. The arguments used in the literature in order to hypothesise the impact of individuals' age on their entrepreneurial performance and growth are contradictory. While some authors argue that young entrepreneurs perform better than older ones (van Praag, 1996), probably because they benefit from higher levels of energy and stamina (Sapienza & Grimm, 1997) and due to their more

favourable attitude towards change, growth and risk-taking decisions (Bantel & Jackson, 1989), others authors assert that older entrepreneurs are likely to have a higher experience, a stronger financial situation and a wider network of social and business contacts that help them to be successful (Blackburn, Mackintosh, & North, 1998; Peña, 2002; Verheul & van Stel, 2007; Weber & Schaper, 2004), and expand their new ventures towards foreign markets (Westhead, et al., 2001). For the aforementioned reasons, the relationship between the age of the entrepreneur and the likelihood of being export-oriented is non-linear, as has been suggested by some studies (Federico, et al., 2011). This relationship may actually peak at a certain age threshold, and decrease afterwards due to lower energy levels, part-time involvement and lower inclination to pursue firm growth. Following this rationale, I include the age squared term (Age^2) to capture the potentially decreasing positive effect of the early-stage entrepreneur's age on his or her export orientation. Third, I also include a dummy variable that indicates whether the entrepreneur is immigrant or not in order to control for the ethnic background (*Immigrant*). The ethnic background may have an impact on the propensity of an entrepreneur to become exporter (Madsen & Servais, 1997; McDougall, Shane, & Oviatt, 1994). In particular, immigrants may be more internationally oriented because they know the marketplace both in their host country and their country of origin, as well as because they usually have certain language proficiencies and access to networks of other immigrants around the world.

Since higher levels of human capital provide the ability to identify and exploit opportunities internationally (Brush, Edelman, & Manolova, 2002; Federico, et al., 2011; Westhead, et al., 2001), I control for three variables related to the early-stage entrepreneur's human capital. First, the literature in economics suggests that education is a good proxy for human capital. Therefore, I control for the educational attainment by including a dummy variable that indicates whether or not the early-stage entrepreneur has a bachelor's degree or higher (*College graduate*). Second, I include a dummy variable that indicates that the early-stage

entrepreneur has recently had an entrepreneurial experience as measured by being involved in a firm closure during the last year (*Recent experience*). Such kind of experience adds to entrepreneurs' human capital by offering the opportunity to learn valuable knowledge, as well as to enhance the ability and potential for recognition of international business opportunities (Federico, et al., 2011; Wright, et al., 2007). Third, I also include a dummy variable that indicates whether or not in the last three years the early-stage entrepreneur has invested in a new venture started by someone else (*Investor experience*). Prior experience as investor in other businesses provides entrepreneurs with an increased knowledge of - and access to - financial sources and networks of business contacts, which makes them able to go through risky activities (e.g., exporting) when they become entrepreneurs. As suggested by Westhead, et al. (2001), highly educated and experienced entrepreneurs are expected to be more export-oriented.

Finally, I control for three perceptual variables. Perceptions are attitudes and beliefs of individuals that represent subjective thoughts or the awareness of certain situations without having an objective evidence of what might be expected (Arenius & Minniti, 2005). As Arenius & Minniti (2005) found, perceptual variables influence the entrepreneurial behaviour of individuals. Within this group of variables, I first include a dummy to control whether the early-stage entrepreneur perceives or not that there are good business opportunities in the market in the very short term (*Opportunity alertness*). The perception of business opportunities implies alertness, which is one of the most important and distinctive characteristics of entrepreneurial behaviour (Kirzner, 1979). And alertness is essential for recognizing and exploiting internationally oriented opportunities (Kontinen & Ojala, 2011) because early alert entrepreneurs are expected to be able to link resources from different countries with international market needs (Oviatt & McDougall, 1994). Second, I include a dummy that indicates whether the early-stage entrepreneur perceives or not that he or she possesses the proper knowledge, skill and experience to be entrepreneur (*Entrepreneurial skills*). Given

that entrepreneurial decision making is linked to intentions, confidence in one's skills and the ability to start a business is essential for entrepreneurial behaviour (Arenius & Minniti, 2005), and therefore such perception is expected to have a positive impact on the involvement in international activities. Third, I control for the risk taking behaviour of the early-stage entrepreneur by including a dummy that indicates whether he or she has no fear of failure (*No fear of failure*). A high perception of fear of failure is a constraint for entrepreneurial behaviour and growth, especially when growth is achieved through exporting since risk is an important component of the entry into foreign markets (Acedo & Florin, 2006; Acedo & Jones, 2007). To sum up, higher business opportunity perception and confidence in one's skills and abilities, along with lower perception of likelihood of failure, should increase the probability that an early-stage entrepreneur will be export-oriented.

Firm-specific control variables: Apart from the demographic characteristics, human capital and perceptions of the early-stage entrepreneur, there are also firm-specific factors of the new venture that may be also important for early internationalisation (Bloodgood, et al., 1996; Campbell, 1996; Dhanaraj & Beamish, 2003). Firm-specific factors refers to unique resources and capabilities that provide organisations with sustainable competitive advantage (Barney, 1991). Focusing on the internal resources and capabilities of their new ventures, early-stage entrepreneurs may be able to tap into foreign markets' imperfections and enter such markets to achieve international sales.

In the present study, I control for three firm-specific resources. I first include a count variable to capture the size of the new venture in terms of employment (*Number of employees*) as a proxy of internal resources. This measure excludes the employment corresponding to entrepreneur founders, even if their allocation of time to the new venture represents full-time jobs. A positive effect of this variable on the export-oriented behaviour of the early-stage entrepreneur is

expected (Ruzzier, Hisrich, & Antoncic, 2006; Westhead, et al., 2001). Second, I also include a count variable to control for the expected employment growth in five years (*Expected growth*) because growth expectations are usually linked to the availability of resources to grow; and more importantly, because a growth-seeking behaviour may be the reflection a proactive attitude towards early international expansion (Baum, Schwens, & Kabst, 2011). Third, I include a count variable to capture the size of the entrepreneurial team (*Number of founders*) as a proxy of the potential resources provided by entrepreneurs in terms of multidisciplinary experience, financial capacity and business contacts and networks. Both the ambition to growth and the dimension of the team are expected to have a positive impact on the export-oriented behaviour of early-stage entrepreneurs.

To conclude, as for the firm-specific capabilities I include two control variables more. On the one hand, a dummy variable indicates whether the good or service offered by the new venture is or not considered new by all customers (*New to all customers*) in order to capture for its degree of innovation capacity. The capability to create an innovative product or service is one of the factors explaining the success of international new ventures (Pla-Barber & Alegre, 2007), especially if it can be commercialised through an international strong network (Dhanaraj & Beamish, 2003; Ø. Moen, 2002; Oviatt & McDougall, 1994). On the other hand, I also take into account the use of recent technologies by including a dummy that indicates whether the technologies required to create the product or service offered by the new venture have been available for less than one year or not (*New technology base*). Technological capability through the use of most recent technology developments in communication and production allow early-stage entrepreneurs to serve the market very fast, as well as to improve the production process or the provision of services to meet the global demand using a small-scale operation that could be economically feasible. These variables strengthen the

ability to reach foreign markets (Dhanaraj & Beamish, 2003), and therefore both of them are expected to have a positive effect on early export orientation.

3.1.4 Descriptive statistics

Table 3, Table 4 and Table 5 summarise the whole sample of entrepreneurs, the sample of export-oriented entrepreneurs and the sample of non-export-oriented entrepreneurs, respectively, according to the descriptive statistics of the variables under analysis.

Table 3: Descriptive statistics for the whole sample

Dependent variable	**Mean**	**s.d.**	**Min.**	**Max.**	**Obs.**
Export	0.36	0.48	0.00	1.00	5,794
Independent variables	**Mean**	**s.d.**	**Min.**	**Max.**	**Obs.**
Individual/firm level, N=5,794					
Male	0.59	0.49	0.00	1.00	5,794
Age	39.61	11.10	18.00	65.00	5,794
Immigrant	0.10	0.31	0.00	1.00	5,794
College graduate	0.34	0.47	0.00	1.00	5,794
Recent experience	0.04	0.19	0.00	1.00	5,794
Investor experience	0.08	0.27	0.00	1.00	5,794
Opportunity alertness	0.38	0.49	0.00	1.00	5,794
Entrepreneurial skills	0.92	0.28	0.00	1.00	5,794
No fear of failure	0.31	0.46	0.00	1.00	5,794
Number of employees	2.00	4.70	0.00	100.00	5,794
Expected growth	3.20	9.03	-25.00	282.00	5,794
Number of founders	1.83	1.19	1.00	10.00	5,794
New to all customers	0.18	0.39	0.00	1.00	5,794
New technology base	0.06	0.24	0.00	1.00	5,794
Regional level, N=17					
Inward FDI	3.47	7.07	0.10	24.86	5,794
Outward FDI	13.69	29.55	0.30	182.11	5,794
Total FDI	17.16	33.04	0.61	182.87	5,794
% of inward FDI	29.97	16.99	0.42	63.68	5,794
R&D Stock	11.33	6.47	2.52	25.00	5,794
Industrial level, N=17					
Inward FDI	6.21	33.18	0.15	585.63	5,794
Outward FDI	14.21	54.46	0.01	607.09	5,794
Total FDI	20.43	82.01	0.16	1192.72	5,794
% of inward FDI	56.76	20.28	6.51	96.04	5,794
R&D stock	4.76	10.23	0.01	71.62	5,794

Notes: All monetary values in thousands of Euros

Table 4: Descriptive statistics for the sample of export-oriented entrepreneurs

Variables	Mean	s.d.	Min.	Max.	Obs.
Individual/firm level, N=2,069					
Male	0.61	0.49	0.00	1.00	2069
Age	39.33	10.97	18.00	65.00	2069
Immigrant	0.14	0.35	0.00	1.00	2069
College graduate	0.37	0.48	0.00	1.00	2069
Recent experience	0.05	0.22	0.00	1.00	2069
Investor experience	0.09	0.29	0.00	1.00	2069
Opportunity alertness	0.41	0.49	0.00	1.00	2069
Entrepreneurial skills	0.93	0.25	0.00	1.00	2069
No fear of failure	0.32	0.47	0.00	1.00	2069
Number of employees	2.14	5.51	0.00	100.00	2069
Expected growth	3.53	9.64	-25.00	200.00	2069
Number of founders	1.85	1.16	1.00	10.00	2069
New to all customers	0.25	0.44	0.00	1.00	2069
New technology base	0.08	0.28	0.00	1.00	2069
Regional level, N=17					
Inward FDI	3.69	7.28	0.10	24.86	2069
Outward FDI	14.25	29.99	0.30	182.11	2069
Total FDI	17.94	33.60	0.61	182.87	2069
% of inward FDI	30.41	17.37	0.42	63.68	2069
R&D Stock	11.39	6.54	2.52	25.00	2069
Industrial level, N=17					
Inward FDI	6.45	34.63	0.15	585.63	2069
Outward FDI	13.69	52.97	0.01	607.09	2069
Total FDI	20.14	82.90	0.16	1192.72	2069
% of inward FDI	56.99	19.76	6.51	96.04	2069
R&D Stock	4.87	10.03	0.01	48.70	2069

Notes: All monetary values in thousands of Euros

For the whole sample, more than a third of the early-stage entrepreneurs included in the sample are export-oriented (36%). More specifically, there are 2,069 entrepreneurs who are export-oriented and 3,725 who are non-export-oriented. Male entrepreneurs represent 59% of the whole sample, 61% of the sample of export-oriented entrepreneurs, and 58% of the sample of non-export-oriented entrepreneurs. The mean age of the total sample of entrepreneurs is 39.6 years, and there are not noticeable age differences between export-oriented ones (39.3

years) non-export-oriented ones (39.8 years). Immigrant entrepreneurs comprise 10% of the total sample, 14% of the sample of export-oriented entrepreneurs and 8% of the sample of non-export-oriented entrepreneurs.

Table 5: Descriptive statistics for the sample of non-export-oriented entrepreneurs

Variables	Mean	s.d.	Min.	Max.	Obs.
Individual/firm level, N=3,725					
Male	0.58	0.49	0.00	1.00	3725
Age	39.77	11.17	18.00	65.00	3725
Immigrant	0.08	0.28	0.00	1.00	3725
College graduate	0.32	0.47	0.00	1.00	3725
Recent experience	0.03	0.18	0.00	1.00	3725
Investor experience	0.07	0.25	0.00	1.00	3725
Opportunity alertness	0.37	0.48	0.00	1.00	3725
Entrepreneurial skills	0.91	0.29	0.00	1.00	3725
No fear of failure	0.30	0.46	0.00	1.00	3725
Number of employees	1.92	4.19	0.00	70.00	3725
Expected growth	3.01	8.67	-20.00	282.00	3725
Number of founders	1.82	1.20	1.00	10.00	3725
New to all customers	0.14	0.35	0.00	1.00	3725
New technology base	0.05	0.22	0.00	1.00	3725
Regional level, N=17					
Inward FDI	3.35	6.95	0.10	24.86	3725
Outward FDI	13.37	29.30	0.30	182.11	3725
Total FDI	16.72	32.72	0.61	182.87	3725
% of inward FDI	29.72	16.77	0.42	63.68	3725
R&D Stock	11.30	6.44	2.52	25.00	3725
Industrial level, N=17					
Inward FDI	6.08	32.34	0.15	585.63	3725
Outward FDI	14.50	55.27	0.01	607.09	3725
Total FDI	20.58	81.53	0.16	1192.72	3725
% of inward FDI	56.64	20.56	6.51	96.04	3725
R&D Stock	4.70	10.35	0.01	71.62	3725

Notes: All monetary values in thousands of Euros

Entrepreneurs with bachelor's or higher degree, recent entrepreneurial experience or investor experience represent 34%, 4% and 8% of the total sample, respectively. For export-oriented entrepreneurs these figures are 37%, 5%, 9%; whereas for non-export-oriented entrepreneurs they are 32%, 3% and 7%, respectively. Besides, 38% of the total sample is made up of alert entrepreneurs

who perceive business opportunities in the short term, 92% corresponds to entrepreneurs who perceive that they have the skills and knowledge required to be entrepreneur, and 31% corresponds to those who perceive that the fear of failure would not prevent them from being entrepreneur. In particular, alert entrepreneurs represent 41% in the case of export-oriented entrepreneurs and 37% in the case of non-export-oriented ones; entrepreneurs who perceive they have entrepreneurial skills represent 93% in the case of export-oriented entrepreneurs and 91% in the case of non-export-oriented ones; and entrepreneurs who perceive they have no fear of failure represent 32% in the case of export-oriented entrepreneurs and 30% in the case of non-export-oriented ones.

The average size of early-stage entrepreneurs' new ventures for the whole sample is 2.00 employees, and the average expected growth in five years is 3.2 employees. While the new venture's size ranges from 0 to 100 employees, the expected growth ranges from -25 to 282 employees, which indicates that some new ventures are planning to decrease their employment size. For export-oriented entrepreneurs, the average new venture's size is 2.14 employees, whereas for non-export-oriented entrepreneurs it is 1.92 employees. In terms of growth in five years, export-oriented entrepreneurs expect to create 3.53 new jobs while non-export oriented entrepreneurs expect to create 3.01 new jobs. In addition, the average size of the entrepreneurial team is 1.83 founder members for the total sample (with a minimum of one and a maximum of ten founder members). No differences in the size of the entrepreneurial team arise when comparing export-oriented entrepreneurs (1.85 founder members) and non-export-oriented entrepreneurs (1.82 founder members). Entrepreneurs whose new ventures offer a good or service new to all customers represent 18% of the total sample, 25% of the sample of export-oriented entrepreneurs, and 14% of the sample of non-export-oriented entrepreneurs. Finally, entrepreneurs whose new ventures rely on new technologies with less than one year represent 6% of the whole sample, 8%

of the sample of export-oriented entrepreneurs and 5% of the sample of non-export-oriented entrepreneurs.

As for the environmental conditions, the regions in which early-stage entrepreneurs included in the total sample are located show an average inward FDI activity of 3.47 thousand Euros per firm (with a minimum of 0.10 and a maximum of 24.86 thousand Euros per firm), and an average outward FDI activity of 13.69 thousand Euros per firm (with a minimum of 0.30 and a maximum of 182.11 thousand Euros per firm). Put differently, the mean of total FDI across regions is 17.16 thousand Euros per firm of which approximately 30% corresponds to inward FDI. Compared to non-export-oriented entrepreneurs, those who are export-oriented seem to be located in regions with a slightly higher amount of total FDI (17.94 thousand Euros per firm versus 16.72 thousand Euros per firm) and a slightly higher proportion of inward FDI (30.41% over the total FDI versus 29.79% over the total FDI). Apart from that, the regional stock of technological knowledge reaches an average amount of 11.33 thousand Euros per firm (which ranges from 2.52 to 25 thousand Euros per firm). In this case, there are not noticeable differences in the stock of technological knowledge between the regions in which export-oriented entrepreneurs and non-export-oriented entrepreneurs tend to be located (11.39 thousand Euros per firm versus 11.30 thousand Euros per firm). In contrast, the industries in which early-stage entrepreneurs included in the total sample operate show an average inward FDI of 6.21 thousand Euros per firm (with a minimum of 0.15 and a maximum of 585.63 thousand Euros per firm), and an average outward FDI of 14.21 thousand Euros per firm (with a minimum of 0.01 and a maximum of 607.09 thousand Euros per firm). Said another way, the mean of total FDI across industries is 20.43 thousand Euros per firm of which approximately 56.76% corresponds to inward FDI. On a disaggregated basis, although the industries in which export-oriented entrepreneurs tend to operate show a slightly lower amount of total FDI than the industries in which non-export-oriented entrepreneurs operate (20.14 thousand

Euros per firm versus 20.58 thousand Euros per firm), they are also characterised by a slightly higher proportion of inward FDI over the total FDI (56.99% versus 56.64%). Finally, the industrial stock of technological knowledge for the whole sample represents an average amount of 4.76 thousand Euros per firm (which ranges from 0.01 to 71.62 thousand Euros per firm). Nonetheless, export-oriented entrepreneurs tend to operate in industries with a slightly higher stock of technological knowledge than the industries in which non-export-oriented entrepreneurs operate (4.87 thousand Euros per firm versus 4.70 thousand Euros per firm).[22]

Table 6: Regional level mean of export-oriented entrepreneurs

Nº	NUTS-2 level regions	Obs.	Mean
11	Extremadura	238	28.2%
7	Castile and León	394	29.7%
15	Chartered Community of Navarre	408	30.4%
17	La Rioja	124	33.1%
12	Galicia	448	33.7%
1	Andalusia	513	33.9%
14	Region of Murcia	235	35.3%
2	Aragon	239	35.6%
16	Basque Country	382	35.9%
10	Valencian Community	443	35.9%
6	Cantabria	119	37.0%
13	Community of Madrid	559	38.3%
5	Canary Islands	507	38.5%
4	Balearic Islands	114	38.6%
8	Castile-La-Mancha	226	39.8%
3	Principality of Asturias	311	40.2%
9	Catalonia	534	41.0%
	Total sample	5,794	35.71%

From Table 6 and Table 7 one can anticipate how much the export-oriented behaviour of early-stage entrepreneurs varies across regions and industries. This

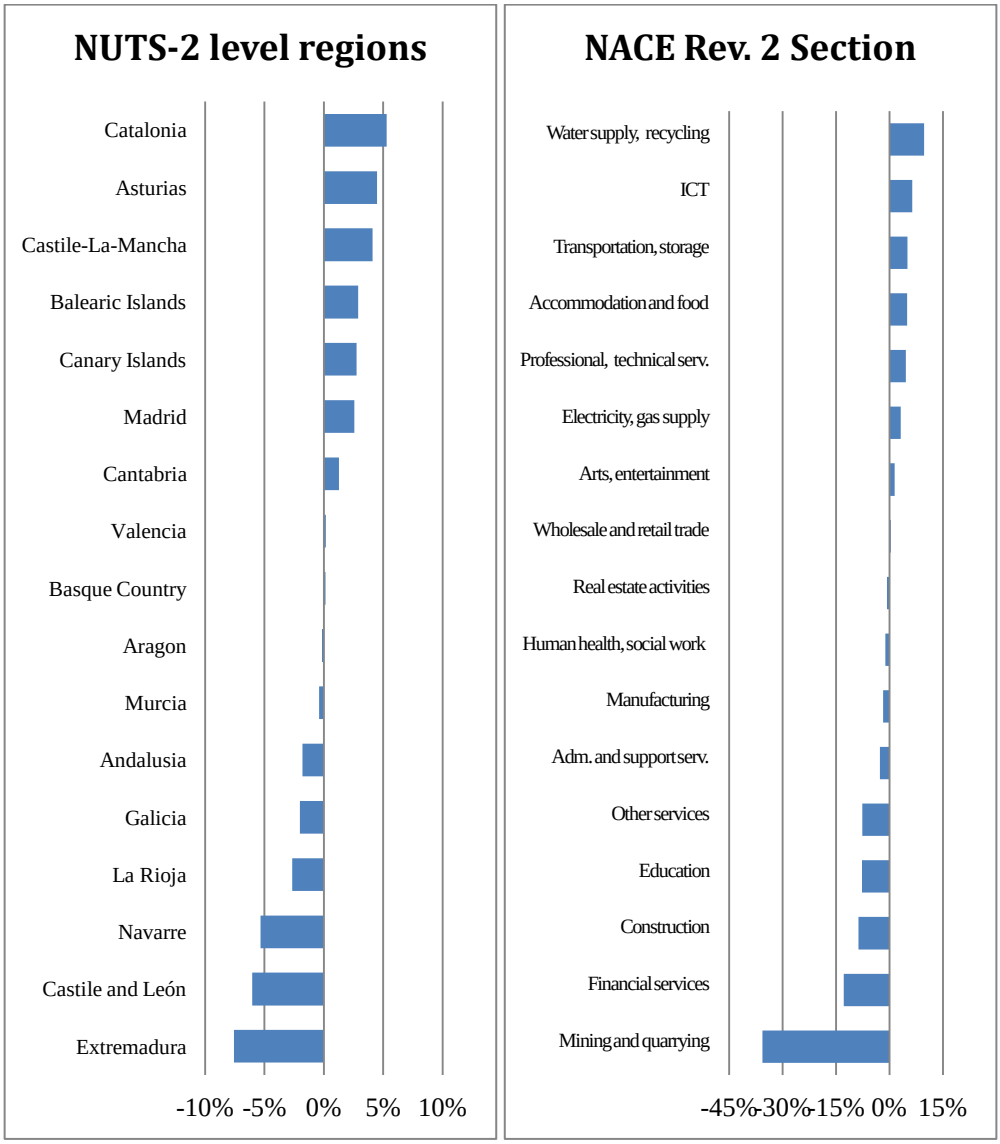
[22] Given that the regional and industrial variables described here have a distribution with a long right tail, I applied a natural log transformation to these variables in order to smooth their skewed distribution and include them in the regression analysis below.

can be seen more easily in Figure 2, in which regions and industries are listed according to the deviation of their corresponding aggregate mean of export-oriented entrepreneurs from the grand mean of export-oriented entrepreneurs for the whole sample. The percentage of export-oriented entrepreneurs across regions varies from -8% to 5% around the grand mean of 35.71%. In contrast, the percentage of export-oriented entrepreneurs across industries shows a higher variation which ranges from -36% to 10% around the grand mean of 35.71%.

Table 7: Industrial level mean of export-oriented entrepreneurs

Industry Sector NACE Rev. 2			**Obs.**	**Mean**
Sections	Divisions	Description		
B	05-09	Mining and quarrying	5	0.0%
K	64-66	Financial and insurance activities	70	22.9%
F	41-43	Construction	429	27.0%
P	85	Education	186	28.0%
S	94-96	Other service activities	260	28.1%
N	77-82	Administrative and support service activities	397	33.0%
C	10-33	Manufacturing	469	33.9%
Q	86-88	Human health and social work activities	284	34.5%
L	68	Real estate activities	140	35.0%
G	45-47	Wholesale and retail trade	1391	36.1%
R	90-93	Arts, entertainment and recreation	194	37.1%
D	35	Electricity, gas, steam and air conditioning supply	18	38.9%
M	69-75	Professional, scientific and technical activities	623	40.3%
H	49-53	Transportation and storage	334	40.7%
I	55-56	Accommodation and food service activities	824	40.7%
J	58-63	Information and communication	159	42.1%
E	36-39	Water supply, and waste management and recycling	11	45.5%
		Total sample	5,794	35.71%

Figure 2: Regions and industries listed according to the deviation from the grand mean of export-oriented entrepreneurs for the whole sample



Source: Own elaboration based on GEM data

The correlation matrix is presented in Table 8. At a first glance, it reveals that some explanatory variables at the industrial level, which should be included in the same model estimation to test one of the hypotheses, are highly correlated. In particular, the coefficient between the inward FDI and the outward FDI at the industrial level is significantly higher than 0.5 (Pearson's correlation 0.74), and this may be a sign of potential collinearity.[23]. To check whether multi-collinearity raises a problem, I computed the Variance Inflation Factor (VIF) scores for all variables included in the study. None of the VIFs scores exceeded 2.0 providing evidence of no multi-collinearity among predictor variables (Bowerman & O'Connell, 1990). In any case, I calculated two new variables at both the regional and industrial level to capture the total FDI, including inward and outward flows (*Total FDI*), and the percentage of inward (*% of inward FDI*), so that both types of flows can be analysed in the same model without any risk of collinearity among the environmental variables.

[23] The risk of multi-collinearity becomes particularly clear when the correlation coefficient between two explanatory variables exceeds 0.80 (Studenmund, 2000). However, correlation coefficients above 0.5 are considered suspiciously high.

Table 8: Correlation matrix for the determinants of the export-oriented behaviour of early-stage entrepreneurs

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
Individual/firm-specific control variables														
(1) *Male*	1.00													
(2) *Age*	-0.03*	1.00												
(3) *Immigrant*	-0.01	-0.06***	1.00											
(4) *Number of founders*	0.03**	0.01	-0.02	1.00										
(5) *College graduate*	0.01	-0.09***	0.06***	0.06***	1.00									
(6) *Investor experience*	0.04***	-0.01	0.01	0.06***	0.07***	1.00								
(7) *Recent experience*	0.02†	-0.02	0.00	0.01	0.02	0.18***	1.00							
(8) *Entrepreneurial skills*	0.01	0.00	0.02	0.00	0.03*	0.02	0.01	1.00						
(9) *No fear of failure*	-0.07***	-0.01	0.00	0.02	-0.03*	0.02	0.01	-0.1***	1.00					
(10) *Opportunity alertness*	0.05***	-0.05***	0.04**	0.02	0.05***	0.05***	0.03*	0.09***	-0.07***	1.00				
(11) *Number of employees*	0.00	0.02	-0.02†	0.07***	0.00	0.04**	0.02	0.00	-0.04**	0.00	1.00			
(12) *Expected growth*	0.04**	-0.01	0.01	0.06***	0.02†	0.07***	0.03*	0.01	-0.03*	0.04**	0.05***	1.00		
(13) *New to all customers*	-0.03†	-0.02	0.03**	0.03†	0.05***	0.03*	0.03*	0.03*	-0.01	0.04**	0.02	0.06***	1.00	
(14) *New technology base*	0.01	-0.05***	0.05***	-0.01	0.05***	0.06***	0.03†	0.01	-0.01	0.02	-0.06***	0.05***	0.09***	1.00
Regional level explanatory variables														
(15) *Inward FDI*	0.02†	-0.01	0.07***	0.01	0.06***	0.02	0.04***	-0.01	-0.02	0.03*	0.01	-0.01	0.03*	0.02
(16) *Outward FDI*	-0.01	0.00	0.01	0.01	0.04**	0.00	0.02	0.00	-0.02	0.02	0.03*	-0.02	0.00	-0.03*
(17) *Total FDI*	-0.01	0.00	0.02	0.01	0.05***	0.00	0.03*	0.00	-0.02	0.02	0.03*	-0.02	0.01	-0.02†
(18) *% of inward FDI*	0.02	-0.01	0.05***	0.01	-0.02	0.00	0.00	0.00	0.02	0.00	-0.01	0.04**	0.02	0.03**
(19) *R&D stock*	0.00	0.00	0.05***	0.02†	0.07***	0.00	0.03*	-0.03*	-0.04**	0.03*	0.00	-0.02	0.01	-0.04**
Industrial level explanatory variables														
(20) *Inward FDI*	0.04**	0.00	-0.01	0.01	0.00	-0.01	-0.02	0.02	-0.01	0.01	0.00	0.02	0.01	0.02†
(21) *Outward FDI*	0.05***	-0.02†	-0.01	0.00	0.03*	-0.01	-0.02	0.02†	0.00	0.01	0.00	0.03†	0.00	0.02
(22) *Total FDI*	0.05***	-0.02	-0.01	0.00	0.02	-0.01	-0.02	0.02†	0.00	0.01	0.00	0.03†	0.00	0.02†
(23) *% of inward FDI*	-0.07***	0.01	0.01	-0.02†	0.07***	0.01	0.00	-0.01	0.00	0.00	-0.04**	-0.05***	0.01	0.00
(24) *R&D stock*	0.06***	-0.01	-0.03†	0.02	0.02	-0.02	-0.02†	0.01	0.01	-0.01	0.00	0.01	0.02	0.01

Notes: Correlations among continuous variables are Pearson's correlation coefficients, whereas correlations among dichotomous variables, as well as between continuous and dichotomous variables are measured by phi coefficients and point biserial coefficients, respectively. Reported coefficients of the aggregate (regional and industry) variables are for their corresponding log values. Level of statistical significance for the two-tailed test: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Table 8: Correlation matrix for the determinants of export-oriented behaviour (continued)

Variables	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Regional level explanatory variables										
(15) *Inward FDI*	1.00									
(16) *Outward FDI*	0.40***	1.00								
(17) *Total FDI*	0.57***	0.98***	1.00							
(18) *% of inward FDI*	0.08***	-0.35***	-0.30***	1.00						
(19) *R&D stock*	0.74***	0.38***	0.50***	-0.19***	1.00					
Industrial level explanatory variables										
(20) *Inward FDI*	0.02	0.01	0.02	0.00	0.02	1.00				
(21) *Outward FD*I	0.02	-0.01	0.00	0.01	0.01	0.74***	1.00			
(22) *Total FDI*	0.02	0.00	0.01	0.01	0.02	0.89***	0.96***	1.00		
(23) *% of inward FDI*	0.00	0.06***	0.05***	-0.01	0.01	-0.12***	-0.41***	-0.32***	1.00	
(24) *R&D stock*	-0.01	-0.02†	-0.02†	0.01	-0.03*	0.22***	0.34***	0.31***	-0.43***	1.00

Notes: Pearson correlations. Reported coefficients of the aggregate (regional and industry) variables are for their corresponding log values. Level of statistical significance for the two-tailed test: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

3.2 Methods and data on the consequences of export-oriented entrepreneurship at the firm-level

3.2.1 Some considerations on the measurement of productivity

Although a consensus exists among scholars that productivity represents how efficiently inputs are employed in the production process in order to obtain the maximum possible output, its measurement is difficult due to the absence of a single common approach. Productivity is measured by a variety of indicators that are estimated using different parametric and non-parametric methods.[24] Nonetheless, at least two widely accepted measures of productivity can be found in the literature, namely labour productivity and total factor productivity (TFP).

On the one hand, labour productivity is a single-factor measure that represents the amount of output per labour unit employed in the production (i.e., output divided by the number of workers or, more accurately, the number of hours worked). This measure is commonly used as an indicator of successful performance and is closely related to the assessment of living standards as determined by per capita income or the availability of goods and services (Backman & Gainsbrugh, 1949). Policy-makers therefore consider labour productivity significant; however, this is a partial measure that captures the contribution to output made by a unit of labour input in combination with other inputs and productivity overall. In other words, it

[24] While parametric methods are based on *a priori* specified models which are estimated with econometric techniques, non-parametric methods depend on the available data to determine the structure of the model under certain simplifying assumptions. In terms of usefulness, productivity measures obtained through parametric methods are mainly applied in the analysis of productivity for academic and specific purposes. In contrast, non-parametric methods are recommended for regular productivity statistics such as those produced under the growth accounting approach, a non-parametric method based on the index numbers technique. A more detailed description of productivity measurement can be found in OECD (2001). Although it is a report that focuses mainly on productivity at the industry and aggregate level of the economy, it considers such levels as groups of individual units sharing similar production activities. Accordingly, the concepts discussed in the report may be applied by extension to the measurement of productivity at firm level.

not only depends on changes in efficiency or technology, but also on the presence of other production inputs and the changes in the ratio of each of these other inputs to labour (e.g., the substitution of labour inputs for others).[25] Hence, labour productivity does not necessarily reflect efficiency gains or a better use of inputs. Nonetheless, this measure has been employed by some studies (Bernard & Jensen, 1995, 1999; Bernard & Wagner, 1997; Castellani, 2002) as a useful starting point for the analysis of exporting and productivity.

TFP, on the other hand, is an analogous concept that relates the change in output to multiple inputs.[26] Although it cannot be interpreted in meaningful units, TFP is specifically understood as the portion of output growth not explained by the weighted average growth of all inputs used in the production. These always consist of primary inputs (i.e. labour and capital), and sometimes intermediate ones too (i.e. raw materials, energy, and other short-term inputs) also. Compared to labour productivity, TFP thus captures information about technological and efficiency shifts not physically tied to any specific input (Bartelsman & Doms, 2000). From a methodological viewpoint, TFP emerges as the residual that remains after controlling for the contribution of all production factors to output growth. This residual is often viewed as "a measure of my ignorance" because of its unobservable nature (Bartelsman & Doms, 2000, p. 586; Griliches, 1994, p. 1). However, a large body of the literature has attributed it to several sources at the firm level (Bartelsman & Doms, 2000; Bloom & Van Reenen, 2010; Lichtenberg & Siegel, 1991; Nelson, 1981; Vendrell-Herrero, 2008), such as the result of

[25] For instance, when a firm outsources its activities, labour inputs are replaced by purchases of intermediate inputs and, consequently, labour productivity based on gross output rises as a result of the firm producing more – or at least the same – output using less units of labour. In contrast, when a firm chooses to bring some of the previously outsourced activities back in-house, labour productivity falls. Under these circumstances, this productivity measure does not specifically reflect changes in individual capacities of workers, shifts in technology or efficiency levels, either. Although they can be compensated each other at the aggregate level, the gains and losses in labour productivity of the different economic agents due to the substitution of inputs are likely to be erroneously interpreted at firm level as changes in productivity of labour units only.

[26] Indeed, TFP is also known as multifactor productivity (MFP)

research and development and learning-by-doing activities, human capital, and other knowledge-related factors that lead to improved production (e.g. managerial skills, organisational change, economies of scale, etc.).

The choice of a productivity measure depends on the purpose of the measurement. As described above, TFP is a measure of productivity specifically linked to learning and the efficient use of inputs, whereas labour productivity is a broader measure that includes both the efficient use of inputs and the effect of input substitutions. My theoretical framework is based on learning, that is, the ability to acquire and reconfigure knowledge, resources and routines in order to improve efficiency. Accordingly, I adopt TFP as my measure (of productivity) and use a parametric approach to analyse the impact of international exposure on the productivity of new ventures.

3.2.2 Empirical model

The starting point for the analysis of productivity is the production function, under which the amount of output (Y) achieved by firm i in year t depends on both the amount of inputs (X_j) employed in the production and the productivity level of the same firm i in year t:

$$Y_{it} = A_{it} \cdot f\left(X_{1it}, X_{2it}, \dots, X_{jit}\right) \quad (3)$$

In equation (3), the residual denoted by the term A_{it} is usually interpreted as the TFP. Improvements in TFP reflect the contribution to output as a result of the more efficient use of inputs or the adoption of new technologies. I argue that exporting is one of the sources of such improvements for new ventures.

Given that specific production functions for individual firms are unknown, I assume a Cobb-Douglas function, which is commonly accepted in the literature on productivity, with value added as a net measure of output *(Y)*, and primary factors, namely labour *(L)* and capital *(K)*, as inputs.[27] Accordingly, I rewrite equation (3) as equation (4):

$$y_{it} = A_{it} \cdot f(L_{it}, K_{it}) = A_{it} \cdot L_{it}^{\beta_1} \cdot K_{it}^{\beta_2} \quad (4)$$

where β_1 and β_2 are the output elasticities of labour and capital inputs, respectively; and $\beta_1 + \beta_2 = 1$ implies constant returns of scale.

I apply logarithms to allow a standard linear estimation of equation (4). Likewise, in order to avoid problems with the presence of unobservable heterogeneity across cases, I control for firm-specific, time-invariant variables not included in the model by employing a specification with fixed effects.[28] This results in the following standard fixed-effects linear model:

$$\ln Y_{it} = \ln A_{it} + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \mu_i + \varepsilon_{it} \quad (5)$$

where μ_i represents the unobserved firm-specific and time-invariant effects of omitted variables and ε_{it} is an idiosyncratic disturbance term that changes across firms and time (Wooldridge, 2009). The final model is estimated through ordinary

[27] Note that production functions based on gross measures of output, like gross sales, must include intermediate inputs as an additional production factor. Given that intermediate inputs are subtracted from gross sales to obtain value added, this production factor is excluded here to avoid double counting (i.e. subtracting on the left side of the equation and adding to the right side).

[28] I assume that omitted variables may be correlated to observable explanatory variables and that the unobservable heterogeneity across cases does not change over time. A Hausman test comparing fixed and random effects was run to determine whether this assumption is reasonably justified in my sample. More details are shown in the results section.

least squares (OLS) in a one-step approach that includes the specifications of A_{it} described below directly in equation (5).

To test whether the TFP depends on export activity under the hypotheses derived from the framework depicted in the previous section, I follow Vendrell-Herrero (2008) who distinguishes between initial differences and subsequent growth in productivity by using a time trend variable in combination with the treatment variable. More specifically, I use interactions between export status and firm age to see whether productivity of exporting new ventures change over time (Wooldridge, 2009). Thus, for testing hypotheses H2.1 and H2.2 I substitute the term A_{it} in equation (5) with:

$$A_{it} = e^{\alpha_0 + \gamma_1 Export_{it} + \gamma_2 Age_{it} + \gamma_3 Age_{it} \times Export_{it}} \quad (6)$$

which yields:

$$\ln Y_{it} = \alpha_0 + \gamma_1 Export_{it} + \gamma_2 Age_{it} + \gamma_3 Age_{it} \times Export_{it} + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \mu_i + \varepsilon_{it} \quad (7)$$

where $Export_{it}$ is a dummy variable that indicates whether or not firm i exports in year t, and Age_{it} is the age of firm i in that year t. Thus, γ_1 represents the difference in productivity at the year of first international sale between exporting and non-exporting new ventures; γ_2 denotes the productivity change over time for non-exporting new ventures, and γ_3 refers to the additional productivity change experienced by exporting new ventures.

If exporting new ventures have higher initial levels of productivity than non-exporting new ventures (hypothesis H2.1), then γ_1 is expected to be significantly

positive after controlling for the level of production inputs. Similarly, if exporting new ventures experience a higher productivity growth over time in comparison to non-exporting new ventures (hypothesis H2.2), γ_3 should be significantly positive too.

On the other hand, hypothesis H2.3 is tested by substituting term A_{it} in equation (5) with:

$$A_{it} = e^{\alpha_0 + \gamma_1' Early_{it} + \gamma_2' Late_{it} + \gamma_3' Age_{it} + \gamma_4' Age_{it} \times Early_{it} + \gamma_5' Age_{it} \times Late_{it}} \quad (8)$$

which yields:

$$\ln Y_{it} = \alpha_0 + \gamma_1' Early_{it} + \gamma_2' Late_{it} + \gamma_3' Age_{it} + \gamma_4' Age_{it} \times Early_{it} + \gamma_5' Age_{it} \times Late_{it} + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \mu_i + \varepsilon_{it} \quad (9)$$

where $Early_{it}$ indicates whether or not firm i exports in year t, provided that its first international sale was made early in its life cycle; and $Late_{it}$ indicates whether or not firm i exports in year t if its first international sale was made late instead. Therefore, γ_1' is the difference in productivity at the year of first international sale between early exporting and non-exporting new ventures; γ_2' is the difference in productivity at the year of first international sale between late exporting and non-exporting new ventures; γ_3' denotes the productivity change over time for non-exporting new ventures, γ_4' stands for the additional productivity change experienced by early exporting new ventures; and γ_5' represents the additional productivity change experienced by late exporting new ventures.

If early exporting new ventures have higher initial levels of productivity than late exporting new ventures (hypothesis H2.3), then γ_4' should be significantly higher than γ_5' after controlling for the level of labour and capital inputs.

3.2.3 Database

Most studies analysing the outcome of early exporting behaviour on new venture performance are based on cross-sectional data. Panel data is scarce because longitudinal design is a time-consuming and expensive process (Davidsson & Wiklund, 2000). However, international activities involve a process, the results of which are exhibited (only) over time. In this sense, there are calls for longitudinal designs to be introduced into international entrepreneurship research (Coviello & Jones, 2004; Zahra & George, 2002b).

This study responds to these calls since it is based on longitudinal data. More specifically, I use data from an unbalanced panel of innovative new firms that were started up in the Basque Autonomous Community (Spain) between 2000 and 2005. Regional and provincial governments of the Basque Autonomous Community support potential innovative entrepreneurs through a network of Business Innovation Centres (BICs) and different venture capital entities. I identified and surveyed entrepreneurial initiatives that either had benefited from the services provided by the regional network of BICs or had received funding from one of the regional venture capital entities. According to information provided by the regional network of BICs[29], 378 potentially innovative firms were started up on their premises during the period 2000-2005. Contact information was found for only 341 of these. In addition, I identified 55 potentially innovative new ventures set up outside the BICs' premises during the same period which had received capital injections from venture capital funds at the regional level[30].

[29] This network is made up of the following centres: BEAZ, BIC BERRILAN, CEDEMI, CEIA and SAIOLAN.

[30] Each of these firms had received funding from one of the following venture capital entities: Gestión de Capital Riesgo del País Vasco, SGECR (www.gestioncapitalriesgo.com), Seed Capital

Having thus eventually contacted 396 new ventures, I asked one of the founders/entrepreneurs of each firm that makes up this sample to fill in a structured questionnaire.[31]

The questionnaire contained a set of questions for gathering cross-sectional information about the entrepreneur's characteristics, the firm's characteristics, the firm's financing sources, and certain aspects of organisational behaviour related to the firm's innovative activities and the internationalisation of its operations (e.g., intensity, speed and scope of international sales)[32]. All questionnaires were sent by mail between February and April 2008. Monitoring of the field work was conducted by an external market research firm, though the process was closely supervised by the doctoral candidate. By the end of May 2008, I received a total of 129 answered questionnaires. The overall answer rate was 32.6%. While 113 survey responses came from the new ventures created on the BICs' premises (a 33.1% answer rate), 16 survey responses came from the new firms operating with funding from public venture capital funds (a 29.1% of answer rate).

Data on internationalisation collected via the mailed survey were complemented with longitudinal data on production output and inputs from the commercial database "Iberian Balance Sheet Analysis System" (SABI)[33]. As not all surveyed

---

Bizkaia (www.seedcapitalbizkaia.com), Sortek (www.inasmet.es/home.aspx?tabid=32) and Hazibide (www.hazibide.es).

[31] Note that these firms were characterised by having an innovative or technological orientation. Hence, they benefited from some special services that were not addressed to the whole population of new firms, such as the services offered by the network of BICs or the funding provided by regional venture capital entities. Innovative firms are more likely to take risks and engage in international activities, whereas firms located in the same a region share cultural and economic similarities. As a result, such common characteristics help to define a homogenous sample in order to reduce the variance due to unobserved variables.

[32] A copy of the questionnaire is provided in Appendix 1. Questions related to international activities are listed in page 3 of the questionnaire.

[33] SABI database is jointly built by INFORMA D&B and Bureau Van Dijk which collect data from the Official Register of Enterprises (i.e. financial statements of Spanish firms appearing in the merchant register). This database provides general information and annual accounts from more than 1.2 million Spanish companies, of which over 50,000 are located in the Basque Autonomous Community.

firms were indexed in the SABI database, only 79 usable cases remained after the matching process. This final selected sample and the group of cases excluded from the original sample of respondents showed no systematic differences in technological level[34] or employment size[35]. The only significant difference between them was that the group of excluded firms was relatively larger than the final sample in the industry sector of other service activities (p-value = 0.030). However, they were not significantly different in the remaining industry sectors (see Appendix 2). A quick look at the composition of the final sample shows that 26 out of the 79 selected firms were involved in exporting at the time of the survey. Of these, 15 firms had made their first international sale within two years from their inception, while the remaining 11 had done so in the third year or later.

I use pooled cross-sectional data corresponding to years 2000 to 2007. However, available data for each case cover an average period of 3.8 years. My database is therefore an unbalanced panel of 297 observations spread across a sample of 79 firm cases.

[34] The technological level refers to whether or not the firm is in one of the industry aggregations defined by Eurostat as high-tech or knowledge-intensive according to the ratio of R&D expenditure/value added. Using the NACE Rev. 1.1 nomenclature at 3-digit level, these industry aggregations are:

- **High technology manufacturing:** Manufacture of pharmaceuticals, medicinal chemicals and botanical products (24.4); manufacture of office machinery and computers (30); manufacture of radio, television and communication equipment and apparatus; (32); manufacture of medical, precision and optical instruments, watches and clocks (33); manufacture of aircraft and spacecraft (35.3)
- **Medium-high technology manufacturing:** Manufacture of chemicals and chemical product (24, **excluding 24.4**); manufacture of machinery and equipment n.e.c. (29); manufacture of electrical machinery and apparatus n.e.c. (31); manufacture of motor vehicles, trailers and semi-trailers (34); manufacture of other transport equipment (35, **excluding 35.1 and 35.3**)
- **High-technology and knowledge intensive services:** Post and telecommunications (64); Computer and related activities (72); Research and development (73)

[35] I considered two measures of employment size to analyse systematic differences, namely the initial number of employees and the number of employees at the time of the survey.

3.2.4 Measurement of variables

A description of the variables used in the analysis of productivity at the firm level is provided below.

Ouput (Y_{it}) is the value added generated by firm i in year t, in thousands of Euros adjusted for the regional change in prices of domestically produced goods and services (GDP deflator, 2005=100) at the subsection level of the NACE Rev.1.1 industry classification.[36] This variable is derived by subtracting the cost of raw materials, purchased services and other consumptions (i.e. intermediate inputs) from the gross output as measured by total sales receipts plus other operating revenues. Value added data were obtained from the SABI database, whilst the GDP deflator was calculated from the statistics on economic accounts which are published every year by the Basque Statistics Office (EUSTAT).

Labour input (L_{it}) is the amount of labour expenses incurred in the production process or business activity by firm i in year t. Since higher skilled employees are likely to earn higher salaries that reflect a productivity premium (Hellerstein, Neumark, & Troske, 1999), measuring labour as the total wage bill instead of the equivalent number of full-time employees captures the effect of human capital (Wakelin, 1998) and other characteristics of labour that influence productivity. Data for this variable were also obtained in thousands of Euros from the SABI database and adjusted for the GDP deflator at the NACE Rev.1.1 subsection level.

Capital input (K_{it}) is approximated as the net book value of total fixed assets of firm i in year t. This includes the value in thousands of Euros of all durable goods that are acquired or produced with the aim of using them in the production process or business activity for a period longer than one year, less accumulated depreciation and amortisation. Although capital input would be better measured by the services drawn from the fixed capital stocks and flows (OECD, 2001),

[36] The NACE Rev 1.1 subsection level is composed of 31 industry aggregations identified by two-character alphabetical codes.

these measures are difficult to estimate at the firm level due to the lack of detailed micro data on investments and retirements of capital stocks over time, as well as on prices and volumes of capital services. Nonetheless, Baily, Hulten & Campbell (1992) found evidence that productivity estimations based on book value measures of fixed capital are not significantly different from those obtained using more accurate measures of fixed capital services. My data on book value of total fixed assets come from the SABI database. These data were deflated by the change in prices of gross fixed capital formation (2005=100) at the regional level, which was estimated using information published by EUSTAT.

Export status ($Export_{it}$*)* is a time-varying dummy that indicates whether or not the firm is an exporter in a given year. More specifically, it takes the value one (1) if the firm *i* exports at year *t*, and zero (0) otherwise. Construction of this variable was based on the year the firm made its first international sale, with the export status changing from zero (0) to one (1) in the period of first international sale and remaining as such in the subsequent periods. Primary data on the year of first international sale was obtained from the survey described above, and all firms that provided this information were involved in exporting at the time of the survey. Burgel & Murray (2000) found evidence that the average time for the internationalisation of new ventures can be as low as 2.2 years. Indeed, selling abroad within two years from inception is clearly an early exporting behaviour, which indicates that internationalisation is embedded in the start-up process (Oviatt & McDougall, 1994). New ventures achieving international sales during the start-up process perceive foreign markets as natural marketplaces, and this behaviour makes them different not only from new ventures that operate exclusively in the domestic market (McDougall, Oviatt, & Shrader, 2003), but also from those involved in international sales two or three years after their foundation (Fletcher, 2004). Consequently, the *export status for early exporting new ventures (*$Early_{it}$*)* indicates whether or not the firm is an exporter in a given

year, provided that its first international sale was made within two years from its inception. In contrast, the *export status for late exporting new ventures ($Late_{it}$)* indicates whether or not the firm is an exporter in a given year, provided that its first international sale was made as from the third year after its founding. Both variables are included in the same model and take the value one (1) if the firm i fits the corresponding criterion at year t, and zero (0) otherwise. Thus, firms that remain non-exporting at year t are the reference category here.

Firm age (Age_{it}) is the time that firm i has operated in the market until the end of year t. Based on primary data obtained from the conducted survey, this variable is calculated as follows: $Age_{it} = current\_year_t - start\text{-}up\_year_i + 1$; where min. $current\_year_t$ ($start\text{-}up\_year_i$) is equal to 2000 (2000), and max. $current\_year_t$ ($start\text{-}up\_year_i$) is equal to 2007 (2005).

3.2.5 Descriptive statistics

Table 9, Table 10 and Table 11 show some descriptive statistics of these variables for the whole sample, for exporting and non-exporting firms, and for early exporting and late exporting firms, respectively. Taking the sample as a whole over the entire period of analysis, each firm on average produced around 395,000 Euros a year in value added, spending approximately 270,000 Euros on labour costs and employing fixed assets valued at 465,000 Euros. These figures correspond to a sample of new firms with an average age of slightly higher than 4 years. Overall, 32% of the observations are made up of firms that are exporting in year t. Of these, 18% are observations of early exporting firms, and 14% belong to late exporting ones. When comparing exporting and non-exporting firms, the former obtained more value added per year than the latter; however, the former also employed a higher amount of labour and capital inputs. In terms of age, exporting firms are one year older than non-exporting ones (see table 10). In contrast, early exporting firms included in the sample generated more value added than late exporting firms, and were also characterised by the use of,

comparatively, less inputs. In this case, the former are noticeably younger than the latter (see table 11).

In table 9, the correlation matrix shows a strong positive relationship between production inputs and output with Pearson's correlation coefficients above 0.75, which is not surprising according to the literature on productivity. To a lesser extent, the dichotomous variable that distinguishes exporting firms from non-exporting ones $(Export_{it})$ and the variable that represents firm age (Age_{it}) were the next variables most correlated with output (Pearson's correlation 0.29). In contrast, the dummy for late exporting firms $(Late_{it})$ is the variable least correlated with output (Pearson's correlation 0.11).

Regarding the relationship among right-hand-side variables, there are some indications of collinearity between labour and capital inputs (Pearson's correlation 0.78). This problem could add some difficulties to the estimation of the individual effects of those correlated variables on the dependent variable. However, high correlation among production inputs is a common pattern found in other studies (see, for example, Audretsch & Keilbach, 2004c). Theories of productivity clearly suggest that net output (i.e. value added) depends on labour and capital inputs, and therefore both of them must be included in the production function. In this sense, the model is well specified and the omission of any of these input variables would lead to biased coefficients (Studenmund, 2000). What is important here is that the variables of treatment, namely export status, are not highly correlated with production inputs or other right-hand-side variables. The strongest –but not worrying– correlation found here is between the dummy for late exporting firms $(Late_{it})$ and firm age (Age_{it}) with a Pearson's correlation coefficient of 0.39.[37]

[37] For clarification, the correlations between both $Early_{it}$ and $Export_{it}$, and $Late_{it}$ and $Export_{it}$, are highly strong too; in fact, there is perfect multicollinearity among all of them. It should be note, however, that these variables are included in different models.

Table 9: Descriptive statistics and correlation matrix of main variables [a]

Variables	Mean	s.d.	Min.	Max.	Obs.	N	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Y_{it}	394.43	792.43	2.02	9282.97	297	79	1.00						
(2) L_{it}	267.33	418.29	2.66	4314.92	297	79	0.92***	1.00					
(3) K_{it}	464.85	975.69	0.91	9062.58	297	79	0.79***	0.78***	1.00				
(4) Age_{it}	4.27	2.53	1.00	8.00	297	79	0.29***	0.29***	0.20***	1.00			
(5) $Export_{it}$	0.32	0.47	0.00	1.00	297	79	0.29***	0.27***	0.29***	0.21***	1.00		
(6) $Early_{it}$	0.18	0.38	0.00	1.00	297	79	0.25***	0.17**	0.13*	-0.10†	0.68***	1.00	
(7) $Late_{it}$	0.14	0.35	0.00	1.00	297	79	0.11*	0.17**	0.24***	0.39***	0.60***	-0.19***	1.00

Notes: All monetary values in thousands of Euros. Level of statistical significance for the two-tailed test: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Table 10: Descriptive statistics by export status

Variables	Exporting new ventures						Non-exporting new ventures					
	Mean	s.d.	Min.	Max.	Obs.	N	Mean	s.d.	Min.	Max.	Obs.	N
Y_{it}	728.45	1,267.13	8.54	9,282.97	94	26	239.76	324.02	2.02	2,332.11	203	64
L_{it}	431.68	608.91	7.59	4,314.92	94	26	191.22	259.42	2.66	1,653.87	203	64
K_{it}	874.79	1,459.58	0.94	9,062.58	94	26	275.03	547.47	0.91	3,259.45	203	64
Age_{it}	5.04	2.61	1.00	8.00	94	26	3.91	2.42	1.00	8.00	203	64

Notes: All monetary values in thousands of Euros.

Table 11: Descriptive statistics of exporting new ventures disaggregated by early or late foreign entry

Variables	Early exporting						Late exporting					
	Mean	s.d.	Min.	Max.	Obs.	N	Mean	s.d.	Min.	Max.	Obs.	N
Y_{it}	819.61	1,650.33	8.54	9,282.97	52	15	615.58	480.15	21.30	2,246.55	42	11
L_{it}	424.77	771.45	7.59	4,314.92	52	15	440.22	317.17	20.24	1,285.53	42	11
K_{it}	743.88	1,658.70	0.94	9,062.58	52	15	1,036.88	1,166.75	84.57	4,126.00	42	11
Age_{it}	3.71	1.66	1.00	8.00	52	15	6.69	2.65	3.00	8.00	42	11

Notes: All monetary values in thousands of Euros.

3.3 Methods and data on the consequences of export-oriented entrepreneurship at the regional level

3.3.1 Empirical model

Here I present the model to analyse the relationship between entrepreneurial activity and economic growth at the regional level, as well as to examine whether export-oriented entrepreneurial activity in particular has an impact on economic growth beyond the impact of the general entrepreneurial activity. Consistent with previous studies, I control for catching-up processes and include variables of human capital and technological knowledge that might account for regional differences in economic growth.

Catching-up effects

Catching-up processes suggest that economic growth varies across regions (or countries) according to their proximity to the technology frontier. More specifically, regions which are further behind the technology frontier will grow faster provided that they have the institutional conditions which facilitates technology transfer by imitation (Aghion & Howitt, 2006). Distance to the technological frontier is commonly measured by the income level in terms of GDP per capita. Therefore, following van Stel, et al. (2005), I use (the natural logarithm of initial) GDP per capita to correct for catch-up effects among regions.

Human capital endowment and technological knowledge

Technological knowledge and human capital are some of the drivers of economic growth commonly analysed in the empirical literature. While globalisation has made it possible for physical capital to be transferred to countries where labour is cheaper, the knowledge base which encourages technological change and growth is harder to delocalise (Arrow, 1962). Hence, public policies in advanced economies focus on the strengthening of knowledge and innovation platforms through investments in human capital and R&D activities.

The human capital endowment of a region (or country) influences its economic growth by enhancing the ability to develop innovations in the domestic market and adopt technologies developed abroad (Barro, 1999). In particular, the qualification of the labour force in terms of educational attainment is commonly regarded as a measure of human capital linked to growth. Hence, education have been a relevant policy for growth (Aghion & Howitt, 2006; Barro, 1999).

On the contrary, R&D activities are expected to generate new knowledge leading to product innovations that generate value added (e.g., new goods and services), as well as innovations in processes that improve productivity (e.g., though the increment of output with unchanged input). Moreover, the quasi-public nature of knowledge, which cannot be fully patented or kept secret (and therefore, can be easily reused without incurring substantial costs), generates externalities that are of benefit to economic agents who have not invested in knowledge generating activities. Thus, as proposed by Romer (1986) in his model of endogenous growth, knowledge is considered to be a key production input which increases output with increasing returns to scale.

Based on the aforementioned arguments, I control for changes in the stock of technological knowledge and human capital endowment at the regional level. In addition, I also control for population growth since in regimes where technological progress is present an increase of the population creates greater demand for goods and services which eventually raises the amount of GDP (Espenshade, 1978; Galor & Weil, 2000).

Empirical model for economic growth

In order to test the hypotheses on the impact of export-oriented entrepreneurship on economic growth at the regional level, I estimate the following fixed-effects linear model[38] using OLS:

$$\Delta GDP_{\mathrm{it}} = \alpha_0 + \beta_1 TEA_{it} + \gamma_{\mathrm{n}} Export_{it} + \delta_1 \log(GDPC_{it-1}) + \delta_3 \Delta Population_{it} + \delta_4 \Delta SkilledLabour_{it} + \delta_5 \Delta R\&Dstock_{it} + \mu_i + \varepsilon_{it} \quad (10)$$

where *i* denotes regions and *t* denotes time instances; Δ*GDP* is the rate of economic growth; *TEA* stands for the level of entrepreneurial activity; *Export* represents the percentage of the total number of entrepreneurs who are export-oriented; *GDPC* is the per capita income level; Δ*Labour* corresponds to the rate of growth in the segment of population which is able to work; Δ*SkilledLabour* indicates the increase in the level of human capital embedded in the labour force; Δ*R&Dstock* refers to the growth of the accumulated stock of technological knowledge; μ_i represents the unobserved region-specific and time-invariant effects of omitted variables and ε_{it} is an idiosyncratic disturbance term that changes across regions and time (Wooldridge, 2009). Finally, *Export* is disaggregated into different ranges of export-oriented entrepreneurial activity according to the percentage of foreign customers.

[38] As mentioned before, Spanish regions differ from each other in terms of economic development and culture. In order to limit the effects of this unobservable heterogeneity across cases, I control for region-specific, time-invariant variables not included in the model by employing a specification with fixed effects. I assume that omitted variables may be correlated to observable explanatory variables and that the unobservable heterogeneity across cases does not change over time. A Hausman test comparing fixed and random effects was run to determine whether this assumption is reasonably justified in my sample. The results of this test support for using the fixed-effects model.

$$\gamma_n Export_{it} \begin{cases} \gamma_1 Export1-25_{it} \\ \gamma_2 Export26-75_{it} \\ \gamma_3 Export76-100_{it} \end{cases}$$

More specifically, *Export1-25* represents the percentage of export-oriented entrepreneurial activity that serves between 1% and 25% of foreign customers; *Export26-75* represents the percentage of export-oriented entrepreneurial activity that serves between 26% and 75% of foreign customers; and *Export76-100* represents the percentage of export-oriented entrepreneurial activity that serves between 76% and 100% of foreign customers.

If higher levels of entrepreneurial activity are linked to higher rates of economic growth (hypothesis H3.1), then I expect coefficient β_1 to be significantly positive. If higher prevalence rates of export-oriented entrepreneurship are linked to additional rates of economic growth (hypothesis H3.2), at least one of the coefficients γ_n is expected to be significantly positive. Finally, if more internationally engaged export-oriented entrepreneurship is linked to stronger additional rates of economic growth (hypothesis H3.3), the corresponding coefficient γ_n for each substantially higher range of export-oriented entrepreneurship is expected to be stronger in such a way that: $\gamma_1 < \gamma_2 < \gamma_3$.

3.3.2 Database

For this research, I analyse the 17 Spanish autonomous communities (sub-national regions at NUTS-2 level) over the period 2003-2009. The case of Spain is suitable for the analysis of regional growth because its autonomous communities – or regions[39] – differ from each other in terms of economic development and performance; that is, there is a variance across regions, which needs to be explained. What is more, due to the high level of decentralisation in Spain, the

[39] I will refer to the Spanish NUTS-2 regions as autonomous communities or regions interchangeably.

implications derived from this study can be applied at the regional level by the corresponding policy makers.[40] Data used in the analysis come from two different sources, namely the GEM project, and the INE.

As mentioned before, the Spanish GEM project has expanded the representativeness of the sample to a regional level since 2003, and nowadays all Spanish regions are covered by the GEM project with their own representative sample of adult population (18-64 years of age). I use Spanish GEM data on entrepreneurial activity and export orientation aggregate at the regional level from years 2003 to 2009, gathered in a merged dataset with data on regional growth, technological knowledge and human capital endowment from the INE. These years include data from a varied range of regions; initially 3 regions in 2003, 8 regions in 2004, 10 regions in 2005 and 17 regions in the subsequent years, respectively. Overall, I have an unbalanced panel of 89 observations corresponding to 17 regions over an average period of 5.2 years. Below, I provide a description of the variables used in the analysis.

3.3.3 Measurement of variables

Dependent variable

Economic Growth (ΔGDP_{it}) is the dependent variable, which is measured by the annual percentage change in real gross domestic product (GDP, constant prices of 2000) for region *i* and year *t*. Data for this variable is publicly available in the Regional Accounting Database provided by the INE.

[40] Since 1978, Spain has developed a unique system of regional autonomy which is known as the "State of the Autonomies". All Spanish regions have their self-government with different degrees of legislation and execution autonomy. Basque Country, Catalonia and Galicia have the strongest regional autonomy due to historical reasons (Indeed, all of them have their own official language which reflects their respective cultures under a historical perspective). Andalusia and Navarre are also regions with a certain degree of autonomy. In particular, Basque Country and Navarre have their own tax system. The rest of regions do not have fiscal autonomy, but they are responsible for the majority of public spending decisions and have competences in industry policy.

Independent variables

Level of Entrepreneurial Activity (TEA_{it}) is measured by the Total Entrepreneurial Activity index (TEA) which describes the percentage of adult population (18-64 years of age) in region *i* and year *t* that either is involved in the start-up process of a nascent business, or owns and manages a new business that has paid salaries for less than 42 months. Data on TEA indexes for Spanish regions is taken from the Spanish GEM project.

Percentage of Export-oriented Entrepreneurial Activity ($Export_{it}$) refers to the percentage of nascent and new entrepreneurs in region *i* and year *t*, whose goods and services are served to foreign customers. In line with my hypotheses, I disaggregate this variable into three ranges of intensity (i.e., low, medium and high). First, the low range considers the percentage of nascent or new entrepreneurs whose foreign customers represents from 1% to 25% of his/her total customers ($Export1\text{-}25_{it}$). Second, the medium range considers the percentage of nascent or new entrepreneurs whose foreign customers represents from 26% to 75% of his/her total customers ($Export26\text{-}75_{it}$). Finally, the high range considers the percentage of nascent or new entrepreneurs whose foreign customers represents from 76% to 100% of his/her total customers ($Export76\text{-}100_{it}$). Data for the construction of these variables comes from the Spanish GEM project.

Control variables

Initial income level ($GDPC_{it-1}$) is measured by the real GDP per capita (constant prices of 2000) for region *i* in the preceding year *t-1*. Data comes from the Regional Accounting Database provided by the INE.

Labour force growth ($\Delta Labour_{it}$) is the annual percentage change of population which is officially able to work (16 years old or older) in region *i* and year *t*. Data is publicly available in the Labour Force Survey conducted by the INE.

Human capital endowment growth ($\Delta SkilledLabour_{it}$) is measured by the annual percentage change of labour force in region *i* and year *t* with higher education (i.e., college degree or higher). Data is collected from the Labour Force Survey provided by the INE.

Stock of technological knowledge growth ($\Delta R\&DstockC_{it}$) refers to the annual percentage change in the stock of technological knowledge per capita which has been accumulated over time in region *i* and year *t*. Based on the methodology proposed by Soete & Patel (1985), this variable is calculated from the past flows of R&D expenses at the regional level.[41] The data used to estimate this variable is from the Statistics about R&D activities made available by the INE.

3.3.4 Descriptive statistics

Table 12 shows the summary statistics for the variables used in the analysis of the impact of export-oriented entrepreneurship on economic growth, whereas Table 13 shows the correlation among these variables. Over the period of analysis, the average economic growth across Spanish regions is 1.81%, and this value ranges from -4.4% to 4.4%.[42] Regarding the remainder of variables, regions show an average 6.43% of TEA rate, and the percentage of this which is export-oriented represents on average 35.81%. The relative importance of export-oriented entrepreneurship varies depending on the range of foreign customers percentage analysed here. For instance, nascent and new entrepreneurs highly involved in exports (between 75% and 100% of foreign customers) represent an average 5.7%

[41] Based on Soete & Patel (1985), the stock of technological knowledge per capita is estimated as follows:

$$R\&DstockC_{it} = \frac{(1-0.15)\ R\&Dstock_{it-1}+0.2\ R\&D_{it-1}+0.3\ R\&D_{it-2}+0.3\ R\&D_{it-3}+0.2\ R\&D_{it-4}}{Population_{it}}$$

where *R&Dstock* denotes the stock of technological knowledge, *R&D* denotes the flows of R&D expenses, and *Population* is the total among of inhabitants at regional level.

[42] Observations with negative values of economic growth correspond to the last year of the analysis, that is, the year 2009 in which the financial and real estate crisis has affected the Spanish economy.

of TEA rate, while the percentage of those involved in exports at an intermediate level (between 26% and 75% of foreign customers) is on average 11.16%, and that of those included in the low range (between 1% and 25% of foreign customers) is on average 18.95%. Likewise, Spanish regions have an average GDP per capita of 17,121 Euros; they also have experienced a labour force growth of 1.34%, and the annual percentage change of regional labour force highly educated represents on average 2.71%. Finally, the annual percentage change of the stock of technological knowledge per capita across regions is 5.94%.

Table 12: Descriptive statistics of the determinants of economic growth

Variables	N	Obs.	Mean	s.d.	Min.	Max.
ΔGDP_{it}	17	89	1.81	2.82	-4.40	4.40
TEA_{it}	17	89	6.43	1.51	2.36	9.28
$Export_{it}$	17	89	35.81	9.43	7.24	71.06
$Export1\text{-}25_{it}$	17	89	18.95	5.84	5.15	38.18
$Export26\text{-}75_{it}$	17	89	11.16	4.90	0.00	32.88
$Export76\text{-}100_{it}$	17	89	5.70	3.35	0.00	13.14
$GDPC_{it-1}$	17	89	17.12	3.49	10.65	23.59
ΔPop_{it}	17	89	1.34	0.93	-0.20	3.10
$\Delta SkilledLabour_{it}$	17	89	2.71	4.33	-7.60	14.66
$\Delta R\&Dstock_{it}$	17	89	5.94	2.98	-0.29	14.72

Notes: All monetary values are expressed in thousands of Euros.

The correlation matrix presented in Table 13 reflects that both the level of entrepreneurial activity in general, and the percentage that which is export-oriented in particular, have a positive and significant correlation with regional economic growth. Excepting the percentage change of the stock of technological knowledge, all control variables also show a positive and significant correlation with economic growth. The coefficients shown in the correlation matrix suggest that there are not indications of collinearity among the independent variables. However, I computed the Variance Inflation Factor (VIF) scores for all variables included in the study to check whether multi-collinearity is a problem. None of the VIFs scores exceeded 2.0 providing evidence of no multi-collinearity among predictor variables (Bowerman & O'Connell, 1990).

Table 13: Correlation matrix for the determinants of regional economic growth

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
(1) ΔGDP_{it}	1.000									
(2) TEA_{it}	0.529***	1.000								
(3) $Export_{it}$	0.366***	0.391***	1.000							
(4) $Export1\text{-}25_{it}$	0.197†	0.246*	0.722***	1.000						
(5) $Export26\text{-}75_{it}$	0.325**	0.183†	0.717***	0.174	1.000					
(6) $Export76\text{-}100_{it}$	0.211*	0.403***	0.507***	0.035	0.251*	1.000				
(7) $GDPC_{it\text{-}1}$	-0.09	-0.011	0.158	-0.043	0.246*	0.161	1.000			
(8) ΔPop_{it}	0.242*	0.367***	0.378***	0.275**	0.277**	0.18†	0.097	1.000		
(9) $\Delta SkilledLabour_{it}$	0.226*	0.012	0.134	0.045	0.266*	-0.092	-0.167	-0.049	1.000	
(10) $\Delta R\&Dstock_{it}$	-0.182†	-0.147	-0.285**	-0.146	-0.311**	-0.093	-0.133	-0.377***	-0.047	1.00

Notes: Pearson correlations. Level of statistical significance for the two-tailed test: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Chapter 4:

Results

This chapter reports and discusses the results obtained from the estimation of the empirical models developed to test the hypotheses of this research. In the same sequence as the previous chapters, I first present the results on the influence of FDI and external knowledge as antecedents of export-oriented entrepreneurship. Second, I present the results on new venture productivity as an outcome of export-oriented entrepreneurship at the firm level. Finally, I present the results on economic growth as an outcome of export-oriented entrepreneurship at the regional level.

4.1 Antecedents of export-oriented entrepreneurship

In order to assess the factors that determine the export-oriented behaviour of early-stage entrepreneurs, I estimate different models based on equation (2) in Chapter 3, which contains individual and firm-specific control variables at level-1, as well as regional or industrial explanatory variables at level-2. The results including environmental determinants at the regional level-2 unit are presented in Table 14, whereas the results including environmental determinants at the industrial level-2 unit are shown in Table 15.

Table 14: Mixed-effect logit regression for individual/firm-specific and regional determinants of export-oriented entrepreneurship

		Model 1	Model 2	Model 3	Model 4
$Male_{ij}$			0.118*	0.110†	0.129*
			(0.056)	(0.057)	(0.057)
Age_{ij}			-0.002	-0.001	0.000
			(0.003)	(0.003)	(0.003)
Age^2_{ij}			0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)
$Immigrant_{ij}$			0.567***	0.541***	0.519***
			(0.087)	(0.088)	(0.089)
$Number\ of\ founders_{ij}$			0.018	0.010	0.002
			(0.023)	(0.023)	(0.024)
$College\ graduate_{ij}$				0.146*	0.116†
				(0.059)	(0.060)
$Recent\ experience_{ij}$				0.323*	0.288*
				(0.140)	(0.142)
$Investor\ experience_{ij}$				0.172†	0.125
				(0.104)	(0.106)
$Opportunity\ alertness_{ij}$				0.164**	0.146*
				(0.057)	(0.058)
$Entrepreneurial\ skills_{ij}$				0.276**	0.260*
				(0.106)	(0.107)
$No\ fear\ to\ failure_{ij}$				0.135*	0.151*
				(0.061)	(0.061)
$Number\ of\ employees_{ij}$					0.011†
					(0.006)
$Expected\ growth_{ij}$					0.002
					(0.003)
$New\ to\ all\ customers_{ij}$					0.663***
					(0.070)
$New\ technology\ base_{ij}$					0.423***
					(0.113)
Ln($Inward\ FDI_j$)					
Ln($Outward\ FDI_j$)					
Ln($Total\ FDI_j$)					
$\%\ of\ inward\ FDI_j$					
Ln($R\&D\ stock_j$)					
Constant		-0.595***	-0.735***	-1.151***	-1.304***
		(0.04)	(0.071)	(0.126)	(0.128)
Random effects: Region	s.d.(*Constant*)	0.116**	0.103**	0.101*	0.092*
		(0.039)	(0.039)	(0.039)	(0.04)
	var(*Constant*)	0.013	0.011	0.01	0.008
		(0.009)	(0.008)	(0.008)	(0.007)
Deviance (-2 ll)		7,545.94	7,497.04	7,458.92	7,345.25
Deviance difference			48.90***	87.02***	113.67***

Notes: N=5,794 at the individual level and N=17 at the regional level. The response variable is ln(p/1-p), where p is the probability that an early-stage entrepreneur is involved in an export-oriented new venture. The exponent of the coefficient is the odds ratio. The deviance difference is calculated against Model 1 which includes the individual and firm-specific control variables. Standard errors are in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Table 14: Mixed-effect logit regression for individual/firm-specific and regional determinants of export-oriented entrepreneurship (continued)

	Model 5	Model 6	Model 7	Model 8	Model 9
$Male_{ij}$	0.128* (0.057)	0.13* (0.057)	0.129* (0.057)	0.129* (0.057)	0.129* (0.057)
Age_{ij}	0.000 (0.003)	0.000 (0.003)	0.000 (0.003)	0.000 (0.003)	0.000 (0.003)
Age^2_{ij}	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
$Immigrant_{ij}$	0.513*** (0.089)	0.519*** (0.089)	0.51*** (0.089)	0.519*** (0.089)	0.513*** (0.089)
College graduate$_{ij}$	0.113† (0.06)	0.112† (0.06)	0.112† (0.06)	0.115† (0.06)	0.114† (0.06)
Recent experience$_{ij}$	0.277† (0.142)	0.281* (0.142)	0.273† (0.142)	0.288* (0.142)	0.269† (0.142)
Investor experience$_{ij}$	0.126 (0.106)	0.125 (0.106)	0.127 (0.106)	0.125 (0.106)	0.126 (0.106)
Opportunity alertness$_{ij}$	0.145* (0.058)	0.145* (0.058)	0.145* (0.058)	0.146* (0.058)	0.147* (0.058)
Entrepreneurial skills$_{ij}$	0.263* (0.107)	0.261* (0.107)	0.264* (0.107)	0.26* (0.107)	0.262* (0.107)
No fear of failure$_{ij}$	0.153* (0.061)	0.154* (0.061)	0.153* (0.061)	0.152* (0.061)	0.15* (0.061)
Number of employees$_{ij}$	0.011† (0.006)	0.011† (0.006)	0.011† (0.006)	0.011† (0.006)	0.011† (0.006)
Expected growth$_{ij}$	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)
Number of founders$_{ij}$	0.001 (0.024)	0.002 (0.024)	0.001 (0.024)	0.002 (0.024)	0.001 (0.024)
New to all customers$_{ij}$	0.663*** (0.07)	0.664*** (0.07)	0.663*** (0.07)	0.663*** (0.07)	0.663*** (0.07)
New technology base$_{ij}$	0.430*** (0.113)	0.431*** (0.113)	0.43*** (0.113)	0.423*** (0.113)	0.425*** (0.113)
Ln(*Inward FDI*$_j$)	0.045† (0.025)				
Ln(*Outward FDI*$_j$)		0.032 (0.021)			
Ln(*Total FDI*$_j$)			0.056* (0.023)		0.078** (0.027)
% of inward FDI$_j$			0.003† (0.002)		0.003† (0.002)
Ln(*R&D stock*$_j$)				0.002 (0.067)	-0.104 (0.073)
Intercept	-1.302*** (0.127)	-1.340*** (0.130)	-1.488*** (0.151)	-1.309*** (0.198)	-1.279*** (0.207)
Random effects: Region — s.d. of *Intercept*	0.075† (0.041)	0.079* (0.040)	0.061 (0.043)	0.092* (0.040)	0.043 (0.052)
Random effects: Region — var. of *Intercept*	0.006 (0.006)	0.006 (0.006)	0.004 (0.005)	0.008 (0.007)	0.002 (0.005)
Deviance (-2 ll)	7,342.09	7,342.94	7,339.22	7,345.25	7,337.31
Deviance difference	3.16†	2.31	6.03*	0.00	7.95*

Notes: N=5,794 at the individual level and N=17 at the regional level. The response variable is ln(p/1-p), where p is the probability that an early-stage entrepreneur is involved in an export-oriented new venture. The exponent of the coefficient is the odds ratio. The deviance difference is calculated against Model 1 which includes the individual and firm-specific control variables. Standard errors are in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Table 15: Mixed-effect logit regression for individual/firm-specific and industrial determinants of export-oriented entrepreneurship

		Model 1	Model 2	Model 3	Model 4
$Male_{ik}$			0.112*	0.104†	0.124*
			(0.057)	(0.057)	(0.058)
Age_{ik}			-0.002	-0.001	0.000
			(0.003)	(0.003)	(0.003)
Age^2_{ik}			0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)
$Immigrant_{ik}$			0.585***	0.556***	0.532***
			(0.087)	(0.088)	(0.089)
Number of founders$_{ik}$			0.016	0.007	-0.001
			(0.023)	(0.023)	(0.024)
College graduate$_{ik}$				0.151*	0.117†
				(0.06)	(0.061)
Recent experience$_{ik}$				0.304*	0.266†
				(0.140)	(0.142)
Opportunity alertness$_{ik}$				0.165**	0.147*
				(0.057)	(0.058)
Investor experience$_{ik}$				0.169	0.117
				(0.104)	(0.106)
Entrepreneurial skills$_{ik}$				0.293**	0.280**
				(0.106)	(0.107)
No fear to failure$_{ik}$				0.133*	0.151*
				(0.061)	(0.061)
Number of employees$_{ik}$					0.012*
					(0.006)
Expected growth$_{ik}$					0.003
					(0.003)
New to all customers$_{ik}$					0.676***
					(0.071)
New technology base$_{ik}$					0.442***
					(0.113)
Ln(*Inward FDI*$_k$)					
Ln(*Outward FDI*$_k$)					
Ln(*Total FDI*$_k$)					
% of inward FDI$_k$					
Ln(*R&D stock*$_k$)					
Constant		-0.636***	-0.773***	-1.211***	-1.374***
		(0.061)	(0.086)	(0.136)	(0.14)
Random effects	s.d.(*Constant*)	0.193***	0.193***	0.192***	0.202***
		(0.053)	(0.053)	(0.053)	(0.054)
	var(*Constant*)	0.037†	0.037†	0.037†	0.041†
		(0.02)	(0.021)	(0.02)	(0.022)
Deviance (-2 ll)		7,531.78	7,480.82	7,442.49	7,323.93
Deviance difference			50.97***	89.3***	118.55***

Notes: N=5,794 at the individual level and N=17 at the industrial level. The response variable is ln(p/1-p), where p is the probability that an early-stage entrepreneur is involved in an export-oriented new venture. The exponent of the coefficient is the odds ratio. The deviance difference is calculated against Model 1 which includes the individual and firm-specific control variables. Standard errors are in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Table 15: Mixed-effect logit regression for individual/firm-specific and industrial determinants of export-oriented entrepreneurship (continued)

	Model 5	Model 6	Model 7	Model 8	Model 9
$Male_{ik}$	0.122*	0.123*	0.123*	0.118*	0.12*
	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)
Age_{ik}	0.000	0.000	0.000	0.000	0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Age^2_{ik}	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Immigrant_{ik}$	0.533***	0.532***	0.533***	0.532***	0.531***
	(0.089)	(0.089)	(0.089)	(0.089)	(0.089)
College graduate$_{ik}$	0.117†	0.117†	0.115†	0.115†	0.113†
	(0.061)	(0.061)	(0.061)	(0.061)	(0.061)
Recent experience$_{ik}$	0.268†	0.267†	0.268†	0.269†	0.267†
	(0.143)	(0.143)	(0.143)	(0.143)	(0.143)
Investor experience$_{ik}$	0.118	0.117	0.118	0.118	0.117
	(0.106)	(0.106)	(0.106)	(0.106)	(0.106)
Opportunity alertness$_{ik}$	0.147*	0.147*	0.146*	0.150**	0.151**
	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)
Entrepreneurial skills$_{ik}$	0.280**	0.280**	0.280**	0.280**	0.281**
	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
No fear of failure$_{ik}$	0.151*	0.151*	0.151*	0.148*	0.147*
	(0.061)	(0.061)	(0.061)	(0.061)	(0.061)
Number of employees$_{ik}$	0.012*	0.012*	0.012*	0.012*	0.013*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Expected growth$_{ik}$	0.003	0.003	0.003	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Number of founders$_{ik}$	-0.001	-0.001	-0.001	0.000	0.001
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
New to all customers$_{ik}$	0.675***	0.676***	0.675***	0.674***	0.674***
	(0.071)	(0.071)	(0.071)	(0.071)	(0.071)
New technology base$_{ik}$	0.441***	0.441***	0.441***	0.428***	0.423***
	(0.113)	(0.113)	(0.113)	(0.114)	(0.114)
Ln(*Inward FDI*$_k$)	0.033				
	(0.040)				
Ln(*Outward FDI*$_k$)		0.012			
		(0.025)			
Ln(*Total FDI*$_k$)			0.043		-0.034
			(0.048)		(0.071)
% of inward FDI$_k$			0.003		0.002
			(0.004)		(0.005)
Ln(*R&D stock*$_k$)				0.061†	0.091†
				(0.034)	(0.051)
Constant	-1.398***	-1.380***	-1.620***	-1.356***	-1.400***
	(0.142)	(0.140)	(0.318)	(0.143)	(0.395)
Random effects: Industry — s.d. of *Intercept*	0.195***	0.199***	0.194***	0.232***	0.256**
	(0.052)	(0.053)	(0.053)	(0.068)	(0.083)
Random effects: Industry — var. of *Intercept*	0.038†	0.040†	0.038†	0.054†	0.066
	(0.020)	(0.021)	(0.020)	(0.032)	(0.042)
Deviance (-2 ll)	7,323.27	7,323.72	7,323.13	7,319.67	7,318.25
Deviance difference	0.66	0.21	0.80	4.26*	5.68

Notes: N=5,794 at the individual level and N=17 at the industrial level. The response variable is ln(p/1-p), where p is the probability that an early-stage entrepreneur is involved in an export-oriented new venture. The exponent of the coefficient is the odds ratio. The deviance difference is calculated against Model 1 which includes the individual and firm-specific control variables. Standard errors are in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

As suggested by Kreft & Leeuw (1998), the hypotheses are examined in an incremental approach. Thus, Model 1 is a null model in which no explanatory variables are included in order to test whether there is significant variation in export-oriented behaviour. Models 2 to 4 include individual and firm-specific control variables related to the demographic characteristics of the entrepreneur, the human capital and perceptions of the entrepreneur, and the firm capabilities and resources of the entrepreneur's new venture, respectively. Subsequent models incorporate the environmental variables that I use to test the hypotheses proposed above with regard to the influence of FDI and external knowledge on the export-oriented behaviour of early-stage entrepreneurs.

Model 1 in Table 14 shows that, on average, the odds ratio for the whole sample of early-stage entrepreneurs across regions is 0.552 [exp(-0.595) = 0.552], meaning that the average entrepreneur is reluctant to export since for every 10 entrepreneurs who are not export-oriented in a given region there are 5.52 entrepreneurs who are export-oriented (i.e., 35.6% of total entrepreneurs). While the log odds in the null model has a significant standard deviation of 0.116 across regions (p-value lower than 0.01), its variance of 0.013 across regions is small and not significant. This results in an intra-class correlation within regions of only 0.4%.[43]

Model 1 in Table 15 points in the same direction by showing that, on average, the odds ratio for the whole sample of early-stage entrepreneurs across industries is 0.529 [exp(-0.636) = 0.529], or in other words for every 10 entrepreneurs who are not export-oriented in a given industry there are 5.29 entrepreneurs who are export-oriented (i.e., 34.6% of total entrepreneurs). The log odds in the null model has a significant standard deviation of 0.193 across industries (p-value lower than

[43] The intra-class correlation indicates the proportion of the variance due to the aggregate level-2 unit. According to Guo & Zhao (2000), the intra-class correlation for binary data models can be estimated as follows: $\rho = \sigma_u^2 / \left(\sigma_u^2 + \Pi^2 / 3\right)$

0.01), and a significant, though small, variance of 0.037 across industries (p-value lower than 0.10). In this case, the intra-class correlation within industries is 1.1%.

To sum up, null models in both Table 14 and Table 15 indicate that a relatively small portion of the total variance in export-oriented behaviour is due to the variance across regions or industries; or alternatively, that most of the variance is at the individual/firm level. However, as it will be presented below, the results provide some interesting insights into the role of environment's FDI and external knowledge on export orientation.

4.1.1 Results on the impact of the environment's FDI activity

According to Table 14, early-stage entrepreneurs included in the sample show a relatively higher propensity to engage in export activities when they are exposed to a higher presence of foreign firms sharing the same regional environment. The coefficient for the natural logarithm of *Inward FDI* at the regional level is significantly positive (Model 5), and the deviance difference against the model with only control variables (Model 4) is also significant. One-unit increase in the natural logarithm of inward FDI flows per firm for a given region raises by 0.045 the log odds of an early-stage entrepreneur in such region being export-oriented instead of non-export oriented, holding the other predictor variables constant; and this increase is significant at the 10% level. In a more meaningful way, if I compare an early-stage entrepreneur located in the region which has the highest *Inward FDI*'s value with other entrepreneur located in the region which has the lowest *Inward FDI*'s value, the former is 1.28 times more likely to be export-oriented than the latter (exp[0.045*ln(24.86/0.10)] = 1.28).[44]

[44] As the explanatory variables at environmental level are transformed into natural logarithms, the interpretation of their coefficients is not straightforward. However, I can interpret these coefficients by using the minimum and maximum values of the non-transformed variable, which are provided in the descriptive statistics table. Holding the other explanatory variables constant, the expected log odds difference between an early-stage entrepreneur operating in a region or industry which has the maximum value in a given environmental variable, $W_{j/k}$(Max), and other early-stage entrepreneur operating in a region or industry which has the minimum value in such

On the contrary, the exposure to other domestic firms carrying out outward FDI activities from the same regional environment seems to have no impact on the propensity of early-stage entrepreneurs' new ventures to export. Although the coefficient for the natural logarithm of *Outward FDI* at the regional level is positive as I expected, it is not statistically significant (Model 6), nor is the deviance difference against the control model. Thus, according to my results, the presence of outward FDI activities in a given region does not considerably increases the probability that an early-stage entrepreneur in that region is export-oriented.

Consistent with the previous findings, the extent to which the regional environment is characterised by a relatively higher presence of inward FDI activities in comparison to outward FDI activities positively affects the export-oriented behaviour of early-stage entrepreneurs. In Model 7, I consider both kinds of flows (i.e., inward and outward FDI) into a single measure of total FDI, along with the percentage of it pertaining to inward flows. The deviance difference of this model against the control model is significant at the 10% level; and while one-unit increase in the natural logarithm of *Total FDI* at the regional level significantly raises the log odds by 0.056 (p-value lower than 0.05), one-unit increase in the *% of inward FDI* significantly raises the log odds by 0.003 (p-value lower than 0.10). Assuming that all other explanatory variables remain constant, this means that an early-stage entrepreneur located in the region with the highest amount of total FDI per firm is 1.38 times more likely to be export-oriented than an entrepreneur located in the region with the lowest amount of total FDI per firm (exp[0.056*ln(182.87/0.61)] = 1.38). In addition to that, if I compare an early-stage entrepreneur located in the region which has the highest proportion of inward FDI over total FDI per firm with other entrepreneur in the region which

---

environmental variable, $W_{j/k}$(Min), is γ_{01}*(ln(Max)-ln(Min)) = γ_{01}*ln(Max/Min); and the corresponding odds ratio is exp[γ_{01}*ln(Max/Min)].

has the lowest value of that proportion, the former is 1.21 times more likely to be export-oriented than the latter (exp[0.003*(63.68-0.42)] = 1.21).

These findings hold when I take into account the impact of the other environmental variable under analysis, namely the level of accumulated knowledge in the region (Model 9). Thus, I can assert that the joint impact inward and outward FDI flows on the export-oriented behaviour of early-stage entrepreneurs is significantly positive, and that such impact is even stronger when the proportion of inward flows over the total amount of FDI is higher than the proportion of outward flows.

Shifting the aggregate unit of analysis from the region to the industry, Table 15 shows that the exposure to foreign and domestic firms engaged in international activities within the same industrial environment does not affect the propensity of early-stage entrepreneurs to engage in export activities. Neither the coefficient for the natural logarithm of *Inward FDI* (Model 5) nor the coefficient for the natural logarithm of *Outward FDI* (Model 6) is statistically significant. As a consequence, the coefficient for the logarithm of *Total FDI* (Model 7) and the coefficient for the *% of inward FDI* are not significant either. In all cases, the deviance difference of these models against the control model (Model 4) is not significant. This suggests that the presence of FDI activities in a given industry, either in the form of inward flows or outward flows, does not considerably increases the probability that an early-stage entrepreneur in that industry is export-oriented.

The results I obtained allow me to accept the hypothesis H1.1a, which suggests that early-stage entrepreneurs in regions with a higher exposure to inward FDI are more likely to be export-oriented, as well as hypothesis H1.3a, according to which the positive influence of inward FDI at the regional level is higher than that of outward FDI. However, I cannot accept or reject hypothesis H1.2a regarding the effect of outward FDI at the regional level, nor can I accept or reject hypotheses

H1.1b, H1.2b and H1.3b corresponding to the influence of the exposure to FDI activities at the industrial level.

4.1.2 Results on the impact of the environment's accumulated knowledge

Table 14 also shows that the availability of external knowledge in the regional environment does not affect the export-oriented behaviour of early-stage entrepreneurs. In model 8, the coefficient for the natural logarithm of *R&D stock* is positive, but statistically insignificant and close to zero. Surprisingly, this coefficient becomes negative and moves away from zero when all regional variables are included in the same estimation (Model 9),[45] but it remains statistically insignificant. Therefore, the benefits derived from the geographic concentration of knowledge (Audretsch & Feldman, 1996) are not large enough as to enable early-stage entrepreneurs included in the sample to develop competitive advantages with which they can successfully enter foreign markets.

On the contrary, according to the results exhibited in Table 15, industries with high levels of external knowledge seem to be ideal environments for early-stage entrepreneurs to be export-oriented. The coefficient for the natural logarithm of *R&D stock* indicates that one-unit increase in this variable causes an increase of 0.061 in the log odds which is significant at the 10% level (Model 8). More explicitly, an early-stage entrepreneur in the industry with the highest stock of technological knowledge per firm is, ceteris paribus, 1.71 times more likely to be export-oriented than an entrepreneur in the industry with the lowest stock of technological knowledge per firm (exp[0.061*ln(71.62/0.01)] = 1.71). The deviance difference of this model against the control model is significant at the 5% level.

[45] Although these changes make the model suspicious of collinearity among the regional variables, VIF scores provide evidence of no multi-collinearity. Moreover, the coefficients for other regional variables remain significant and do not change in a noticeable way, which suggests that they are consistent and that multi-collinearity is not a problem.

These results remain similar if I include the other environmental variables under analysis (Model 9). In view of that, I can accept the hypothesis H1.4b, which suggests that early-stage entrepreneurs operating in industries which have a higher stock of technological knowledge are more likely to be export-oriented, but I cannot accept or reject the hypothesis H1.4a, which suggest that the same happens at the regional level.

4.1.3 Discussion of results

I have applied a multilevel modelling approach in order to analyse the influence of FDI and external knowledge at the regional and industrial level on the export-oriented behaviour of early-stage entrepreneurs at the individual level. Although a relatively small proportion of the variance in the data used in this analysis depended on the variation across regions and industries, I have found some evidence supporting the idea that FDI and external knowledge have an influence on the export-oriented behaviour of early-stage entrepreneurs. Such evidence provided by the data has allowed me to accept three of the eight hypotheses proposed with regard to the antecedents of export-oriented entrepreneurship.

As suggested in hypothesis H1.1a, I have found that early-stage entrepreneurs located in regions with a higher exposure to inward FDI flows are more likely to be export-oriented. This finding complements prior studies which have provided evidence on the propensity of a new venture to export as a result of the imitation of other organisations located in the same environment (Fernhaber & Li, 2010; Lu, 2002). For instance, while Fernhaber & Li (2010) found that international expansion among IPO new ventures based in the U.S. may be the result of the imitation of certain organisations from the same national industry which are involved in exporting, the present study shows that this mimetic behaviour holds in Spain when new ventures are exposed to foreign firms in their regional

environment[46], but not when they are exposed to foreign firms in their industrial environment[47]. Likewise, this finding also supports De Clercq, et al.'s (2008) findings suggesting that inward FDI activities has a positive effect on the proportion of export-oriented new ventures in high-income countries. In particular, the present study provides evidence of the relationship between inward FDI at the regional level and export-oriented behaviour of early-stage entrepreneurs at the individual level in a high-income country, while De Clercq, et al. (2008) provide evidence of such relationship only at the country level.

Moreover, as proposed in hypothesis H1.3a, I have found that the positive influence of the regional exposure to inward FDI flows on the export-oriented behaviour of early-stage entrepreneurs is significantly higher than the positive influence of the regional exposure to outward FDI flows. This expand the findings of previous which have analysed the impact of inward and outward FDI on export-oriented entrepreneurship without measuring the comparative importance of each one (De Clercq, et al., 2008).

According to hypothesis H1.4b, the results also reveal that the importance of the environment's accumulated knowledge for export orientation seems to be linked to the industry in which the entrepreneur operates, but not to the region in which he or she is located as it was proposed in hypothesis H1.4a. This finding suggests that, in order to use external knowledge as a resource for entering foreign markets, the technological base of an entrepreneur's new venture is required to be related to such knowledge, and this is not evidenced through geographical proximity, but through industrial similarity. Consistent with this view, early and fast internationalisation is more common in high technology industries in which firms are characterised by high levels of knowledge intensity (Autio, et al., 2000), due

[46] Note that I refer to the regional environment regardless of the industry in which inward FDI activities are carried out by foreign firms.

[47] In this case, I refer to the industrial environment regardless of the Spanish region in which inward FDI activities by foreign firms are located.

in part to the fact that they have increased access to external knowledge. Not surprisingly, first international new ventures were identified in that kind of industries (Jolly, et al., 1992; Knight & Cavusgil, 2004; Oviatt, et al., 1993).

4.2 Outcomes of export-oriented entrepreneurship at the firm level

To test whether export orientation and the age at international have an effect on productivity at the firm level, I estimated several fixed-effects linear models using OLS. Apart from the fixed-effects estimator, I also examined alternative specifications based on random-effects, but the Hausman's (1978) test provided evidence against the use of the random-effects estimator at the 7.16% level of significance (or lower) for all estimated models (see Appendix 3). Therefore, the results reported and discussed here are from the fixed-effects estimator.[48] For all models, standard errors were corrected for potential heteroscedasticity – typically associated with panel data – using the Huber-White estimator (White, 1980), which produces heteroscedastic-consistent standard errors.[49]

[48] A fixed-effects specification for panel data assumes that there may be omitted variables which are correlated to the observable explanatory variables and which do not change over time (Wooldridge, 2009). If this is not true, then unobserved variables are just additional factors that affect the dependent variable, only. Therefore, they can be treated as random-effects that are present in the error term. In contrast, if omitted variables are correlated with some observable explanatory variables, then putting them into the error term can causes severe problems. Accordingly, the fixed-effects estimation treats the specific unobserved characteristics as a parameter to be estimated for each individual so that they are excluded from the error term and the bias of omitted variables is reduced. The Hausman's (1978) test is widely accepted as a mean of determining whether or not omitted variables are correlated with some observable explanatory variables. While the fixed-effects estimation is consistent when such correlation exists, the random-effects estimation is inconsistent. Therefore, a statistically significant difference between the common parameters estimated through both estimations provides evidence that there is correlation, and supports the use of the fixed-effects specification.

[49] Heteroscedasticity arises when the variance of error terms or disturbances is not homogeneous across all the observations. The main consequence of heteroscedastic disturbances is the estimation of consistent but inefficient coefficients with an inconsistent covariance matrix. That is, although the coefficients are unbiased in the presence of heteroscedasticity, they are inefficient and the usual test of significance becomes inconsistent. To correct for this potential problem, I use the estimator proposed by White (1980), which allows me to fit the models and obtain consistent covariance matrix estimates even if the disturbances are heteroscedastic.

According to the empirical model outlined in Sub-subsection 3.2.2, the effects of exporting behaviour on new venture productivity are formally tested through the Cobb-Douglas production functions specified in equations (7) and (9) of Chapter 3. Results from these regression models are shown in Table 16 and Table 17, respectively. In both tables, column 1 is a sub-model that excludes the interaction between firm age and export status (i.e., $Age_{it}xExport_{it}$ in Table 16, and $Age_{it}xEarly_{it}$ and $Age_{it}xLate_{it}$ in Table 17), whereas column 2 shows the results for the complete model, including the interaction. For all production functions, the sum of the elasticities of output with respect to labour and capital is consistently lower than one ($\beta_1 + \beta_2 < 1$) at the 10% level (or lower), suggesting the presence of decreasing returns to scale. Finally, the goodness of fit of these models is quite acceptable since all of them account for more than 85% of the total variance.

Table 16: The effects of exporting on new venture productivity

Variables		**(1)**	**(2)**
		Cobb-Douglas	**Cobb-Douglas**
Average and initial TFP	$Export_{it}$ (γ_1)	0.3209** (0.1179)	0.0550 (0.0604)
TFP Growth	Age_{it} (γ_2)	0.0817*** (0.0242)	0.0723* (0.0280)
	Age_{it} x $Export_{it}$ (γ_3)		0.0365† (0.0193)
Inputs	LnL_{it} (β_1)	0.8239*** (0.0805)	0.8393*** (0.0806)
	LnK_{it} (β_2)	0.0398 (0.0475)	0.0347 (0.0478)
	Constant	0.4213 (0.2895)	0.4537 (0.2971)
Observations		297	
Cases		79	
R^2:	Within	0.8138	0.8113
	Between	0.9222	0.9287
	Overall	0.8827	0.8834

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** p ≤ 0.1%, ** p ≤ 1%, * p ≤ 5%, † p ≤ 10%.

Table 17: Age at foreign market entry and new venture productivity

Variables		(1)	(2)
		Cobb-Douglas	**Cobb-Douglas**
Average and initial TFP	$Early_{it}$ (γ_1')	0.7448** (0.2723)	-0.0541 (0.0776)
	$Late_{it}$ (γ_2')	0.2510* (0.1208)	-0.0450 (0.0651)
TFP growth	Age_{it} (γ_3')	0.0873*** (0.0249)	0.0768** (0.0277)
	Age_{it} x $Early_{it}$ (γ_4')		0.1159* (0.0516)
	Age_{it} x $Late_{it}$ (γ_5')		0.0244 (0.0182)
Inputs	LnL_{it} (β_1)	0.8155*** (0.0815)	0.8250*** (0.0821)
	LnK_{it} (β_2)	0.0341 (0.0468)	0.0237 (0.0417)
	Constant	0.4010 (0.2825)	0.5160† (0.2941)
Observations		297	
Cases		79	
R^2:	Within	0.8154	0.8150
	Between	0.8995	0.9270
	Overall	0.8727	0.8863

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** p ≤ 0.1%, ** p ≤ 1%, * p ≤ 5%, † p ≤ 10%.

Having a look at the model shown in column 1 of Table 16, one can see some initial insights about the average productivity difference between exporting and non-exporting new ventures over the period of study as a whole, as well as the gains in productivity over time for the entire sample. For instance, the estimated coefficient γ_1 indicates that, once the level of inputs employed in the production is accounted for, exporting new ventures obtain 32.1% more value added than non-exporting ones. Likewise, for all observations in the sample, the coefficient γ_2

tells that the value added output rises 8.2% per each additional year.[50] The effect of these coefficients is significant at the 1% and 0.1% level, respectively.

In column 1 of Table 17, after controlling for the level of inputs employed in production during the period of analysis, the estimated coefficient γ_1' shows that early exporting new ventures achieve on average 74.5% more value added than non-exporting new ventures, while the estimated coefficient γ_2' reveals that late exporting firms only obtain 25.1% more value added. These coefficients are significant at the 1% and 5% levels, respectively, meaning that exporters have a productivity premium over non-exporters regardless of the time of the first international sale. However, the difference in average output between early and late exporting new ventures is also significant at the 10% level (*Prob.* > *F* = 0.0982),[51] which suggests that the former are seemingly more productive than the latter. Taking into account the whole sample, the output also rises over time at a rate of 8.7% per each additional year, as indicated by the estimated coefficient γ_3', which is significant at the 1% level.

In general, these preliminary findings are consistent with the extant literature. More specifically, I confirm that, on the one hand, exporters have a productivity premium, as has been found in other studies (Alvarez & López, 2005; Arnold & Hussinger, 2005; Aw & Hwang, 1995; Baldwin & Gu, 2003; Bernard & Jensen, 1995; Bernard & Wagner, 1997; Blalock & Gertler, 2004; Breau & Rigby, 2008; Castellani, 2002; Clerides, et al., 1998; Delgado, et al., 2002; Girma, et al., 2004;

[50] Changes in logged units are roughly equal to percentage changes in the original units that have been transformed into natural logarithms. Therefore, when using logged units, as is the case in production functions, estimated coefficients must be interpreted in relative terms. More specifically, estimated coefficients of dummy variables (i.e., export status) are almost equal to percentage differences in the dependent variable with respect to the reference category, whereas estimated coefficients of time trend variables (i.e., age) are almost equal to the average percentage growth in the dependent variable.

[51] To see whether there was a significant difference between the average output of early and late exporting new ventures, I run a Wald test of simple and composite linear hypotheses after the estimation of coefficients γ_1' and γ_2'.

Greenaway & Kneller, 2004; Kraay, 1999; Wagner, 2002); and on the other hand, new ventures in general experience productivity improvements which provide supportive evidence to the learning curve pattern that characterises organisations after the commencement of their operations, and during their start-up phase (1966). The remainder of this section describes the results that are related to the hypotheses of the present study.

4.2.1 Results on the initial productivity differentials between exporting and non-exporting new ventures

When introducing the interaction between firm age and export status in column 2 of Table 16, I control for the effect of export status over time. Thus, the estimated coefficient γ_1 indicates that the change in export status from zero (0) to one (1) implies 5.5% of positive variance in output that is not accounted for by production inputs. However, this variance is not significantly different from zero. This means that new ventures which have just started exporting do not show significant differences in the value added not explained by the use of production inputs with respect to those which remain non-exporters. Therefore, the former are not more productive than the latter at foreign market entry. As I find no evidence of additional output that may be interpreted as a productivity premium held by exporting new ventures during the first year of international activity, I cannot accept hypothesis H2.1. Consequently, at international entry, new ventures selling to foreign markets do not necessarily have a higher initial productivity level than those selling only to domestic markets.

4.2.2 Results on the differences in productivity growth between exporting and non-exporting new ventures

In column 2 of table 16, the estimated coefficient γ_3 for the interaction term represents the subsequent output growth that depends on export status. If exporting improves productivity, then I expect a stronger average output growth after the first international sale due to the new knowledge learned or acquired in

foreign markets, and as a result of the learning process involved in approaching such markets. As seen above, the average output growth of the entire sample is 8.2%. However, for exporting new ventures, the results show that each additional year is predicted to increase value added by 10.9% $\left(\frac{\partial LnY_{it}}{\partial Age_{it}} = \gamma_2 + \gamma_3 = 0.0723 + 0.0365 = 0.1088\right)$; while for non-exporting new ventures, the marginal effect of each additional year on value added is 7.2% $\left(\frac{\partial LnY_{it}}{\partial Age_{it}} = \gamma_2 = 0.0723\right)$. The additional 3.7% output growth obtained by exporting new ventures, which is represented by the estimated coefficient γ_3, is significant at the 10% level. Consequently, I can assert that new ventures selling to foreign markets are able to improve productivity after their international entry in such a way that their output rises above the average output growth of those selling only to domestic markets. This allows me to accept hypothesis H2.2.

4.2.3 Results on the effects of age at foreign market entry on productivity growth

Significant differences in output between both early and late exporting firms, on the one hand, and non-exporting firms, on the other hand, disappear when I introduce the interaction between export status and age in column 2 of Table 17. Thus, I do not find significant differences in the initial productivity level between exporting and non-exporting firms, even if I separate exporting new ventures into early exporting and late exporting. Moreover, the estimated coefficients γ_1' and γ_2' are not significantly different each other, meaning that early exporting new ventures and late exporting ones show the same initial productivity level at international entry. Nonetheless, I can see some growth differences among the groups of analysis. For instance, in comparison to non-exporting new ventures, the estimated coefficient γ_4' indicates that early exporters have an additional 11.6% output growth which is significant at the 5% level; whereas, the estimated coefficient γ_5' shows that late exporting new ventures increase their output only

2.4% more than non-exporting firms, though this additional growth is not significantly different from zero. Overall, while for non-exporting new ventures each additional year yields 7.7% more value added $\left(\frac{\partial LnY_{it}}{\partial Age_{it}} = \gamma_3' = 0.0768\right)$, early exporting new ventures are able to increase their value added by 19.3% per each additional year $\left(\frac{\partial LnY_{it}}{\partial Age_{it}} = \gamma_3' + \gamma_4' = 0.0768 + 0.1159 = 0.1927\right)$, and late exporting new ventures are able to do so by 10.1% $\left(\frac{\partial LnY_{it}}{\partial Age_{it}} = \gamma_3' + \gamma_5' = 0.0768 + 0.0244 = 0.1012\right)$. These results suggest that exporting new ventures may differ substantially in terms of productivity growth due to the age at foreign market entry. Indeed, a Wald test of simple and composite linear hypotheses confirms that the additional output growth obtained by early exporting new ventures is significantly higher than that of late exporting new ventures ($\gamma_4' > \gamma_5'$) at the 10% level (*Prob* > *F* = 0.0671). This supports the idea that the former are able to learn from foreign markets faster than the latter, and that such ability is translated into productivity improvements leading to a higher output growth. Accordingly, I can also accept hypothesis H2.3.

4.2.4 Analysing the sources of output growth

An interesting way to understand the contribution of productivity to output growth is by disaggregating the output growth into the growth due to an increased use of inputs and the growth due to productivity improvements. Table 18 presents the regressions of output and inputs on export status, firm age and the interaction between them.[52] While the estimated coefficient δ_1 refers to the initial differences between exporting and non-exporting new ventures in the corresponding dependent variable, the estimated coefficients δ_2 and δ_2 represent the differences in growth. From these results and those provided above in table 16, I create table

[52] The basic model for the regressions reported in table 18 is a fixed-effects specification of the form: $\ln X_{jit} = \alpha_0 + \delta_1 Export_{it} + \delta_2 Age_{it} + \delta_3 Age_{it} \times Export_{it} + \mu_i + \varepsilon_{it}$; where $\ln X_j$ corresponds to the logarithm of output, labour or capital.

20 to distinguish the sources of output growth for exporting and non exporting new ventures.[53]

According to table 20, the average output growth obtained by exporting and non-exporting new ventures is almost the same. Indeed, the average output growth of the former is only 0.9% lower than that of the latter. In both cases, the contribution of capital growth to output growth is less than 1%. However, the percentage of output growth due to an increased use of labour inputs is 21.8% for exporting firms and 26.2% for non-exporting ones. The remaining output growth corresponds to the productivity growth, which is 10.9% for exporting new ventures and 7.2% for non-exporting new ventures. The difference of 3.7% means that exporting new ventures are able to grow roughly at the same rate as non-exporting new ventures do, but without increasing their inputs as much as them. Therefore, as I have previously shown, exporting new ventures have a productivity growth premium over non-exporting new ventures. Here, I can see that this premium is mainly due to a better use of the additional labour inputs employed in the production.

I also disaggregate the sources of output growth for early exporting and late exporting new ventures. Thus, table 21 shows the growth estimations of output and inputs from the results provided in table 17 and table 19.[54] In this case, each group of analysis experiences a different output growth. While early exporting new ventures increase their value added by 52.5% a year, late exporting and non exporting new ventures do so by 30.1% and 33.7%, respectively. For all of them,

[53] The contribution of each input to output growth is calculated as the multiplication of the corresponding input growth and its output elasticity. The difference between the output growth and the change due to the growth of inputs is then the residual considered as TFP.

[54] Here, the basic model for the regressions reported in table 19 is specified as follows: $\ln X_{jit} = \alpha_0 + \delta_1' Early_{it} + \delta_2' Late_{it} + \delta_3' Age_{it} + \delta_4' Age_{it} \times Early_{it} + \delta_5' Age_{it} \times Late_{it} + \mu_i + \varepsilon_{it}$; where, again, $\ln X_j$ corresponds to the logarithm of output, labour or capital. While the estimated coefficients δ_1' and δ_2' refer to the initial differences in the corresponding dependent variable for early exporting and late exporting new ventures with respect to non-exporting ones, respectively, the estimated coefficients δ_3', δ_4' and δ_5' represent the differences in growth.

roughly 1% of the increase corresponds to capital growth. In contrast, the contribution of labour growth to output growth is 32.2%, 19.6% and 25.4% for early exporting, late exporting and non-exporting new ventures, respectively. These figures help understand why the portion of output growth that is not attributable to the growth of inputs ranges from 7.7% for non-exporting new ventures to 19.3% for early exporting ones. For instance, despite their comparatively lower output growth, late exporting new ventures show a slightly higher productivity growth than non-exporting ones because they use much fewer additional labour inputs. Nonetheless, the difference in productivity growth between late exporting and non-exporting new ventures is not significant, as has been shown before. On the other hand, early exporting new ventures show a higher productivity growth than late exporting and non-exporting ones because they not only use the additional labour inputs needed in production more efficiently, but also have a much higher output growth than the rest.

Table 18: Estimation of output and inputs growth for exporting and non-exporting new ventures

Variables		Model 1	Model 2	Model 3
		$Y=LnY_{it}$	$Y=LnL_{it}$	$Y=LnK_{it}$
Initial output levels	$Export_{it}$ (δ_1)	0.7430*** (0.1454)	0.7681*** (0.1333)	1.2487*** (0.2195)
Output growth	Age_{it} (δ_2)	0.3441*** (0.0416)	0.3126*** (0.0339)	0.2706*** (0.0464)
	Age_{it} x $Export_{it}$ (δ_3)	-0.0090 (0.0433)	-0.0525 (0.0396)	-0.0438 (0.0674)
	Constant	0.7430*** (0.1454)	0.7681*** (0.1333)	1.2487*** (0.2195)
Observations			297	
Cases			79	
R^2:	Within	0.5832	0.5712	0.3135
	Between	0.0836	0.0508	0.0407
	Overall	0.2279	0.1713	0.0605

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** p ≤ 0.1%, ** p ≤ 1%, * p ≤ 5%, † p ≤ 10%.

Table 19: Estimation of output and inputs growth for early exporting and late exporting new ventures

Variables		Model 1	Model 2	Model 3
		$Y=LnY_{it}$	$Y=LnK_{it}$	$Y=LnL_{it}$
Initial output levels	$Early_{it}$ (δ_1')	0.2217	0.3304*	0.1339
		(0.1767)	(0.1639)	(0.3065)
	$Late_{it}$ (δ_2')	0.6788***	0.8237***	1.8670***
		(0.1741)	(0.1659)	(0.2059)
Output growth	Age_{it} (δ_3')	0.3368***	0.3076***	0.2627***
		(0.0413)	(0.0337)	(0.0465)
	Age_{it} x $Early_{it}$ (δ_4')	0.1881*	0.0827	0.1679
		(0.0919)	(0.0751)	(0.1576)
	Age_{it} x $Late_{it}$ (δ_5')	-0.0356	-0.0707†	-0.0723
		(0.0415)	(0.0401)	(0.0677)
	Constant	3.5406***	3.5633***	3.5748***
		(0.1346)	(0.1118)	(0.1857)
Observations			297	
Cases			79	
R^2:	Within	0.6063	0.5864	0.3406
	Between	0.1296	0.0772	0.0475
	Overall	0.2803	0.2035	0.0701

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Table 20: Sources of output growth for exporting and non-exporting new ventures

	Output (LnY_{it})	**Labour input (LnL_{it})**			**Capital input (LnK_{it})**			**Diff. output and inputs growth**
	ΔLnY_{it}	ΔLnL_{it}	β_1	$\beta_1*\Delta LnL_{it}$	ΔLnK_{it}	β_2	$\beta_2*\Delta LnK_{it}$	$\Delta LnY_{it} - \beta_1*\Delta LnL_{it} - \beta_2*\Delta LnK_{it}$
Exporting ($\delta_2 + \delta_3$)	0.3351	0.2601	0.8393	0.2183	0.2268	0.0347	0.0079	0.1089
Non-exporting (δ_2)	0.3441	0.3126	0.8393	0.2624	0.2706	0.0347	0.0094	0.0723

Notes: The parameters β1 and β2 refer to the output elasticities of labour and capital inputs, respectively, which are estimated in column 2 of Table 16.

Table 21: Sources of output growth for early exporting and late exporting new ventures

	Output (LnY_{it})	**Labour input (LnL_{it})**			**Capital input (LnK_{it})**			**Diff. output and inputs growth**
	ΔLnY_{it}	ΔLnL_{it}	β_1	$\beta_1*\Delta LnL_{it}$	ΔLnK_{it}	β_2	$\beta_2*\Delta LnK_{it}$	$\Delta LnY_{it} - \beta_1*\Delta LnL_{it} - \beta_2*\Delta LnK_{it}$
Early exporting ($\delta_3' + \delta_4'$)	0.5249	0.3902	0.8250	0.3220	0.4306	0.0237	0.0102	0.1927
Late exporting ($\delta_3' + \delta_5'$)	0.3012	0.2369	0.8250	0.1955	0.1904	0.0237	0.0045	0.1012
Non-exporting (δ_3')	0.3368	0.3076	0.8250	0.2538	0.2627	0.0237	0.0062	0.0768

Notes: The parameters β_1 and β_2 refer to the output elasticities of labour and capital inputs, respectively, which are estimated in column 2 of Table 17.

4.2.5 Robustness checks

Given that no control variables were included, here I present some exercises to confirm that the results are robust to the model specification of the production function and do not depend on potential systematic differences among the groups of analysis.

Are the differences in productivity growth perpetual?

The estimated models implicitly assume that the output growth due to productivity gains is linear and constant. Under this assumption the productivity differences between exporting and non-exporting new ventures, as well as between early exporting and late exporting ones, are expected to remain equal over time since productivity grows at a constant rate. However, output growth derived from productivity might reach a certain limit given that once a firm exceeds a threshold of productivity, additional improvements become increasingly harder. Therefore, for each group of analysis I test whether the productivity growth is linearly constant over time. For that purpose I include the age-squared (Age^2_{it}) and its respective interactions with the export status in the TFP specifications already defined in equations (6) and (8) of Chapter 3. I report the results of this analysis in Table 22 and Table 23.

In general, one observes that all firms included in the sample exhibit a decreasing evolution of the output growth due to productivity. More specifically, the time for achieving the maximum productivity ranges from 8.67 to 9.98 years.[55] However, I found no additional patterns of non-linear productivity growth for exporting new ventures – neither for those which start exporting early in their life cycle, nor for

[55] For example, according to the estimated coefficients γ_{2a} and γ_{2b} in column 1 of Table 22, all firms in the sample achieve the highest productivity in 9.74 years, ceteris paribus, as determined by the first order condition:

$\frac{\partial LnY_{it}}{\partial Age_{it}} = \gamma_{2a} + 2(\gamma_{2b})Age_{it}$ ➔ $0.2396 + 2(-0.0123)Age_{it} = 0$ ➔ $Age_{it} = 9.74$

those which start exporting late. Both in column 2 of Table 22 and in column 2 of Table 23, interactions between organisational age (including age-squared) and export status are insignificant, meaning that I cannot reject that the productivity growth premium held by exporting new ventures is reduced or increased over time. Of course, I must be cautious about the conclusions regarding the long-term evolution of productivity, since my sample is made up of an average of 3.8 yearly observations per firm.

Table 22: The effects of exporting on new venture productivity using age-squared

Variables		Model 1	Model 2
		Cobb-Douglas	Cobb-Douglas
Average and initial TFP	$Export_{it}$ (γ_1)	0.2571† (0.1326)	0.0379 (0.0626)
TFP Growth	Age_{it} (γ_{2a})	0.2396*** (0.0664)	0.2428** (0.0740)
	Age^2_{it} (γ_{2b})	-0.0123** (0.0044)	-0.0140** (0.0053)
	Age_{it} x $Export_{it}$ (γ_{3a})		0.0497 (0.0443)
	Age^2_{it} x $Export_{it}$ (γ_{3b})		-0.0005 (0.004)
Inputs	LnL_{it} (β_1)	0.7386*** (0.0811)	0.7427*** (0.0797)
	LnK_{it} (β_2)	0.0456 (0.0458)	0.0432 (0.0454)
	Constant	0.4582† (0.2690)	0.4835† (0.2716)
Observations		297	
Cases		79	
R^2:	Within	0.8231	0.8239
	Between	0.9078	0.9098
	Overall	0.8759	0.8761

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** p ≤ 0.1%, ** p ≤ 1%, * p ≤ 5%, † p ≤ 10%.

Table 23: Age at foreign market entry and new venture productivity using age-squared

Variables		Model 1	Model 2
		Cobb-Douglas	Cobb-Douglas
Average and initial TFP	$Early_{it}$ (γ'_1)	0.6577* (0.2852)	-0.0050 (0.0819)
	$Late_{it}$ (γ'_2)	0.1917 (0.1358)	-0.0955 (0.0677)
TFP growth	Age_{it} (γ'_{3a})	0.2435*** (0.0671)	0.2347** (0.0752)
	Age^2_{it} (γ'_{3b})	-0.0122** (0.0044)	-0.0131* (0.0054)
	Age_{it} x $Early_{it}$ (γ'_{4a})		0.1323 (0.1529)
	Age^2_{it} x $Early_{it}$ (γ'_{4b})		-0.0060 (0.0155)
	Age_{it} x $Late_{it}$ (γ'_{5a})		0.0361 (0.0414)
	Age^2_{it} x $Late_{it}$ (γ'_{5b})		0.0002 (0.0039)
Inputs	LnL_{it} (β_1)	0.7313*** (0.082)	0.7394*** (0.0816)
	LnK_{it} (β_2)	0.0402 (0.0451)	0.0363 (0.0421)
	Constant	0.4388† (0.2622)	0.5149† (0.2744)
Observations		297	
Cases		79	
R^2:	Within	0.8245	0.8251
	Between	0.8895	0.9100
	Overall	0.8686	0.8785

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Are the results consistent under an alternative functional form?

The Cobb-Douglas production function is widely used in empirical studies of productivity because of its log-linear form, and the relatively easy interpretation of the estimated coefficients it provides. However, this functional form imposes strong restrictions on the substitutability among production inputs. More

specifically, the elasticities of substitution and transformation patterns of production inputs are assumed to be constant and equal to one (Uzawa, 1962). In contrast, the transcendental logarithmic (translog) production function is much more flexible in the empirical determination of production patterns since it allows for non-linear relations between inputs and output, as well as interactive relations among inputs (Christensen, Jorgenson, & Lau, 1973). Therefore, as a robustness check, I replicate my empirical models in Table 24 and Table 25 using a translog specification.[56]

In both tables I can observe similar results to those I found under the Cobb-Douglas production function. On the one hand, I confirm that exporting new ventures are significantly more productive than non-exporting ones considering the whole period of analysis (see coefficient γ_1 in column 1 of table 24); this is true regardless of firm age at foreign market entry (see coefficients γ_1 and γ_2 in column 1 of table 25).[57] Likewise, all new ventures experience productivity growth over time (see coefficient γ_2 in column 1 of table 24 and coefficient γ_3 in column 1 of table 25).

On the other hand, when introducing the interaction between age and export status in column 2 of Table 24, the coefficient γ_1 loses significance, meaning that there are not significant productivity differences between exporting and non-exporting new ventures during the first year of international activity. Similarly, in column 2 of table 24, coefficient γ_3 is significant, which confirms that exporting new ventures have a higher productivity growth than non-exporting ones. Finally, coefficients γ_4 and γ_5 in column 2 of table 25 not only are significantly different from zero, but also significantly different from each other at the 10% level (*Prob*

[56] I estimate a translog production function by using the following fixed-effects linear specification: $\ln Y_{it} = \ln A_{it} + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \beta_3 \ln L_{it}^2/2 + \beta_4 \ln K_{it}^2/2 + \beta_2 \ln K_{it} \times \ln K_{it} + \mu_i + \varepsilon_{it}$; where the term A_{it} is substituted with the equations previously defined in the empirical model section in order to prove my hypotheses.

[57] Of course, early exporting new ventures are more productive than late exporting ones (coefficients γ_1 and γ_2 are significantly different at the 10% level)

> $F = 0.0851$). Therefore, firm age affects productivity growth in such a way that the younger the firm at foreign market entry, the more able it is to learn from foreign markets and improve productivity.

Table 24: The effects of exporting on new venture productivity using a translog production function

Variables		Model 1	Model 2
		Translog	Translog
Average and initial TFP	$Export_{it}$ (γ_1)	0.3584** (0.1148)	0.0210 (0.0619)
TFP Growth	Age_{it} (γ_2)	0.0784*** (0.0216)	0.0662* (0.0254)
	Age_{it} x $Export_{it}$ (γ_3)		0.0461* (0.0187)
Inputs	LnL_{it} (β_1)	0.7585*** (0.1619)	0.8093*** (0.1610)
	LnK_{it} (β_2)	0.1875† (0.1073)	0.2059† (0.1163)
	$LnL_{it}^2 / 2$ (β_3)	0.0908† (0.0458)	0.0837† (0.0462)
	$LnK_{it}^2 / 2$ (β_4)	0.0531† (0.0272)	0.0491† (0.0267)
	LnL_{it} x LnK_{it} (β_5)	-0.0786** (0.0260)	-0.0797** (0.0292)
	Constant	0.1374 (0.3998)	0.0634 (0.4273)
Observations		297	
Cases		79	
R^2:	Within	0.8215	0.8191
	Between	0.9030	0.9132
	Overall	0.8805	0.8824

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** p ≤ 0.1%, ** p ≤ 1%, * p ≤ 5%, † p ≤ 10%.

Thus, the findings do not depend on the model specification form since a translog production function yields similar results to those of Table 16 and Table 17 above for a Cobb-Douglas production function.

Table 25: Age at entry and new venture productivity using a translog production function

Variables		Model 1	Model 2
		Translog	Translog
Average and initial TFP	$Early_{it}$ (γ_1)	0.7035***	-0.0674
		(0.2120)	(0.0811)
	$Late_{it}$ (γ_2)	0.3001*	-0.0789
		(0.1244)	(0.0675)
TFP growth	Age_{it} (γ_3)	0.0825***	0.0711**
		(0.0225)	(0.0254)
	Age_{it} x $Early_{it}$ (γ_4)		0.1185*
			(0.0508)
	Age_{it} x $Late_{it}$ (γ_5)		0.0355*
			(0.0178)
Inputs	LnL_{it} (β_1)	0.7425***	0.8210***
		(0.1643)	(0.1611)
	LnK_{it} (β_2)	0.1743	0.1937
		(0.1068)	(0.1213)
	LnL_{it}^2 / 2 (β_3)	0.0905†	0.0735
		(0.0460)	(0.0478)
	LnK_{it}^2 / 2 (β_4)	0.0519†	0.0453†
		(0.0272)	(0.0230)
	LnL_{it} x LnK_{it} (β_5)	-0.0758**	-0.0756*
		(0.0260)	(0.0299)
	Constant	0.1591	0.0838
		(0.3935)	(0.4350)
Observations		297	
Cases		79	
R^2:	Within	0.8225	0.8220
	Between	0.8854	0.9129
	Overall	0.8726	0.8849

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Are the results biased due to sample selection?

A final robustness check deals with testing the presence of potential bias driven by systematic differences among the groups of analysis. Industrial organisation literature emphasises that significant inter-industry differences exist that influence strategies at the firm level (Porter, 1979). From a neoclassical perspective, these differences depend mostly on the available technology and market conditions. In contrast, evolutionary theories suggest that firms are tremendously heterogeneous in both size and performance within industries (Nelson, 1981) and that this is due to their firm-specific resources (Barney, 1991). Hence, I test for differences on industry sector, technological level and size of firms in order to verify that the export premium in productivity growth is not due to unobserved variables other than exporting behaviour. Based on a two-sample t-Test for equal means, exporting and non-exporting new ventures do not show significant differences in these control variables. Similarly, early exporting and late exporting new ventures do not show significant differences either. This allows me to confirm that my results are not biased by potential systematic differences among observations. Results of the two-sample t-Test for equal means for each pair of groups are provided in Appendix 4.

4.2.6 Discussion of results

I have used a Cobb-Douglas production function framework under a longitudinal setting to estimate differences in TFP between exporters and non-exporters, on the one hand, and between early exporters and late exporters, on the other hand, as well as to analyse the evolution of such differences over time. The estimations have been replicated using a translog production function which has yielded similar results. Likewise, I have tested whether productivity growth follows non-linear patterns, and confirmed that the groups of analysis do not show differences from each other after controlling for a set of initial variables that can be related to

differences in productivity from inception. Overall, my empirical results have supported two of the three proposed hypotheses.

Firstly, contrary to my expectations in hypothesis H2.1, I have found that, even though exporting new ventures are significantly more productive than non-exporting ones over the whole period of analysis, they are not significantly more productive than the latter at the time of foreign market entry. Even when considering the age at foreign market entry, I have not found significant differences in initial productivity levels between either early exporting new ventures and non-exporting ones or late exporting new ventures and non-exporting ones. Previous research has highlighted that, before entering foreign markets, exporting firms must improve their productivity relative to firms that do not export because internationalisation involves large sunk costs (Alvarez & López, 2005; Arnold & Hussinger, 2005; Bernard & Jensen, 1999; Roberts & Tybout, 1997). In this sense, improving productivity during the time leading up to the first foreign sale is consistent with the stages model of internationalisation process, according to which the international behaviour of firms is the result of a gradual development process of knowledge acquisition and resources commitment (Bilkey & Tesar, 1977; Johanson & Vahlne, 1977, 1990). However, my results suggest that exporting new ventures do not necessarily develop high initial levels of productivity before their first international sale in comparison to non-exporting new ventures. One explanation for this finding is that traditional models of internationalisation process overlook the role of globalisation and recent technological innovations (e.g., information and communication technologies) in reducing the cost barriers to reaching foreign markets. Certainly, during the last decades globalisation and the emergence of information and communication technologies have enabled new ventures with limited resources to successfully compete in international markets (Bell, 1995; Knight & Cavusgil, 1996; Oviatt & McDougall, 1997). On the other hand, the formation of organisations that are international from inception has led to the development of the new research field

of international entrepreneurship (Acs, et al., 2003; Autio, 2005; Coviello, et al., 2011; Oviatt & McDougall, 1994, 2005b; Zahra, 2005). Based on the theoretical foundations of this field, I expected exporting new ventures to have high initial levels of productivity derived from either the entrepreneur's experience or the access to strategic capital inputs through collaborative governance structures that are aimed at overcoming the costs of internationalisation (Oviatt & McDougall, 1994). However, in light of my results, these elements might not make a considerable difference in terms of initial productivity because the achievement of substantial productivity levels for any organisation requires time and effort in learning activities. Furthermore, export decisions at an early stage might not depend on productivity levels because these kind of decisions are strategic (Zahra & George, 2002b), and, as such, may simultaneously have positive and negative effects (Sapienza, et al., 2006). A final explanation is the absence of initial heterogeneity. In the particular case of the sample analysed in the present study, a two-sample t-Test for equal means (see Appendix 5) shows no significant differences in prior experience between entrepreneurs of exporting new ventures and those of non-exporting new ventures.[58] Likewise, the same test shows that exporting new ventures and non-exporting new ventures included in my sample are not significantly different in terms of establishing collaborative agreements with other firms, at least when it comes to R&D activities.[59] Accordingly, the

[58] More specifically, entrepreneurs of exporting new ventures have roughly the same average number of years of labour experience in their current industry as those entrepreneurs in charge of non-exporting new ventures. Besides, although the former have on average less experience in terms of number of new ventures previously created than the latter, the mean difference is not statistically significant. The same applies for early exporting and late exporting new ventures, which do not exhibit significant differences to each other with regard to the entrepreneur's prior experience. The only significant difference is in formal education since the entrepreneurs of non-exporting new ventures hold a college degree in a significantly higher percentage of cases than the entrepreneurs of exporting new ventures. In contrast, the latter have masters or doctoral degrees in a higher percentage of cases than the former, thought the difference is not significant.

[59] In point of fact, I have analysed internationalisation through exports, which is actually an entry mode that does not involve strong collaboration with other firms, like licensing or joint venturing. Indeed, Shrader's (2001) study provides some evidence that most new ventures involved in international activities do not rely on collaborative governance structures. Thus, the exporting new

finding that exporting new ventures are not necessarily more productive than non-exporting new ventures at foreign market entry may be specific to my sample since the groups of analysis have similar initial characteristics.

Secondly, productivity growth is related to the ability to reconfigure resources and routines in such a way that the level of output rises using the same level of inputs, or remains equal using a lower level of inputs. Consistent with hypothesis H2.2, I have found that exporting new ventures are able to increase their output at the same level as non-exporting ones, but using much fewer additional inputs. In other words, exporting new ventures show higher productivity growth than non-exporting ones following foreign market entry. Unlike prior studies that have found no evidence of learning from exporting (Arnold & Hussinger, 2005; Aw & Hwang, 1995; Bernard & Jensen, 1999, 2004; Bernard & Wagner, 1997; Breau & Rigby, 2008; Wagner, 2002), I have focused specifically on new ventures which are indeed involved in a process of development and learning. Accordingly, my results suggest that new ventures may benefit from learning-by-exporting effects: that is, new ventures are seemingly able to absorb new knowledge and develop productive capabilities from the exposure to an expanded market in which very different conditions prevail.

Finally, as suggested in hypothesis H2.3, productivity gains from exporting may be constrained by the presence of organisational rigidities and the different learning modes associated with organisational age (Hannan & Freeman, 1984; Zahra, et al., 2006). More specifically, I have argued that the younger the firm, the more able it is to improve the level of productivity over time. In line with this view, I have found that early exporting new ventures exhibit higher productivity growth than late exporting new ventures. In particular, the former are able to increase their output much more than the latter by using their inputs more

---

ventures included in my sample might not have benefited from the advantages of accessing (instead of owning) capital inputs through collaboration.

efficiently. This finding supports the belief that very new ventures possess some learning advantages of newness in international markets (Autio, et al., 2000).

4.3 Outcomes of export-oriented entrepreneurship at the regional level

Table 26 shows the results of the estimation of equation (10), which measures the impact of export-oriented entrepreneurship on economic growth at the regional level. Model 1 reflects the impact of the control variables only. In Model 2, I examine the relationship between general entrepreneurial activity and economic growth. Model 3 and Model 4 analyse the additional effect on economic growth of the prevalence of export-oriented entrepreneurial activity as a whole, and the prevalence of export-oriented entrepreneurial activity disaggregated into different ranges of export intensity, respectively.

Model 5 and Model 6 are special cases including an alternative operationalisation of the main variables under analysis. In these models the variable of general entrepreneurial activity (*TEA*) is decomposed into purely domestic entrepreneurial activity (*TEAdomestic*), on the one hand, and total export-oriented entrepreneurial activity (*TEAexport*) or disaggregated export-oriented entrepreneurial activity (*TEAexport1-25*, *TEAexport26-75*, *TEAexport76-100*), on the other hand. [60]

All estimated models are based on a fixed-effects specification, which allows controlling for region specific characteristics.[61]

[60] This is done by multiplying as appropriate the level of entrepreneurial activity (*TEA*) by the percentage of non-export-oriented entrepreneurial activity (1 - *%Export*), by the total percentage of export-oriented entrepreneurial activity (*Export*), or by the disaggregated percentage of export-oriented entrepreneurial activity (*Export1-25*, *Export26-75*, *Export76-100*).

[61] A Hausman test supports using a fixed-effects specification against a random-effects specification.

Table 26: Determinants of regional economic growth

	Model 1	Model 2	Model 3	Model 4
TEA_{it}		0.671*** (0.128)	0.583*** (0.120)	0.569*** (0.135)
$\%Export_{it}$			0.046* (0.017)	
$\%Export1\text{-}25_{it}$				0.005 (0.023)
$\%Export26\text{-}75_{it}$				0.079* (0.034)
$\%Export76\text{-}100_{it}$				0.089† (0.045)
$TEAdomestic_{it}$				
$TEAexport_{it}$				
$TEAexport1\text{-}25_{it}$				
$TEAexport26\text{-}75_{it}$				
$TEAexport76\text{-}100_{it}$				
Ln($GDPC_{it-1}$)	-30.177*** (4.949)	-29.180*** (5.937)	-31.253*** (6.168)	-33.276*** (6.407)
ΔPop_{it}	4.447*** (0.573)	3.426*** (0.481)	3.092*** (0.515)	3.104*** (0.519)
$\Delta SkilledLabour_{it}$	0.109* (0.040)	0.099** (0.030)	0.083* (0.031)	0.073* (0.030)
$\Delta R\&Dstock_{it}$	-0.361* (0.140)	-0.387** (0.113)	-0.400** (0.105)	-0.373*** (0.096)
Constant	82.791*** (13.501)	77.212*** (16.163)	82.542*** (16.694)	88.363*** (17.434)
Observations			89	
Cases			17	
R^2: Within	0.7622	0.8505	0.8638	0.874
R^2: Between	0.0369	0.0269	0.0226	0.0177
R^2: Overall	0.0706	0.1019	0.0999	0.0964

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

Table 26: Determinants of regional economic growth (continued)

	Model 5	Model 6
TEA_{it}		
$\%Export_{it}$		
$\%Export1\text{-}25_{it}$		
$\%Export26\text{-}75_{it}$		
$\%Export76\text{-}100_{it}$		
$TEAdomestic_{it}$	0.329† (0.192)	0.341† (0.189)
$TEAexport_{it}$	1.067*** (0.212)	
$TEAexport1\text{-}25_{it}$		0.418 (0.276)
$TEAexport26\text{-}75_{it}$		1.577* (0.595)
$TEAexport76\text{-}100_{it}$		1.828** (0.589)
Ln($GDPC_{it-1}$)	-32.212*** (5.811)	-34.086*** (5.707)
ΔPop_{it}	3.074*** (0.512)	3.093*** (0.527)
$\Delta SkilledLabour_{it}$	0.092** (0.030)	0.081* (0.031)
$\Delta R\&Dstock_{it}$	-0.393** (0.103)	-0.361*** (0.085)
Constant	86.745*** (16.013)	91.943*** (15.739)
Observations	89	
Cases	17	
R^2: Within	0.8614	0.8722
R^2: Between	0.0198	0.0158
R^2: Overall	0.096	0.093

Notes: Heteroscedastic-consistent standard errors in parentheses. Level of statistical significance: *** $p \leq 0.1\%$, ** $p \leq 1\%$, * $p \leq 5\%$, † $p \leq 10\%$.

4.3.1 Results on the impact of general entrepreneurial activity

After controlling for catching-up effects, as well as for the population growth, and the increase in the human capital endowment and the stock of technological knowledge, the estimate coefficient of TEA_{it} is significantly positive at the 0.1% level for all estimated models (See Models 2 to 4). One unit increase in the regional percentage of adult population involved in entrepreneurial activity is associated with an additional rate of regional economic growth, which ranges between 0.57% and 0.67%.

If one only takes into account the part of entrepreneurial activity that is purely domestic (See Models 5 and 6), its impact on regional economic growth is also positive and statistically significant, as suggested by the coefficient for $TEAdomestic_{it}$ (p-value lower than 0.10). In this case, one unit increase in the percentage of adult population that is involved in the start-up process of a new venture with no foreign customers is associated an additional rate of economic growth at the regional level of approximately 0.33%. Although this contribution to the regional economic growth is relatively lower than that of the total entrepreneurial activity, it is still significantly positive.

These findings imply that entrepreneurial activity in general exerts an unquestionable positive impact on regional economic growth. Thus, I can accept hypothesis H3.1.

4.3.2 Results on the impact of export-oriented entrepreneurial activity

The expected additional contribution of export-oriented entrepreneurship to regional economic growth is supported by the results. For instance, the estimated coefficient for $Export_{it}$ (Model 3) is statistically significant at the 5% level, meaning that one unit increase in the proportion of the level of entrepreneurial activity that is export-oriented is linked with an additional 0.046% rate of economic growth at the regional level. If one distinguishes between purely domestic entrepreneurship and export-oriented entrepreneurship (Model 5), the

coefficient for $TEAexport_{it}$ indicates that one unit increase in the percentage of adult population involved in the start-up process of an export-oriented new venture raises the economic growth at the regional level by 1.07%. A Wald test of simple and composite linear hypotheses confirms that this contribution to regional economic growth is significantly higher than the contribution of domestic entrepreneurship (0.33%) at the 5% level.

These findings suggest that the extent to which the level of entrepreneurial activity is export-oriented exerts a positive impact on regional economic growth in addition to the influence exerted by the level of general entrepreneurial activity. Thus, I can accept hypothesis H3.2.

The additional contribution of export-oriented entrepreneurship to economic regional growth is actually accounted for by those entrepreneurs who sell their goods and services to a substantially higher percentage of foreign customers (i.e., at least 26% or more customers abroad). More specifically, while the estimated coefficient for $Export1\text{-}25_{it}$ is not significant, the coefficients for $Export26\text{-}75_{it}$ and $Export76\text{-}100_{it}$ are positive and statistically significant at the 5% and 10% level, respectively (Model 4). This means that one unit increase in the proportion of the level of entrepreneurial activity corresponding to entrepreneurs who sell to a segment comprised by 26%-75% of foreign customers is associated with an additional economic growth rate of 0.08%, while one unit increase in the proportion of the level of entrepreneurial activity corresponding to entrepreneurs who sell to a segment comprised by 76%-100% of foreign customers is associated with an additional economic growth rate of 0.09%. Nonetheless, a Wald test indicates that only the coefficient for $Export76\text{-}100_{it}$ is significant higher than the coefficient for $Export1\text{-}25_{it}$ (p-value lower than 0.10).

The results remain quite similar when purely domestic entrepreneurship and export-oriented entrepreneurship are distinguished from each other (Model 6). The estimated coefficients for $TEAexport26\text{-}75_{it}$ and $TEAexport76\text{-}100_{it}$ are

positive and statistically significant at the 1% and 5% level, respectively, whereas the coefficient for $TEAexport1\text{-}25_{it}$ is not significant. Thus, one unit increase in the percentage of adult population involved in the start-up process of a new venture with 26%-75% of foreign customers raises the regional economic growth by 1.56%, whereas one unit increase in the percentage of adult population involved in the start-up process of a new venture with 76%-100% of foreign customers raises the economic growth by 1.83%. In this case, a Wald test suggests that the coefficient the estimated coefficients for $TEAexport26\text{-}75_{it}$ and $TEAexport76\text{-}100_{it}$ are significantly higher than the estimated coefficient for $TEAexport1\text{-}25_{it}$ at the 10% and 5% level, respectively.

According to these findings, the economic impact exerted by the prevalence of export-oriented entrepreneurship is stronger as the level of export intensity is higher, and therefore I can accept hypothesis H3.3.

4.3.3 Other factors influencing regional economic growth

Regarding the remainder of variables, the coefficient of $Ln(GDPC_{it-1})$ is significantly negative, implying that, as a result of a catching-up process, regions with a higher income level exhibit a subsequent low rate of growth in comparison with regions with a lower income level (Aghion & Howitt, 2006). As expected, the percentage change in population also contributes to explain economic growth, as indicated by the coefficient of ΔPop_{it} which is significantly positive. However, while the coefficient of $\Delta SkilledLabour_{it}$ is positively significant implying that the increase in human capital endowment improves economic growth, the coefficient of $\Delta R\&DstockC_{it}$ is negatively significant suggesting that regions with higher levels of stock of technological knowledge do not exhibit higher growth rates. This means that the efforts made in Spain during the last years to create new knowledge are not yielding the expected results. Nonetheless, this contradictory finding may be a result of the catching-up effects since regions which are close to the technology frontier make higher investments in knowledge generating

activities, and are usually the same regions with higher income level for which subsequent growth rates are relatively low (though high in absolute terms).

4.3.4 Discussion of results

Based on a fixed-effect linear model, I have analysed the impact of export-oriented entrepreneurship on regional economic growth. All hypotheses in this regard have been confirmed.[62]

As expected in hypothesis H3.1, I have found that regions with higher levels of general entrepreneurial activity exhibit higher rates of economic growth. This is accordance with the extant literature that analyses the benefits of general entrepreneurial activity for regional (Audretsch, et al., 2008; Audretsch & Keilbach, 2004a, 2004b, 2004c) and national economies (van Stel, et al., 2005).

Likewise, as proposed in hypothesis H3.2, I have found that regions with a higher prevalence of export-oriented entrepreneurial activity exhibit higher rates of economic growth. With this finding I support the study of Hessels and van Stel's (2010) who provide similar results for developed countries. The present study thus confirms that the positive impact of export-oriented entrepreneurs on economic growth holds at sub-national levels within a developed country, namely Spain.

Finally, consistent with hypothesis H3.3, the results have provided evidence as to confirm that regions with a higher prevalence of export-oriented entrepreneurial initiatives that sell to a substantially higher proportion of foreign customers (more than 25% or more than 75%) exhibit higher additional rates of economic growth. In this way, for entrepreneurial new ventures, exporting represents a strategic activity that influences performance at the firm level according to the intensity of

[62] Due to globalisation, changes in the external environment worldwide are likely to influence the generalised economic growth within a country in the short term. In particular, the global economic crisis affected the market conditions in Spain during 2009. Accordingly, as a robustness check, I ran all models excluding observations of year 2009. However, I found similar results as those reported above which confirm the hypotheses of this part of the study. Results of the estimation excluding observations of year 2009 are not reported, but can be provided by the author upon request.

foreign sales (Fryges & Wagner, 2008); while for regions, entrepreneurial new ventures involved in increasing levels of export intensity represents a important phenomenon influencing economic growth at the aggregate level.

These findings contribute to the literature in international entrepreneurship since no previous studies have analysed the economic impact of export-oriented entrepreneurship at the regional level.

Chapter 5:

Conclusions and implications

Similarly to previous chapters, the conclusions of this investigation are presented in three blocks. First, I present the conclusions on the antecedents of the export-oriented entrepreneurship with an emphasis on the role of the environment's FDI and external knowledge; second, I present the conclusions on the outcomes of the export-oriented entrepreneurship in terms of productivity at the firm-level; and finally, I present the conclusions on the outcomes of the export-oriented entrepreneurship in terms of economic growth at the regional level.

5.1 Conclusions on the influence of the environment on export-oriented entrepreneurship

The present study responds to calls by scholars who have encouraged more research on the role of the environment on international entrepreneurship (Cumming, et al., 2009; Oviatt & McDougall, 2005a; Rialp, Rialp, & Knight, 2005; Zahra & George, 2002b). Attracting FDI and encouraging direct investment of domestic firms abroad are part of development policies designed in both developed and developing countries. Likewise, based on the belief that knowledge spills over across economic agents, countries around the world have made great efforts in generating new knowledge to drive economic growth. Understanding the impact of these elements of the environment is relevant for any economy in which there are policies and programmes devoted to foster them. While most previous studies on the impact of FDI activities have concentrated on the

productivity effects, most previous studies on the role of knowledge spillovers have focused on the innovation outcome. This research contributes to the extant literature by analyzing other type of effects from FDI and external knowledge. In particular, I have provided evidence on the positive relationship between inward FDI flows at the regional level as well as the stock of technological knowledge at the industrial level, on the one hand, and the export-oriented behaviour of early-stage entrepreneurs at the individual level, on the other hand.

These findings on the antecedents of export-oriented entrepreneurship are complementary to those of prior studies which have suggested that the exposure to the international activities of other organisations located in the same environment influences the propensity of a new venture to export (De Clercq, et al., 2008; Fernhaber & Li, 2010; Lu, 2002). For instance, while De Clercq, et al.'s (2008) study demonstrates that the level of inward FDI is related to the proportion of export-oriented entrepreneurial activity at the aggregate level in high-income countries, the present research provides evidence of this relationship at lower units of analysis by showing that the level of Inward FDI in the region increases the probability of an early-stage entrepreneur being export-oriented. In addition, unlike Fernhaber & Li (2010) and Lu (2002), who explore the influence of exporters including both domestic and foreign firms, I have separately analysed the specific impact on exerted by foreign firms and domestic firms involved in international activities in the same region.

These findings are also consistent with studies suggesting that the early internationalisation is more common among new ventures with high levels of knowledge intensity (Autio, et al., 2000; Knight & Cavusgil, 2004); that is, firms which are typically found in high technology industries (e.g., Jolly, et al., 1992; Oviatt, et al., 1993). More specifically, assuming that increased availability of external knowledge in the environment help firms develop high levels of knowledge intensity to achieve competitive advantage in foreign markets, I have

found that the availability of external knowledge at the industrial level increases the probability of an early-stage entrepreneur being export-oriented.

5.1.1 Practical implications

This research raises some implications for policy makers. By creating incentives and providing resources, policy makers are able to influence organisational behaviour. In this way, the findings on the antecedents of export-oriented entrepreneurship suggest that policy makers must attract inward FDI at the regional level and foster firm creation in highly knowledge-intensive industries if they seek a higher percentage of entrepreneurial activity to be involved in international activities.

5.1.2 Limitations and future research

The results on the role of FDI and external knowledge, however, cannot be generalised since Spanish regions have considerable differences that may not be present in other country's regions. Moreover, as any research, this investigation is subject to some limitations. First, I have relied on a proxy measure of export orientation which is dichotomous. It would be desirable to have had a more flexible measure to capture the intensity of export activity in a continuous way, or, even better, to have had several variables measuring internationalisation in its different dimensions (i.e., speed, scope and intensity). Second, my models rely on certain assumptions concerning the regional and industrial boundaries of the early-stage entrepreneur's new venture. More specifically, I have assumed that new ventures are located in a single location and operate in a single industry. However, entrepreneurs - especially global-oriented ones - often create new activities that do not fit existing industry classifications and that are orchestrated from different locations. Both the different industries and locations in which an entrepreneur acts represent the actual environment affecting his/her entrepreneurial decisions. The lack of proper and reliable data limits the analysis of such complex relations. Third, the main argument behind the relationship

between the presence of foreign firms in a given environment and the export-oriented behaviour of early-stage entrepreneurs is that the latter adopt an export-oriented behaviour as a mimetic response to the exposure to the international activities of the former. This relationship could be expected in the case that entrepreneurs imitate foreign firms, but it is not explicitly tested in this research, nor it has been tested in previous works either (Fernhaber & Li, 2010). Thus, I acknowledge that this relationship could also emerge for other reasons, although I argue that in the long term the spread of an export-oriented behaviour among early-stage entrepreneurs is arguably driven by an isomorphism process.

Future research could address the role of imitation and overcome some of my limitations by using primary data collected in a proper way. Additional insights would be gained from secondary data if they allowed longitudinal analysis or provided more accurate measurement of export orientation and its determinants. The lack of proper data prevented me to address additional issues such as the role of entrepreneur's human capital, which is essential to benefit from external forces according to the literature on absorptive capacity (Cohen & Levinthal, 1990). For instance, high-skilled entrepreneurs can benefit more from the exposure to FDI and external knowledge than low-skilled entrepreneurs. Future research could advance in this regard by analyzing the interactions between specific human capital skills and the alternative typologies of environmental conditions. Another avenue for future research is the motivation behind FDI activities. Dunning (1993) distinguishes four different motivations for an organisation to engage in FDI activities: resource seeking, market seeking, efficiency seeking and asset seeking. As shown by Driffield & Love (2007), different types of FDI motivation have different productivity effects on host economies. Similarly, the effect of FDI on the export orientation can be different depending on the FDI motivation. For instance, early-stage entrepreneurs exposed to asset seeking FDI may be more influenced to mimic an export-oriented behaviour than those exposed to FDI activities driven by market seeking motivations. Finally, the origin of the funding

for external knowledge (i.e., public versus private) can be a factor that facilitates or restricts its use to introduce innovations and reach foreign markets. Similarly, the origin of FDI can be determinant since positive spillovers from it are more likely when investments come from or go to advanced industrial economies (Blomström & Kokko, 1998).

5.2 Conclusions on productivity outcome of export-oriented entrepreneurship at the firm level

Over the last two decades there has been increasing interest shown in the analysis of both firm productivity (Bartelsman & Doms, 2000) and internationalisation of new ventures (Jones, et al., 2011). In the present research work I have endeavoured to contribute to these two streams of the literature by addressing the question of whether exporting, and, in particular, early export behaviour, leads to improved productivity for new ventures.

More specifically, my study adds to the extant literature in three different ways. First, I have analysed the differences in productivity between exporting and non-exporting new ventures, and thus expanded an issue that has been traditionally studied with respect to established firms (Bernard & Jensen, 1995, 1999; Bernard & Wagner, 1997; Greenaway & Kneller, 2004; Wagner, 2007). Second, my results have shed light on how early internationalisation activities affect a firm's performance and create value, a subject which, according to Zahra & George (2002b) and other authors (Keupp & Gassmann, 2009; Pla-Barber & Escribá-Esteve, 2006), remains to be insufficiently analysed in the literature. Third, in response to a clear demand from scholars for new studies which examine international entrepreneurship from a longitudinal perspective (Coviello & Jones, 2004; Zahra & George, 2002b), I have designed a panel analysis based on pooled cross-sectional data in order to observe the evolution over time of the productivity differences that arise from the export behaviour of new ventures.

Despite the limitations, my study has revealed that exporting new ventures are not necessarily more productive than non-exporting ones at the time of foreign market entry. Nonetheless, differences in productivity over time are correlated with differences in export behaviour. On the one hand, exporting new ventures show higher productivity growth than non-exporting new ventures following foreign market entry. Exporting improves productivity because it not only provides access to new knowledge (Salomon & Shaver, 2005), but also facilitates the development of economies of scale (Castellani, 2002) and competitive advantages derived from the exposure to an expanded and complex market with different conditions and rules (Sanders & Carpenter, 1998). At the same time, I have also found that productivity gains from exporting depend on organisational age. Very young firms lack organisational rigidities (Hannan & Freeman, 1984), and most of them tend to use faster learning modes (Zahra, et al., 2006). I argue that these age-related patterns enable early exporting new ventures to benefit from exposure to foreign markets in order to improve productivity much more than late exporting new ventures.

5.2.1 Practical implications

Although it is reasonable that entrepreneurs/managers of firms choose to enter foreign markets due to the perception of merely economic incentives (Simpson & Kujawa, 1974), recent research works, including the present study, suggest that other benefits may arise from exporting. In particular, for new ventures the exposure to foreign markets involves learning effects that lead to improvements in productivity. Moreover, early exporting is a strategic choice which not only encourages new ventures to have an international disposition (Brush, 1992a), but also has a potentially great impact on the subsequent organisational success of new ventures, since adaptation to new changes at an early stage creates an open form of organisational behaviour (Hannan, 1998) that makes the firm more adaptable to new conditions in the future.

Therefore, entrepreneurs in charge of new ventures should consider these kind of benefits (apart from profitability), especially when they define the market scope of their start-up business strategies, or at least before creating repertoires of established routines that are difficult to modify.

Due to their short history, very young firms might not develop high levels of productivity before their first international sale. Unfortunately, insubstantial levels of initial productivity may also hinder survival in foreign markets (Sapienza, et al., 2006). In this respect, policy-makers should design public policies and programmes that not only foster exporting behaviour at very early stages, but also reduce the cost of internationalisation and provide support for new ventures during the period they are absorbing the learning-by-exporting effects.

5.2.2 Limitations and future research

At least two limitations apply to study of the outcomes of export-oriented entrepreneurship in terms of productivity at the firm level. First, the measurement of production factors is based on monetary units instead of physical units. I have assumed that prices of inputs and output are constant and equal for all firms in the market, which is a strong assumption that is far from what happens in the actual economy. Actually, most studies in the literature on productivity estimate production functions using monetary values due to the lack of data on physical units (Bartelsman & Doms, 2000). Nonetheless, Foster, Haltiwanger & Syverson (2005) found that productivity measures based on monetary values (i.e. quantities multiplied by prices) and those based on quantities are highly positively correlated.

Second, productivity and input choices are likely to be correlated, leading to potential problems of endogeneity (Marschak & Andrews, 1944). In this respect, entrepreneurs/managers usually know their firm's productivity level – at least partially – before they make choices about the combination of variable inputs (i.e., labour and intermediate inputs) used in production. This problem of endogeneity

or simultaneity is well-known among econometricians who have proposed several methodological techniques to overcome the issue. One traditional solution involves estimation based on fixed effects models, as used in the present study. However, to apply this method I have assumed that the unobserved productivity influencing the choice of inputs is a time-invariant and firm-specific attribute. I acknowledge that using alternative methods to fixed effects models would have solved this problem in a less restrictive manner. For instance, the Generalized Method of Moments proposed by Blundell & Bond (1998) allows the estimation of regression models even in the presence of endogeneity. Other specific methods include semi parametric techniques, such as the estimator developed by Olley & Pakes (1996) or the extension made by Levinsohn & Petrin (2003), who use proxies to estimate the unobserved productivity shocks.

Exporting is the predominant foreign entry choice used by new ventures (Knight & Cavusgil, 2004), even in high technology industries (Bell, 1995; Shrader, 2001). Accordingly, I focus on what new ventures actually do in the international arena. However, there exist other modes of entry. Even if the choice of exporting as a preferred mode of entry is due to a lack of resources, some new ventures may chose more complex modes of entry (Oviatt & McDougall, 1994). This choice is strategic and its consequences can affect productivity. For instance, foreign direct investments in the form of subsidiaries or joint ventures involve the use of substantial capital inputs. Consequently, I can expect initial productivity at foreign market entry to be lower when the entry mode is more complex. To the best of my knowledge, analysing the impact of entry mode on productivity is an interesting research task that has not been addressed yet.

Apart from the internationalisation of sales - and being closely allied to the mode of foreign entry - moving production and R&D activities to foreign countries may be related to productivity improvements too, especially when those countries provide an environment which is more technologically relevant to the core

business than the home environment. In this sense, future research studies addressing the manner in which the international location of production inputs affect the firm's productivity would be very welcome.

Finally, the impact of international activities on firm productivity may be moderated by the "psychic distance" to foreign markets (Johanson & Vahlne, 1977). This concept has been well developed in the literature of international business, and refers to the factors associated with country-based differences (i.e., linguistic, cultural, economic and political differences) that disturb the flow of market information across borders and, therefore, may hinder the potential productivity gains derived from the exposure to foreign markets. Although several studies have analysed the impact of certain psychic distance factors on a firm's performance and have found weak evidence of this relationship (Gomez-Mejia & Palich, 1997; Tallman & Li, 1996), an examination of how these factors specifically affect the productivity of firms which decide to enter foreign markets is largely missing so far.

I believe that these suggested areas of future research could provide a better understanding of what exactly firms learn from foreign markets, from whom they learn and how they learn.

5.3 Conclusions on the economic outcome of export-oriented entrepreneurship at the regional level

Previous research has provided empirical evidence on the relationship between entrepreneurship and economic growth at both the country (Stam & van Stel, 2009; van Stel, et al., 2005; Wong, et al., 2005) and regional level (Audretsch, et al., 2008; Audretsch & Keilbach, 2004a, 2004b, 2004c; González-Pernía, et al., 2011). Likewise, the specific role of export-oriented new ventures has been analysed at the country level (Hessels & van Stel, 2010). The present study contributes to the extant literature by analysing this issue at a (sub-national)

regional level. Regions are at the core of development processes (Scott & Storper, 2003), and entrepreneurship is essentially a regional event that emerges from the interactions within geographically close areas (Feldman, 2001). Accordingly, I have found that Spanish regions with higher levels of entrepreneurial activity exhibit higher rates of economic growth, supporting thus the idea that entrepreneurship is a mechanism of knowledge exploitation enhancing regional development (Audretsch, et al., 2008; Audretsch & Keilbach, 2004b, 2004c). Moreover, my results reveal that export-oriented entrepreneurial activity makes an additional positive contribution to regional economic growth in Spain. Such contribution may take place because export activity is associated with learning processes leading to improved productivity at the firm level (Clerides, et al., 1998); but it also may take place due to the reallocation of resources from non-exporting firms to (probably more productive) exporting new ventures (Bernard & Jensen, 2004), or due to the influence of the latter on the former's productivity via knowledge spillovers at the (sub-national) aggregate level (Branstetter, 2001). The additional economic impact of export-oriented entrepreneurship is especially noticeable when I consider the role of entrepreneurs committed to a substantially higher proportion of foreign customers. Exports become a strategic activity for any firm when a significant proportion of its revenue comes from foreign customers. Hence, new ventures involved in high levels of export intensity may be more likely to take advantage from international activities (which are in line with their strategy), and therefore to cause a stronger impact in the economy. These findings are consistent with previous studies which show a positive relationship between exports' productivity and regional growth (Minondo, 2010), and they complement the study of Hessels & van Stel (2010) by showing that there is also a positive relationship between export-oriented entrepreneurship and economic growth at the regional level, and that the extent of this relationship depends on the proportion of foreign customers to which the entrepreneur sells goods and services.

5.3.1 Practical implications

The concentration of exporting new ventures only on certain regions may contribute to increase differences in growth within a nation. Thus, policy implications derived from my results suggest that trade programmes for export promotion among new ventures should be carried out homogenously across regions and connected with economic growth policies. Moreover, public policies and programmes should not only facilitate foreign market entry, but also provide tools to help export-oriented entrepreneurs reach higher levels of export intensity. Low levels of export intensity represent a non-strategic activity for firms, and for that reason the efforts made to encourage only foreign market entry (without exports growth) may eventually have no economic impact.

5.3.2 Limitations and future research

This study is not without limitations. First, although exporting is the most common entry mode to reach foreign markets (Bell, 1995), it is not the only way through which new ventures can compete internationally and improve economic growth in domestic markets. More committed entry modes than exporting (e.g., contractual agreements, joint ventures or wholly owned subsidiaries, among others) may have a different impact on productivity at the firm level, and economic growth at the aggregate level. I have tried to proxy the effect of high commitment to foreign markets by individually analysing the impact of different ranges of export-oriented entrepreneurship (e.g., the impact of entrepreneurs with 75% or more of customers located abroad); however, future research should consider the role of different entry modes in this analysis. A second limitation has to do with the sample size, which is limited to Spanish regions over an average period of 5.2 years. Studies including a broader geographic scope of regions across different countries would provide a better insight into the impact of export-oriented entrepreneurship on export-led growth. Likewise, a longer temporal scope would allow analysing the effect of lagged determinants to determine

causality in the relationship between export-oriented entrepreneurship and economic growth.

References

Acedo, F. J., & Casillas, J. C. (2007). Age at Entry in International Markets of Spanish SMEs: Entrepreneurial and Institutional Determinants. *International Journal of Entrepreneurial Behaviour & Research, 13*(3), 130-150.

Acedo, F. J., & Florin, J. (2006). An entrepreneurial cognition perspective on the internationalization of SMEs. *Journal of International Entrepreneurship, 4*(1), 49-67.

Acedo, F. J., & Jones, M. V. (2007). Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms. *Journal of World Business, 42*(3), 236-252.

Acs, Z. J., Audretsch, D. B., & Feldman, M. P. (1994). R&D Spillovers and Recipient Firm Size. *The Review of Economics and Statistics, 76*(2), 336-340.

Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The Knowledge Spillover Theory of Entrepreneurship. *Small Business Economics, 32*(1), 15-30.

Acs, Z. J., Dana, L.-P., & Jones, M. V. (2003). Toward New Horizons: The Internationalisation of Entrepreneurship. *Journal of International Entrepreneurship, 1*(1), 5-12.

Agarwal, R., Audretsch, D., & Sarkar, M. B. (2007). The process of creative construction: knowledge spillovers, entrepreneurship, and economic growth. *Strategic Entrepreneurship Journal, 1*(3-4), 263-286.

Aghion, P., & Howitt, P. (2006). Joseph Schumpeter Lecture Appropriate Growth Policy: A Unifying Framework. *Journal of the European Economic Association, 4*(2-3), 269-314.

Aitken, B., Hanson, G. H., & Harrison, A. E. (1997). Spillovers, foreign investment, and export behavior. *Journal of International Economics, 43*(1-2), 103-132.

Aldrich, H. E. (1979). *Organizations and Environments*. Englewood Cliffs, NJ: Prentice-Hall.

Aldrich, H. E., & Auster, E. R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. *Research in Organizational Behavior, 8*, 165-198.

Allison, C. W., Chell, E., & Hayes, J. (2000). Intuition and Entrepreneurial Behaviour. *European Journal of Work and Organizational Psychology, 9(1)*, 31-43.

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

Andersson, S., & Evangelista, F. (2006). The entrepreneur in the Born Global firm in Australia and Sweden. *Journal of Small Business and Enterprise Development, 13*(4), 642-659.

Arenius, P., & Minniti, M. (2005). Perceptual Variables and Nascent Entrepreneurship. *Small Business Economics, 24*(3), 233-247.

Arnold, J. M., & Hussinger, K. (2005). Export Behavior and Firm Productivity in German Manufacturing: A Firm-Level Analysis. *Review of World Economics, 141(2)*, 219-243.

Arrow, K. J. (1962). Economic Welfare and the Allocation of Resources for Invention. In Universities-National-Bureau-Committee-for-Economic-Research (Ed.), *The Rate and Direction of Inventive Activity: Economic and Social Factors* (pp. 609-626). Princenton, NJ: Princeton University Press.

Audretsch, D. B. (1995). *Innovation and Industry Evolution*. Cambridge, MA: The MIT Press.

Audretsch, D. B. (1998). Agglomeration and the location of innovative activity. *Oxford Review of Economic Policy, 14*(2), 18-29.

Audretsch, D. B. (2004). Sustaining Innovation and Growth: Public Policy Support for Entrepreneurship. *Industry an Innovation, 11*(3), 167-191.

Audretsch, D. B. (2007). *The Entrepreneurial Society*. New York: Oxford University Press.

Audretsch, D. B., Bönte, W., & Keilbach, M. (2008). Entrepreneurship capital and its impact on knowledge diffusion and economic performance. *Journal of Business Venturing, 23*(6), 687-698.

Audretsch, D. B., & Feldman, M. P. (1996). R&D Spillovers and the Geography of Innovation and Production. *The American Economic Review, 86*(3), 630-640.

Audretsch, D. B., & Keilbach, M. (2004a). Does Entrepreneurship Capital Matter? *Entrepreneurship Theory and Practice, 28*(5), 419-429.

Audretsch, D. B., & Keilbach, M. (2004b). Entrepreneurship and regional growth: an evolutionary interpretation. *Journal of Evolutionary Economics, 14*(5), 605-616.

Audretsch, D. B., & Keilbach, M. (2004c). Entrepreneurship Capital and Economic Performance. *Regional Studies, 38*(8), 949-959.

Audretsch, D. B., & Keilbach, M. (2008). Resolving the knowledge paradox: Knowledge-spillover entrepreneurship and economic growth. *Research Policy, 37*(10), 1697-1705.

Autio, E. (2005). Creative tension: the significance of Ben Oviatt's and Patricia McDougall's article 'toward a theory of international new ventures'. *Journal of International Business Studies, 36*(1), 9-19.

Autio, E. (2007). *Global Entrepreneurship Monitor: 2007 Global Report on High-Growth Entrepreneurship*. London: Babson College, London Business School, and Global Entrepreneurship Research Consortium.

Autio, E., & Acs, Z. (2010). Intellectual property protection and the formation of entrepreneurial growth aspirations. *Strategic Entrepreneurship Journal, 4*(3), 234-251.

Autio, E., George, G., & Alexy, O. (2011). International Entrepreneurship and Capability Development—Qualitative Evidence and Future Research Directions. *Entrepreneurship Theory and Practice, 35*(1), 11-37.

Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of Age at Entry, Knowledge Intensity, and Imitability on International Growth. *The Academy of Management Journal, 43*(5), 909-924.

Aw, B. Y., & Hwang, A. (1995). Productivity and the Export Market: A Firm Level Analysis. *Journal of Development Economics, 47*(2), 313-332.

Backman, J., & Gainsbrugh, M. R. (1949). Productivity and Living Standards. *Industrial and Labor Relations Review, 2*(2), 163-194.

Baily, M. N., Hulten, C., & Campbell, D. (1992). Productivity Dynamics in Manufacturing Plants. *Brookings Papers on Economic Activity, Microeconomics*, 187-249.

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

Baloff, N. (1966). Startups in machine intensive production systems. *Journal of Industrial Engeneering, 17*(1), 25-32.

Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference? *Strategic Management Journal, 10*(S1), 107-124.

Barbosa, N., & Eiriz, V. (2009). The role of inward foreign direct investment on entrepreneurship. *International Entrepreneurship and Management Journal, 5*(3), 319-339.

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management, 17*(1), 99-120.

Barrios, S., Görg, H., & Strobl, E. (2003). Explaining Firms' Export Behaviour: R&D, Spillovers and the Destination Market*. *Oxford Bulletin of Economics and Statistics, 65*(4), 475-496.

Barro, R. J. (1999). Human capital and growth in cross-country regressions. *Swedish Economic Policy Review, 6*(2), 237-277.

Bartelsman, E. J., & Doms, M. (2000). Understanding Productivity: Lessons from Longitudinal Microdata. *Journal of Economic Literature, 38*(3), 569-594.

Bartlett, C. A., & Ghoshal, S. (1987). Managing Across Borders: New Organizational Responses. *Sloan Management Review, 29(1),* 43-53.

Baum, M., Schwens, C., & Kabst, R. (2011). A Typology of International New Ventures: Empirical Evidence from High-Technology Industries. *Journal of Small Business Management, 49*(3), 305-330.

Bell, J. (1995). The Internationalization of Small Computer Software Firms - A Further Challenge to Stage Theories. *European Journal of Marketing, 29*(8), 60-75.

Bernard, A. B., & Jensen, J. B. (1995). Exporters, Jobs, and Wages in U.S. Manufacturing: 1976-1987. *Brooking Papers on Economic Activity: Microeconomics, 1995*, 67-112.

Bernard, A. B., & Jensen, J. B. (1999). Exceptional Exporter Performance: Cause, Effect, or Both? *Journal of International Economics, 47(1),* 1-25.

Bernard, A. B., & Jensen, J. B. (2004). Exporting and Productivity in the USA. *Oxford Review of Economic Policy, 20*(3), 343-357.

Bernard, A. B., & Wagner, J. (1997). Exports and Success in German Manufacturing *Weltwirtschaftliches Archiv (Review of World Economics), 133(1),* 134-157.

Bhide, A. V. (2000). *The origin and evolution of new businesses*. New York, NY: Oxford University Press.

Bilkey, W. J., & Tesar, G. (1977). The Export Behaviour of Smaller-Sized Wisconsin Manufacturing Firms. *Journal of International Business Studies, 8*(1), 93-98.

Blackburn, R., Mackintosh, L., & North, J. (1998). *Entrepreneurship in the third age*. Surrey, UK: Kingston University Entrepreneurship Centre.

Blalock, G., & Gertler, P. J. (2004). Learning from Exporting Revisited in a Less Developed Setting. *Journal of Development Economics, 75*(2), 397-416.

Blomström, M., & Kokko, A. (1998). Multinational corporations and spillovers. *Journal of Economic Surveys, 12*(2), 1-31.

Bloodgood, J. M., Sapienza, H. J., & Almeida, J. G. (1996). The Internationalization of New High Potential Ventures: Antecedents and Outcomes. *Entrepreneurship Theory & Practice, 20*(4), 61-76.

Bloom, N., & Van Reenen, J. (2010). Why Do Management Practices Differ across Firms and Countries? *Journal of Economics Perspectives, 24*(1), 203-224.

Blundell, R., & Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics, 87*(1), 115-143.

Bouchikhi, H. (1993). A Constructivist Framework for Understanding Entrepreneurship Performance. *Organization Studies, 14*(4), 549-570.

Bowerman, B. L., & O'Connell, R. T. (1990). *Linear Statistical Models: An Applied Approach* (2nd ed.). Belmont, CA: Duxbury Press.

Branstetter, L. G. (2001). Are knowledge spillovers international or intranational in scope?: Microeconometric evidence from the U.S. and Japan. *Journal of International Economics, 53*(1), 53-79.

Breau, S., & Rigby, D. (2008). Participation in Export Markets and Productivity of Plants in Los Angeles, 1987–1997. *Economic Geography, 84*(1), 27-50.

Brush, C. G. (1992a). *Factors motivating small firms to internationalize: The effect of firm age.* Boston University, Boston.

Brush, C. G. (1992b). Research on women business owners: Past trends, a new perspective and future directions. *Entrepreneurship Theory & Practice, 16*(4), 6-30.

Brush, C. G., Edelman, L. F., & Manolova, T. S. (2002). The impact of resources on small firm internationalization. *Journal of Small Business Strategy, 13*(1), 1-17.

Bruton, G. D., Ahlstrom, D., & Han-Lin, L. (2010). Institutional Theory and Entrepreneurship: Where Are We Now and Where Do We Need to Move in the Future? *Entrepreneurship: Theory & Practice, 34*(3), 421-440.

Burgel, O., & Murray, G. (2000). The International Market Entry Choices of Start-Up Companies in High-Technology Industries. *Journal of International Marketing, 8(2)*, 33-62.

Busenitz, L. W., & Barney, J. B. (1997). Differences between Entrepreneurs and Managers in Large Organizations: Biases and Heuristics in Strategic Decision-Making. *Journal of Business Venturing, 12(1)*, 9-30.

Callejón, M., & Segarra, A. (1999). Business Dynamics and Efficiency in Industries and Regions: The case of Spain. *Small Business Economics, 13*(4), 253-271.

Campbell, A. J. (1996). The Effects of Internal Firm Barriers on the Export Behavior of Small Firms in a Free Trade Environment. *Journal of Small Business Management, 34*(3), 50-58.

Campbell, A. J., & Verbeke, A. (1994). The Globalization of Service Multinationals. *Long Range Planning, 27*(2), 95-102.

Cantwell, J., & Hodson, C. (1991). Global R&D and UK competitiveness. In M. Casson (Ed.), *Global research strategy and international competitiveness* (pp. 133-182). Oxford, UK: Basil Blackwell.

Carree, M., & Thurik, R. (2003). The Impact of Entrepreneurship on Economic Growth. In Z. J. Acs & D. B. Audretsch (Eds.), *Handbook of Entrepreneurship Research*. Boston: Kluwer Academic Publishers.

Carter, N. M., Gartner, W. B., & Reynolds, P. D. (1996). Exploring Start-Up Event Sequences. *Journal of Business Venturing, 11*(3), 151-166.

Casillas, J. C., Acedo, F. J., & Barbero, J. L. (2010). Learning, unlearning and internationalisation: Evidence from the pre-export phase. *International Journal of Information Management, 30*(2), 162-173.

Casillas, J. C., Moreno, A. M., Acedo, F. J., Gallego, M. A., & Ramos, E. (2009). An integrative model of the role of knowledge in the internationalization process. *Journal of World Business, 44*(3), 311-322.

Casson, M., & Wadeson, N. (2007). Entrepreneurship and macroeconomic performance. *Strategic Entrepreneurship Journal, 1*(3-4), 239-262.

Castellani, D. (2002). Export Behavior and Productivity Growth: Evidence from Italian Manufacturing Firms. *Review of World Economics, 138*(2), 605-628.

Castrogiovanni, G. J. (1991). Environmental Munificence: A Theoretical Assessment. *Academy of Management Review, 16*(3), 542-565.

Caves, R. E. (2007). *Multinational Enterprise and Economic Analysis* (3rd ed.). Cambridge, UK: Cambridge University Press.

Christensen, L. R., Jorgenson, D. W., & Lau, L. J. (1973). Transcendental Logarithmic Production Frontiers. *The Review of Economics and Statistics, 55*(1), 28-45.

Clerides, S. K., Lach, S., & Tybout, J. R. (1998). Is Learning by Exporting Important? Micro-Dynamic Evidence from Colombia, Mexico and Morocco. *Quarterly Journal of Economics, 113(3)*, 903-948.

Cliff, J. E. (1998). Does one size fit all? exploring the relationship between attitudes towards growth, gender, and business size. *Journal of Business Venturing, 13*(6), 523-542.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly, 35*, 128-152.

Coviello, N. E. (2006). The network dynamics of international new ventures. *Journal of International Business Studies, 37*(5), 713-731.

Coviello, N. E., & Jones, M. V. (2004). Methodological Issues in International Entrepreneurship Research. *Journal of Business Venturing, 19*(4), 485-508.

Coviello, N. E., McDougall, P. P., & Oviatt, B. M. (2011). The emergence, advance and future of international entrepreneurship research — An introduction to the special forum. *Journal of Business Venturing, 26*(6), 625-631.

Cumming, D., Sapienza, H. J., Siegel, D. S., & Wright, M. (2009). International entrepreneurship: managerial and policy implications. *Strategic Entrepreneurship Journal, 3*(4), 283-296.

Cummings, J., Manyika, J., Mendoca, L., Greenberg, E., Aronowitz, S., Chopra, R., et al. (2010). *Growth and competitiveness in the United States: The role of its multinational companies*: McKinsey Global Institute.

Cyert, R. M., & March, J. G. (1963). *A Behavioural Theory of the Firm*. New York: Prentice-Hall.

Czinkota, M. (1982). *Export development strategies: US promotion policies*. New York: Praeger Publishers.

Dana, L.-P., & Wright, R. W. (2003). Changing Paradigms of International Entrepreneurship Strategy. *Journal of International Entrepreneurship, 1*(1), 135-152.

Davidsson, P., & Wiklund, J. (2000). Conceptual and Empirical Challenges in the Study of Firm Growth. In D. L. Sexton & H. Landstrom (Eds.), *Handbook of Entrepreneurship* (pp. 26-44). Oxford, UK: Blackwell.

De Clercq, D., Hessels, J., & van Stel, A. (2008). Knowledge spillovers and new ventures' export orientation. *Small Business Economics, 31*(3), 283-303.

Delgado, M. J., Fariñas, C., & Ruano, S. (2002). Firms' Productivity and the Export Markets. *Journal of International Economics, 57*, 397-422.

Delmar, F., & Shane, S. (2003). Does Business Planning Facilitate the Development of New Ventures? *Strategic Management Journal, 24(12)*, 1165-1186.

Dess, G. G., & Beard, D. W. (1984). Dimensions of Organizational Task Environments. *Administrative Science Quarterly, 26*(1), 52-73.

Dhanaraj, C., & Beamish, P. W. (2003). A Resource-Based Approach to the Study of Export Performance. *Journal of Small Business Management, 41*(3), 242-261.

DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review, 48*(2), 147-160.

DiMaggio, P. J., & Powell, W. W. (1991). Introduction. In W. W. Powell & P. J. DiMaggio (Eds.), *The New Institutionalism in Organizational Analysis* (pp. 1-38). Chicago, IL: The University of Chicago Press.

Driffield, N., & Love, J. H. (2007). Linking FDI motivation and host economy productivity effects: conceptual and empirical analysis. *Journal of International Business Studies, 38*(3), 460-473.

Dunning, J. H. (1989). Multinational Enterprises and the Growth of Services: Some Conceptual and Theoretical Issues. *The Service Industries Journal, 9*(1), 5-39.

Dunning, J. H. (1993). *Multinational Enterprise and the Global Economy*. Wokingham: Addison Wesley.

Edelman, L., & Yli-Renko, H. (2010). The Impact of Environment and Entrepreneurial Perceptions on Venture-Creation Efforts: Bridging the Discovery and Creation Views of Entrepreneurship. *Entrepreneurship: Theory & Practice, 34*(5), 833-856.

Eisenhardt, K. M. (1989). Making Fast Strategic Decisions in High-Velocity Environments. *Academy of Management Journal, 32*(3), 543-576.

Eisenhardt, K. M., & Tabrizi, B. N. (1995). Accelerating Adaptive Processes: Product Innovation in the Global Computer Industry. *Administrative Science Quarterly, 40(1),* 84-110.

Espenshade, T. J. (1978). Zero Population Growth and the Economies of Developed Nations. *Population and Development Review, 4*(4), 645-680.

Evenson, R. E., & Westphal, L. E. (1995). Technological Change and Technology Strategy *Handbook of Development Economics, Volume 3A* (pp. 2209-2299). Amsterdam: North-Holland.

Fagerberg, J. (1996). Technology and Competitiveness. *Oxford Review of Economic Policy, 12*(3), 39-51.

Feder, G. (1982). On exports and economic growth. *Journal of Development Economics, 12*(1-2), 59-73.

Federico, J., Kantis, H., Rialp, A., & Rialp, J. (2011). Entrepreneurs' Human Capital and Relational Capital as Predictors of Early Internationalization: Evidence from Latin America and Southeast Asia. In N. Nummela (Ed.), *International Growth of Small and Medium Enterprises*. Abingdon, UK: Routledge.

Feldman, M. P. (2001). The Entrepreneurial Event Revisited: Firm Formation in a Regional Context. *Industrial and Corporate Change, 10*(4), 861-891.

Fernhaber, S. A., & Li, D. (2010). The Impact of Interorganizational Imitation on New Venture International Entry and Performance. *Entrepreneurship: Theory & Practice, 34*(1), 1-30.

Fernhaber, S. A., McDougall-Covin, P. P., & Shepherd, D. A. (2009). International entrepreneurship: leveraging internal and external knowledge sources. *Strategic Entrepreneurship Journal, 3*(4), 297-320.

Fernhaber, S. A., McDougall, P. P., & Oviatt, B. M. (2007). Exploring the Role of Industry Structure in New Venture Internationalization. *Entrepreneurship Theory and Practice, 31*(4), 517-542.

Fletcher, D. (2004). International Entrepreneurship and the Small Business. *Entrepreneurship & Regional Development, 16*(4), 289-305.

Fosfuri, A., Motta, M., & Rønde, T. (2001). Foreign direct investment and spillovers through workers' mobility. *Journal of International Economics, 53*(1), 205-222.

Foster, L., Haltiwanger, J., & Syverson, C. (2005). Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?, *IZA Discussion Paper Series No. 1705*. Bonn: Institute for the Study of Labor.

Fryges, H., & Wagner, J. (2008). Exports and Productivity Growth: First Evidence from a Continuous Treatment Approach. *Review of World Economics, 144*(4), 695-722.

Gaba, V., Pan, Y., & Ungson, G. R. (2002). Timing of Entry in International Market: An Empirical Study of U.S. Fortune 500 Firms in China. *Journal of International Business Studies, 33*(1), 39-55.

Galor, O., & Weil, D. N. (2000). Population, Technology, and Growth: From Malthusian Stagnation to the Demographic Transition and beyond. *The American Economic Review, 90*(4), 806-828.

Gershenberg, I. (1987). The training and spread of managerial know-how, a comparative analysis of multinational and other firms in Kenya. *World Development, 15*(7), 931-939.

Gilbert, B. A., McDougall, P. P., & Audretsch, D. B. (2008). Clusters, knowledge spillovers and new venture performance: An empirical examination. *Journal of Business Venturing, 23*(4), 405-422.

Giles, J. A., & Williams, C. L. (2000a). Export-led Growth: A Survey of the Empirical Literature and Some Non-causality Results. Part 1. *Journal of International Trade and Economic Development, 9*(3), 261-337.

Giles, J. A., & Williams, C. L. (2000b). Export-led Growth: A Survey of the Empirical Literature and Some Non-causality Results. Part 2. *Journal of International Trade and Economic Development, 9*(4), 445-470.

Girma, S., Greenaway, D., & Kneller, R. (2004). Does Exporting Increase Productivity? A Microeconometric Analysis of Matched Firms. *Review of International Economics, 12*(5), 855-866.

Gnyawali, D. R., & Fogel, D. S. (1994). Environments for Entrepreneurship Development: Key Dimensions and Research Implications. *Entrepreneurship: Theory & Practice, 18*(4).

Gomez-Mejia, L. R., & Palich, L. E. (1997). Cultural Diversity and the Performance of Multinational Firms. *Journal of International Business Studies, 28(2),* 309-335.

González-Pernía, J. L., Peña-Legazkue, I., & Vendrell-Herrero, F. (2011). Innovation, entrepreneurial activity and competitiveness at a sub-national level. *Small Business Economics*, 1-14.

Görg, H., & Greenaway, D. (2004). Much Ado about Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment? *The World Bank Research Observer, 19*(2), 171-197.

Greenaway, D., & Kneller, R. (2004). Exporting and Productivity in the United Kingdom. *Oxford Review of Economic Policy, 20*(3), 358-371.

Greenaway, D., Sousa, N., & Wakelin, K. (2004). Do domestic firms learn to export from multinationals? *European Journal of Political Economy, 20*(4), 1027-1043.

Griliches, Z. (1994). Productivity, R&D, and the Data Constraint. *American Economic Review, 84*(1), 1-23.

Grossman, G. M., & Helpman, E. (1991). Trade, Knowledge Spillovers, and Growth. *European Economic Review, 35(2-3),* 517-526.

Guillen, M. F. (2002). Structural Inertia, Imitation, and Foreign Expansion: South Korean Firms and Business Groups in China, 1987-95. *Academy of Management Journal, 45*(3), 509-525.

Guo, G., & Zhao, H. (2000). Multilevel Modeling for Binary Data. *Annual Review of Sociology, 26*(1), 441-462.

Hannan, M. T. (1998). Rethinking Age Dependence in Organizational Mortality: Logical Formalizations. *American Journal of Sociology, 104*(1), 126-164.

Hannan, M. T., & Freeman, J. (1984). Structural Inertia and Organizational Change. *American Sociology Review, 49*(2), 149-164.

Harveston, P. D., Kedia, B. L., & Davis, P. S. (2000). Internationalization of Born Global and Gradual Globalizing Firms: The Impact of the Manager. *Advances in Competitive Research, 8*(1), 92-99.

Haunschild, P. R., & Miner, A. S. (1997). Modes of Interorganizational Imitation: The Effects of Outcome Salience and Uncertainty. *Administrative Science Quarterly, 42*(3), 472-500.

Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica, 46*(6), 1251-1271

Hayek, F. (1945). The Use of Knowledge in Society. *American Economic Review, 35(4),* 519-530.

Hellerstein, J. K., Neumark, D., & Troske, K. R. (1999). Wages, Productivity, and Worker Characteristics: Evidence from Plant-Level Production Functions and Wage Equations. *Journal of Labor Economics, 17*(3), 409-446.

Henisz, W., & Delios, A. (2001). Uncertainty, Imitation, and Plant Location: Japanese Multinational Corporations. *Administrative Science Quarterly, 46*(3), 443-475.

Hessels, J., & Terjesen, S. (2010). Resource dependency and institutional theory perspectives on direct and indirect export choices. *Small Business Economics, 34*(2), 203-220.

Hessels, J., & van Stel, A. (2010). Entrepreneurship, export orientation, and economic growth. *Small Business Economics, 37*(2), 255-268.

Hofstede, G. (1983). The Cultural Relativity of Organizational Practices and Theories. *Journal of International Business Studies, 14*(2), 75-89.

Hollenstein, H. (2005). Determinants of International Activities: Are SMEs Different? *Small Business Economics, 24*(5), 431-450.

Johanson, J., & 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), 23-32.

Johanson, J., & Vahlne, J.-E. (1990). The Mechanism of Internationalisation. *International Marketing Review, 7*(4), 11-24.

Johanson, J., & Vahlne, J.-E. (2003). Business Relationship Learning and Commitment in the Internationalization Process. *Journal of International Entrepreneurship, 1*(1), 83-101.

Johanson, J., & Vahlne, J.-E. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies, 40*(9), 1411-1431.

Jolly, V. K., Alahuhta, M., & Jeannet, J.-P. (1992). Challenging the incumbents: How high technology start-ups compete globally. *Strategic Change, 1*(2), 71-82.

Jones, M. V., Coviello, N., & Tang, Y. K. (2011). International Entrepreneurship research (1989–2009): A domain ontology and thematic analysis. *Journal of Business Venturing, 26*(6), 632-659.

Katrishen, F. A., & Scordis, N. A. (1998). Economies of Scale in Services: A Study of Multinational Insurers. *Journal of International Business Studies, 29*(2), 305-323.

Keats, B. W., & Hitt, M. A. (1988). A Causal Model of Linkages among Environmental Dimensions, Macro Organizational Characteristics, and Performance. *The Academy of Management Journal, 31*(3), 570-598.

Keupp, M. M., & Gassmann, O. (2009). The Past and the Future of International Entrepreneurship: A Review and Suggestions for Developing the Field. *Journal of Management, 35*(3), 600-633.

King, A. A., & Tucci, C. L. (2002). Incumbent Entry into New Market Niches: The Role of Experience and Managerial Choice in the Creation of Dynamic Capabilities. *Management Science, 48(2),* 171-186.

Kirzner, I. M. (1979). *Perception, opportunity and profit*. Chicago, IL: University of Chicago Press.

Knight, G. A., & Cavusgil, S. T. (1996). The Born Global Firm: A Challenge to Traditional Internationalization Theory. In T. K. Madsen (Ed.), *Advances in International Marketing* (pp. 11-26). New York, NY: JAI Press Inc.

Knight, G. A., & Cavusgil, S. T. (2004). Innovation, Organizational Capabilities, and the Born-global Firm. *Journal of International Business Studies, 35*(2), 124-141.

Kogut, B., & Zander, U. (1993). Knowledge of the Firm and the Evolutionary Theory of the Multinational Corporation. *Journal of International Business Studies, 24*(4), 625-645.

Kontinen, T., & Ojala, A. (2011). International Opportunity Recognition among Small and Medium-Sized Family Firms*. *Journal of Small Business Management, 49*(3), 490-514.

Kostova, T., & Zaheer, S. (1999). Organizational Legitimacy under Conditions of Complexity: The Case of the Multinational Enterprise. *The Academy of Management Review, 24*(1), 64-81.

Kraay, A. (1999). *Exports and Economic Performance: Evidence from a Panel of Chinese Enterprises*. Washington: The World Bank.

Kreft, I., & de Leeuw, J. (1998). *Introducing Multilevel Modeling*. London, UK: SAGE Publications.

Levinsohn, J., & Petrin, A. (2003). Estimating Production Function Using Inputs to Control for Unobservables. *Review of Economic Studies, 70*(7), 317–341.

Lichtenberg, F. R., & Siegel, D. (1991). The Impact of R&D Investment on Productivity - New Evidence Using Linked R&D-LRD Data. *Economic Inquiry, 29*(2), 203-229.

Liu, Z. (2008). Foreign direct investment and technology spillovers: Theory and evidence. *Journal of Development Economics, 85*(1-2), 176-193.

Low, M. B., & MacMillan, I. C. (1988). Entrepreneurship: Past Research and Future Challenges. *Journal of Management, 14*(2), 139-161.

Lu, J. W. (2002). Intra- and Inter-organizational Imitative Behavior: Institutional Influences on Japanese Firms' Entry Mode Choice. *Journal of International Business Studies, 33*(1), 19-37.

Luke, D. A. (2004). *Multilevel modelling*. London: Sage Publications.

Lundström, A., & Halvarsson, S. (2006). Entrepreneurship Research: Past Perspectives and Future Prospects. *Foundations and Trends® in Entrepreneurship, 2*(3), 145-259.

Madsen, T. K., & Servais, P. (1997). The Internationalization of Born Globals: an Evolutionary Process? *International Business Review, 6*(6), 561-583.

Marschak, J., & Andrews, W. H. (1944). Random Simultaneous Equations and the Theory of Production. *Econometrica, 12*(3/4), 143-205.

Martin, X., Swaminathan, A., & Mitchell, W. (1998). Organizational Evolution in the Interorganizational Environment: Incentives and Constraints on International Expansion Strategy. *Administrative Science Quarterly, 43*(3), 566-601.

McDougall, P. P. (1989). International versus domestic entrepreneurship: New venture strategic behavior and industry structure. *Journal of Business Venturing, 4*(6), 387-400.

McDougall, P. P., Covin, J. G., Robinson, R. B., & Herron, L. (1994). The effects of industry growth and strategic breadth on new venture performance and strategy content. *Strategic Management Journal, 15*(7), 537-554.

McDougall, P. P., & Oviatt, B. M. (2000). International Entrepreneurship: The Intersection of two Research Paths. *Academy of Management Journal, 43*(5), 902-906.

McDougall, P. P., Oviatt, B. M., & Shrader, R. C. (2003). A Comparison of International and Domestic New Ventures. *Journal of International Entrepreneurship, 1*(1), 58-82.

McDougall, P. P., Oviatt, B. M., Shrader, R. C., & Simon, M. (1993a). Heartware International Corporation: An Entrepreneur's Roller Coaster Ride Part B. *Entrepreneurship: Theory & Practice, 18*(2), 129-135.

McDougall, P. P., Oviatt, B. M., Shrader, R. C., & Simon, M. (1993b). Heartware International Corporation: Death of a Company Part C. *Entrepreneurship: Theory & Practice, 18*(2), 137-139.

McDougall, P. P., Shane, S., & Oviatt, B. M. (1994). Explaining the formation of international new ventures: The limits of theories from international business research. *Journal of Business Venturing, 9*(6), 469-487.

McKinsey-Global-Institute. (1993). *Manufacturing Productivity*. Washington, DC: McKinsey & Company Inc.

Meyer, J. W., & Rowan, B. (1991). Institutionalized Organizations: Formal Structures as Myth and Ceremony. In W. W. Powell & P. J. DiMaggio (Eds.), *The New Institutionalism in Organizational Analysis* (pp. 41-62). Chicago, IL: The University of Chicago Press.

Miller, D., & Chen, M. J. (1994). Sources and Consequences of Competitive Inertia: A Study of the U.S. Airline Industry. *Administrative Science Quarterly, 39(1),* 1-23.

Minondo, A. (2010). Exports' Productivity and Growth across Spanish Regions. *Regional Studies*, *44*(5), 569–577.

Moen, E., & Lilja, K. (2005). Change in Coordinated Market Economies: The Case of Nokia and Finland. In G. Morgan, R. Whitley & E. Moen (Eds.), *Changing Capitalisms?: Internationalism, Institutional Change, and Systems of Economic Organization* (pp. 352-379). New York, NY: Oxford University Press.

Moen, Ø. (2002). The Born Globals: A new generation of small European exporters. *International Marketing Review, 19*(2), 156-175.

Naman, J. L., & Slevin, D. P. (1993). Entrepreneurship and the concept of fit: A model and empirical tests. *Strategic Management Journal, 14*(2), 137-153.

Nelson, R. R. (1981). Research on Productivity Growth and Productivity Differences: Dead Ends and New Departures. *Journal of Economic Literature*, *19*(3), 1029-1064.

Nelson, R. R., & Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge, MA: Belknap Press.

North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge, UK: Cambridge University Press.

OECD. (1990). *The Technology and Economic Policy Report*. Paris: OECD.

OECD. (2001). *Measuring Productivity: Measurement of Aggregate and Industry-Level Productivity Growth*. Paris: OECD.

OECD. (2008). *OECD Benchmark Definition of Foreign Direct Investment - 4th Edition*. París: OECD.

Oliver, C. (1991). Strategic Responses to Institutional Processes. *Academy of Management Review, 16*(1), 145-179.

Olley, G. S., & Pakes, A. (1996). The Dynamics of Productivity in the Telecommunications Equipment Industry. *Econometrica, 64*(6), 1263-1297.

Orser, B., Spence, M., Riding, A., & Carrington, C. A. (2010). Gender and Export Propensity. *Entrepreneurship: Theory & Practice, 34*(5), 933-957.

Oviatt, B. M., & McDougall, P. P. (1994). Toward a Theory of International New Ventures. *Journal of International Business Studies, 25*(2), 45-64.

Oviatt, B. M., & McDougall, P. P. (1997). Challenges for Internationalization Process Theory: The Case of International New Ventures. *Management International Review, 37*(2), 85-99.

Oviatt, B. M., & McDougall, P. P. (1999). A Framework for Understanding Accelerated International Entrepreneurship. In A. M. Rugman & R. W. Wright (Eds.), *International Entrepreneurship Globalization of Emerging Businesses* (pp. 23-40). Stamford, CT: JAI Press.

Oviatt, B. M., & McDougall, P. P. (2005a). Defining International Entrepreneurship and Modelling the Speed of Internationalization. *Entrepreneurship Theory & Practice, 29*(5), 537-554.

Oviatt, B. M., & McDougall, P. P. (2005b). The internationalization of entrepreneurship. *Journal of International Business Studies, 36*(1), 2-8.

Oviatt, B. M., McDougall, P. P., Simon, M., & Shrader, R. C. (1993). Heartware International Corporation: A Medical Equipment Company "Born International" Part A. *Entrepreneurship: Theory & Practice, 18*(2), 111-128.

Peña, I. (2002). Intellectual capital and business start-up success. *Journal of Intellectual Capital, 3*(2), 180-198.

Pfeffer, J., & Salancik, G. R. (2003). *The External Control of Organizations: A Resource Dependence Perspective*. Standford, CA: Standford University Press.

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

Pla-Barber, J., & Escribá-Esteve, A. (2006). Accelerated internationalisation: evidence from a late investor country. *International Marketing Review, 23*(3), 255-278.

Polanyi, M. (1958). *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago, IL: University of Chicago Press.

Porter, M. E. (1979). How Competitive Forces Shape Strategy. *Harvard Business Review, 57*(2), 5-8.

Porter, M. E. (1986). *Competition in Global Industries*. Boston: Harvard Business School Press.

Porter, M. E. (1990). The Competitive Advantage of Nations. *Harvard Business Review, 68*(2), 73-93.

Porter, M. E. (1998a). Clusters and the New Economics of Competition. *Harvard Business Review*(November–December), 77-90.

Porter, M. E. (1998b). *On Competition*. Boston: Harvard Business Review Press.

Randolph, W. A., & Dess, G. G. (1984). The Congruence Perspective of Organization Design: A Conceptual Model and Multivariate Research Approach. *Academy of Management Review, 9*(1), 114-127.

Requena Silvente, F. (2005). Changing export status and firm performance: evidence from UK small firms. *Applied Economics Letters, 12*(9), 567-571.

Reynolds, P., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., et al. (2005). Global Entrepreneurship Monitor: Data Collection and Implementation (1998-2003). *Small Business Economics, 24*, 205-231.

Rhee, Y., Ross-Larson, B., & Pursell, G. (1984). *Korea's Competitive Edge: Managing the Entry into World Markets*. Baltimore, MD: Johns Hopkins University.

Rialp, A., Rialp, J., & Knight, G. A. (2005). The phenomenon of early internationalizing firms: what do we know after a decade (1993-2003) of scientific inquiry? *International Business Review, 14*(2), 147-166.

Rialp, A., Rialp, J., Urbano, D., & Vaillant, Y. (2005). The Born-Global Phenomenon: A Comparative Case Study. *Journal of International Entrepreneurship, 3*(2), 133-171.

Roberts, M. J., & Tybout, J. R. (1991). Size Rationalization and Trade Exposure in Developing Countries. In R. E. Baldwin (Ed.), *Empirical Studies of Commercial Policy* (pp. 169-200). Chicago, IL: University of Chicago Press.

Roberts, M. J., & Tybout, J. R. (1997). The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs. *American Economic Review, 87*(4), 545-564.

Robinson, K. C. (1999). An examination of the influence of industry structure on eight alternative measures of new venture performance for high potential independent new ventures. *Journal of Business Venturing, 14*(2), 165-187.

Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *The Journal of Political Economy, 94*(5), 1002-1037.

Ruzzier, M., Hisrich, R. D., & Antoncic, B. (2006). SME internationalization research: past, present, and future. *Journal of Small Business and Enterprise Development, 13*(4), 476-497.

Salomon, R. M., & Shaver, J. M. (2005). Learning by Exporting: New Insights from Examining Firm Innovation. *Journal of Economics & Management Strategy, 14(2),* 431-460.

Sanders, W. G., & Carpenter, M. A. (1998). Internationalization and Firm Governance: The Roles of CEO Compensation, Top Team Composition, and Board Structure. *Academy of Management Journal, 41(2)*, 158-178.

Sapienza, H. J., Autio, E., George, G., & Zahra, S. A. (2006). A Capabilities Perspective on the Effects of Early Internationalization on Firm Survival and Growth. *Academy of Management Review, 31*(4), 914-933.

Sapienza, H. J., & Grimm, C. M. (1997). Founder Characteristics, Start-Up Process, and Strategy/Structure Variables as Predictors of Shortline Railroad Performance. *Entrepreneurship Theory & Practice, 22*(1), 5-24.

Sarkar, M. B., Echambadi, R., Agarwal, R., & Sen, B. (2006). The effect of the innovative environment on exit of entrepreneurial firms. *Strategic Management Journal, 27*(6), 519-539.

Schumpeter, J. A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Cambridge, MA: Harvard University Press.

Scott, A., & Storper, M. (2003). Regions, Globalization, Development. *Regional Studies, 37*(6&7), 579-593.

Shane, S. (2000). Prior Knowledge and the Discovery of Entrepreneurial Opportunities. *Organization Science, 11*(4), 448-469.

Shane, S. (2009). Why encouraging more people to become entrepreneurs is bad public policy. *Small Business Economics, 33*(2), 141-149.

Shane, S., & Venkataraman, S. (2000). The Promise of Enterpreneurship as a Field of Research. *Academy of Management Journal, 25*(1), 217-226.

Shenkar, O. (2001). Cultural Distance Revisited: Towards a More Rigorous Conceptualization and Measurement of Cultural Differences. *Journal of International Business Studies, 32*(3), 519-535.

Shrader, R. C. (2001). Collaboration and Performance in Foreign Markets: The Case of Young High-Technology Manufacturing Firms. *Academy of Management Journal, 44*(1), 45-60.

Shrader, R. C., Oviatt, B. M., & McDougall, P. P. (2000). How New Ventures Exploit Trade-Offs Among International Risk Factors: Lessons for the

Accelerated Internationalization of the 21st Century. *Academy of Management Journal, 43(6),* 1227-1247.

Simpson, C. L., & Kujawa, D. (1974). The Export Decision Process: An Empirical Inquiry. *Journal of International Business Studies, 5(1),* 107-117.

Sine, W. D., & David, R. J. (2003). Environmental jolts, institutional change, and the creation of entrepreneurial opportunity in the US electric power industry. *Research Policy, 32*(2), 185-207.

Soete, L., & Patel, P. (1985). Recherche–Développement, importations de technologie et croissance économique. Une tentative de comparaison internationales. *Revue Économique, 36*(5), 975-1000.

Solow, R. M. (1956). A contribution to theory of economic growth. *Quarterly Journal of Economics, 70*(1), 65-94.

Stam, E., & van Stel, A. (2009). Types of Entrepreneurship and Economic Growth, *UNU-MERIT Working Papers Nº 2009-049*. Maastricht, The Netherlands: United Nations University.

Staw, B. M., & Szwajkowski, E. (1975). The Scarcity-Munificence Component of Organizational Environments and The Commission of Illegal Acts. *Administrative Science Quarterly, 20*(3), 345-354.

Sternberg, R., & Wennekers, S. (2005). Determinants and Effects of New Business Creation Using Global Entrepreneurship Monitor Data. *Small Business Economics, 24*(3), 193-203.

Stinchcombe, A. L. (1965). Social Structure and Organizations *Handbook of Organizations* (pp. 142-193). Chicago, IL: Rand McNally.

Strang, D., & Soule, S. A. (1998). Diffusion in Organizations and Social Movements: From Hybrid Corn to Poison Pills. *Annual Review of Sociology, 24*(1), 265-290.

Studenmund, A. H. (2000). *Using Econometrics: A Practical Guide* (4th ed.). Boston, MA: Addison-Wesley.

Tallman, S., & Li, J. (1996). Effects of International Diversity and Product Diversity on the Performance of Multinational Firms. *Academy of Management Journal, 39*(1), 179-196.

Turnbull, P. W. (1987). A Challenge to the Stages Theory of the Internationalization Process. In P. J. Rosson & S. D. Reed (Eds.), *Managing Export Entry and Expansion* (pp. 21-40). New York, NY: Praeger.

Uzawa, H. (1962). Production Functions with Constant Elasticities of Substitution. *The Review of Economic Studies, 29*(4), 291-299.

van Beers, C., & van der Panne, G. (2011). Geography, knowledge spillovers and small firms' exports: an empirical examination for The Netherlands. *Small Business Economics, 37*(3), 325-339.

van Praag, C. M. (1996). *Determinants of Successful Entrepreneurship*. Amsterdam, The Netherlands: Thesis Publishers.

van Stel, A., Carree, M., & Thurik, R. (2005). The Effect of Entrepreneurial Activity on National Economic Growth. *Small Business Economics, 24*(3), 311-321.

van Stel, A., & Storey, D. J. (2004). The Link between Firm Births and Job Creation: Is There a Upas Tree Effect? *Regional Studies, 38*(8), 893 - 909.

Vendrell-Herrero, F. (2008). *Transfer of knowledge from the lab to the market: The idiosyncrasy of academic entrepreneurs.* Unpublished Doctoral dissertation, Universitat Autònoma de Barcelona, Bellatera.

Venkataraman, S. (1997). The distintive domain of entrepreneurship research: An editor's perspective. In J. A. Katz (Ed.), *Advances in entrepreneurship, firm emergence, and growth* (Vol. 3, pp. 119-138). Greenwich, CT: JAI Press.

Verheul, I., & van Stel, A. (2007). Entrepreneurial diversity and economic growth, *SCALES report H200701*. Zoetermeer, The Netherlands: EIM.

Verheul, I., van Stel, A., & Thurik, R. (2006). Explaining female and male entrepreneurship at the country level. *Entrepreneurship & Regional Development, 18*(2), 151-183.

von Hippel, E. (1994). 'Sticky Information' and the Locus of Problem Solving: Implications for Innovation. *Management Science, 40*(4), 429-439.

Wagner, J. (2002). The Causal Effects of Exports on Firm Size and Labour Productivity: First Evidence from a Matching Approach. *Economics Letters, 77*(2), 287-292.

Wagner, J. (2007). Exports and Productivity: A Survey of the Evidence from Firm Level Data. *The World Economy, 30(1),* 60-82.

Wakelin, K. (1998). Innovation and export behaviour at the firm level. *Research Policy, 26*(7-8), 829-841.

Wan, W. P., & Hoskisson, R. E. (2003). Home Country Environments, Corporate Diversification Strategies, and Firm Performance. *Academy of Management Journal, 46*(1), 27-45.

Weber, P., & Schaper, M. (2004). Understanding the grey entrepreneur. *Journal of Enterprising Culture, 12*(2), 147-164.

Wennekers, S., & Thurik, R. (1999). Linking Entrepreneurship and Economic Growth. *Small Business Economics, 13*(1), 27-55.

Wennekers, S., van Stel, A., Carree, M., & Thurik, R. (2010). The Relationship between Entrepreneurship and Economic Development: Is it U-shaped? *Foundations and Trends® in Entrepreneurship, 6*(3), 167-237.

Wennekers, S., van Stel, A., Thurik, R., & Reynolds, P. (2005). Nascent Entrepreneurship and the Level of Economic Development. *Small Business Economics, 24*, 293-309.

Westhead, P., Wright, M., & Ucbasaran, D. (2001). The internationalization of new and small firms: A resource-based view. *Journal of Business Venturing, 16*(4), 333-358.

White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica, 48*(4), 817-838.

Whitley, R. (1999). *Divergent capitalisms: The social structuring and change of business systems*. Oxfod, UK: Oxford University Press.

Wong, P. K., Ho, Y. P., & Autio, E. (2005). Entrepreneurship, Innovation and Economic Growth: Evidence from GEM data. *Small Business Economics, 24*(3), 335-350.

Wooldridge, J. M. (2009). On Estimating Firm-level Production Functions Using Proxy Variables to Control for Unobservables. *Economics Letters, 104*(3), 112-114.

Woolley, J. L., & Rottner, R. M. (2008). Innovation Policy and Nanotechnology Entrepreneurship. *Entrepreneurship Theory and Practice, 32*(5), 791-811.

Wright, M., Westhead, P., & Ucbasaran, D. (2007). Internationalization of Small and Medium-sized Enterprises (SMEs) and International Entrepreneurship: A Critique and Policy Implications. *Regional Studies, 41*(7), 1013-1030.

Yasai-Ardekani, M. (1989). Effects of Environmental Scarcity and Munificence on the Relationship of Context to Organizational Structure. *The Academy of Management Journal, 32*(1), 131-156.

Zaheer, S., & Mosakowski, E. (1997). The dynamics of the liability of foreignness: A global study of survival in financial services. *Strategic Management Journal, 18*(6), 439-463.

Zahra, S. A. (2005). A theory of international new ventures: a decade of research. *Journal of International Business Studies, 36*(1), 20-28.

Zahra, S. A., & George, G. (2002a). Absorptive Capacity: A Review, Reconceptualization, and Extension. *Academy of Management Review, 27*(2), 185-203.

Zahra, S. A., & George, G. (2002b). International Entrepreneurship: The Current Status of the Field and Future Research Agenda. In M. A. Hitt, R. D.

Ireland, S. M. Camp & D. L. Sexton (Eds.), *Strategic Entrepreneurship: Creating a New Mindset* (pp. 255-288). Oxford: Blackwell Publishing.

Zahra, S. A., Ireland, R. D., & Hitt, M. A. (2000). International Expansion by New Venture Firms: International Diversity, Mode of Market Entry, Technological Learning, and Performance. *Academy of Management Journal, 43*(5), 925-950.

Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda. *Journal of Management Studies, 43(4),* 917-955.

Zimmerman, M. A., & Zeitz, G. J. (2002). Beyond Survival: Achieving New Venture Growth by Building. *Academy of Management Review, 27(3),* 414-431.

Zollo, M., & Winter, S. G. (2002). Deliberate Learning and the Evolution of Dynamic Capabilities. *Organization Science, 13(3),* 339-351.

Appendices

Appendix 1: Questionnaire on innovative entrepreneurship administered to new ventures started up in the Basque Autonomous Community (BAC) during the period 2000-2005.

Appendix 2: Testing for systematic differences between the final sample and the group of firms excluded from the original sample in the analysis of the outcomes of export-oriented entrepreneurship at firm-level

Appendix 3: Random effects models and Hausman's test for the appropriateness of the random-effects estimator

Appendix 4: Testing for systematic differences among groups of analysis within the sample used in the analysis of the outcomes of export-oriented entrepreneurship at firm-level

Appendix 5: Testing for differences in entrepreneur's experience, entrepreneur's human capital, and inter-firm's collaboration within the sample used in the analysis of the outcomes of export-oriented entrepreneurship at firm-level

Appendix 1: Questionnaire on innovative entrepreneurship administered to new ventures started up in the Basque Autonomous Community (BAC) during the period 2000-2005.

Note: This questionnaire is designed to assess both the characteristics of the BAC innovative entrepreneur and those of his or her entrepreneurial (business) projects; the objective is to achieve an understanding of the reality surrounding this group of individuals and to offer recommendations for improvements directed at the public authorities and other parties concerned with promoting the entrepreneurial and innovative spirit. The information will be treated in the strictest confidence and used only for academic and consultancy purposes. Once you have filled in the questionnaire, please return it in the postage-paid envelope provided, or, if you prefer, send it to the following FAX number: **943 42 22 24**. If you wish to receive a copy of the results and conclusions of the study, please provide the following details:

Name: _____ Company: _____

Address: Town: Postal Code:

Questionnaire Nº 1

A. CHARACTERISATION OF THE ENTREPRENEUR AND/OR GENERAL DIRECTOR

1. Age ☐

2. Sex ☐

3. Place of birth ☐

4. Indicate level of studies attained *(Mark only one option)*

- Secondary or inferior ☐
- Mid-level (technical studies of all types) ☐
- 3-year University ☐
- 5-year University ☐
- Master o specialisation ☐
- Doctorate ☐

5. Indicate the approximate number of years that you have dedicated to each of the following professional activities *(Write zero (0) if not applicable)***:**

	Number of years
• Employee	☐
• Departmental management post (e.g., finance, marketing) or business unit management post (e.g., product line, overseas division)	☐
• General Directorship	☐
• Board of directors	☐
• Teaching staff/Researcher	☐
• Public administration	☐
• Self-employed professional	☐
• Investor in businesses (Business Angel, Venture Capitalist, etc.)	☐

6. Is there or has there been any other entrepreneur in your family?

Yes ☐ No ☐

7. Indicate if you are able to negotiate in the following languages *(Mark several options if necessary)*

- English ☐
- French ☐
- German ☐
- Others ☐

8. Did you have any professional work-experience in the sector that you decided to create your business?

Yes ☐ No ☐ (11)

(9)

9. Indicate the number of years of professional work-experience in the sector that you decided to create the business. ☐

10. Your present business is related to your previous professional activity because *(Mark only one option; that which corresponds to the most relevant situation)***:**

- The previous enterprise is my principal supplier (more than 50% of purchases) ☐
- The previous enterprise is one of my principal suppliers (10% - 50% of purchases) ☐
- The previous enterprise is my principal client (more than 50% of sales) ☐
- The previous enterprise is one of my principal clients (10% - 50% of sales) ☐
- My business has received financial help from the previous enterprise ☐
- My business is a competitor of the previous enterprise ☐
- I took some employees from the previous enterprise ☐
- Other reasons *(specify)* ☐
  _____
  _____

11. Regarding your future, professionally, rate from 1 (Not at all) to 5 (Totally) whether you would be disposed to:

	Not at all 1	2	More or less 3	4	Totally 5
• Creating a new business, in spite of having experienced the failure of a previous entrepreneurial project.	☐	☐	☐	☐	☐
• Living in a foreign country in order to achieve your professional goal with respect to your entrepreneurial Project.	☐	☐	☐	☐	☐

12. Indicate if you have had any previous experience as entrepreneur (starting up businesses).	**13. How many previous businesses have you set up?**	**14. Of the last three entrepreneurial experiences (or number of businesses quoted earlier) indicate the following** *(Write zero (0) if not applicable)***:**		
		Nº of businesses set up in the same sector as where you are currently operating	*Nº of businesses set up in the same province as where you are currently located*	*Nº of businesses set up that have been successful*
Yes ☐ ---▶				
No ☐				

▼ Go to the next section (B)

15. If you have had unsuccessful entrepreneurial experiences in the past, indicate the three main causes that led to their failure.	**16. If you have had successful entrepreneurial experiences in the past, indicate the three main causes that contributed to their success.**
a.	.
b.	.
c.	.

B. COMPANY DATA

1. Date of business start-up

Month: ☐ **Year:** ☐

2. Place/town of the business

3. Describe in detail the activity of the business

(*If you know the NACE code of your business, please include it in the description)*

4. Indicate the main sector of activity in which your business falls *(Mark only one option)*

A. Agriculture, livestock, hunting and forestry	☐	J. Financial intermediation and services	☐
B. Fishing	☐	K. Real estate, letting and business service activities	☐
C. Extractive industries	☐	L. Public administration, defence and compulsory social security	☐
D. Manufacturing	☐	M. Education	☐
E. Production and distribution of electrical energy, gas and water	☐	N. Health and veterinary activities; social services	☐
F. Construction	☐	O. Other social activities and community services	☐
G. Commerce	☐	P. Household activities	☐
H. Hotel trade	☐	Q. Extraterritorial agencies	☐
I. Transport and communications	☐		

5. Enter the initial number of company owners	**6. How much did the initial capital of the company amount to?**	**7. If your business involves the use of foreign capital, indicate the approximate percentage of the initial capital** *(Write zero (0) if not applicable)*
	€	%

8. Indicate approximately the net sales and value of purchases of your business in the year 2006 (values in Euros)	**9. Indicate approximately the amount of sales made to your three principal clients as a percentage of total sales.**	**10. Indicate approximately the amount of purchases from your three principal suppliers as a percentage of total purchases.**
• Sales €		
• Purchases €	%	%

11. Enter the number of personnel employed in the first year of starting the business

- Full time ☐
- Part time ☐

12. Enter the number of personnel employed in the business by December 31st 2006

- Full time ☐
- Part time ☐

13. How many people do you estimate will work in your business in the next five years?

- Full time ☐
- Part time ☐

14. Enter the number of people with a Bachelor's degree in your company *(Write zero (0) if none)* ☐

15. Enter the number of people with a Masters in your company *(Write zero (0) if none)* ☐

16. Enter the number of Doctorates in your company *(Write zero (0) if none)* ☐

17. Indicate for each geographic area, the approximate percentage of…

	… sales destined for	… purchases originating in	… employees located in
• BAC	%	%	%
• Rest of the State	%	%	%
• European Union (EU25)	%	%	%
• Rest of the World	%	%	%
	100%	**100%**	**100%**

18. Indicate which of the following activities of your business take place abroad (partially or totally), either with internal staff or with third-party collaboration *(Mark various options if necessary)*

- Distribution activities ☐
- Production activities ☐
- R & D activities ☐

19. Indicate in how many countries your product(s) or services have a presence *(Write zero (0) if none)* ☐

20. Indicate the year that your business executed its first international activity (sales or implementation of foreign activity) ☐

21. How many product lines are provided by the company? *(Write zero (0) if not applicable)* ☐

22. Are more than 50% of the product lines related to each other?

Yes ☐ No ☐

23. Have you set up any division or department of the company abroad?

Yes ☐ No ☐

24. Has the company generated any new spin-off companies in the past?

Yes ☐ → 25

No ☐ → 27

25. How many *spin-off s* in total? ☐

26. How many foreign *spin-offs?* *(Write zero (0) if not applicable)* ☐

27. Is the company planning to create a spin-off in the next two years?

Yes ☐

No ☐

28. Do you find it difficult to create other businesses?

Yes ☐ → 29

No ☐ → Go to the next section (C)

29. If so, what are the three major difficulties encountered?

a. ☐

b. ☐

c. ☐

C. INVESTIGACIÓN Y DESARROLLO (I+D)

1. Indicate whether the company undertook or contracted research and development (R&D) activities in 2006 *(Mark only one option)*

- The company undertook R&D activities internally, but did not outsource. ☐
- The company contracted R&D activities externally, but they were not carried out in the company. ☐
- R&D activities have been undertaken in the company and have also been outsourced. ☐
- R&D activities have neither been undertaken in the company nor been outsourced. ☐

2. What portion, approximately, of turnover is currently dedicated to R&D activities?

(2) ____ %

3. Indicate how sources of financial funding are approximately distributed.

- Autonomic administration ____ %
- Central administration ____ %
- Personal resources ____ %
- Others (*Specify*) _____ ____ %

100%

(9)

4. Indicate if you collaborate with any of these centres in R&D activities *(Mark various options if necessary):*

A. Technology Centre:

- CEIT ☐
- CIDETEC ☐
- ESI ☐
- Fatronik ☐
- Gaiker ☐
- Ideko ☐
- Ikerlan ☐
- Inasmet ☐
- Labein ☐
- Leia ☐
- Robotiker ☐
- Tecnalia ☐
- Tekniker ☐

B. Centre of Cooperative Innovation

- Biogune ☐
- Biomagune ☐
- Margune ☐
- Mikrogune ☐
- Nanogune ☐
- Tourgune ☐

C. International Centre for Development and Technology Transfer:

- Vicomtech ☐

5. Indicate if you collaborate with universities in R&D activities in the following geographic contexts *(Mark various options if necessary)***:**

- Autonomic (BAC) ☐
- National (Rest of Spain) ☐
- International (Outside of Spain) ☐

6. Indicate if you collaborate with other companies in R&D activities in the following geographic contexts *(Mark various options if necessary)***:**

- Autonomic (BAC) ☐
- National (Rest of Spain) ☐
- International (Outside of Spain) ☐

7. Of the total time allocated to pursuing R&D activities with other partners, what proportion, approximately, is dedicated to the following organisations?

A. Research Centres..... ____ %

B. National universities ____ %

C. Foreign universities..... ____ %

D. Other domestic companies ____ %

E. Other foreign companies..... ____ %

100%

8. Classify the partners with whom you have R&D collaboration/cooperation deals from 1 (greatest) to 3 (least), with respect to received value (utility)

Research Centres ☐

Universities ☐

Other companies ☐

9. How many of your clients would you say consider your product or service new or novel? *(Mark only one option)*

- All ☐
- Some ☐
- None ☐

10. At the present time, how many businesses are offering the same product or service that you are offering your clients? *(Mark only one option)*

- None ☐
- Some ☐
- Many ☐

11. How long has it been possible to access the technologies necessary to produce or carry out the product or service that you offer? *(Mark only one option)*

- Less than 1 year ☐
- Between 1 y 5 years ☐
- More than 5 years ☐

12. What percentage of sales revenues depend on products created in the last 3 years that are new to the market in which they are competing? *(Write zero (0) if not applicable)*	**13. How many patents have been granted in the last 5 years to your company?** *(Write zero (0) if not applicable)*	**14. What is the annual income from the sale of licences (royalties) of patents granted in the last 5 years?** *(Write zero (0) if not applicable)*
%		€

15. In the last 5 years has your company invested in *(Mark several options if necessary)***…**

- … methods of manufacture or production of new or improved products or services within the sector or market? ☐
- … logistics systems or methods of delivery or distribution of new or improved goods, products or services within the sector or market? ☐
- … support activities for its new or improved processes (maintenance systems or purchase or accounting operations) within the sector or market? ☐

D. SOURCES OF COMPANY FUNDING

1. Indicate the percentage distribution of funding sources at the founding year and at year 2006

	Founding year	**Year 2006**
• Resources provided by the entrepreneur (promoter)	%	%
• Resources provided by relatives or friends	%	%
• Resources provided by the company where the entrepreneur worked	%	%
• Resources provided by Venture Capital Funds	%	%
• Resources provided by *Business Angels*	%	%
• Resources provided by banks, savings and other financial institutions	%	%
• Others *(Specify)*: _____		
	100%	**100%**

2. Do you hope one day to float your company on the stock market?

Yes ☐ No ☐

3. Rate from 1 (Poor) to 5 (Excellent) the degree of difficulty you encountered when seeking funding for…

	Poor 1	2	3	4	Excellent 5
• the creation of the business	☐	☐	☐	☐	☐
• financing growth of the business	☐	☐	☐	☐	☐
• financing innovation in the business	☐	☐	☐	☐	☐
• financing the creation of spin-offs	☐	☐	☐	☐	☐

4. Indicate if you have received or are receiving public financial support for the creation of your business.

Yes ☐ → 5

No ☐ → Go to the next section (E)

5. Indicate the value in % terms that this assistance represents with respect to the initial capital

%

6. Rate this assistance from 1(Poor) to 10 (Excellent).

7. Rate the public financial support received from 1 (Poor) to 5 (Excellent) according to the following aspects:

	Poor 1	2	Acceptable 3	4	Excellent 5
• The financial support was or has been timely.	☐	☐	☐	☐	☐
• The financial support received was useful for the survival of the business plan.	☐	☐	☐	☐	☐
• The amount received was sufficient.	☐	☐	☐	☐	☐

E. FACTOR OF SUCCESS AND PROBLES THAT AFFECT THE ACTIVITY OF THE BUSINESS

1. Identify three factors that do foster or could foster …

…its innovative activity	…its growth	…its entry into foreign markets
a.	a.	a.
b.	b.	b.
c.	c.	c.

2. Indicate three difficulties that do limit or could limit…

… its innovative activity	… its growth	… its entry into foreign markets
a.	a.	a.
b.	b.	b.
c.	c.	c.

F. EVALUATION OF PUBLIC POLICIES

1. Rate the following public policies in the BAC from 1 (Poor) to 5 (Excellent):

	Poor		Acceptable		Excellent
	1	**2**	**3**	**4**	**5**
• Policies aimed at the creation of technological and innovative businesses	☐	☐	☐	☐	☐
• Policies aimed at supporting the internationalisation of young businesses	☐	☐	☐	☐	☐
• Policies aimed at supporting the growth of young businesses	☐	☐	☐	☐	☐
• Administrative procedures for business creation	☐	☐	☐	☐	☐
• Tax incentives for setting up innovative businesses	☐	☐	☐	☐	☐
• Legal facilities to attract talent and foreign capital	☐	☐	☐	☐	☐

G. BUSINESS INNOVATION CENTRES (BICs)

1. Indicate if you have been assisted by any of the following BICs, and also if you are continuing to receive their services *(Mark only one option; that which refers to the most recent association with a BIC):*

- Beaz ☐
- Bic Berrilan ☐
- CEDEMI ☐
- CEIA ☐
- Saiolan ☐

Are you continuing to receive the services of the BIC?

Yes ☐ No ☐

2. Indicate if you have been located in any of the following technology parks and also if you still are *(Mark only one option; that which refers to the most recent location)*

- Garaia ☐
- Miñano ☐
- Miramón ☐
- Zamudio ☐

Are you still located in the technology park?

Yes ☐ No ☐

3. Indicate if you have been assisted by a cluster association

(Specify which):

_____

_____

_____

_____

4. Rate from 1 to 10 the services received from:

- BICs ☐
- Technology parks ☐
- Clusters ☐

5. Indicate if the entrepreneurial/business environment of the BIC promoted the growth expectations of your company *(Mark only one option)*

- It greatly improved the expectations I/it had. ☐
- It improved the expectations I/it had a bit. ☐
- It neither improved nor worsened them. ☐
- It worsened the expectations I/it had. ☐

6. To what extent do you consider CEIs to be effective instruments in the creation and consolidation of innovative businesses? *(Mark only one option)*

- Very effective ☐
- Quite effective ☐
- A bit effective ☐
- Not very effective ☐
- Not very effective at all ☐

7. Rate the following aspects of the BIC from 1 (Poor) to 5 (Excellent):

	Poor		Acceptable		Excellent
	1	**2**	**3**	**4**	**5**
• Installations and infrastructure	☐	☐	☐	☐	☐
• Entrepreneurial environment	☐	☐	☐	☐	☐
• Search for funding	☐	☐	☐	☐	☐
• Access to customer and supplier networks	☐	☐	☐	☐	☐
• Protection of intellectual property mechanisms	☐	☐	☐	☐	☐
• Innovation and technology development	☐	☐	☐	☐	☐
• Support for the process of internationalisation	☐	☐	☐	☐	☐

Thank you very much for completing this questionnaire. Please return it in the postage-paid envelope provided; or, if you prefer, you can send it to the following FAX number: **943 42 22 24.**

Appendix 2: Testing for systematic differences between the final sample and the group of firms excluded from the original sample in the analysis of the outcomes of export-oriented entrepreneurship at firm-level

Group statistics of firms included in the final sample and firms that were excluded because they were not indexed in SABI

Group	Variables	Sample	n	Mean	Standard Deviation	Standard Error of mean
Sector	Manufacturing	Excluded firms	50	0.160	0.370	0.052
		Final sample	79	0.253	0.438	0.049
	Construction	Excluded firms	50	0.000	0.000	0.000
		Final sample	79	0.025	0.158	0.018
	Trade, hotels and transport	Excluded firms	50	0.060	0.240	0.034
		Final sample	79	0.127	0.335	0.038
	Banking, insurance and business services	Excluded firms	50	0.660	0.479	0.068
		Final sample	79	0.570	0.498	0.056
	Other services activities	Excluded firms	50	0.120	0.328	0.046
		Final sample	79	0.025	0.158	0.018
Techno-logical level	High technology, medium-high technology or knowledge intensive industry	Excluded firms	50	0.327	0.474	0.068
		Final sample	79	0.440	0.500	0.058
Size	Employment size at the inception	Excluded firms	50	3.917	5.914	0.854
		Final sample	79	4.513	4.436	0.499
	Employment size at the time of the survey	Excluded firms	50	10.510	21.908	3.130
		Final sample	79	9.627	15.091	1.698

Two-sample t-Test for equal means

Group	Variables	t	d.f.	Sig. level (bilateral)	Means difference	S.E. of the difference	95% C.I. of the difference	
							Lower	Upper
Sector	Manufacturing	-1.248	127	0.214	-0.093	0.075	-0.241	0.055
	Construction	-1.131	127	0.260	-0.025	0.022	-0.070	0.019
	Trade, hotels and transport	-1.222	127	0.224	-0.067	0.055	-0.174	0.041
	Banking, insurance and business services	1.019	127	0.310	0.090	0.089	-0.085	0.266
	Other services activities	2.196	127	0.030	0.095	0.043	0.009	0.180
Techno-logical level	High technology, medium-high technology or knowledge intensive industry	-1.261	127	0.210	-0.113	0.090	-0.292	0.065
Size	Employment size at the inception	-0.646	127	0.520	-0.596	0.923	-2.422	1.230
	Employment size at the time of the survey	0.270	127	0.548	-0.596	0.989	-2.564	1.372

Notes: Equal variance assumed

Appendix 3: Random effects models and Hausman's test for the appropriateness of the random-effects estimator

The effects of exporting on new venture productivity
(Compare to Table 16)

Variables		(1)	(2)
		Cobb-Douglas	Cobb-Douglas
Average and initial TFP	$Export_{it}$ (γ_1)	0.1918**	0.0193
		(0.0667)	(0.0576)
TFP Growth	Age_{it} (γ_2)	0.0483***	0.0384**
		(0.0120)	(0.0135)
	Age_{it} x $Export_{it}$ (γ_3)		0.0304*
			(0.0119)
Inputs	LnL_{it} (β_1)	0.9266***	0.9338***
		(0.0433)	(0.0434)
	LnK_{it} (β_2)	0.0536*	0.0527*
		(0.0251)	(0.0248)
	Constant	0.0413	0.0661
		(0.1467)	(0.1506)
Observations		297	
Cases		79	
R^2:	Within	0.8092	0.8077
	Between	0.9355	0.9360
	Overall	0.8923	0.8913

Hausman's test

Coefficients	Column 1				Column 2			
	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.
$Export_{it}$ (γ_1)	0.321	0.192	0.129	0.109	0.055	0.019	0.036	0.018
Age_{it} (γ_2)	0.082	0.048	0.033	0.016	0.072	0.038	0.034	0.020
Age_{it} x $Export_{it}$ (γ_3)					0.037	0.030	0.006	0.016
LnL_{it} (β_1)	0.824	0.927	-0.103	0.047	0.839	0.934	-0.094	0.048
LnK_{it} (β_2)	0.040	0.054	-0.014	0.033	0.035	0.053	-0.018	0.033
Hausman's test	X^2 = 9.32, d.f. = 4, Prob. > X^2 = 0.054				X^2 = 10.13, d.f. = 5, Prob. > X^2 = 0.0716			

Notes:

Ho: The difference in coefficients is not systematic

b = Fixed-effects estimates are consistent under Ho and Ha

B = Random effects estimates are inconsistent under Ha, but efficient under Ho

The fixed-effects estimates are copied from Table 16.

Age at foreign market entry and new venture productivity
(Compare to Table 17)

Variables		(1)	(2)
		Cobb-Douglas	Cobb-Douglas
Average and initial TFP	$Early_{it}$ (γ_1)	0.2915**	-0.0004
		(0.1045)	(0.0743)
	$Late_{it}$ (γ_1)	0.0494	-0.0430
		(0.0848)	(0.0610)
TFP growth	Age_{it} (γ_3)	0.0550***	0.0475***
		(0.0135)	(0.0134)
	Age_{it} x $Early_{it}$ (γ_4)		0.0790**
			(0.0294)
	Age_{it} x $Late_{it}$ (γ_5)		0.0090
			(0.0096)
Inputs	LnL_{it} (β_1)	0.9219***	0.9208***
		(0.0426)	(0.0428)
	LnK_{it} (β_2)	0.0586*	0.0554*
		(0.0256)	(0.0242)
	Constant	0.0116	0.0619
		(0.1423)	(0.1435)
Observations		297	
Cases		79	
R^2:	Within	0.8080	0.8099
	Between	0.9384	0.9396
	Overall	0.8954	0.8963

Hausman's test

Coefficients	Column 1				Column 2			
	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.
$Early_{it}$ (γ_1)	0.745	0.292	0.453	0.329	-0.054	0.000	-0.054	0.026
$Late_{it}$ (γ_1)	0.251	0.049	0.202	0.098	-0.045	-0.043	-0.002	0.028
Age_{it} (γ_3)	0.087	0.055	0.032	0.016	0.077	0.048	0.029	0.020
$Age_{it}xEarly_{it}$ (γ_4)					0.116	0.079	0.037	0.038
$Age_{it}xLate_{it}$ (γ_5)					0.024	0.009	0.015	0.015
LnL_{it} (β_1)	0.815	0.922	-0.106	0.048	0.825	0.921	-0.096	0.048
LnK_{it} (β_2)	0.034	0.059	-0.024	0.033	0.024	0.055	-0.032	0.034
Hausman's test	X^2 = 16.17, d.f. = 5, Prob. > X^2 = 0.006				X^2 = 21.72, d.f. = 7, Prob. > X^2 = 0.003			

Notes:

Ho: The difference in coefficients is not systematic

b = Estimates are consistent under Ho and Ha

B = Estimates are inconsistent under Ha, but efficient under Ho

Fixed-effects estimates are copied from Table 17.

The effects of export-oriented entrepreneurship on economic growth
(Compare to Table 26)

	Model 1	**Model 2**	**Model 3**	**Model 4**
TEA_{it}		0.927*** (0.141)	0.839*** (0.137)	0.885*** (0.158)
$\%Export1\text{-}100_{it}$			0.048† (0.028)	
$\%Export1\text{-}25_{it}$				0.012 (0.035)
$\%Export26\text{-}75_{it}$				0.124* (0.061)
$\%Export76\text{-}100_{it}$				-0.007 (0.092)
$TEAdomestic_{it}$				
$TEAexport1\text{-}100_{it}$				
$TEAexport1\text{-}25_{it}$				
$TEAexport26\text{-}75_{it}$				
$TEAexport76\text{-}100_{it}$				
$LnGDPC_{it\text{-}1}$	-1.529 (1.535)	-1.099 (1.361)	-1.436 (1.407)	-1.852 (1.526)
ΔPop_{it}	0.691** (0.261)	0.134 (0.321)	0.033 (0.321)	0.027 (0.34)
$\Delta SkilledLabour_{it}$	0.140** (0.052)	0.134** (0.049)	0.117** (0.042)	0.090† (0.049)
$\Delta R\&Dstock_{it}$	-0.097 (0.085)	-0.089 (0.083)	-0.069 (0.082)	-0.052 (0.088)
Constant	15.953 (15.091)	6.525 (13.51)	8.729 (13.78)	12.595 (14.812)
Observations			89	
Cases			17	
R^2 : Within	0.3884	0.4751	0.4851	0.5047
R^2 : Between	0.1805	0.0619	0.0823	0.101
R^2 : Overall	0.1336	0.3443	0.3626	0.3791

The effects of export-oriented entrepreneurship on economic growth
(Compare to Table 26)

		Model 5	**Model 6**
TEA_{it}			
$\%Export1\text{-}100_{it}$			
$\%Export1\text{-}25_{it}$			
$\%Export26\text{-}75_{it}$			
$\%Export76\text{-}100_{it}$			
$TEAdomestic_{it}$		0.625* (0.285)	0.614* (0.283)
$TEAexport1\text{-}100_{it}$		1.272*** (0.331)	
$TEAexport1\text{-}25_{it}$			0.848† (0.478)
$TEAexport26\text{-}75_{it}$			2.571** (0.96)
$TEAexport76\text{-}100_{it}$			0.617 (1.153)
$LnGDPC_{it\text{-}1}$		-1.383 (1.443)	-1.788 (1.551)
ΔPop_{it}		0.053 (0.319)	0.013 (0.336)
$\Delta SkilledLabour_{it}$		0.129** (0.044)	0.102* (0.049)
$\Delta R\&Dstock_{it}$		-0.073 (0.083)	-0.052 (0.089)
Constant		9.729 (14.374)	13.546 (15.355)
Observations		89	
Cases		17	
R^2:	Within	0.4795	0.494
	Between	0.070	0.0963
	Overall	0.3561	0.3707

Hausman's test

Coefficients	Model 1				Model 2			
	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.
TEA_{it}					0.671	0.927	-0.256	.
$Ln(GDPC_{it-1})$	-30.177	-1.529	-28.648	5.064	-29.180	-1.099	-28.082	4.015
ΔPop_{it}	4.447	0.691	3.756	0.305	3.426	0.134	3.292	0.244
$\Delta SkilledLabour_{it}$	0.109	0.140	-0.031	.	0.099	0.134	-0.035	.
$\Delta R\&Dstock_{it}$	-0.361	-0.097	-0.263	0.102	-0.387	-0.089	-0.297	0.072
Hausman's test	$X^2 = 318.87$, d.f. = 4, Prob. > $X^2 = 0$				$X^2 = 476.52$, d.f. = 5, Prob. > $X^2 = 0$			

Coefficients	Model 3				Model 4			
	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.
TEA_{it}	0.583	0.839	-0.255	.	0.569	0.885	-0.316	.
$\%Export_{it}$	0.046	0.048	-0.002	.				
$\%Export1\text{-}25_{it}$					0.005	0.012	-0.007	.
$\%Export26\text{-}75_{it}$					0.079	0.124	-0.045	.
$\%Export76\text{-}100_{it}$					0.089	-0.007	0.095	.
$Ln(GDPC_{it-1})$	-31.253	-1.436	-29.817	3.929	-33.276	-1.852	-31.424	3.955
ΔPop_{it}	3.092	0.033	3.059	0.250	3.104	0.027	3.077	0.233
$\Delta SkilledLabour_{it}$	0.083	0.117	-0.034	.	0.073	0.090	-0.018	.
$\Delta R\&Dstock_{it}$	-0.400	-0.069	-0.331	0.065	-0.373	-0.052	-0.321	0.061
Hausman's test	$X^2 = 592.34$, d.f. = 6, Prob. > $X^2 = 0$				$X^2 = 599.01$, d.f. = 8, Prob. > $X^2 = 0$			

Coefficients	Model 5				Model 6			
	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.	Fixed-effects (b)	Random-effects (B)	(b-B)	S.E.
$TEAdomestic_{it}$	0.329	0.625	-0.295	.	0.341	0.614	-0.273	.
$TEAexport1\text{-}100_{it}$	1.067	1.272	-0.205	.				
$TEAexport1\text{-}25_{it}$					0.418	0.848	-0.431	.
$TEAexport26\text{-}75_{it}$					1.577	2.571	-0.995	.
$TEAexport76\text{-}100_{it}$					1.828	0.617	1.212	.
$Ln(GDPC_{it-1})$	-32.212	-1.383	-30.829	4.098	-34.086	-1.788	-32.299	4.064
ΔPop_{it}	3.074	0.053	3.021	0.265	3.093	0.013	3.080	0.252
$\Delta SkilledLabour_{it}$	0.092	0.129	-0.037	.	0.081	0.102	-0.021	.
$\Delta R\&Dstock_{it}$	-0.393	-0.073	-0.320	0.065	-0.361	-0.052	-0.309	0.062
Hausman's test	$X^2 = 572.74$, d.f. = 6, Prob. > $X^2 = 0$				$X^2 = 597.44$, d.f. = 8, Prob. > $X^2 = 0$			

Notes:
Ho: The difference in coefficients is not systematic
b = Fixed-effects estimates are consistent under Ho and Ha
B = Random effects estimates are inconsistent under Ha, but efficient under Ho
The fixed-effects estimates are copied from Table 26.

Appendix 4: Testing for systematic differences among groups of analysis within the sample used in the analysis of the outcomes of export-oriented entrepreneurship at firm-level

Group statistics of exporting and non-exporting new ventures

Group	Variables	Sample	n	Mean	Standard Deviation	Standard Error of mean
Sector	Manufacturing	Non-exporting	53	0.226	0.423	0.058
		Exporting	26	0.308	0.471	0.092
	Construction	Non-exporting	53	0.038	0.192	0.026
		Exporting	26	0.000	0.000	0.000
	Trade, hotels and transport	Non-exporting	53	0.113	0.320	0.044
		Exporting	26	0.154	0.368	0.072
	Banking, insurance and business services	Non-exporting	53	0.585	0.497	0.068
		Exporting	26	0.538	0.508	0.100
	Other services activities	Non-exporting	53	0.038	0.192	0.026
		Exporting	26	0.000	0.000	0.000
Techno-logical level	High technology, medium-high technology or knowledge intensive industry	Non-exporting	53	0.392	0.493	0.069
		Exporting	26	0.577	0.504	0.099
Size	Employment size at the inception	Non-exporting	53	4.245	3.553	0.488
		Exporting	26	5.058	5.890	1.155
	Employment size at the time of the survey	Non-exporting	53	7.774	8.494	1.167
		Exporting	26	13.404	23.202	4.550

Two-sample t-Test for equal means

Group	Variables	t	d.f.	Sig. Level (bilateral)	Means difference	S.E. of the difference	95% C.I. of the difference	
							Lower	Upper
Sector	Manufacturing	-0.774	77	0.441	-0.081	0.105	-0.290	0.128
	Construction	0.997	77	0.322	0.038	0.038	-0.038	0.113
	Trade, hotels and transport	-0.505	77	0.615	-0.041	0.081	-0.201	0.120
	Banking, insurance and business services	0.387	77	0.700	0.046	0.120	-0.192	0.285
	Other services activities	0.997	77	0.322	0.038	0.038	-0.038	0.113
Techno-logical level	High technology, medium-high technology or knowledge intensive industry	-1.544	77	0.127	-0.185	0.120	-0.423	0.054
Size	Employment size at the inception	-0.763	77	0.448	-0.812	1.065	-2.933	1.308
	Employment size at the time of the survey	-1.509	77	0.135	-5.502	3.645	-12.764	1.760

Notes: Equal variance assumed

Group statistics of early exporting and late exporting new ventures

Group	Variables	Sample	n	Mean	Standard Deviation	Standard Error of mean
Sector	Manufacturing	Late	11	0.455	0.522	0.157
		Early	15	0.200	0.414	0.107
	Construction	Late	11	0.000	0.000[a]	0.000
		Early	15	0.000	0.000[a]	0.000
	Trade, hotels and transport	Late	11	0.091	0.302	0.091
		Early	15	0.200	0.414	0.107
	Banking, insurance and business services	Late	11	0.455	0.522	0.157
		Early	15	0.600	0.507	0.131
	Other services activities	Late	11	0.000	0.000[a]	0.000
		Early	15	0.000	0.000[a]	0.000
Techno-logical level	High technology, medium-high technology or knowledge intensive industry	Late	11	0.546	0.522	0.157
		Early	15	0.600	0.507	0.131
Size	Employment size at the inception	Late	11	6.773	8.250	2.488
		Early	15	3.800	3.052	0.788
	Employment size at the time of the survey	Late	11	11.364	10.548	3.180
		Early	15	14.900	29.600	7.643

[a] t cannot be computed because the standard deviations of both groups are 0.

Two-sample t-Test for equal means

Group	**Variables**	**t**	**d.f.**	**Sig. level (bilateral)**	**Means difference**	**S.E. of the difference**	**95% C.I. of the difference**	
							Lower	**Upper**
Sector	Manufacturing	1.387	24	0.178	0.255	0.183	-0.124	0.633
	Trade, hotels and transport	-0.740	24	0.466	-0.109	0.147	-0.413	0.195
	Banking, insurance and business services	-0.714	24	0.482	-0.145	0.204	-0.566	0.275
Techno-logical level	High technology, medium-high technology or knowledge intensive industry	-0.268	24	0.791	-0.055	0.204	-0.475	0.366
Size	Employment size at the inception	1.288	24	0.210	2.973	2.308	-1.790	7.736
	Employment size at the time of the survey	-0.377	24	0.709	-3.536	9.372	-22.880	15.807

Notes: Equal variance assumed

Appendix 5: Testing for differences in entrepreneur's experience, entrepreneur's human capital, and inter-firm's collaboration within the sample used in the analysis of the outcomes of export-oriented entrepreneurship at firm-level

Group statistics of exporting and non-exporting new ventures

Group	Variables	Sample	N	Mean	Standard Deviation	Standard Error of mean
Entrepreneur's experience	Prior labour experience in current industry (Years)	Non-exporting	52	5.846	7.185	0.996
		Exporting	26	5.462	6.153	1.207
	Prior entrepreneurial experience (Start-ups)	Non-exporting	52	0.423	0.915	0.127
		Exporting	26	0.154	0.613	0.120
Entrepreneur's formal education	Non-college qualification	Non-exporting	53	0.302	0.463	0.064
		Exporting	26	0.269	0.452	0.089
	College degree	Non-exporting	53	0.377	0.489	0.067
		Exporting	26	0.192	0.402	0.079
	Master degree	Non-exporting	53	0.226	0.423	0.058
		Exporting	26	0.346	0.485	0.095
	Doctoral degree	Non-exporting	53	0.075	0.267	0.037
		Exporting	26	0.192	0.402	0.079
Inter-firm's collaboration	R&D collaboration with other firms	Non-exporting	53	0.453	0.503	0.069
		Exporting	26	0.538	0.508	0.100

Two-sample t-Test for equal means

Group	**Variables**	**t**	**d.f.**	**Sig. level (bilateral)**	**Means difference**	**S.E. of the difference**	**95% C.I. of the difference**	
							Lower	Lower
Entrepreneur's experience	Prior labour experience in current industry (Years)	0.233	76	0.816	0.385	1.648	-2.898	3.668
	Prior entrepreneurial experience (Nº start-ups)	1.354	76	0.180	0.269	0.199	-0.127	0.665
Entrepreneur's formal education	Non-college qualification	0.297	77	0.768	0.033	0.110	-0.187	0.252
	College degree	1.670	77	0.099	0.185	0.111	-0.036	0.406
	Master degree	-1.127	77	0.263	-0.120	0.106	-0.331	0.092
	Doctoral degree	-1.539	77	0.128	-0.117	0.076	-0.268	0.034
Inter-firm collaboration	R&D collaboration with other firms	-0.709	77	0.480	-0.086	0.121	-0.326	0.155

Notes: Equal variance assumed

Group statistics of early exporting and late exporting new ventures

Group	Variables	Sample	N	Mean	Standard Deviation	Standard Error of mean
Entrepreneur's experience	Prior labour experience in current industry (Years)	Late	11	5.273	5.658	1.706
		Early	15	5.600	6.685	1.726
	Prior entrepreneurial experience (Start-ups)	Late	11	0.000	0.000	0.000
		Early	15	0.267	0.799	0.206
Entrepreneur's formal education	Non-college qualification	Late	11	0.182	0.405	0.122
		Early	15	0.333	0.488	0.126
	College degree	Late	11	0.364	0.505	0.152
		Early	15	0.067	0.258	0.067
	Master degree	Late	11	0.273	0.467	0.141
		Early	15	0.400	0.507	0.131
	Doctoral degree	Late	11	0.182	0.405	0.122
		Early	15	0.200	0.414	0.107
Inter-firm collaboration	R&D collaboration with other firms	Late	11	0.545	0.522	0.157
		Early	15	0.533	0.516	0.133

Two-sample t-Test for equal means

Group	**Variables**	**t**	**d.f.**	**Sig. level (bilateral)**	**Means difference**	**S.E. of the difference**	**95% C.I. of the difference**	
							Lower	Lower
Entrepreneur's experience	Prior labour experience in current industry (Years)	-0.131	24	0.897	-0.327	2.492	-5.470	4.816
	Prior entrepreneurial experience (Nº start-ups)	-1.101	24	0.282	-0.267	0.242	-0.767	0.233
Entrepreneur's formal education	Non-college qualification	-0.839	24	0.410	-0.152	0.181	-0.524	0.221
	College degree	1.965	24	0.061	0.297	0.151	-0.015	0.609
	Master degree	-0.653	24	0.520	-0.127	0.195	-0.529	0.275
	Doctoral degree	-0.112	24	0.912	-0.018	0.163	-0.354	0.318
Inter-firm collaboration	R&D collaboration with other firms	0.059	24	0.954	0.012	0.206	-0.413	0.437

Notes: Equal variance assumed

Orkestra

BASQUE INSTITUTE
OF COMPETITIVENESS
DEUSTO FOUNDATION

SEDE SAN SEBASTIÁN
Edificio Instituto Vasco de Competitividad
Campus Universidad de Deusto
Mundaiz 50
20012 Donostia-San Sebastián

SEDE BILBAO
Edificio La Comercial, 2ªplanta
Hermanos Aguirre 2
48014 Bilbao

e-mail: secretaria@orkestra.deusto.es

www.orkestra.deusto.es