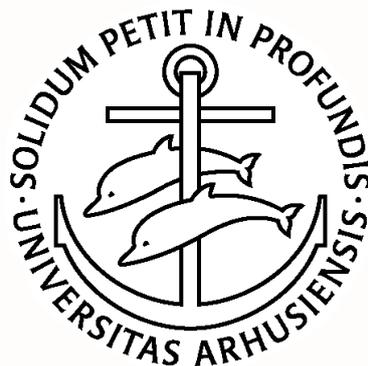


# **Essays on sources of export market knowledge and firms' export behavior**

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## ENGLISH SUMMARY

What are the drivers behind firms' internationalization and success in international markets? Why are some firms involved in international trade while others only focus on the domestic market? These questions are on the political and economic agenda of most, if not all, nations and are at the origin of the *Made in Denmark, anno 2050* project in which this dissertation is embedded. The aim of this project was to combine insights from the International Business and International Trade literatures to provide novel answers to these crucial questions. Moreover, the project aimed at providing insights as to how we can ensure that Denmark remains an active part of the international scene in the light of the rapid globalization of emerging economies. In line with this, the present dissertation is driven by an interest in knowing more about firms' internationalization process and the drivers behind their behavior in export markets. The research included here is particularly concerned with the role of knowledge in this process and is thereby greatly embedded in the behavioral approach to firms' internationalization.

The overarching theme across the four papers included in this anthology revolves around the notion of knowledge acquisition, and particularly around firms' responses to diverse knowledge sources in the context of their internationalization through exports. The dissertation attempts at providing pieces of answer to the following overall research question:

***What are the sources of knowledge firms base their export-related decisions on and how do these sources affect their export behavior?***

Despite a widening of the spectrum of international knowledge sources recognized in the International Business literature, some sources have been greatly overlooked in previous research.

This dissertation attempts to contribute to this academic discussion by focusing on some of the voids found in this literature with respect to the sources of knowledge firms may capitalize on when internationalizing, namely: through grafting export experienced managers to their management team; through the presence of other exporting firms; and finally from their own international experience as importer. Selection with regards to which export behavior to investigate was made based on literature reviews conducted on each of the chosen knowledge sources, but also on the rationale behind how each source of knowledge might possibly affect firms' behavior in international markets.

In light of these choices, this dissertation is first concerned with the effect of hiring managers with export experience on firms' export initiation and market selection. Results show that firms that are recruiting export experienced managers have a higher probability of subsequently initiating export activities. Moreover, these firms tend to enter the same market(s) in which the newly recruited managers have gained their export experience. This supports the idea that grafting is a source of market knowledge and that such knowledge is relevant in the context of first internationalization activity(ies). In the same line of thought, the second paper is also concerned with the effect of hiring managers with export experience, but focuses on already exporting firms. The paper particularly assesses whether grafting export experienced managers affects firms' export growth. Evidence that the [positive] effect of grafting such individuals to the managerial team is entirely dependent on the breadth of the recruiting firms' export experience, measured in terms of number of markets it is exporting to at the moment of hiring. Thereby, the results of this paper re-enforce the importance of firms' prior experience in international markets.

The third paper looks at export spillovers, i.e. at the effect of the presence of other exporting firms, and how they influence firms' decision to enter specific export markets. Here, evidence of destination-specific export spillovers are provided, as the presence of other firms exporting to a

specific market positively influences the decision of non-exporting firms to enter that same export market. This paper moreover disentangles the channels through which these spillovers may occur and show the relevance of inter-firm labor mobility, intra-industry linkages as well as backward linkages in explaining these spillovers.

Finally, the fourth paper builds on the relatively scant literature stream focusing on inward-outward linkages in the context of firms' internationalization and focuses on the effect of a firm's international experience as importer on its chance of survival in individual export markets. Here the results show a negative effect of prior import experience from a particular market on a firm's chance of survival as exporter in the same market. This finding might be explained from a sunk costs and real option perspective; the higher the fixed costs associated with export market entry, the longer will a firm be willing to wait before exiting an export market when facing a change in market conditions. In that sense firms facing smaller fixed export entry costs are expected to react more rapidly to change in export market conditions. This finding however holds only for exports to developed countries. The probability of export survival to least-developed countries appears to be higher for firms with prior market-specific import experience. This provides support to the thesis that prior import experience leads to a certain learning effect which is translated into a higher chance of export survival. In contrast, ongoing importing activities increase firms' chance of survival in export markets, as expected from the literature documenting the efficiency enhancing effect of international sourcing.

Overall, this dissertation fulfils the aim of the *Made in Denmark* project by shedding light on factors affecting Danish firms' participation into export markets as well as on factors affecting their export growth and survival prospects. By the same token, the findings presented in this dissertation are relevant for governmental decision-makers in charge of developing initiatives supporting the internationalization of Danish firms.

## DANSK RESUMÉ

Hvordan forklares virksomheders internationalisering og succes på de internationale markeder? Hvorfor er nogle virksomheder involveret i international handel, mens andre kun fokuserer på hjemmemarkedet? Disse spørgsmål er på den politiske og økonomiske dagsorden for de fleste, hvis ikke alle, lande og er i fokus i projektet ”*Made in Denmark, anno 2050*”, som denne afhandling er en del af. Formålet med dette projekt er at kombinere indsigt fra forskningslitteraturen inden for International Business og International Trade, for at kunne give nye svar på disse vigtige spørgsmål. Derudover er det projektets ambition at opnå indsigt i hvordan det sikres, at Danmark fortsat er en aktiv del af den internationale scene, set i lyset af den hastige globalisering af de nye vækstøkonomier. I tråd med dette udspringer denne afhandling i en interesse i at vide mere om virksomheders internationaliseringsproces og drivkræfterne bag deres adfærd på eksportmarkederne. Afhandlingen fokuserer især på den rolle viden har i denne proces og er dermed i høj grad inspireret af den adfærdsmæssige tilgang (behavioral approach) til virksomheders internationalisering.

Det overordnede tema på tværs af de fire artikler, som indgår i denne antologi, er videntilførsel, og særligt hvordan virksomheder drager fordel af forskellige videnkilder i forbindelse med deres internationalisering gennem eksport. Afhandlingen forsøger at give svar på følgende overordnede forskningsspørgsmål:

*Hvilke videnkilder baserer virksomheder deres eksport-relaterede beslutninger på og hvordan påvirker disse kilder deres eksportadfærd?*

På trods af at litteraturen inden for International Business over tid har accepteret et bredt spektrum af videnkilder, som er relevante for virksomheders internationalisering, er nogle kilder overset i den eksisterende forskning. Denne afhandling forsøger at bidrage til den akademiske diskussion ved at fokusere på nogle af de huller, der findes i litteraturen, med hensyn til de videnkilder virksomheder kan udnytte, når de gennemgår en internationaliseringsproces, nemlig: (1) ved at ansætte ledere med eksporterfaring (*grafting*), (2) gennem tilstedeværelsen af andre eksporterende virksomheder, og endelig (3) via deres egen internationale erfaring som importør. Valget af hvilken eksportadfærd der undersøges er truffet ud fra litteraturgennemgange foretaget inden for hver af de udvalgte videnkilder, men også på baggrund af rationale for hvordan hver videnkilde påvirker virksomhedernes adfærd på eksportmarkeder.

Som følge af dette, fokuserer denne afhandling indledningsvis på effekten af at ansætte ledere med eksporterfaring på virksomheders initiering af eksport og udvælgelse af marked. Resultaterne viser, at virksomheder, der rekrutterer ledere med eksporterfaring har en højere sandsynlighed for efterfølgende at indlede eksport. Desuden har disse virksomheder også en tendens til at påbegynde eksport til de samme markeder, hvorfra de nyansatte ledere fik deres eksporterfaring. Resultaterne støtter tesen om at *grafting* er en kilde til viden om internationale markeder, og at denne viden er relevant i forbindelse med virksomheders første internationaliseringsaktiviteter.

I forlængelse heraf fokuserer den anden artikel på effekten af ansættelse af ledere med eksporterfaring for allerede eksporterende virksomheder. Artiklen undersøger hvorvidt *grafting* af ledere med eksporterfaring har indflydelse på virksomheders vækst på eksportmarkeder. Bevis for denne [positive] effekt af grafting af ledere med eksporterfaring afhænger af omfanget af de rekrutterende virksomheders eksporterfaring, målt på antallet af markeder de eksporterer til, på ansættelsestidspunktet for den nye leder.

Den tredje artikel omhandler eksport”spillovers”, dvs. effekten af tilstedeværelsen af andre eksporterende virksomheder i geografisk nærhed, og hvordan disse påvirker virksomheders beslutning om opstart af eksport til specifikke eksportmarkeder. Resultaterne viser, at der er tegn på destinations-specifikke eksport*spillovers*, da tilstedeværelsen af andre virksomheder der eksporterer til et specifikt marked influerer positivt på ikke-eksporterende virksomheders beslutning om at eksportere til det samme eksportmarked. Denne artikel undersøger desuden de kanaler, hvorigennem disse spillovers forekommer, og viser relevansen af arbejdskraftens mobilitet mellem virksomheder, *intra-industry linkages* samt *backward linkages* i at forklare disse spillovers.

Den fjerde og sidste artikel bygger på den forholdsvis sparsomme litteratur om *inward-outward linkages* i forbindelse med virksomheders internationalisering. Artiklen fokuserer på effekten af virksomheders internationale erfaring som importør, på deres chance for at overleve på de eksportmarkeder de er aktive på. Her viser resultaterne, at importerfaring før begyndelse af eksport, har en negativ effekt på sandsynligheden for overlevelse som eksportør. Dette resultat kan formentlig forklares med, at importerfaring forud for opstart af eksport til det samme marked reducerer de ”sunk costs”, der er, ved at begynde at eksportere til det pågældende marked, hvilket gør virksomhederne mere ”uforsigtige”. Effekten varierer dog over de forskellige land en virksomhed eksporterer til.

Samlet set opfylder denne afhandling formålet med Made in Danmark projektet ved at belyse hvordan forskellige videnkilder påvirker danske virksomheders deltagelse på eksportmarkeder samt hvordan de påvirker deres eksportvækst og overlevelsesmuligheder på eksportmarkederne. Af samme grund er resultaterne præsenteret i denne afhandling relevante for de politiske beslutningstagere, der har ansvaret for at udvikle initiativer, der støtter internationalisering af danske virksomheder.

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# **CHAPTER 1: Introduction**

The main purpose of this introductory chapter is to guide the reader through the different articles composing the core of this anthology. It does so by first presenting the larger research project in which this dissertation is embedded and introducing the motivation behind the specific research conducted within the frame of this dissertation. The overall and specific research questions are then formulated. The research design employed in this dissertation is thereafter presented, reviewing the overall empirical approach and introducing the main data sets used. Finally, a summary of the four papers included in this anthology is presented as well as the overall contributions of this dissertation.

## **1. PROJECT BACKGROUND**

This dissertation has been developed and written on the background of the larger, interdisciplinary research project “*Made in Denmark – Anno 2050, The Role of Firms in Globalization*” financed by the Tuborg Foundation. The essence of this project is to enhance our understanding of the drivers of internationalization of Danish firms and, as expressed in the title, the role of firms in international trade. In so doing, the project aims at providing insights as to how we can ensure that Denmark remains an active part of the international scene in light of the uprising presence and importance of developing and emerging economies in globalization.

From a theoretical angle, the *Made in Denmark – Anno 2050* project aims at bridging two streams of literature, namely International Business (IB) and International Economics (IE), which research foci to some extent overlap but have until recently rarely been inspired by one another. Since the

past few years though, this trend seems to be reversing in part due to the growing availability of detailed micro-data allowing IE scholars to shift their focus from a more macro approach of international trade toward firm-level theoretical models and empirical applications. The availability of such data sets also creates numerous opportunities for testing IB theories which have been developed based on case studies or cross-sectional studies on larger, longitudinal samples. Access to such data thereby allows for more dynamic and large-scale quantitative assessments of firms' internationalization process. As the level of analysis of the two streams of literature is converging (toward firm-level), it becomes obvious that combining theoretical insights from both disciplines creates endless avenues for future research within the field.

This dissertation rests on assumptions about knowledge and learning inspired by the behavioral view of the firm (Cyert, 1963; March & Simon, 1958) and developed in the literature on firms' internationalization (Johanson & Vahlne, 1977). Hypotheses regarding knowledge acquisition and more specifically diverse sources of knowledge are tested in light of their effect on firms' export behavior by using a set of data and methods that have so far been more frequently used in International Economics. Moreover, this dissertation builds on notions and evidence from the international trade literature, primarily from the literature on trade with heterogeneous firms (Melitz, 2003) which are combined with the notions of knowledge and learning used in the international business literature to provide new insights. Hence, this dissertation responds to one of the aims of the *Made in Denmark* project by bridging both literatures in terms of theories and constructs. Furthermore, it does so by using data and applying methods inspired from the IE discipline to answer IB unresolved questions about the relevance of different knowledge sources in the context of firms' internationalization.

Empirically, the project is grounded in a vast selection of registers available thanks to a restricted access to Statistics Denmark databanks. More particularly, this dissertation exploits individual-level

registers, employer-employee linked data, firm-level registers, and finally foreign trade registers providing information on firms' exporting and importing activities, both at the firm- and destination-levels. Similar types of data have been previously employed in IE literature (Koenig, 2009; Koenig, Mayneris, & Poncet, 2010; Munch & Skaksen, 2008), in Labor Economics (Frederiksen, Halliday, & Koch, 2010; Frederiksen & Kato, 2011; Smith, Smith, & Verner, 2011), and in Entrepreneurship research (Dahl & Sorenson, 2012), to name but a few, but has been rarely used in the IB research. This is despite the fact that longitudinal, quantitative research design has repeatedly been called for in the International Business literature, as it allows moving closer to the identification of causal relationships and adopting a dynamic view of certain aspects of firms' internationalization. As such, the data material used in this dissertation makes it possible to address some of these voids, as it will be presented in further details later on.

## **2. THE MOTIVATION BEHIND THE PRESENT PHD PROJECT**

Since the seminal work of Johanson and Vahlne (1977), IB scholars have emphasized the uncertain nature of international activities and firms' lack of knowledge about international markets as important impediments to the furthering of their internationalization process. According to this stream of research, dissimilarities between home and foreign markets, resulting in knowledge disadvantage for foreign entrants (liability of foreignness (Zaheer, 1995)) and uncertainty, impair firms' assessment of international opportunities and costs and consequently their internationalization (Johanson & Vahlne, 1977). Because of this, scholars active in this stream of research view firms' internationalization as an incremental learning process and particularly emphasize the role played by market knowledge in this process. This approach to internationalization builds on Penrose's work (1966) and accordingly acknowledges both objective and experiential knowledge while stressing the relatively higher importance of experiential

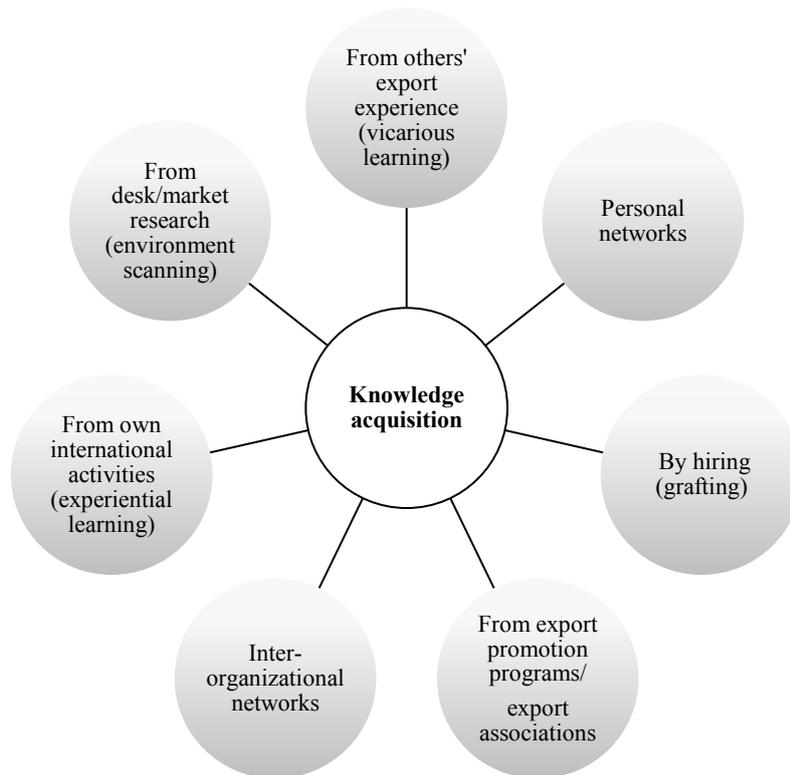
knowledge in firms' internationalization process. As such, firms' prior experience in international markets, as a way to acquire experiential market knowledge, is considered a crucial factor explaining firms' decisions to further invest in a specific market and/or expand to new international markets and constitute the core assumption behind the Uppsala internationalization process model (Johanson & Vahlne, 1977).

The idea behind this dissertation was inspired from Forsgren's (2002) critique of the research embedded in this stream of literature. The central element of his critical review resides in the somewhat restrictive view adopted by scholars in this sub-field of international business with regards to how firms may acquire knowledge and learn about international markets. Particularly, the focus on experiential knowledge and the lack of attention to other learning pillars acknowledged in the organizational learning literature are stressed as important issues to consider in future research focusing on the internationalization of firms (Forsgren, 2002).

The research that has been done on the premises of Johanson and Vahlne's (1977) model can therefore be seen as somewhat limiting when it comes to alternative ways in which firms may acquire knowledge relevant to their internationalization. The objective of this dissertation is to address this by devoting attention to some of these "alternative" ways of acquiring knowledge and how they impact firms' internationalization through exports. The latter is not the same as saying that I share the view that their original model is erroneous, on the contrary. Their contribution has been extremely influential in the field of firms' internationalization and like in any model theirs represents a simplified view of reality and focuses on a specific aspect of it. The idea of this dissertation is to investigate in more depth alternative knowledge sources which have been to some extent left aside in the literature, and not to refute previous work. In fact, Johanson and Vahlne already acknowledged in their original model other ways in which firms may acquire the knowledge relevant to further their internationalization, for instance through the previous experience of

decision-makers or external persons (Johanson & Vahlne, 1977). They, however, argue that firms' experiential knowledge in international markets is hardly substitutable with experiential knowledge gained by others outside the context of the firm. Therefore, they focus on firms' prior experience in international markets as the main drivers of their internationalization process (Ibid).

To be fair, one needs to acknowledge that the field of research linking knowledge to internationalization has developed over the years, resulting in a wider spectrum of knowledge sources recognized as relevant for firms' internationalization. Recently, Fletcher and Harris (2012) have investigated the sources and content of knowledge relevant for the internationalization of [smaller] firms and by doing so provided a good overview of the different sources of knowledge previously looked at in the academic discussion. In their study, they identify several internal and external sources which they categorize according to the type of knowledge they are likely to transmit, whether it is experiential or objective knowledge. Building on their work, Figure 1 depicts the different knowledge sources investigated in the IB literature. Naturally, when reviewing the literature, experiential knowledge coming from firms' own activities in international markets appears as an important source of knowledge. Some scholars have suggested that experiential knowledge about specific international markets is not only developed through outward internationalization activities, such as export and FDI, but also through inward activities. Research focusing on inward-outward linkages in firms' internationalization process have documented that firms use the knowledge and contacts developed while importing from a country when they, later on, decide to export to that same country (Welch & Luostarinen, 1993; Di Gregorio, Musteen, & Thomas, 2009).



**Figure 1: Sources of knowledge about export markets**

Moreover, indirect experience (external experiential knowledge) also appears to be an important source of knowledge used by firms when internationalizing (Aitken, Hanson, & Harrison, 1997; Fletcher & Harris, 2012; Leonidou & Theodosiou, 2004). In other words, there is evidence that firms are able to capitalize on the international experience of others. One way in which firms may learn from others' experience in international markets is through their networks, whether they are professional or personal networks (Andersen, 2006). Johanson and Vahlne themselves have revised their original Uppsala model in light of newer evidence where firms tap into the resources available from their network when internationalizing, their partners' knowledge being one of them (Johanson & Vahlne, 2009). Evidence on this source of knowledge facilitating firms' internationalization, for instance through reducing the liability of foreign entrants by being part of a network from the beginning and having access to "insiders' knowledge" about the specific market, has been provided in previous studies (Athanassiou & Nigh, 2002). Other ways for firms to learn from the experience

of others is by grafting external knowledge to their organization, either through hiring experienced employees (Loane, Bell, & McNaughton, 2007) or acquiring knowledgeable organizations.

Alternatively, firms may acquire knowledge about international markets via export promotion programs and trade fairs. Recent evidence shows that membership in export associations is linked with higher propensity to export and higher export sales (Hiller, 2012), suggesting that firms indeed gain knowledge about international markets through these associations. Firms may moreover acquire export market [objective] knowledge via desk/market research, which may be conducted internally or be provided by external sources (Fletcher & Harris, 2012; Leonidou & Theodosiou, 2004; Reid, 1984; Souchon & Diamantopoulos, 1999).

As expressed in previous research, all these sources of knowledge are not mutually exclusive; one source may open the door to several others (Andersen, 2006; Souchon & Diamantopoulos, 1999). For instance, going to trade fairs may be a way for firms to gain objective knowledge about a prospective export market while inter-organizational [experiential] knowledge exchange may also find place.

Despite the widening of the spectrum of knowledge sources recognized in the IB literature, some sources have been greatly overlooked, paving the way for further research in this field (Fletcher & Harris, 2012). This is the overall discussion that this dissertation attempts to contribute to, by combining both insights from the IB and IE literature and exploiting a rich set of firm-level, longitudinal data that is particularly suited to investigate some of these knowledge sources.

### **3. RESEARCH QUESTIONS**

The previous section hopefully succeeded in clarifying that the overarching theme and common denominator between the four papers included in this dissertation revolve around the notion of

knowledge acquisition, and particularly around firms' responses to diverse knowledge or information transmission channels. The chosen format of this dissertation, an anthology, implies that the different articles do not necessarily build up on each other, but rather provide a contribution on their own. Yet, all papers fit under the umbrella of knowledge acquisition in the context of firms' internationalization through exports. The overall research question of the dissertation is formulated as follows:

***What are the sources of knowledge firms base their export-related decisions on and how do these sources affect their export behavior?***

To help answer this question, choices with regard to which sources of knowledge to focus on were made based on the voids found in the IB literature with respect to alternatives knowledge sources that firms may capitalize on when internationalizing. The path employed in this PhD project may slightly differ from the usual path in management research where one begins by identifying a gap in the literature, formulates a research agenda, and thereafter collects and analyzes the data and conclude. This project was slightly different in the sense that the project was from the start connected to this rich data about firms' exporting and importing activities, financial information, as well as employee data. The last three years have therefore been more of an iterative process where knowledge about the literature and about the data evolved jointly to formulate the focus of the research agenda and ultimately of the different papers included here. As a result, the core of this dissertation is concerned with the following three sources of knowledge: (1) from hiring export experienced managers; (2) from others' experience in export markets; and (3) from firms' own experience in international markets, though not as exporters but importers. Selection with regard to which internationalization behavior to investigate was made based on literature reviews conducted on each of the chosen source of knowledge, but also on the rationale behind how each sources of

knowledge may possibly affect firms' behavior in export markets. In light of these choices, the following working questions were developed, each forming the basis of a paper in the dissertation:

- 1) **Can firms buy their way into becoming exporters by hiring managers with export experience, and which consequences does the previous export experience of newly hired managers have on the selection of export market(s) at the moment of initiating export activities?**
- 2) **Does hiring managers with export experience from previous employment affect the rate at which firms' exports are growing, and how does the recruiting firm's prior export experience influence this relationship?**
- 3) **Do firms learn from the presence of other exporting firms in their surroundings, and if so, which mechanisms are at play?**
- 4) **Does firms' import experience affect their chance of survival in export markets?**

It is worth highlighting that while most papers contain arguments in support of a certain learning effect from being exposed to these sources of knowledge, there may be other explanations than learning supporting the hypothesized relationships. Theoretical argumentation of the mechanisms behind each relationship is provided in the respective papers and therefore will not be repeated in this section. The point here is rather to stress that though this dissertation is inspired by the organizational learning literature and is concerned with knowledge sources, learning may not be the only mechanism at play.

#### **4. RESEARCH DESIGN**

As expressed earlier, the path leading to this dissertation may be seen as unconventional in the way that access to the data was granted from the beginning of the PhD project. While the research questions underlying this dissertation were informed by some voids in the literature, they were also

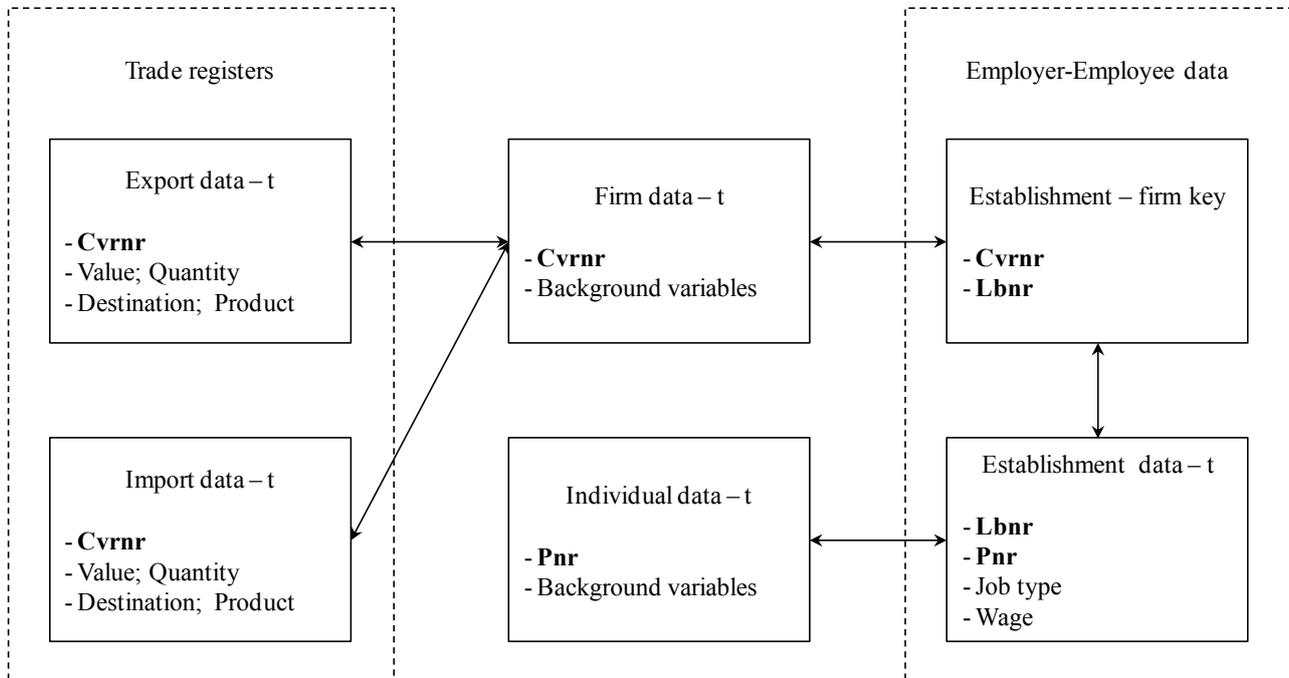
formulated in combination with these data. Moreover, the choice of research design was to some extent provided by the premise of the *Made in Denmark* project which is to bridge the IB and IE research also in terms of data and methods. Consequently, part of the contribution of this dissertation is embedded in the adopted quantitative research design based on longitudinal, registered data. Access to such data was crucial for all of the papers included here, as it allowed for adopting a more dynamic view on (1) some sources of knowledge, particularly grafting and (2) the different export behaviors examined.

The findings presented in this dissertation are the fruits of empirical exercises on the relevance of alternative sources of export knowledge in explaining firms' behavior in export markets. In other words, the original idea was to test whether and in which ways other acknowledged sources of knowledge (recognized in other research fields and to a much more limited extent in IB and IE literature) influence diverse dimensions of a firm internationalization. As such, the internal processes at play once a firm is exposed to knowledge about international markets, for instance organizational learning, are not the focus of this dissertation. Their presence and nature are rather inferred from theory and previous empirical evidence. Looking at these internal processes would however expand our understanding of how these sources of knowledge affect firms' behavior in export markets. Accordingly, conducting in depth qualitative studies of these processes would appear as natural extensions of the research presented in this dissertation.

#### **4.1. Data**

The existence of the *Made in Denmark* project is grounded in several Danish registers made available by Statistics Denmark via a restricted access. This dissertation particularly uses individual-level registers, employer-employee linked data, firm-level registers, and foreign trade registers. Figure 2 below presents an overview of the information contained in the different data sets

and how they have been linked with each other to create the unique data used in this dissertation (the linking variables are in bold).



**Figure 2: Structure of the different data sets, in year  $t$**

The primary source of data used in this dissertation comes from foreign trade registers which are available on a yearly basis and provide information about importing and exporting figures at the firm-destination- and firm-destination-product-level. Such disaggregated data allows researchers to uncover counter-effects of covariates across destinations or product groups and to account for destination-specific attributes which could not be controlled for in previous firm-level research. This dissertation focuses on firm-level (aggregated from firm-destination export and import figures) and firm-destination-level trade figures, depending on the topic of the paper. For instance, firm-level export data is used in the first and second paper focusing on the effect of hiring managers with export experience on a firm’s probability of subsequently initiating export activities and its rate of export growth. Yet, in paper one, firm-destination-level export data is also used to assess whether firms enter markets in which the newly hired managers got their export experience. Firm-

destination-level trade figures are also exploited in papers three and four when investigating the destination-specific nature of export spillovers and inward-outward linkages.

The foreign trade registers have been combined with firm-level registers thanks to a unique firm identifier (cvnr), resulting in a firm-level, longitudinal data set where firms' financial information and other characteristics (background variables) can be analyzed in relation to firms' yearly import and export figures (at the diverse levels presented above). Moreover, this information can be coupled to a linked employer-employee database which is constructed by combining establishment level data providing a list of all employees in a specific establishment in a specific year with a key linking establishment and firm identifiers. The establishment-level data set provides information on the entire working population and presents yearly, individual-level information on workplace. Hence, one knows who is working in which firm in which year. This data set can in turn be linked to individual-level data, as all individuals are also attributed a unique identifier (pnr), thereby providing information on a firm's labor force composition in terms of nationality, age, gender, education level, job position and other characteristics.

Combining all these data sources results in a unique data set containing information on firms' background information, export and import activities (in terms of values and quantities, across destinations and products), and labor force characteristics. One of the distinctive features of this database resides in the fact that it allows for investigating the effect of a change in the composition of a firm's labor force on firms' export behavior. This unique feature is exploited in the first and second papers focusing on the effect of grafting, as well as in the paper on export spillovers.

The sample size for each paper varies depending on the number of observations for which all the variables included in the econometric models are available, and so does the period covered by the analysis. It goes without saying that each paper presents detailed information on the creation of the

sample and the period covered. Nevertheless, an overview of the whole firm-level data set is presented in Table 1 below, to provide readers who are unfamiliar with this kind of data or these data in particular with an idea of the data material this dissertation is based on.

The baseline, firm-level data set covers the period from 1995 to 2006 and contains information on 17,630 firms, out of which 57% are micro firms (less than 10 employees), 41% are SMEs (between 10 and 250 employees), and the remaining 2% are large firms (250 employees and more)<sup>1</sup>. The data set is unbalanced, meaning that some firms enter the data set later in the period and some exit before 2006. The patterns of entry and exit are exhibited in Table 1. In terms of industrial coverage, the baseline data set contains information on manufacturing firms only, as the trade data used refers to export and imports of goods and not services. This dissertation is concerned with all manufacturing firms since focusing on one particular industry might have resulted in too few observations to be able to properly assess the impacts of the diverse sources of knowledge on firms' export behavior. Systematic differences in export behavior across industries are rather controlled for by including industry dummies indicating which industry a firm is active.

Around 39% of the sampled firms are exporting at some point or another during the period observed, corresponding to around 40% of the observations. Around 23% of the micro firms are exporting at some point in time over the period, while 60% of SMEs and 92% of large firms are. The increasing share of exporting firms across each group of different firm size as well as the higher productivity for the group of exporting firms are in line with the international trade literature and descriptive statistics which show that exporting firms tend to be larger and more productive than non-exporting firms (Bernard & Jensen, 1999).

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<sup>1</sup> Firms are categorized into size group according to their average number of employees over the period.

**Table 1: Descriptive overview of the baseline, firm-level data set**

Years	No. of observations			Dynamics		Firm characteristics			
	All	Exporting	Non-exporting	Entry	Exit	Size		Labor Productivity	
						Exporting	Non-exporting	Exporting	Non-exporting
<b>1995</b>	8 477	3 373	5 104	.	.	77	19	432 338	372 668
<b>1996</b>	9 247	3 375	5 872	1 922	1 152	76	17	528 240	341 054
<b>1997</b>	9 026	3 184	5 842	916	1 295	89	15	519 186	366 461
<b>1998</b>	8 814	3 197	5 617	725	1 032	88	15	484 601	366 703
<b>1999</b>	8 696	3 150	5 546	827	1 131	85	13	496 520	365 497
<b>2000</b>	7 331	3 021	4 310	941	2 447	92	14	386 331	358 301
<b>2001</b>	7 075	2 895	4 180	664	1 256	93	15	398 855	367 508
<b>2002</b>	6 768	2 927	3 841	656	1 295	89	14	425 975	384 851
<b>2003</b>	6 538	2 914	3 624	599	1 156	88	13	437 109	387 349
<b>2004</b>	6 520	2 819	3 701	596	1 014	86	13	461 266	399 348
<b>2005</b>	6 486	2 662	3 824	676	1 153	88	12	457 136	387 233
<b>2006</b>	6 380	2 663	3 717	631	1 074	87	13	470 075	411 079

## 5. ARTICLE OVERVIEW

This section presents a synopsis of the four papers included in this dissertation, the motivation behind each of them, and how some of the papers relate to each other. It is divided into three sections corresponding to the three sources of knowledge investigated in this dissertation. A summary table is included at the end of this section (Table 2), so that the reader can have a rapid overview of the core elements of each paper.

### 5.1. Acquiring Export Knowledge through Grafting

The first two papers of this dissertation investigate the notion of grafting, i.e. when firms get access to new information by internalizing its source (Huber, 1991), in the context of internationalization through exports. In that respect, paper one and paper two relate to each other as they focus on the same phenomenon. However, they differ in terms of the particular context in which each analysis is conducted; paper one focuses on non-exporting firms that hire managers with export experience and paper two focuses on firms that are already involved in exporting activities at the moment of hiring such managers. The idea behind separating the analysis of grafting into two separate papers is to first address the issue that the effect may differ according to the level of export experience firms possess at the moment of hiring and second to have sufficient space to conduct an in-depth investigation of each case. Yet, the core argumentation linking the event of hiring managers with export knowledge and subsequent change in behavior toward more international activities is very similar in both papers and departs from the behavioral approach to export initiation and further internationalization (Johanson & Vahlne, 1977) as well as the literature focusing on the of top management teams and their internationalization (Hambrick & Mason, 1984; Nielsen, 2010; Reuber & Fischer, 1997). These two papers rest on the assumption that human beings are faced with bounded rationality, meaning that decisions are made on the basis of a restricted set of information

and of individuals' limited cognitive base (Cyert, 1963; March & Simon, 1958), as opposed to the pure rationality assumption implying that decisions are taken on the full set of information.

In paper 1 (jointly written with Poul Houman Andersen), we investigate the relationship between grafting export experience, export initiation and market selection. On the one hand, we find that firms hiring managers with previous export experience have a higher probability of initiating export activities in the subsequent year. We find, though, that only smaller firms benefit from grafting experiential knowledge to the management team and that grafting is subject to a window of opportunity after which it has no effect on firms' internationalization decisions. On the other hand, we find a connection between the market(s) in which a manager has gained his or her export experience and the market(s) the hiring firm enters, which confirms that grafting is a source of market knowledge and that such knowledge is relevant in the context of the first internationalization activity(ies).

Paper 2 (single-authored) focuses on the effect of hiring managers with export experience on firms' export growth. Additionally, this paper investigates the moderating effect of the recruiting firm's level of export experience at the moment of hiring on the relationship between grafting export experienced managers and firms' export growth. In that respect, the literature on absorptive capacity (Cohen & Levinthal, 1990) and the one on organizations' inability to learn (Weick, 1991) offer insights as to how different aspects of export experience, here measured in terms of depth (number of years as exporter) and breadth (scope of exporting activities), may play a role in the identification of an effect of grafting. The results indeed show that the effect of grafting on export growth depends on the scope of a firm's export portfolio, measured in terms of number of markets a firm is exporting to. The effect of hiring managers with export experience increases with a firm's number of export destinations, which is in line with the absorptive capacity argument. Conversely,

the depth of the recruiting firms' export experience, measured by the number of years a firm has been exporting, does not play a role in this context.

Overall, these two papers confirm an original concern regarding the ease of accumulating organizational knowledge by grafting managerial capabilities, as the findings show that either the effect is only experienced by a particular type of firms or that other conditions need to be in place for firms to benefit from hiring managers with export knowledge. Yet, grafting appears to be a significant source of knowledge in the context of firms' internationalization through exports, both in the first stage and later on. The novelty of these papers comes from looking at the change in the composition of the management team (in terms of export experience) and linking it to a change in export behavior. Previous research has not been able to properly tackle the issue of grafting as the relationship between managers' international experience and firms' international behavior has been looked at in a static way.

## **5.2. Capitalizing on Others' Export Experience**

The second theme investigated in this PhD project is concerned with the idea that firms may learn from the export experience that other firms have gained, also called vicarious learning (Huber, 1991). In particular, paper 3 (jointly written with Philipp Meinen) focuses on export spillovers, which refers to the effect of the presence of other exporting firms in a firm's surroundings (Aitken, et al., 1997; Koenig, 2009), a phenomenon that has mainly had the interest of economic scholars. For that reason, the paper adopts an economic view of firms' decision to enter specific export markets and particularly departs from the theory of trade and heterogeneous firms (Melitz, 2003).

This stream of literature originates from the stylized fact that exporting firms and firms involved in other international activities are more productive than firms selling in their domestic market only (Bernard & Jensen, 1999). This difference between exporting and non-exporting firms has led

scholars to develop theoretical models explaining the self-selection of more productive firms into exporting on the basis of their productivity (Melitz, 2003). Indeed, differences across markets require firms to gather information prior to their entry in international markets, resulting in sunk costs which more productive firms may find easier to bear compared to less productive ones. In light of this, export spillovers are in this paper hypothesized as an alternative or complementary way to reduce these sunk costs of exporting, thereby possibly leading to export market entry (Aitken, et al., 1997; Koenig, 2009; Koenig, et al., 2010). This paper thereby distances itself from the other three in terms of theoretical underpinning, though it contains elements of both IB and management literatures, especially when providing the rationale for the mechanisms through which export spillovers may occur.

The aim of this paper is twofold; (1) to investigate the effect of the presence of other exporting firms on a firm's decision to enter a specific export market and (2) to extend the current state of the literature on export spillovers by assessing different mechanisms through which these spillovers may occur, namely inter-firm labor mobility, intra-industry spillovers, and inter-industry linkages.

We corroborate the literature on export spillovers by presenting robust evidence of destination-specific export spillovers. The novelty of this study, however, really resides in the fact that we find evidence of inter-firm labor mobility, intra-industry and backward linkages as channels for export spillovers. Hence, it appears that export strategy in terms of market selection diffuses across firms, even after controlling for other factors which could explain that firms enter the same markets over time.

### **5.3. Capitalizing on Internal Knowledge about International Markets**

The last pillar of this PhD project focuses on the role of experiential knowledge in firms' internationalization, though not in terms of export experiential knowledge but rather in terms of

knowledge developed through a firm's importing experience. This study relates to an older and, until recently, relatively neglected discussion about the linkages between inward and outward international activities of firms (Welch & Luostarinen, 1993). It provides a new angle as to how firms' imports influence their export activities by looking at survival in individual export markets.

This paper argues that firms' import experience prior to export market entry may be positively related to the length of their export spell via several mechanisms. First, international sourcing activities might act as a source of knowledge about international markets and consequently facilitate the outward internationalization of firms (Di Gregorio, Musteen, & Thomas, 2009). Second, the international suppliers' networks may create subsequent international business opportunities and help the exporter to have a stronger foothold in the market from the start. Firms with importing experience also have the possibility to learn about and establish relationships in foreign markets before starting to export, while firms without such experience really do so once they enter it. They are therefore advantaged compared to firms for which exporting is the first international activity in a particular market, and one would expect this to be reflected into higher chances of export survival for firms with a priori import experience in a particular market.

On the other hand, importing activities may lower the costs of initiating exports into a market which may result in decision-makers reacting more quickly after discovering that exporting to a market is not as profitable as expected. On the contrary, firms that have had to bear larger costs prior to export market entry may be tempted to remain in the export market even though it is unprofitable in the hope of recovering their investment and not have to pay re-entry costs later on.

The results reveal that firms with import experience from a specific market prior to initiating exports to this market have a shorter export spell. This finding supports the idea that prior importing experience facilitates firms' outward internationalization by reducing the sunk costs associated with

export market entry and that export survival is correlated with these sunk costs. However, this result only hold for exports to developed countries whereas export survival in least developed countries appear to be higher for firms with prior import experience. Such findings suggest that the two competing reasoning co-exist, but that they apply to different types of destination.

The paper's contribution to the scant literature on inward-outward linkages in firms' internationalization is twofold: first it provides evidence of inward-outward linkages beyond export market entry, and second it introduces a so far neglected approach in the international business literature to understanding the impacts of inward-outward linkages. More generally, this paper also contributes to the internationalization literature by focusing on the underlying factors behind firm de-internationalization.

**Table 2: Summary of the four papers**

	<b>Theoretical positioning</b>	<b>Dependent variable(s)</b>	<b>Explanatory variable(s)</b>	<b>Moderators</b>	<b>Findings</b>
<b>Paper 1: grafting and export initiation</b>	Behavioral approach to export initiation (Cyert, 1963; Johanson & Vahlne, 1977; March & Simon, 1958); Managers' international experience and internationalization (Nielsen, 2010; Reuber & Fischer, 1997)	1) Export initiation 2) Export market selection	Recruiting managers with export experience from prior employment	Firm size  Knowledge specificity	- Hiring managers with export experience from prior employment lead to subsequent initiation (smaller firms only) - Firms tend to choose markets in which newly hired managers have experienced in (larger firms only)
<b>Paper 2: grafting and export growth</b>	Role of managers' international experience in internationalization (Nielsen, 2010; Reuber & Fischer, 1997)	Rate of export growth	Recruiting managers with export experience from prior employment	Knowledge specificity Firms' export experience	- Hiring managers with export experience from prior employment positively affects subsequent rate of export growth, though only when moderated by a firm's breadth of export experience at the moment of hiring
<b>Paper 3: Export spillovers and export market entry</b>	Trade with heterogeneous firms (Melitz, 2003) Export spillovers (Aitken, et al., 1997; Koenig, 2009; Koenig, et al., 2010)	Export market entry	1) Number of exporting in a firm's surroundings 2) Inter-industry linkages 3) Intra-industry linkages 4) Inter-firm labor mobility	Firm size  Destination countries' characteristics	- Number of other firms exporting to a specific market increases the likelihood of a firm to enter that same export market - Export spillovers occur via: backward linkages, intra-industry spillovers and inter-firm labor mobility - Export spillovers' channels differ across groups of firm size and across types of export destinations
<b>Paper 4: Inward-outward linkages and export survival</b>	Inward-outward linkages (Welch & Luostarinen, 1993); Real option and fixed costs (Dixit, 1989)	Export survival	1) Importing experience prior to export market entry	Export destination's grouping	- Importing experience prior to export market entry reduces firms' chances of export survival - Effect differs across country groups

## 6. CONTRIBUTIONS, LIMITATIONS AND IDEAS FOR FURTHER RESEARCH

This section completes the introduction and relates the findings presented above to the objectives of the *Made in Denmark* project. By shedding light on factors affecting Danish firms' participation in export markets, export growth and survival prospects, this dissertation contributes to the *Made in Denmark* project's aim to enhance our understanding of the drivers of internationalization of Danish firms. Moreover, by providing evidence on the sources of knowledge that firms are basing their export-related decisions on and how they affect their subsequent behavior, the findings of the research presented here are relevant for governmental decision-makers in charge of developing initiatives supporting the internationalization of Danish firms. Additionally, the findings of the dissertation have managerial implications, for instance when evaluating the effects of recruiting managers with export experience as a way to increase a firm's knowledge base about export markets and even more importantly the conditions under which these effects are stronger or weaker.

In terms of theoretical ambitions, the *Made in Denmark* project aimed at bridging two different disciplines concerned with similar issues related to firms' internationalization. While the majority of the papers included in this dissertation depart from the behavioral view of the firm and of its internationalization, making it greatly entrenched in the IB literature, elements of the theory of trade with heterogeneous firms, export spillovers and prospect theories are also part of the theoretical foundation of this dissertation. The combination of these elements with more mainstream IB concepts led to the creation of new insights, for instance in the discussion of inward-outward linkages in which learning from importing from a specific market may not lead to the expected, positive effect on subsequent internationalization. As such, the combination of both fields of research broadens the horizon of and enriches the academic discussion revolving around firms' internationalization.

Finally, this dissertation fulfills the last goal of the *Made in Denmark* project by adopting a research design and using data and methods that are heavily inspired from the economic discipline to answer questions that remained unresolved in the IB literature. The data available through this project made it possible to look at the effect of managers' international experience in a dynamic manner by looking at the effect of recruiting managers with such experience, thereby addressing a clear void in the literature (Nielsen, 2010). Moreover, the nature of the data used in this dissertation allowed for assessing the market and industry specificity of different knowledge sources, also contributing to deepening our understanding of how different sources of knowledge affect firms' export behavior.

### **6.1. Limitations and Ideas for Further Research**

As in any other study, this dissertation has some limitations which would benefit from being addressed in future research. As expressed earlier, while the data used in the different papers included here has clear benefits, such as its longitudinal nature allowing for the adoption of a dynamic view on diverse sources of knowledge, it also presents clear limitations. Among them is the impossibility to tackle the internal processes at play when firms are exposed to different sources of knowledge. For instance, in the inward-outward linkages discussion, it would be informative to uncover how the information flows from those in charge of importing to those in charge of exporting and which internal processes ensure this flow of information between the two entities. Moreover, it would be relevant to investigate the dynamics within the management team following the recruitment of managers with export experience to understand how their knowledge or experience is perceived and exploited. It could enlighten us even more on the conditions under which recruiting such managers leads to the desired effects. Another limitation comes from the fact that only data on exports and imports was available, restricting the scope of the conducted research to firms' export behavior. For instance, having information on other modes of internationalization

would have been interesting to exploit in the inward-outward linkages paper to investigate whether the shorter export spells for firms having prior import experience may be explained by the fact that these firms decide earlier on to switch to a different entry mode than export.

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## **CHAPTER 2: Grafting Competency by Hiring Internationally Experienced Managers: The Effect on Export Initiation and Market Selection<sup>2</sup>**

### **ABSTRACT**

In this paper, we investigate the relationship between grafting export experience, export initiation and market selection. We adopt a behavioral approach to export initiation and question the ease of accumulating organizational knowledge by grafting managerial capabilities. On the one hand, we find that firms hiring managers with previous export experience have a higher probability of initiating export activities in the subsequent year. In contrast with previous evidence we find that knowledge specificity (understood in terms of industry knowledge) does not play a role in identifying the effect of hiring managers with export experience and subsequent export initiation. Both hiring managers with intra- and inter-industry export experiences are associated with a higher probability of subsequently initiating export activities. We find though that only smaller firms benefit from grafting experiential knowledge to the management team and that grafting is subject to a window of opportunity after which it has no effect on firms' internationalization decisions. This suggests that grafting is not unconditionally beneficial in the context of export initiation. On the other hand, we find a positive relationship between the market(s) in which managers have gained their export experience and the market(s) the hiring firm enters, which confirms the relevance of market knowledge.

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## 1. INTRODUCTION

Following the widespread acceptance of the Uppsala model for understanding how firms expand internationally, there is a growing consensus among researchers to explain the lack of firm export initiation from a behavioral perspective (Johanson & Vahlne, 2009; Malhotra & Hinings, 2010). Researchers find that the unfamiliarity with foreign business contexts is an important inhibitor of international expansion (Hymer, 1976; Zaheer, 1995). Managers regard foreign-market opportunities as more risky and are biased towards domestic market opportunities that influence their organizational processes and routines. Therefore, international expansion becomes a gradual process of organizational learning through trial and error, where the first step (export initiation) might be the largest to overcome.

In this literature, the focus is on the development of experiential knowledge through firms' own international experience as a way of understanding further commitment in international markets, rather than on its role in the initiation of international activities (Ellis & Pecotich, 2001; Leonidou, 1995). Often, the determining role of managers for export performance has been put to the fore, whether it is related to their intentions, their attitudes towards risk or their knowledge (Dhanaraj & Beamish, 2003; Loane, Bell, & McNaughton, 2007; Reid, 1981). Research posits that individual managers have skills that influence organizational behavior. The past experiences of managers can provide important knowledge inputs to organizations and direct them in their export activities. For instance, their skills can alter the dominant perception of opportunities in international markets for the management team and help decision makers recognize and act on such market opportunities (Daily, Certo, & Dalton, 2000).

Although the behavioral perspective attributes a large role to individuals (Forsgren, 2002), the idea of grafting an internationally experienced manager to the managerial team as an alternative route to

enhance organizational knowledge (Huber, 1991) has not received much attention in the international business literature (Fletcher & Harris, 2012). To say that the relationship between managers' international profile and its effect on firm internationalization has completely been ignored in the field would be erroneous. However, very scant attention has been devoted to the recruitment of experienced managers as a source of knowledge (Fletcher & Harris, 2012) thereby providing a more dynamic perspective on this relationship. This lack of attention is striking as research points out that a better utilization of human capital presents an untapped resource for export growth, especially for SMEs (Gomez-Mejia, 1988) and that firms use grafted knowledge to compensate for their lack of internally developed experiential knowledge (Fletcher & Harris, 2012).

We should nonetheless mention that a few recent working papers look at inter-firm employee mobility and exports (Mion & Opromolla, 2011; Molina & Muendler, 2009; Sala & Yalcin, 2012). Molina & Muendler (2009)'s paper model the probability of firms to hire workers with export experience in light of an anticipated export participation and presents evidence that Brazilian firms indeed prepare to export by hiring workers with export-related knowledge. The other two papers are closer to ours as they look at the effect of recruiting managers from exporting firms and relate it to focal firms' export participation decision. Yet, our paper distinguishes itself from these contributions by introducing the notion of knowledge specificity in the discussion of grafting export-related knowledge in non-exporting firms and more importantly by looking at firms' export market selection at the moment of initiating exports. Moreover, while our empirical strategy is similar to the one of Mion & Oppromolla (2011) and focuses explicitly on firms' export initiation, the way we construct our variables of interest differ. As presented later on, we capture the effect of hiring managers with export experience from previous employment by using an indicator variable of whether such a manager has been hired in a given year while they are using firms' share of managers who have previously been working in an exporting firm. Their approach could be subject

to measurement error; one would observe an increase in the share of managers with export-related knowledge from previous employment following a downsizing of the management team, and not necessarily following the recruitment of such managers. Sala & Yalcin (2012) estimate firms' export status and therefore do not particularly focus on export starters (compared to non-exporters) and identify managers as the top-five individuals with the highest wages in a company.

In the literature, grafting is presented as an alternative way for firms to easily increase their knowledge base compared to developing this knowledge or competencies internally (Huber, 1991). Consequently, the benefits of grafting knowledge (in general and in relation to grafting international experience to a firm's management team on future export initiation) may seem obvious. Yet, several scholars have documented the inability or difficulty of firms to learn and change (Argyris & Schon, 1996; Weick, 1991). According to Weick, organizations are purposefully structured to produce predictable outputs from diverse inputs and organizational routines work in that favor. There are thereby strong incentives to socialize newly hired managers into existing norms and belief systems of the organization (Denis, Langley, & Pineault, 2000). As a result, newly hired managers may simply adopt the view and routines in place in the firm after their venue instead of acting as change agents and transferring or exploiting their knowledge about exporting gained through previous working experience. Thus, organizational learning and organizational knowledge are not necessarily complementary, as newcomers' views not necessarily are accepted as valid (Andersen, 2008; Forsgren, 2002). Hence, the effect grafting managerial team with individuals possessing exporting experience on subsequent export behavior of the recruiting firms remains an empirical exercise which has not received the deserved attention.

Our article contributes to the behavioral literature on export initiation by investigating whether hiring managers with exporting experience is related to future export initiation and affects export market selection. In particular, we question the suggested ease of grafting competencies in the

context of firms' internationalization. Moreover, we build on the recent work that focuses on knowledge specificity in the context of internationalization (Chetty, Eriksson, & Lindbergh, 2006; Malhotra & Hinings, 2010) and assess which type of knowledge matters for export initiation by distinguishing between knowledge on internationalization, markets, and industries.

Besides contributing to the academic debate surrounding export initiation, our findings have important practical implications. Particularly, they are relevant both in terms of recruiting policies as well as industrial policy aimed at enhancing the internationalization of firms. Understanding the factors that trigger export initiation remains an important issue for societies and firms alike. From a societal perspective, during an economic recession, net export expansion entails several positive socioeconomic outcomes. In most countries, export initiation holds unleashed potential because only a fraction of the firm population is directly engaged in international activities (Ghemawat, 2007). Secondly, exports remain the most widely used pathway for the international expansion of firms. For the individual firm, the initiation of exports is often an untested opportunity that might support its economic growth as well as its competitive power in the domestic market.

We structure the rest of the paper as follows. Section 2 presents our theoretical framework from which we formulate our hypotheses. Section 3 introduces the data and method used, and Section 4 presents and discusses the results. In Section 5, we conclude and discuss the implications for future research and for management.

## **2. THEORETICAL BACKGROUND**

### **2.1. Behavioral Approach to Internationalization**

The behavioral approach's starting point for export initiation (or the lack thereof) is the concept of bounded rationality. Bounded rationality causes problemistic search behavior and limited

information processing capabilities in individuals (Cyert, 1963; March & Simon, 1958). March and Simon note that: “*Individuals and organizations give preferred treatment to alternatives that represent continuation ...over those that represent change* (1958: 173).” The cognitive limitations of decision makers affect both the scope of intelligence gathering as well as the focus of managerial attention and choice. For management teams with no prior export experience, export-market opportunities represent a change alternative that diverts managerial attention away from existing and known alternatives. Domestic market opportunities are therefore likely to be prioritized, as they entail more predictability (Ellis & Pecotich, 2001; Johanson & Vahlne, 2009). Because information gathering follows known alternatives, and opportunities in export markets are more uncertain due to psychic distance (Ellis & Pecotich, 2001) and the liability of foreignness (Hymer, 1976; Zaheer, 1995); decision makers are subject to a home bias.

Following this reasoning, uncertainty based on the lack of knowledge of organizational decision makers is the most important factor for understanding a lack of export initiation (Bilkey, 1978). In that respect, the acquisition of knowledge through the hiring of managers with exporting experience provides one possible route to overcome the liabilities associated with foreign activities (Forsgren, 2002; Greiner & Bhambri, 1989). Following Huber (1991), firms commonly use grafting through the hiring of managers with experience to increase the firm’s knowledge base that is, “often faster than acquisition through experience and more complete than acquisition through imitation (1991: 97).” Correspondingly, increasing the management teams’ international business experience by hiring internationally experienced managers should work in favor of decreasing the home bias of the organization.

## **2.2. International Experience and Export Initiation**

In the literature on the role of managerial experience in the internationalization process of firms, and particularly the one focusing on the internationalization of SMEs, key decision makers are often seen as the single most important factor in deciding of a firm's export behavior, both in terms of its international orientation and with respect to its pace of international expansion (Loane, et al., 2007). Several studies point out that SMEs regard the lack of managerial resources as decisive for not initiating export activities or for their inability to further develop international activities (Baird, Lyles, & Orris, 1994; Hollenstein, 2005; Lyles, Baird, Orris, & Kuratko, 1993). This echoes what the upper echelon theory stands for, i.e. firms' managerial background influences the way decisions are made, and beyond that, the kind of opportunities their managers are aware of (Hambrick & Mason, 1984). Hence, from the perspective that organizations are reflections of their management teams, we expect to see a change in a firm's behavior following a change in its managerial composition. In particular, we should see a change towards internationalization after adding a manager with international experience to the current management team of a non-exporting firm.

Informational obstacles, caused by the dissimilarities of home and foreign markets, impede firms' entry into international markets (Morgan & Katsikeas, 1997). As suggested by the Uppsala model, both objective and experiential knowledge support internationalization by increasing an organization's cognitive ability to process information and to discover, evaluate, and plan systematically on export-market opportunities (Westhead & Storey, 1996). Likewise, firms regard managers' knowledge about international business gained through previous working experience as an important contribution to the resource base of the firm (Fletcher & Harris, 2012). This knowledge can enhance the firms' awareness of opportunities abroad and reduce managers' bias for the home market. Possessing knowledge about foreign markets might indeed reduce (or render more accurate) the managers' risk perception related to export markets, which in turn can lead to export

initiation (Morgan & Katsikeas, 1997). Hence integrating an experienced manager into the management team might result in lower risk aversion towards international business in general.

Studies exist on the role of management experience in internationalization processes (Athanassiou & Nigh, 2002; Casillas, Acedo, & Barbero, 2010; Eriksson, Johanson, Majkgard, & Sharma, 1997; Yeoh, 2004). Reuber & Fischer (1997) provide a study on how management teams influence the internationalization behaviors of SMEs and conclude that internationally experienced management teams influence SMEs to establish strategic partnership with international actors and enter more rapidly the international scene. These actions in turn further their firms' internationalization.

Surprisingly, however, our literature search does not uncover contributions within the behavioral approach that link a change in the experience of the firm's management team with export initiation. This is in line with the claim in Weerawardena, Mort, Liesch, and Knight (2007) that the Uppsala model does not have learning and knowledge acquisition in its pre-internationalization phase. Yet, evidence from the literature on born-globals and international new ventures show that such firms tend to be initiated by internationally experienced founders (Oviatt & McDougall, 1997; Weerawardena, et al., 2007), which suggests that previous experience can be used in a new context.

Based on the above, we argue that managers' knowledge about foreign markets gained through previous professional experiences can provide important knowledge inputs to the recruiting organizations and direct them in their export behavior. Therefore, we propose:

**Hypothesis 1:** Firms that hire one (or more) manager with previous working experience in an exporting firm are more likely to start exporting.

### **2.3. Knowledge Specificity**

The original Uppsala model emphasizes the role of market-specific knowledge (Johanson & Vahlne, 1977). However, in their recent restatement of the internationalization model, Johanson & Vahlne (2009) stress the importance of other forms of experience or knowledge for internationalization. This concept is in line with a recent stream of literature focusing on the specificity of managerial experience and how it affects internationalization (Chetty, et al., 2006; Zhou, Barnes, & Lu, 2010).

Eriksson et al. (1997) distinguish between two forms of experiential learning in the internationalization process. One relates to institutional market experience that broadly covers the concept of market-specific knowledge in the original Uppsala internationalization model (Johanson & Vahlne, 1977). This form of knowledge encompasses language skills, awareness about laws, and norms and rules for a specific institutional context such as a country market. The other one relates to the experience in the business environment that comprises the interrelations between the focal firm and other actors such as potential customers, rivals, and suppliers. Similar to their categorization of specific experience, we hypothesize on the impact of hiring managers with market experience and industry experience.

A key issue here is the transferability of the knowledge gained through international experience from one business context to another, in this case from one firm to another and/or from one market to another. Although some forms of experience might inherently be context-specific, such as experience from trading with a specific middleman in a specific country, other forms of experience are transferrable to other contexts. For instance, knowledge about how to set up and conduct an internationalization strategy may not be bounded to one country (Eriksson, et al., 1997; Fletcher & Harris, 2012). Therefore, hiring managers with such experience may increase the possibilities of

discovering export-market opportunities or avoiding unnecessary costs (Chetty, et al., 2006) and might reduce the impact of the liability of foreignness (Zaheer, 1995).

Thus, we contend that the knowledge gained through previous working experience is in part market specific and that market knowledge remains a relevant concept for firms' internationalization (Johanson & Vahlne, 2009). For instance, managers might gain knowledge about a certain institutional environment related to a market in which he or she worked before that might be irrelevant in other markets. Further, managers might have developed network relations in foreign markets that can be relevant for and used in the new organization (Reuber & Fischer, 1997). Yet, these contacts might very well be market specific and of no use in other contexts.

Evidence supports the claim that market-specific experience matters because experiential knowledge reduces a firm's risk perception of a particular market, in turn increasing the likelihood of the focal firm entering the same market (Ellis & Pecotich, 2001). Hence, we expect to see a correspondence between the countries the newly hired manager gained his or her experience in and the countries the focal firm starts exporting to. We therefore suggest that:

**Hypothesis 2:** A firm that hires one (or more) manager with previous export experience in a specific market is more likely to choose that market when initiating export activity.

On the other hand, the firm's industry can be a very important part of its business environment (Porter, 1985) and the knowledge and core skills developed through previous working experience within an industry is not to be underestimated (Neal, 1995). Industrial experience results also in building a body of knowledge on the specific practices, beliefs, and assumptions that are taken for granted in a specific industry (Spender, 1989). This institutional experience constitutes the backdrop for managerial information processing and judgment in the industry. Often, this knowledge is uncodified and internalized to an extent that it comprises a barrier of outsidership (Johanson &

Vahlne, 2009). Thus, industrial experience influences managers in their discovery of market opportunities (Matthyssens, Vandenbempt, & Berghman, 2006), organizing exchange activities (Whitley, 1992), and collaborating with other actors (Windeler & Sydow, 2001). With the global expansion of business, “best practices” or “recipes” also expand their reach as they are imposed on supplier networks or intermediaries in other business contexts. The global adaption of quality assurance systems in car manufacturing is one example, but the phenomenon exists in several industry studies (Dicken, 2010; Gereffi & Korzeniewicz, 1994). In some cases, international trade is contingent on international industry standards to an extent that all international trade follows the same international standard for exchange. For instance, this is the case in the steel industry or in the pork industry (Strandskov, 2006). For the management team, hiring a manager with industry-specific knowledge can also decrease perceived market distance and increase the propensity for export-market initiation. Hence, if export knowledge is combined with industry-specific knowledge, the effect on export initiation might be enhanced. We therefore propose:

**Hypothesis 3:** Hiring a manager with industry-specific export experience increases the likelihood of subsequent export initiation.

**Hypothesis 4:** Hiring a manager with industry- and country-specific export experience increases the likelihood of choosing that particular market when initiating export activity.

### 3. EMPIRICAL STRATEGY

To test the above hypotheses, we conduct our analysis in two steps: first, we analyze firms’ decision to initiate exports and second, we analyze their decision in terms of market selection at the moment of initiating exports.

In the first part of the analysis, because our dependent variable is a binary variable and we are dealing with panel data, we use the following random-effect probit model (Wooldridge, 2002):

$$P(y_{it} = 1 | x_{it,t-1,t-2}, \varepsilon_{it}) = \Phi (\beta_1 \text{hiring}_{it,t-1,t-2} + \delta w_{it,t-1,t-2} + \gamma z_{it,t-1} + \varepsilon_{it}) \quad (1)$$

where  $P(y_{it} = 1 | x_{it,t-1,t-2}, \varepsilon_{it})$  stands for the probability of a firm starting to export at time  $t$  conditional on the vector of firm characteristic  $X$ . The probit model ensures that the probability of starting to export remains between zero and one by using the cumulative distribution function denoted by  $\Phi$ . We estimate the probability of starting to export at a specific point in time by controlling for whether a firm hires a new manager in different time periods ( $\text{hiring}_{it,t-1,t-2}$ ), for management team characteristics at the moment of hiring ( $\delta w_{it,t-1,t-2}$ ) as well as for other firm-level covariates ( $z_{it,t-1}$ ) that may influence the firm's export propensity. We control for potential endogeneity problems coming from the reverse causality between export behavior and firms' characteristics by lagging firm-level control variables, which we denote by the subscript  $(t-1)$  in equation (1).

In the second part of the analysis, which focuses on firms' market selection, we estimate the following probit model (Wooldridge, 2002), which is particularly attractive as it allows firms to enter more than one export destination at once<sup>3</sup>:

$$P(y_{ij} = 1 | x_{ijt-1}, w_{jt-1}, \varepsilon_{ij}) = \Phi (\beta_1 \text{hiring}_{ijt-1} + \beta x_{ijt-1} + \zeta GDP_{jt-1} + \delta w_j + \varepsilon_{ij}); \quad (2)$$

where  $P(y_{ij} = 1 | x_{ijt-1}, w_{jt-1}, \varepsilon_{ij})$  represents the probability of firm  $i$  to enter market  $j$  in its first year as an exporter, conditional on whether the firm hired a manager with export experience from that market, among others. Note that we only look at the year in which firms initiate exporting. The

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<sup>3</sup> When analyzing location choice in the international literature, it is common to use conditional logit model. We do not use this approach for the main reason that one assumption of the model is that the different alternatives that a firm is facing should be mutually exclusive, which means in the context of our paper that only one market can be chosen. This assumption does not hold in our paper. The same applies for the use of a mixed logit model, which would have the advantage of dealing with the IIA assumption.

model allows us to control for destination characteristics that can influence a firm's decision to start exporting to a particular market. We do so by controlling for the one year lagged real GDP of the destination and by including destinations dummies ( $w_j$ ).

### **3.1. Data**

We test the previous hypotheses by using a panel of Danish manufacturing firms for the period from 1997 to 2006. As such, Denmark is a great case for studying the effect of grafting international experience to the managerial team on export initiation and market selection for several reasons. First, Denmark is a small, open and export oriented economy, which ensures some dynamism in terms of firms' export involvement. Moreover, Denmark is known for its flexible labor market such that firms encounter relatively low hiring and firing costs, which results in high labor mobility within and across firms over the years. Finally, Denmark possesses unique and rich labor market data at the individual and firm level, which allows us to observe the dynamics in terms of human capital within the firms. Together, these conditions suggest that Denmark provides a relevant background for testing the propositions developed.

We construct our final data set by combining two main data bases containing information on 1) firms' exporting activities and 2) labor market data. The export figures come from the Danish foreign trade statistics that comprise within-EU trade data and extra-EU trade data. Within-EU export information is available from the Ministry of Taxation, Central Customs, the Tax Administration, and VAT registers. For export destinations outside the European Union, the figures we use come from the Tax and Customs Authorities. We exclude services due to data restriction. The data come in different disaggregation levels and in this paper we use export data at both the firm- and the destination-level. We group the export destinations into 16 markets according to the

UN geographical classification<sup>5</sup>, thereby making sure to have a minimum of instances where firms hire managers with market-specific export experience and ensuring convergence of the econometric model.

Small inconsistencies are caused by different reporting requirements for export figures according to the export destination. In particular, within-EU trade is subject to looser reporting criteria compared to extra-EU trade. According to the most recent data documentation provided by Denmark Statistics, firms that export less than 4.7 million kroner (627 thousand Euros) across all EU destinations per year are not obliged to report their export figures. However, in our data set we encounter many entries below this threshold for intra-EU trade, which suggests that some firms nonetheless report their export activities despite not being obliged to do so. As documented in Munch & Skaksen (2008) the coverage of the intra-EU export data set is of around 85-90% of the total export figures while Denmark Statistics claims that this threshold is set to ensure coverage of 97% of all export activities. Yet, one should keep this in mind when interpreting the results as we may end up underestimating export initiation in the case of entry into European countries. For trade outside the European Union, the rule is much stricter: firms exporting more than 7,500 kroner per year are obliged to report their export sales.

We construct the variables of interest by merging the export data with a linked employer–employee data set available from Statistics Denmark. This data set provides yearly information on each individual’s workplace, for the population of individuals that are employed. We exploit the fact that we have access to data on each individual’s employer in order to track his or her inter-organizational mobility. Moreover, as firms are identified with a unique identifier across the different data sets, we are able to merge the employer–employee linked data with our export data.

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<sup>5</sup> See Table A1 for a list of the 16 groupings, as well as the frequency at which they are selected when firms initiate export activities.

Hence, we know whether an individual previously worked in an exporting firm or not. Additionally, we have information on individuals' socio-economic characteristics and job position. As a result, we are able to identify when a new manager is hired in and whether he or she possesses export experience from previous employment history.

As we focus on the mobility of managers, we restrict our analysis to firms that report at least one manager. Many of the firms in our original sample do not report a manager, which explains why our sample is rather small despite the fact that we have access to population data. We find that larger firms are more likely to report managerial positions, which could lead to a bias in our results. We control for this by adding firm size to our regression analyses.

The final data set that we use for the first part of our analysis (to test Hypotheses 1 and 3) is limited to non-exporters and export starters (until they start exporting) and comprises 499 firms that amount to 1 701 firm-year observations (one year lagged sample). Firms are on average present for around four years in the data set.

To test Hypotheses 2 and 4, we depart from the data set described above and expand it to include the export destination dimension of our data. As mentioned before, we limit our sample to export starters in the year when they initiate export activities. The final firm-destination-level data set contains 4 432 observations with information on 277 export starts and comprises 16 markets.

### **3.2. Dependent Variables**

We define export initiation as a binary variable ( $expstart_{it}$ ) that equals one when a firm is exporting at time  $t$  but was not exporting at time  $t-1$ , and equals zero if a firm is not exporting in both  $t-1$  and  $t$ . Observations that do not satisfy these conditions are coded as missing values. This coding means that our estimation sample does not include continuously exporting firms. Moreover, export starters

drop out of our sample after they start exporting. As documented in Mion & Opromolla (2011) doing so allows us to compare firms with the same export “history”. Hence, we can estimate the effect of hiring an experienced manager on the probability of starting to export. In the sample a firm can be considered a multiple starter, which means that a firm starts exporting more than once over the observed period (for instance if a firm stops exporting for some time). We account for this by adding a dummy variable that indicates whether a firm was previously involved in export activities or not.

In the second part of our analysis, we are particularly interested in the choice of export market at entry (Hypotheses 2 and 4). We depart from the destination-level data set and create a binary variable ( $expstart_{ijt}$ ) equal to one when a firm is exporting to a specific market  $j$  in year  $t$  but was not exporting to that market in year  $t-1$ , and the variable equals zero if a firm is not exporting to market  $j$  in both  $t$  and  $t-1$ .

### **3.3. Variables of Interest**

The first step in constructing our variables of interest is the identification of managers. As such, managers are identified by using a variable characterizing the job occupation of all individuals, called DISCO, which is the Danish adaptation of the International Standard Classification of Occupations (ISCO) delivered by the International Labor Organization (ILO). The variable is available from the wage statistics and filled out by employers on a yearly basis. Firms with less than 10 employees are not obliged to provide such information, and for this reason the estimations are done on a sample of Danish export starters that are employing at least 10 employees over the whole period during in which they are observed. Using job classification to identify managers and specially managers’ inter-firm mobility requires a few extra steps to ensure that measurement errors do not bias the results. The fact is that an individual is classified into a selection of possible job

positions based on his or her main occupation over the year. As we do not know the exact date at which an individual changes employer, it can create inconsistencies when one is looking at employees' mobility and even more when focusing on the mobility of a particular group of people, for instance managers. To ensure that we capture managers' mobility, we therefore impose the following condition: (1) We only consider as inter-firm mobility cases in which an individual changes employer in one year and remains attached to this employer in the next year and (2) cases in which an individual is changing employer and is classified as manager both in the year of the change and in the year after.

Second, because we want to assess the specificity of the relevant knowledge for export initiation, we construct four variables that capture the event of hiring a manager that refer to more (or less) specific definitions of their previous experience. Their effect is captured by  $\beta_j$  in equations (1) and (2) above. Table 1 presents a concise definition of the different variables of interest.

The first and most general hiring variable is a binary variable ( $hiring_{it}$ ) equal to one if the firm has at least one newly hired manager that comes from an exporting firm<sup>7</sup>. In order to distinguish between the effect of hiring a manager with export experience and simply hiring a new manager, we also control for whether a firm hires one or more managers without previous working experience in an exporting firm. To assess whether what matters is export experience or industry-specific export experience (H3), we construct a second recruiting variable defined as a binary variable equal to one if a firm has at least one newly hired manager with industry and export experience. We make sure to control for the effect of hiring managers with export experience from outside the industry in a

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<sup>7</sup> In this paper we do not directly observe whether an individual was involved in the export activities of his previous employer, neither if he is directly involved in the export activities of his current employer. All else equal, it is assumed that the difference between newly hired managers coming from exporting firms and the ones coming from non-exporting firms resides in the fact that the former were exposed to export-related knowledge in their previous employment.

similar fashion. We use the 2-digits NACE rev. 2 industrial classification to determine whether a manager has gained his or her exporting experience within the same industry or not<sup>8</sup>.

The tests for Hypotheses 2 and 4 we use market-specific and market-industry-specific hiring variables that are both binary variables equal to one if a firm has at least one newly hired manager that comes from a firm exporting to a specific market  $j$ . In the latter case (H4), we impose a second condition related to industry-specific market knowledge.

### **3.4. Control Variables**

We add several control variables that previous studies identify as influencing export behavior. Particularly, in all models we control for firm size, which is expressed as the logarithmic function of the total number of employees, because evidence shows that larger firms are more likely to become involved in international trade (Bernard & Jensen, 2004). Intuitively, larger firms probably have larger management teams that increase the likelihood of having experienced managers on board who might influence the firms' export status. We account for this by adding the size of the top management team, which also allows us to control for whether the newly hired managers with export experience are added to the management or are filling a vacant position.

Further, we control for the average age of the management team, because previous research shows that older managers are more risk adverse (MacCrimmon & Wehrung, 1990), which means that they might be more reluctant to initiate export activities. On the other hand, older managers benefit from more experience and possibly export experience. In any case, by omitting the control for age, we might allocate too large (small) of an importance to export experience. Therefore, the effect we find might be in part driven by the effect of age.

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<sup>8</sup>Our results also hold when using more detailed industry classifications (3-digit and 4-digit industry classifications), showing that the knowledge brought in by managers is more of a general nature.

We also control for firm productivity, to control for the self-selection of more productive firms into exporting (Melitz, 2003). We measure productivity as the logarithm transformation of value added per worker. Moreover, we control for the average wage for employees within a firm as a proxy for the quality of the labor force, because more qualified employees can help firms enter international markets more easily (Bernard & Jensen, 2004). Furthermore, we control for the nationality of the management team by adding the number of foreign managers to control for the effect that national diversity might have on the decision to start exporting.

Grafting export-related knowledge might not be the only way for firms to learn about export markets. Indeed, previous evidence suggests that firms learn from other firms' international experience (Aitken, Hanson & Harrison, 1997) and from their own experience as importers (Welch & Luostarinen, 1993)<sup>9</sup>. We account for these alternative knowledge sources by controlling for the number of exporting firms located in the same region as firm  $i$  and for firms' previous import status. Finally, we include industry and year dummies to control for differences in export behavior across different industries and structural variations that might occur during the period and might affect the decision to start exporting respectively. Moreover, the location of firms might influence their ability to hire qualified workforce as individuals are less willing to move far away for a new job and as a result remotely located firms might find it particularly hard to attract managers with specific characteristics and knowledge. We account for such local labor market differences by including region fixed-effects<sup>10</sup>.

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<sup>9</sup> Other sources of export-related knowledge such as firms' use of export associations and desk research could be relevant to include here. However, due to data unavailability such export-related knowledge sources could not be included in the analysis.

<sup>10</sup> We group firms according to the provinces (*landsdele*) they belong to. Similar results are obtained when using 51 commuting areas (Andersen, 2000) in which regions are determined by the concentration of individuals' place of work and residence.

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive Evidence

Our final firm-level sample includes 90 cases of recruitment of managers with export experience and 277 cases of export initiation. Tables 2 and 3 respectively provide summary statistics and correlation matrices of the main variables included in each model. From these, we can see that export initiation is positively correlated with hiring managers with export experience, both within the same industry or across. Moreover, we see that newly hired managers' market-specific export experience is positively related to the choice of export market(s) at the moment of initiating exporting activities. Table 4 presents further descriptive evidence of the relationship between hiring managers with export experience and subsequent export initiation. It shows that in 34% of the cases, a firm that hires managers with export experience starts exporting in the following period, compared to 15% of the cases in which firms initiate export activities without previously recruiting an experienced manager.

Turning to the analysis of export market selection at the moment of export initiation, around 95% of firms which initiate exporting activities do so in three markets or less, with 70% of all export starters only entering one market in their first year. In line with the learning perspective on firms' internationalization, the most common destinations to which firms start exporting are Northern and Western Europe, accounting for 43% and 16% respectively of all export market entries at the moment of export initiation, while Central Asia is never chosen when it comes to a firm's "first" export market entry. See Table A1 for further information.

## 4.2. Export Initiation

In line with the behavioral perspective on a firm's internationalization, we start our analysis by testing whether hiring a manager from an exporting firm influences the decision of the recruiting firm to start exporting. Table 5 presents the results.

As presented in column (i), we find that a firm that hires a manager (or more) with exporting experience at time  $t$  is also more likely to start exporting in that same period, compared to firms that do not hire a manager with exporting experience, all else equal. Similarly, we find that hiring managers without export experience does not influence the likelihood of the hiring firm initiating export activities. Because both the hiring and the export initiation are measured at the same point in time, it is not possible to distinguish between the two following scenarios: (1) a firm hires an experienced manager and subsequently starts exporting or (2) a firm starts exporting and subsequently hires a manager with export experience to manage its new international activities. The primary focus in this paper is the first scenario. For this reason, we exploit the panel dimension of our data by lagging the hiring variable by one and two years. When doing so, we find that hiring managers with previous experience in exporting is associated with a larger probability that the focal firm starts exporting in the next period. This is in line with the studies of Mion & Opromolla (2011), Molina & Muendler (2009), and Sala & Yalcin (2012), which all find a positive relationship between hiring managers with previous experience and the propensity of the focal firm to export in the future.

As seen in Table 5, column (iii), the two-year lagged hiring variable is insignificant. This finding may be explained in two ways. On the one hand, it suggests that the effect of grafting is subject to a one-year "window of opportunity" after which the knowledge brought in by recently recruited managers may not be as relevant or up to date to lead to higher chances of internationalizing. It

could also be a sign that the newly hired managers are prone to socializing effect (Denis, Langley, and Pineault, 2000) if their knowledge is not exploited shortly after being recruited. On the other hand, the insignificant effect could also be due to the fact that we lose firms which are internationalizing shortly after they first appear in the data set. Particularly, when using the two-year lagged hiring variables, we exclude both firms which start exporting less than three years after being observed for the first time in the data set and firms who do not survive. Further research into this issue is warranted in order to more confidently explain this “window of opportunity” that we observe with our data.

We ran the same estimations on a sub-sample of firms which are present at least three years before initiating exports (or for at least four years for non-starters) and we indeed find that these firms are affected differently by grafting. The results presented in columns (iv) and (v) in Table 5 show that the effect the hiring managers with export-related experience is positive but insignificant. The fact that these firms are potentially older when they internationalize may result in them having more rigid structures and be more resistant to change at the moment of hiring experienced managers. This could explain why we do not find an effect for these firms. However, more research in this area could provide important insights on the conditions under which the effect of grafting is maximized.

In the remainder of the paper, we focus on the one-year lagged hiring variable to ensure that the hiring event occurs before a firm starts exporting.

#### **4.3. Alternative sources of knowledge and matching between firms and managers**

As mentioned before, hiring managers with export experience is not the only source of knowledge that a non-exporting firm can rely on when planning on starting to export. In the following, we test whether the results found above hold when controlling for firms’ prior import experience as well as the number of exporting firms located in the region of

the observed non-exporting firm. The results, presented in Table 6 columns (i) to (iii), show that indeed the results found above hold when controlling for these alternative sources of knowledge. It turns out that the import experience of a firm increases its probability of becoming an exporter, suggesting that it can capitalize on the knowledge it gained from this experience. In contrast, the presence of exporting firms does not influence the probability of a firm to start exporting.

Moreover, as we do not directly observe the export experience of managers, it is important to test for alternative explanations that could drive the effect found above. We investigate one of these alternatives, namely a non-random match between managers and firms. This can indeed be problematic in this paper if only the best firms are able to attract the best managers. As prior evidence suggests that more productive firms are more likely to be involved in international trade (Bernard and Jensen, 2004), this non-random matching of managers to firms could bias our results. We address this concern by controlling for the wage of newly hired managers, expecting that “better” match would be captured by higher wages. Fortunately, the results obtained above are robust to including such variable, as depicted in column (iv) of Table 6.

#### **4.4. Industry-Specific Export Experience**

We argued for the importance of industry-specific experience and hypothesized that hiring a manager with export and industry experience should lead to a higher chance of export initiation by the focal firm, in part because the new firm now possesses knowledge about international business that is relevant to its industry. Column (i) of Table 7 presents the results. To assess the importance of industry-specific export experience, we control for both hiring a manager with export and industry experience as well as hiring a manager with export experience coming from another industry. After controlling for the latter, we show that both intra- and inter-industry export

experience leads to export initiation. This finding in a way goes against the stream of literature promoting the existence of industry-specific human capital (Neal, 1995), at least in the context of a firm's first step in its internationalization process. We find no evidence that the depth of industry experience combined with previous experience with exporting is a prerequisite for the recruiting firms to be able to capitalize on the knowledge brought in by the newly hired manager. As such, H3 is not supported.

#### **4.5. Firm Size**

Most of the literature that we reviewed for this paper and used to develop our hypotheses focuses on SMEs or smaller firms. In line with this evidence, we expect the effect of hiring an experienced manager to be larger for such firms. Indeed, such firms are faced with resource constraints that might reduce their capacity to monitor different foreign environments for business opportunities. In this way, the knowledge brought in by the newly hired experienced manager is likely to add more to the body of knowledge about international markets already available within the firm. We test this by estimating equation (1) on two subsamples consisting of (1) firms between 10 and 54 employees and (2) firms of 55 employees and more. We use this threshold based on the distribution of firms across the whole spectrum of size, which refers to the 75<sup>th</sup> percentile's firm size within the final sample. Table 7 (columns (iii) to (v)) shows that the results we previously found only hold for firms of less than 55 employees, indicating that indeed only smaller firms benefit from acquiring knowledge about international markets through hiring experienced managers. Using the average firm size (around 76 employees) as threshold holds similar results.

#### **4.6. Choice of Export Market at Entry**

We now turn to the second part of our analysis and assess whether the previous experience of the newly hired manager influences market selection when initiating export activities. In other words,

we assess whether the knowledge relevant for export initiation is market-specific. If affirmative, we expect to see a correspondence between the country (countries) in which the newly hired manager gained his or her export experience in and the country (countries) the focal firms decide to enter. Table 8 presents our findings. In line with our hypothesis, we find that firms which hire managers with export experience in a specific market tend to enter the same market when initiating exports. Hence, our findings provide support to the idea that grafting experience is a source of market knowledge (Fletcher & Harris, 2012).

When assessing the importance of industry-specific experience in a particular market (Table 8, column (ii)), we find that industry experience is not decisive for the identification of the effect and thereby is not crucial for the choice of export market at entry. As before, these results are robust after controlling for whether a firm hired managers without export experience.

A potential drawback of using a probit model here is that it assumes entry decisions to be made independently for each destination. This is a strong assumption to make and therefore we check for the robustness of our results to using a rank-ordered logit model, in which destinations are ranked according to their “importance” in terms of how much (export sales) a firm is exporting to each respective destination in the first year. As such, the model is estimating whether hiring managers with export experience from a particular region is associated with a destination being more highly ranked. The results are presented in columns (iii) and (iv) of Table 8 and are very much in line with our previous findings; they show that destinations for which a firm has hired a manager with market-specific export experience are likely to be ranked higher than destinations for which the firm has no knowledge of. This confirms the importance of market-specific knowledge when internationalizing.

## 5. CONCLUSION

Increasing the number of exporting firms remains a top priority for governments and business investors in recent years. In addition to compensating for limited domestic demand, exports can strengthen the domestic position of local firms and increase productivity in the domestic market. In this study, we add important insights into the importance of human capital for the decision to initiate export activities. We further our understanding of one particular and important pillar: recruiting experienced managers to the management team.

We show that managers' export experience indeed matters for export initiation. However, we show that the industry specificity of experience does not moderate the relationship between hiring a new manager and subsequent export initiation. Particularly, we find that the effect of export experience on export initiation is similar when distinguishing for intra- and inter-industry experience which contradicts the claim that industry-specific skills and knowledge is important (Neal, 1995) in an internationalization context. When looking at the choice of export market at the moment of entry, our results are in line with the Uppsala model. We see that recruiting managers with market-specific export knowledge increases the probability of the recruiting firm entering that same export market. This finding suggests that market knowledge remains a relevant concept in the discussion on firm internationalization, not least of all for the case of export initiation.

Our results extend the research conducted in lieu of the Uppsala research program on internationalization by focusing on the pre-internationalization phase of firms. They also extend the literature concerned with the effect of recruiting managers on organizational behavior and performance. Our findings are in line with the few studies on managers' mobility and export initiation. The findings extend these studies by looking at the specificity of experience as a moderator of the relation between recruiting experienced managers and the decision to start

exporting as well as export market selection at entry. In particular, we support the findings of Eriksson et al.(1997) that suggest different forms of international experience contribute to overcoming the perceived barriers for international expansion and/or for discovering international market opportunities.

Also, we provide support to the concept that grafting can be a particular way to complement an organization's knowledge, as suggested by Huber (1991). As we show, there are particular issues to take into account when combining grafted knowledge with the existing knowledge base. Our results indicate that the specificity of the managerial knowledge (in terms of export market) that the organization seeks to integrate moderates the effect of grafting. Also, our results suggest that the grafting effect from hiring managerial experience is contingent on the size of the recruiting firm, suggesting that its effect is not as straightforward as often presented.

Besides contributing to the academic debate surrounding the "lack" of exporting SMEs, our results present important implications for managers; an obvious one concerns the recruitment policies in such organizations. Linking to the grafting argument, our results indicate that the international experience that managers bring with them to the target firm is not invariably valuable for ensuring growth through internationalization, but to some extent depends on the specificity of such experience and the characteristics of the firm. For investors and other stakeholders these results are valuable.

Our paper is no exception and contains limitations. One comes from the possibility that the hiring decision of the firms is endogenous. Indeed, firms might on purpose hire managers with export experience as they are planning on initiating export activities in the near future. In this paper, we lag the hiring variable by one year, but doing so might not fully eliminate the endogeneity. Mion & Opromolla (2011) address this concern and find that when allowing the hiring decision to be

endogenous, the effect of hiring becomes larger and remains significant. Similarly, Choquette & Meinen (2012) find that after controlling for the potential endogeneity of the hiring decision, the effect of hiring employees with export experience on export market entry becomes larger and remains significant. Based on this evidence, we are confident that endogeneity issues do not drive the whole positive effect we find from hiring managers with export experience on export initiation. Nevertheless, future research should offer solutions to deal with this endogeneity. Moreover, replicating our study in other countries can further develop our understanding of the effect of hiring in export experience to market entry. Such research could also help us to establish better the role of the national context, such as for instance the labor market.

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**Table 1: Hiring variables according to type of experience**

Export experience	= 1 if a firm hires managers coming from an exporting firm; = 0 otherwise
Export and industry experience	= 1 if a firm hires managers coming from an exporting firm within the same industry; = 0 otherwise
Market-specific export experience	= 1 if a firm hires managers coming from a firm exporting to market $j$ ; = 0 otherwise
Market- and industry-specific export experience	= 1 if a firm hires managers coming from a firm exporting to market $j$ within the same industry; = 0 otherwise

**Table 2: Descriptive statistics**

Part 1	One year lag				
	Nb obs	Mean	Std. Dev.	Min	Max
export initiation	1701	0.163	0.369	0	1
<b>Hiring variables</b>					
hiring with export experience	1701	0.053	0.224	0	1
hiring with export experience, same industry	1701	0.041	0.197	0	1
hiring with export experience, different industry	1701	0.017	0.129	0	1
hiring without export experience	1701	0.052	0.223	0	1
<b>Controls</b>					
prior import	1701	0.377	0.485	0	1
# exporters in region	1701	350.412	150.723	16	555
wage newly hired manager (ln)	1701	5.532	0.376	3.279	7.889
foreigners in TMT	1701	0.064	0.361	0	6
TMT size	1701	3.474	6.085	1	103
average age in TMT	1701	48.814	6.909	27	70
export experience, firm-level	1701	0.270	0.444	0	1
productivity (ln)	1701	12.714	0.469	9.669	14.827
size (ln)	1701	3.562	1.024	2.303	7.679
average salary (ln)	1701	5.154	0.180	4.636	5.933
Part 2	One year lag				
	Nb obs	Mean	Std. Dev.	Min	Max
export initiation, destination-level	4432	0.0967	0.295	0	1
<b>Hiring variables</b>					
hiring with market specific export experience	4432	0.047	0.211	0	1
hiring with market specific export experience, same industry	4432	0.031	0.172	0	1
hiring with market specific export experience, different industry	4432	0.021	0.141	0	1
hiring without export experience	4432	0.098	0.298	0	1
<b>Controls</b>					
market specific export experience, firm-level	4432	0.065	0.265	0	1
prior import	4432	0.581	0.493	0	1
# exporters in region	4432	91.926	94.262	0	473
Real GDP (ln)	4432	27.449	1.429	24.221	30.114

**Table 3: Correlation matrices**

**Part 1**

export initiation	1.000														
hiring with export experience	0.116	1.000													
hiring without export experience	-0.032	0.086	1.000												
hiring with export experience, same industry	0.087	0.870	0.059	1.000											
hiring with export experience, different industry	0.090	0.557	0.091	0.157	1.000										
import experience	0.238	0.049	-0.041	0.024	0.066	1.000									
# exporters in region	0.077	0.014	-0.091	0.012	0.009	0.040	1.000								
wage newly hired manager	-0.013	0.078	0.024	0.072	0.027	0.090	-0.230	1.000							
foreigners in TMT	0.019	0.147	0.061	0.162	0.140	0.137	-0.113	0.072	1.000						
TMT size	0.039	0.257	0.154	0.261	0.200	0.184	-0.115	0.107	0.731	1.000					
average age in TMT	-0.021	-0.090	-0.041	-0.076	-0.066	-0.034	0.006	0.034	-0.068	-0.102	1.000				
export experience, firm-level	0.312	-0.038	-0.048	-0.045	0.012	0.364	0.092	0.049	0.119	0.143	0.069	1.000			
productivity	0.058	-0.030	-0.042	-0.035	0.011	0.113	-0.077	0.218	0.088	0.059	-0.020	0.124	1.000		
size	0.063	0.190	0.122	0.181	0.110	0.339	-0.080	0.283	0.290	0.529	-0.156	0.121	-0.116	1.000	
average salary	-0.005	0.078	0.139	0.083	0.033	0.054	-0.320	0.501	0.177	0.263	-0.058	0.022	0.340	0.302	1.000

**Part 2**

export initiation, destination-level	1.000														
hiring with market specific export experience	0.217	1.000													
hiring with market specific export experience, same industry	0.189	0.804	1.000												
hiring with market specific export experience, different industry	0.125	0.654	0.159	1.000											
hiring without market specific export experience	-0.031	0.053	0.064	0.022	1.000										
market specific export experience, firm-level	0.311	0.020	0.001	0.033	-0.078	1.000									
prior import	-0.036	-0.072	-0.082	-0.019	-0.026	0.223	1.000								
# exporters in region	-0.005	0.003	-0.003	0.033	0.031	-0.006	-0.002	1.000							
Real GDP (ln)	0.238	0.093	0.080	0.057	-0.057	0.190	0.017	-0.033	1.000						

**Table 4: Mobility of managers over the years and frequency of export initiation according to firms' hiring status in the previous period**

year	Firms' hiring status in each year		Firms not hiring managers with export experience in $t-1$			Firms hiring managers with export experience in $t-1$		
	Not hiring managers with export experience	Hiring managers with export experience	No export initiation in $t$	Export initiation in $t$	%	No export initiation in $t$	Export initiation in $t$	%
1999	278	13	238	40	0.14	9	4	0.34
2000	229	13	187	42	0.18	10	3	0.23
2001	218	14	183	35	0.16	10	4	0.29
2002	196	12	161	35	0.18	7	5	0.42
2003	183	9	155	28	0.15	6	3	0.33
2004	171	7	151	20	0.12	2	5	0.71
2005	167	10	143	24	0.14	7	3	0.30
2006	169	12	147	22	0.13	8	4	0.33
Total	1611	90	1365	246	0.15	59	31	0.34

**Table 5: Export experience and export initiation (H1)**

	Whole sample			Sub-sample: firms present for 4 years or more only	
	(i) Export experience (H1); no lag	(ii) Export experience (H1); one-year lag	(iii) export experience (H1); two-year lag	(iv) Export experience (H1); no lag	(v) Export experience (H1); one-year lag
<i>Hiring variables</i>					
hiring with export experience	0.35*** (0.14)			0.29 (0.2)	
hiring without export experience	0.09 (0.18)			-0.07 (0.25)	
hiring with export experience t-1		0.76*** (0.18)			0.36 (0.3)
hiring without export experience t-1		-0.16 (0.22)			-0.7 (0.45)
hiring with export experience t-2			0.17 (0.3)		
hiring without export experience t-2			0.18 (0.28)		
<i>Controls</i>					
foreigners in TMT	-0.04 (0.15)	-0.06 (0.18)	-0.11 (0.21)	-0.41** (0.22)	-0.16 (0.2)
TMT size	0.003 (0.01)	-0.01 (0.01)	-0.001 (0.01)	0.01 (0.01)	0 (0.01)
average age in TMT	-0.004 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.02* (0.01)
export experience, firm-level	0.72*** (0.11)	0.94*** (0.11)	1.15*** (0.12)	1.16*** (0.12)	1.17*** (0.12)
productivity	0.11 (0.08)	0.13 (0.11)	0.38** (0.15)	0.37** (0.16)	0.35* (0.15)
size	0.13** (0.06)	0.17*** (0.07)	0.16** (0.08)	0.14* (0.08)	0.14 (0.08)
average salary	0.87*** (0.31)	0.16 (0.38)	-0.8* (0.47)	-0.8* (0.48)	-0.72 (0.47)
nb obs	2184	1701	1261	1260	1260
nb firms	631	499	374	373	373
log likelihood	-852.0521	-630.497	-437.654	-434.526	-433.8301

Random effect probit regressions; all explanatory variables are lagged by one year; industry and year dummies are included but not shown in the table; standard errors in parentheses; \*\*\*, \*\*, \* and denote significance level at the 0.1, 1, 5 and 10 per cent level

**Table 6: Alternative knowledge sources and matching between managers and firms**

	(i) Import experience	(ii) Export spillovers	(iii) Full model	(iv) Matching managers to firms
<i>Hiring variables</i>				
hiring with export experience	0.775*** (0.175)	0.755*** (0.177)	0.782*** (0.175)	0.808*** (0.176)
hiring without export experience	-0.1 (0.221)	-0.162 (0.223)	-0.095 (0.222)	-0.097 (0.221)
<i>Controls</i>				
import experience	0.508*** (0.108)		0.507*** (0.109)	0.506*** (0.109)
# exporting firms in vicinity		0.0004 (0.0005)	0.004 (0.003)	0.004 (0.003)
wage newly hired manager				-0.242* (0.144)
<i>management team level</i>				
foreigners in TMT	-0.082 (0.175)	-0.054 (0.181)	-0.077 (0.175)	-0.073 (0.176)
TMT size	-0.006 (0.011)	-0.008 (0.012)	-0.006 (0.011)	-0.008 (0.012)
average age in TMT	-0.009 (0.007)	-0.01 (0.007)	-0.009 (0.007)	-0.008 (0.007)
<i>firm level</i>				
export experience, firm-level	0.829*** (0.108)	0.951*** (0.108)	0.833*** (0.108)	0.839*** (0.109)
productivity	0.069 (0.109)	0.131 (0.111)	0.068 (0.109)	0.091 (0.11)
size	0.071 (0.066)	0.171*** (0.066)	0.071 (0.066)	0.089 (0.068)
average salary	0.185 (0.372)	0.146 (0.381)	0.199 (0.373)	0.443 (0.401)
nb obs	1701	1701	1701	1701
nb firms	499	499	499	499
log likelihood	-619.047	-629.586	-618.267	-616.833

Random effect probit regressions; all explanatory variables are lagged by one year; industry, region and year dummies are included but not shown in the table; standard errors in parentheses; \*\*\*, \*\*, \* and denote significance level at the 0.1, 1, 5 and 10 per cent level

**Table 7: Industry-specific export experience and moderating effect of firm size**

	Export experience and industry-specific export experience by firm size				
	(i) Industry-specific export experience	(ii) Export experience; < 55 employees	(iii) Export experience; >=55 employees	(iv) Industry-specific export experience; <55 employees	(v) Industry- specific export experience; >=55 employees
<i>Hiring variables</i>					
hiring with export experience t-1		0.97*** (0.24)	0.23 (0.29)		
hiring with export experience, same industry t-1	0.66*** (0.2)			0.89*** (0.27)	0.11 (0.34)
hiring with export experience, different industry t-1	0.73*** (0.28)			0.89** (0.43)	0.29 (0.42)
hiring without export experience t-1	-0.1 (0.22)	0.002 (0.27)	-0.32 (0.4)	-0.02 (0.27)	-0.34 (0.41)
<i>Controls</i>					
import experience	0.51*** (0.11)	0.51*** (0.12)	0.26 (0.26)	0.51*** (0.12)	0.25 (0.26)
nb exporters at proximity	0.004 (0.003)	0.01* (0.004)	-0.01 (0.01)	0.01* (0.004)	-0.01 (0.01)
foreigners in TMT	-0.1 (0.18)	-0.003 (0.31)	-0.25 (0.23)	-0.001 (0.31)	-0.27 (0.23)
TMT size	-0.01 (0.01)	0.05 (0.04)	0.02 (0.02)	0.04 (0.04)	0.02 (0.02)
average age in TMT	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.02)	-0.01 (0.01)	-0.02 (0.02)
export experience, firm-level	0.83*** (0.11)	0.97*** (0.12)	0.37 (0.27)	0.97*** (0.12)	0.36 (0.28)
productivity	0.06 (0.11)	0.03 (0.13)	0.03 (0.23)	0.02 (0.13)	0.03 (0.24)
size	0.08 (0.07)	0.16 (0.13)	0.22 (0.17)	0.15 (0.13)	0.24 (0.18)
average salary	0.19 (0.37)	0.55 (0.4)	-1.26 (0.96)	0.58 (0.4)	-1.32 (0.98)
nb obs	1701	1290	390	1290	390
nb firms	499	375	113	375	113
log likelihood	-618.776	-427.843	-147.38	-427.972	-147.35

Random effect probit regressions; all explanatory variables are lagged by one year; industry, labor market and year dummies are included but not shown in the table; standard errors in parentheses; \*\*\*, \*\*, \* and denote significance level at the 0.1, 1, 5, and 10 per cent level

**Table 8: Market-specific export experience and market selection**

	Probit estimations		Rank-ordered logit estimations	
	(i) Market-specific export experience	(ii) Industry- and market- specific export experience	(iii) Market-specific export experience	(iv) Industry- and market- specific export experience
<i>Hiring variables</i>				
hiring with market specific export experience	0.971*** (0.11)		0.916* (0.508)	
hiring with market specific export experience, same industry		0.937*** (0.134)		1.096** (0.557)
hiring with market specific export experience, different industry		0.692*** (0.161)		1.542*** (0.629)
hiring without export experience	-0.038 (0.122)	-0.053 (0.123)	-1.122** (0.451)	-0.826** (0.414)
<i>Control</i>				
previous export experience in the market	0.652*** (0.107)	0.647*** (0.107)	2.342*** (0.187)	2.342*** (0.187)
import experience from region	-0.294*** (0.079)	-0.293*** (0.08)	.	.
# exporters to region	0.0001 (0.0003)	0.0001 (0.0003)	-0.00001 (0.001)	-0.00002 (0.001)
Real GDP region (ln)	0.961 (1.23)	0.952 (1.227)	0.569*** (0.034)	0.567*** (0.034)
nb obs	4155	4155	4432	4432
Pseudo R-squared	0.3586	0.3581	.	.
log likelihood	-885.1716	-885.8766	-868.92	-867.89

Notes: All explanatory variables are lagged by one year; standard errors in parentheses; \*\*\*, \*\* and \*denote significance level at the 1, 5, and 10 per cent level

**Table A1. Export market selection when initiating export activities**

<b>Regions</b>	<b>Number of export market entries</b>
Northern Africa	5
Sub-Saharan Africa	5
Caribbean	2
Central America	6
South America	3
North America	49
Central Asia	0
Eastern Asia	20
Southern Asia	3
South-Eastern Asia	10
Western Asia	16
Eastern Europe	34
Northern Europe	183
Southern Europe	16
Western Europe	70
Oceania	7
<b>Total</b>	<b>429</b>

# **CHAPTER 3: The more, the merrier? Investigating the effect of grafting export-related knowledge in already exporting firms on their subsequent export growth**

## **ABSTRACT**

This paper expands our understanding of the role of knowledge derived from other sources than the firms' own experience in international markets on firms' internationalization and does so by focusing on the effect of hiring managers with export experience on firms' export growth. Econometric analyses on an unbalanced panel of Danish exporters in the manufacturing sector covering the years from 1997 to 2006 are used to investigate this relationship. The results show no significant association between the event of hiring managers with export experience and a firm's export growth rate. However, it is argued in this paper that the effect of hiring managers with export experience on a firm's subsequent export growth may depend on the recruiting firm's prior export experience. The findings support this claim, and show that the effect of hiring managers with export experience indeed depends on the scope of a firm's export portfolio, measured in terms of number of markets a firm is exporting to. The effect of hiring managers with export experience increases with the number of export destinations. Conversely, the depth of the recruiting firm's export experience, measured by the number of years a firm has been exporting, does not play a role in this context.

## **1. INTRODUCTION**

The role of knowledge in firms' internationalization process is widely acknowledged in the international business literature (Eriksson, Johanson, Majkgard, & Sharma, 1997; Forsgren, 2002;

Johanson & Vahlne, 1977, 2009). Early work in this line of research has emphasized the role of experiential knowledge in enabling firms to further internationalize (Johanson & Vahlne, 1977). With time, the spectrum of possible sources of knowledge about international markets and internationalization in general has expanded. First, evidence of vicarious learning where firms learn about international markets by observing and interacting with others, for instance with their network has been provided (Johanson & Vahlne, 2009). Second, evidence of congenital learning where newly established firms learn from the founding team's prior international experience has been documented in the literature on international new ventures (Casillas, Moreno, Acedo, Gallego, & Ramos, 2009; McDougall, Oviatt, & Shrader, 2003). At last, evidence that firms may gain international knowledge through grafting, i.e. by internalizing a source of knowledge, either through the acquisition of knowledgeable organizations or recruiting internationally experienced employees, has been provided (Andersen & Choquette, 2012; Loane, Bell, & McNaughton, 2007; Mion & Opromolla, 2011; Sala & Yalcin, 2012).

This paper focuses on the latter and provides first evidence on the effect of grafting international experience to the management team on firms' international growth. Case study evidence suggests that grafting may indeed be a way for firms, particularly smaller firms, to rapidly gain experiential knowledge about internationalization and specific export markets (Fletcher & Harris, 2012).

Grafting international experience to the management team has, however, been devoted very scant attention in IB research (De Clercq, Sapienza, Yavuz, & Zhou, 2012) despite the volume of research focusing on the role of managers and the repeated evidence stressing that managers play a central role in determining firms' international behavior and performance. The research on managers' importance in the internationalization process is well rooted in the behavioral approaches to decision-making (March & Simon, 1958) and internationalization (Johanson & Vahlne, 1977), as well as in the theory of upper echelons (Hambrick & Mason, 1984). It emphasizes decision-makers'

bounded rationality, knowledge, and cognitive schemes as central elements in explaining how they play a role in firms' internationalization process. The bulk of evidence steaming from this research stream documents that managers' characteristics, for instance their international intentions (Nielsen & Nielsen, 2011), their demographics (Rivas, 2012), and their international experience (Loane, et al., 2007; Nielsen, 2010; Papadopoulos & Martín Martín, 2010; Reuber & Fischer, 1997) are linked to firms' internationalization process and performance. However, an understanding of how a change in a firm's top management team composition and managerial resources will affect its internationalization is more or less absent in the field (Nielsen, 2010), with the exceptions of Mion and Opromolla (2011), Sala and Yalcin (2012) and Andersen and Choquette (2012) who provide evidence that hiring export experienced managers increases a firm's likelihood of becoming an exporter. However, the literature has been, until now, silent about the effect of grafting export experienced manager on a firm's international growth and this is addressed in this paper.

In addition of looking at the main effect of grafting experiential knowledge to a firm's managerial team on its export growth, this paper investigates whether integrating and exploiting the export knowledge brought in by newly hired managers is influenced by a firm's prior experience in international markets. As this paper focuses on current exporters, all sampled firms have, by default, a certain level of prior export experience when recruiting new managers. Therefore, the analysis goes beyond simply distinguishing between whether a firm possesses international experience or not. Drawing from previous research, this paper hypothesizes that the breadth of a firm's international experience at the moment of hiring, measured by the number of export destinations (Erramilli, 1991), increases its ability to exploit such knowledge. Adversely, building on evidence documenting the role of organizational routines in reducing firms' ability to learn (Weick, 1991), this paper argues that the depth of a firm's international experience, measured by the recruiting firm's number of years of export experience (Erramilli, 1991), reduces the chance for firms to

exploit the export knowledge brought in by newly hired managers. The findings presented later on are partly in line with these two hypotheses.

This paper presents both theoretical and managerial contributions. By providing evidence that the effect of grafting export experience to the management team on a firm's export growth is positively moderated by the number of markets a firm is exporting to, this study extends our understanding of how different sources of knowledge influence a firm's internationalization. Moreover, it uncovers a way in which international, experiential knowledge may be linked to firms' international growth by showing that it enables them to benefit more from external knowledge brought in by new managers.

The remainder of the paper is structured as follows. Section 2 provides a more detailed review of the literature and develops the hypotheses to be tested in this paper. Section 3 argues for the choice of empirical strategy and in Section 4 the data is described and the variables included in the analysis are defined. Section 5 presents and discusses the results of the main analysis and of the robustness checks conducted to assess the sensibility of these results. In section 6, the paper concludes and presents avenues for further research.

## **2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### **2.1. Top Management Team Internationalization and Export Behavior**

A large body of research focuses on the role of managerial resources in the internationalization of firms and highlights their crucial importance (Knight, Madsen, & Servais, 2004; Loane, et al., 2007; Reuber & Fischer, 1997). Part of this literature is specifically concerned with managers' and top management teams' international experience and particularly focuses on how it affects firm's internationalization. Managers' international experience has been related with specific behavior influencing their firm's internationalization, such as being better at establishing strategic

partnerships and using their networks in foreign markets (Reuber & Fischer, 1997). Moreover, managers' international experience has been linked with diverse internationalization outcomes such as international diversification and choice of entry modes (Nielsen & Nielsen, 2011), degree of internationalization (Reuber & Fischer, 1997), and overall firm performance (Nielsen, 2010). While earlier contributions are very helpful in deepening our understanding of the implications of managerial characteristics and resources as regards to strategy and performance, the trend has been to take a static view of this relationship. Such an approach has pros and cons, obviously. On the one hand it allows researchers to obtain more detailed information about the experience and/or the behavior of firms with regard to their internationalization. On the other hand, we know very little about the consequences of a change in managerial resources on a firm's internationalization (Nielsen, 2010), for instance following the recruitment of a new export-experienced manager, besides that it makes the recruiting firms' more likely to start exporting (Andersen & Choquette, 2012; Mion & Opromolla, 2011; Sala & Yalcin, 2012).

Yet, the literature on international new ventures provides insights as to the effect of international experiential knowledge acquired prior to the establishment of the new venture on its rapid internationalization (Knight, et al., 2004; Oviatt & McDougall, 1997). Indeed, evidence has documented how the founder's or the founding team's prior knowledge about international markets increases the chance of a new venture to internationalize very soon after its inception. Nonetheless, the knowledge held by newly hired managers may not be as easily transferable to or integrated into an established company due to its inability or unwillingness to learn (Weick, 1991). Therefore, it remains unclear how the prior experience of newly recruited managers influences the export growth of the focal firm.

Scholars adopting a behavioral lens have argued for the importance of managers' international experience in the internationalization process of firms. Behavioral scientists indeed assert that

managers are faced with bounded rationality when it comes to decision-making and that their cognitive schemes, defined in part by their previous experience, act as filters through which situations are perceived and interpreted and solutions chosen (Cyert, 1963; March & Simon, 1958). Similarly, the upper echelon theory stipulates that organizations are reflections of their top management team since managers' cognitive base and values determine their attention span and interpretation, thereby influencing strategic decisions and outcomes (Hambrick & Mason, 1984). Following this reasoning, managers with international experience may be perceived as more likely to pay more attention to international activities, to adopt a different behavior in international markets, and to have a different perception of the risks involved and the opportunities for their firm in international markets (Ellis & Pecotich, 2001; Reuber & Fischer, 1997). As such, the knowledge brought in by newly hired export experienced managers may add to the cognitive base of a firm, which serves as the root of its behavior (Gioia & Manz, 1985). Managers may bring experiential knowledge about a foreign market to a firm, which may result in reconsideration and change in its export market portfolio and consequently change its performance in international markets. Moreover, newly hired managers may help redeploy resources in a more efficient manner based on their knowledge of how to conduct export activities and of certain export markets, which may lead to larger export growth.

In light of this, the following hypothesis is formulated:

**Hypothesis 1:** Firms that hire export experienced managers experience a higher growth in export sales compared to firms who do not hire managers with export-related knowledge.

## **2.2. Moderating Effect of Recruiting Firms' Level of Export Experience**

It is however not because firms are exposed to external knowledge through hiring managers with export knowledge that they automatically benefit from it. Indeed, having a few individuals possessing [international] knowledge does not necessarily equal having organizational-level knowledge [of the internationalization process] (Casillas, et al., 2009). A firm needs to be aware of the value of the new knowledge, to adapt it to its own situation and to disseminate it throughout the organization in order to be able to exploit it. According to the proponents of the concept of absorptive capacity, a firm's ability to recognize, assimilate and act upon external knowledge rests on the firm's prior related knowledge, without which it becomes very difficult to do so (Cohen & Levinthal, 1990; Volberda, Foss, & Lyles, 2010). A large body of literature has focused on defining absorptive capacity and how it impacts the extent to which firms are able to take advantage of the knowledge developed by others (Volberda, et al., 2010). While the concept of absorptive capacity has largely been related to innovation capabilities and firm performance (Volberda, et al., 2010), more and more research in the field of international business draws on the concept (Casillas, et al., 2009; Eriksson & Chetty, 2003; Lane, Salk, & Lyles, 2001). Applied to the context of this paper, it is argued that a firm's prior export experience, being a source of prior [related] knowledge and forming the basis of its cognitive base, may affect the extent to which it benefits from hiring managers with export experience.

Previous research has documented that firm-level international experience is multifaceted and has particularly focused on two elements: its depth, in terms of number of years of international experience; and its breadth, in terms of number of markets a firm is exporting to (Cadogan, Diamantopoulos, & Siguaw, 2002; Erramilli, 1991; Papadopoulos & Martín Martín, 2010). Using the same operationalization of international experience, Eriksson and Chetty (2003) argue that both the breadth and the depth of a firm's international experience positively affect its absorptive

capacity. In the context of this paper, the breadth of international experience might ensure that a firm has experience in integrating and in dealing with diverse information and stimuli and enhances a firm's cognitive base, thereby increasing its ability to use external knowledge. Moreover, following the absorptive capacity argument; the broader a firm's knowledge about international markets, the likelier it is that the export knowledge brought in by new managers relates to the recruiting firm's existing knowledge base. This leads to the formulation of the second hypothesis tested in this paper:

**Hypothesis 2:** The breadth of a firm's export experience positively moderates the relationship between hiring export experienced managers and export growth.

Eriksson and Chetty's (2003) study focuses on market knowledge and thereby absorptive capacity in relation to specific markets and/or networks. In this context, it is reasonable to argue that the depth of international experience in a specific market increases a firm's absorptive capacity related to the relationships developed in relation to that market. However, when adopting a broader perspective on international experience and looking at the overall international experience of a firm, one could argue that the depth of its experience may act as an inhibitor to the integration and use of external knowledge. One could imagine that firms which have been involved in export activities for a long time have well-established routines for conducting international business and beliefs about which markets to serve. As routines are there to ensure achievement of definite outcomes, they reduce a firm's openness toward integrating new knowledge (Weick, 1991) and thereby may create a certain resistance to change. Therefore, it is possibly harder for newly hired managers to exploit their export knowledge gained in previous employment in such a context. This leads to the formulation of the last hypothesis of this paper:

**Hypothesis 3:** The depth of a firm's export experience weakens the effect of hiring managers with export experience and export growth.

### 3. ECONOMETRIC APPROACH

Because the variable which this paper attempts to explain is the rate at which a firm's export sales are growing, which is a continuous variable, linear models are used for testing each of the three hypotheses stated above. Moreover, because panel data are used, unobserved heterogeneity across subjects (firms) is taken into account by using fixed-effect linear regression models. The baseline model is specified in the following way:

$$Exp\_growth_{it} = \beta_0 + \beta_1 hiring\_exp_{it-1} + \gamma Z_{it-1} + \delta_t + \varphi industry_t + c_i + \mu_{it}; \quad (1)$$

where  $Exp\_growth_{it}$  represents the rate at which firms' total export sales are growing from year  $t-1$  to  $t$ .  $hiring\_exp_{it-1}$  is the variable indicating whether a firm has hired an export experienced manager in the previous time period and, as such,  $\beta_1$  is the parameter of interest of this paper.

$Z_{it-1}$  represents the lagged control variables,  $\delta_t$  represents the year dummies included in the model and  $\varphi industry_t$  represents the industry dummies to account for heterogeneity across different industries. The advantage of employing a fixed-effect setting is that this model allows to account for unobserved constant factors ( $c_i$  in the equation above) that could impact firms' export growth rate (Wooldridge, 2002).

To test hypotheses 2 a moderated fixed-effect linear models are used. This implies that the variable of interest, the event of hiring at least one manager with export experience, is interacted with the number of export markets. Using a moderated model allows investigating which group of firms particularly benefits from hiring experienced managers or put another way, under which circumstances hiring experienced managers is beneficial for a firm's rate of export growth. As such,

the rejection or not of the different moderation hypotheses depends on the significance of the interaction term, while the main effects of both the predictor and the moderator in the moderated regressions are irrelevant when testing a moderating relationship (Baron & Kenny, 1986). The moderated model are specified as in the following:

$$Exp\_growth_{it} = \beta_0 + \beta_1 hiring\_exp_{it-1} + \beta_2 moderator_{it-1} + \beta_3 hiring\_experience_{it-1} \quad (2)$$

$$* moderator_{it-1} + \gamma Z_{it-1} + \delta_t + \varphi industry_t + c_i + \mu_{it}$$

where  $\beta_3$  is the coefficient of interest.

Hypothesis 3 is tested by running model (1) on different samples consisting of firms with different number of years of experience.

## 4. EMPIRICAL STRATEGY

### 4.1. Sample

The analysis focuses on the case of Denmark and is conducted on a sample of exporters of more than 10 employees covering the period from 1997 to 2006. As the aim of this paper is to look at the growth of export sales following the recruitment of managers with export experience, the sample is limited to the years in which a firm is exporting. This means that non-exporting firms are excluded from the analysis and that those years prior to export initiation and following a stop in export activities are also left out of the sample. Hence, after deleting firms which do not report any manager in any of the year and outliers<sup>11</sup>, the sample consists of an unbalanced panel of 6,357 observations corresponding to 1,354 exporting firms.

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<sup>11</sup> Some firms have extreme and questionable export growth, which when included in the estimations considerably influence the results. Therefore I deleted the observations that are in the top 10% of export growth in the final sample, which corresponded to deleting observations with a yearly export growth rate above 340%.

## 4.2. Variables and Data Sources

### *Dependent variable*

The dependent variable, the rate of export growth, is constructed using the trade registers available via a restricted access to Statistics Denmark. This data set contains information about the trading patterns of firms and is available at the destination and product level. It informs us about the quantity and value of exported and imported goods for each product to each destination in every year<sup>12</sup>. In this paper, the analysis is conducted at the firm level and the rate of export growth is computed in the following way:

$$Exp\_growth_{it} = (export\_sales_{it} - export\_sales_{i,t-1}) / export\_sales_{i,t-1} \quad (3)$$

By construction, the dependent variable is only observed from a firm's second year of exporting and until it stops its export activities.

### *Independent variables - Variable of interest*

The explanatory variable in focus in this paper accounts for the event of hiring managers with export experience and is constructed by combining trade registers with employer-employee data sets. The employer-employee data is crucial for identifying which individuals hold a managerial position and not least when (in which year) a firm recruits a new manager. All individuals who are part of the active population are included in these employer-employee databases and are attributed a code corresponding to the job position they hold in a firm, in each year.

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<sup>12</sup> Mention should be made of the fact that different reporting criteria apply to exports to EU and non-EU destinations, constituting a potential source of discrepancy in export figures and consequently in the growth rate of a firm's export activities. While non-EU export figures are obtained via tax declaration, EU export figures are subject to looser reporting criteria. For instance, in 2012, only firms whose export exceeds DKK 5m (ca. 666,666 EUR) to EU destinations (all confounded) are required to report their export activities. The reporting threshold is much lower for non-EU destinations, set at DKK 7,500 (ca. 1,000 EUR) for a transaction. Further information about the Foreign Trade Statistics can be found on Statistics Denmark's website.

The variable used to identify managers is called DISCO which comes from the Danish version of the International Standard Classification of Occupations developed by ILO (International Labour Organization). This variable is available from the wage statistics, in which every employer attributed a code for the main occupation of each of its employees. Despite a change in the coding of the variable in 2003, where additional and more detailed occupational categories were added, the variable is consistent during the whole period. Firms with more than 10 employees are required to provide this information. For this reason, the baseline analysis is made on a sample of firms that have at least 10 employees. This variable has been used in several instances in previous research where the identification of individuals holding a managerial position is at the core (Frederiksen, et al., 2010; Frederiksen & Kato, 2011; Smith, Smith, & Verner, 2011)<sup>13</sup>. It is important to note that not all firms report having managers though. In fact, a large part of the population of firms does not, especially smaller ones. This should be kept in mind when assessing the results.

Having identified all managers, it became possible to construct a yearly indicator of whether individual holding a managerial position changed employer, and whether the newly hired manager came from an exporting firm or not. After aggregating the individual-level data at the firm level, the following dichotomous variable was created:

$$hiring\_exp_{it-1} = \begin{cases} 1, & \text{if firm } i \text{ hired at least one manager with export experience in } t - 1 \\ 0, & \text{if firm } i \text{ did not hire any manager with export experience in } t - 1 \end{cases} \quad (4)$$

Note that the variable is lagged by one year. As the exact time of hiring is unknown (we only know the year in which an individual changes employer), lagging the variable ensures that the event of hiring occurs before any change in export sales within a current year. An additional condition is made to ensure that a manager hired in the previous period is still employed by the same firm in time  $t$ . Finally, it is important to note that the DISCO variable used to identify managers refers to

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<sup>13</sup> In this paper, individuals who are attributed a DISCO code starting with 1 are considered as managers, all codes starting with 1 refer to the overall category of *Managerial Work (Ledelsesarbejde)*.

the main occupation of an individual over a year, while the variable identifying the employer of each individual refers to the firm in which the individual is employed ultimo November of each year. Potentially, this may create discrepancies, especially in cases of labor mobility occurring late in the calendar year. In such cases, an individual may be attributed a DISCO code which refers to his previous occupation, while the employer identifier refers to his new employer. To reduce this measurement error, an additional condition stating that an individual needed to be categorized as a manager also in the next time period was imposed. This last condition ensures that only managers' mobility is captured and, as such, cases where an individual changes employer and moves from a managerial to a non-managerial position relatively late in the year are disregarded. Robustness checks where these conditions are relaxed are performed at the end of the paper.

Furthermore, I control for alternative options firms have when deciding to hire a new manager, namely (1) hiring a manager without export experience, and/or (2) internally promoting an individual into management position. Indeed, the event of hiring or internally promoting an individual into a managerial position may in itself have an effect on a firm's export growth. This is addressed by controlling for whether a firm hired a manager without export experience and for whether a firm internally promoted an individual into management. The variables are constructed in a similar fashion and are subject to the same conditions mentioned above:

$$hiring\_noexp_{it-1} = \begin{cases} 1, & \text{if firm } i \text{ hired managers without export experience in } t - 1 \\ 0, & \text{otherwise} \end{cases} \quad (5)$$

$$internal\_promotion_{it-1} = \begin{cases} 1, & \text{if internal promotion into managerial position in } t - 1 \\ 0, & \text{otherwise} \end{cases} \quad (6)$$

### ***Independent variables – Moderators***

As mentioned, the aim of this paper is not only to test whether there is an effect from hiring managers with export experience on subsequent export growth, but also to test whether a firm's

export experience prior to recruiting moderates this relationship. In other words, I am interested in finding out if and how firms' level of export experience influences the strength and direction of the relationship between hiring export experienced managers and subsequent export growth.

The first moderator is the breadth of export experience of the recruiting firm at the moment of hiring, which in line with the literature is approximated by the number of export markets a firm is present on at the moment of hiring (Cadogan, et al., 2002; Eriksson & Chetty, 2003; Erramilli, 1991; Papadopoulos & Martín Martín, 2010).

The second moderator accounts for the depth of the recruiting firm's export experience, which is approximated by the number of years a firm has been exporting prior to the moment of hiring (Cadogan, et al., 2002; Eriksson & Chetty, 2003; Erramilli, 1991; Papadopoulos & Martín Martín, 2010). As the variable is by construction truncated because exporting experience is only traced back to 1997, the depth of export experience is divided into two categories: (1) firms with less than 5 years of export experience at the moment of hiring and (2) firm with 5 years and more at the moment of hiring.

### ***Independent variables – Controls***

In addition to the previously mentioned independent variables, a series of factors that have been found to be related to firms' export behavior in previous studies are controlled for.

At the firm level, a variable accounting for firm size is included as large firms may be more likely to be exporters and to export more (Bernard & Jensen, 2004; Majocchi, Bacchiocchi, & Mayrhofer, 2005). In line with the literature, I compute firm size as the logarithmic transformation of the number of employees in each year. Firm productivity is also controlled for as it has been shown that more productive firms self-select into exporting (Bernard & Jensen, 2004; Melitz, 2003) and may therefore be able to export more. Here, I measure firm productivity as labor productivity which is

defined as the logarithmic transformation of a firm's value added divided by the number of employees. By including the log of the average wage within a firm, in each year, I also account for differences in quality of the labor force across firms, which could either enable or constrain a firm in its international activities (Bernard & Jensen, 2004). To control for whether the newly hired manager fills an existing position or a newly created one, the size of the management team is included in all regression models<sup>14</sup>. This is to distinguish between the effect of having a large management team from the one of hiring experienced managers on the rate at which a firm's export activities are growing.

Finally, industry and year dummies are included in all models to account for heterogeneity in export behavior across industries and for business cycles which may also impact the rate at which a firm's export activities grow. All the control variables are lagged by one year to control for possible reverse causality between firm characteristics and export behavior.

Descriptive statistics and a correlation matrix of all the variables stated above and included in the regression models are presented in Tables 1 and 2 below. Table 1 shows that the average rate at which firms' export sales grow from year to year is 6.34%, ranging from -100% (when a firm ceases to export) to 339.7%. Around 13% of the firm-year observations constitute events in which a firm has hired at least one manager with export experience, corresponding to 834 hiring cases. Furthermore, Table 1 provides separate summary statistics for firms which have hired export experienced managers at least once during the period and for firms which have never hired export-experienced managers. Here we see that hiring firms have larger average rates of export growth, are larger, export to more markets and have longer export experience, are more productive and pay higher wages. Table 2 shows that there is a positive and significant correlation between hiring

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<sup>14</sup> As a robustness check, the models have been run on two samples: (1) on the sample of cases where hiring did not lead to an increase in the management and (2) on the sample of cases where hiring led to an increase in the management team. The results remain the same.

managers (with export experience) and a firm's subsequent rate of export growth. No variables appear to have very high correlation with each other.

## 5. RESULTS AND DISCUSSION

Table 3 presents the results for each of the three hypotheses developed in Section 2. In column (i) we see that firms having recruited export experienced managers do not experience different export growth than those that did not. While not reported in Table 3, I also tried and distinguished between industry-specific export experience and similarly, no significant effect of hiring managers with export experience was found, neither for intra- nor inter- industry export experience. Based on these results it can be concluded that H1 is not supported, as grafting export experience to the management team by hiring an experienced manager does not appear to result in higher export sales.

However, as previously argued, the effect of recruiting experienced managers might depend on the recruiting firm's export experience. Let us therefore proceed to the second part of the analysis in which whether the effect of hiring experienced managers depends on a firm's breadth of export experience at the moment of hiring is first investigated. The results, presented in columns (ii) and (iii) of Table 3, show that the breadth of the recruiting firm's export experience, measured by the number of its export markets, positively moderates the relationship between grafting export knowledge through hiring experienced managers and a firm's subsequent export growth. The results show that firms that are present on a larger number of export markets and hire managers with export-related knowledge experience a higher export growth, compared to those who do not hire such managers or those who are present on fewer markets. As such, grafting export knowledge to the management team by hiring managers with export experience is not, per se, a sufficient condition for experiencing higher export growth. On the contrary, learning from the export

experience of newly hired managers depends on the recruiting firm's prior international experience, and particularly its breadth. This is in line with the scant literature on absorptive capacity in the context of international business and provides support to H2. When looking at the magnitude of the effect, the results indicate that a firm which is present on one more export market at the moment hiring a manager with export-related knowledge experiences a higher growth rate in exports of 0.3 percentage point. Considering that the average rate at which firms' exports are growing is of 6.3 per cent, the effect represents an increase in export growth of 4.7 percent, which is not negligible.

Looking at the number of years that a firm has been exporting to at the moment of hiring and the effect of hiring managers with export-related knowledge, no significant moderating effect of a firm's depth of export experience on the relationship between hiring managers with export experience and export growth is found (columns (iv) and (v) of Table 3), indicating that H3 is rejected.

While the main effect of the moderators is not the focus of this paper, it is at first sight intriguing that the rate at which a firm's export activities grow is negatively related to its level of experience in export markets, and particularly its breadth. Indeed, firms being active in more export markets have lower rate of export growth while the depth of a firm's export experience does not significantly influence a firm's export growth rate. These findings contradict the notion that experiential knowledge is the core driver of a firm's internationalization process (Johanson & Vahlne, 1977). The negative effect of a firm's breadth of export experience on its export growth is in contrast with other research which finds a positive association between a firm's number of export markets and its export growth (Cadogan, et al., 2002) and its propensity for further export market entry (Erramilli, 1991). However, departing from the behavioral approach to internationalization in which firms progressively expand their international activities (Johanson & Vahlne, 1977), one may argue that firms which are active on several export markets are likely to have a more established position,

meaning that they may be more likely to have reached maturity in the export markets they serve. Consequently, this may result in smaller growth opportunities. Moreover, firms may change entry modes over time, resulting in lower growth in export sales, without meaning that a firm is less involved in international activities. Alternatively, constraints in terms of resources may also explain why firms which are presents in more exporting markets may not experience as high an export growth, simply because they may not have the resources to respond to changes in the respective markets. Finally, the difference between our results and the ones from previous studies could also be explained by the fact that the present analysis is done on panel data, and more precisely using within-estimation. Previous research has in comparison been made on cross-sectional data, meaning that the relationship between depth and breadth of export experience and export growth is determined by comparing across subjects while in the present analysis it is determined by looking at the variation of these variables within subjects, over time.

### **5.1. Robustness Checks**

In this section the robustness of the results presented above is assessed, first by testing their sensitivity when the minimum threshold of 10 employees is ignored. To do so, I re-estimate the baseline model and the moderated models on the population of exporting firms which report having managers, the results of which are shown in Table 4 – panel 1. When using this new sample, still no main effect of hiring managers with export experience on export growth is found while the moderating, positive effect of the breadth of a firm’s export experience remains. As such, the findings presented in the previous section are not sensitive to this minimum size threshold.

Second, I test the sensitivity of the results by re-estimating the same two models as before while this time sequentially relaxing the two conditions imposed for the identification of managers’ mobility. Remember that managerial mobility is only considered to happen when (1) the individual is present

in the recruiting firm for at least two time periods and (2) the individual is also attributed a managerial position (according to the DISCO variable) in the second time period. First, only condition (2) is relaxed, meaning that the job position of an individual in the year following a change of employer is not considered for the identification of managers' inter-firm mobility. The results are presented in Table 4 – panel 2. Once more, they are robust in the sense that only the moderated relationship between the breadth of a firm's export experience when recruiting managers with export experience matters for subsequent export growth. Finally, both conditions are relaxed (see Table 4 – panel 3) and, despite resulting in many more cases of “hiring” and potentially in measurement error, the core results of this paper hold. Indeed, even without imposing any condition when defining managers' mobility, the moderated relationship between hiring a manager with export experience and the breadth of firm-level export experience is positive and significant while no main effect of hiring experienced managers on export growth is found. The results are therefore also robust to this specification.

Based on these robustness checks, it is sustained that the results found in the previous section are robust.

## **6. CONCLUSION**

Focusing on the case of exporters located in Denmark, this paper investigates the relationship between grafting managerial expertise about export markets to a firm's top management team by hiring in managers from exporting firms and a firm's export growth. The paper adopts a behavioral approach and goes beyond merely assessing the main effect of hiring such managers by looking at how recruiting firms' export experience influences whether and to which extent they are able to benefit from hiring such individuals. The results therefore present a novel angle to the discussion of the role and importance of managers in firms' internationalization.

More precisely, this paper shows that the effect of hiring managers with export experience fully depends on the number of markets the recruiting firm is exporting to. Indeed, in line with the absorptive capacity literature, the effect of hiring managers with export experience is larger, the more markets the recruiting firm serves. On the other hand, the number of years a recruiting firm has been exporting does not influence whether it benefits, i.e. experiences higher export growth, from hiring managers with export experience or not.

These findings are relevant for broadening our understanding of the different ways firms may learn to internationalize, and not least how grafting managerial resources affects a firm's export growth. Firms may indeed learn from hiring managers with international knowledge depending on how broad their knowledge about international markets is prior to hiring. As such, it is interesting to find that firms may learn in other ways than only through their own experience, though their experience remains important as it influences the extent to which a firm is able to exploit the new knowledge brought in by experienced managers. Hence, despite not being the focus of this paper, the results re-enforce the importance of firms' prior experience in international markets.

Finally, this study could be extended in several ways. For instance, to better understand how the recruitment of managers with export experience affects export growth, one might look at mechanisms which are likely to be at play, such as whether the venue of a manager with export experience affects a firm's export portfolio in terms of export destinations and products, thereby affecting its growth prospects. Moreover, alternative specification of export experience could provide a more sophisticated explanation as to under which circumstances firms are able to exploit export knowledge gained in its employees' previous employment.

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**Table 1: Summary statistics**

Variables	Mean	Std. Dev.	Min	Max	Firms which never hire managers with export experience		Firms which hire managers with export experience	
					Mean	Std. Dev.	Mean	Std. Dev.
Rate of export growth	0.063	0.894	-1	3.397	0.02	0.896	0.124	0.889
Hiring manager with export experience	0.131	0.338	0	1				
Hiring manager without export experience	0.021	0.143	0	1				
Internal promotion	0.210	0.407	0	1				
Number of export markets (destinations)	18.487	19.141	1	130	12.442	13.128	26.872	22.686
Number of years of firm-level export experience	4.701	2.272	1	9	4.523	2.277	4.947	2.241
Size of the management team	7.349	18.885	1	610	3.727	4.325	3.727	4.325
Firm size (ln)	4.319	1.185	2.303	9.451	3.807	0.9	5.029	1.167
Labor productivity (ln)	12.923	0.424	9.946	15.989	12.887	0.419	12.973	0.426
Average wage (ln)	5.165	0.165	4.59	7.681	5.152	0.169	5.185	0.156

Note: All variables except *rate of export growth* are lagged by one year; \*\*\* signifies that the difference between the means of the two groups is significant at the 1%-level.

**Table 2: Correlation matrix**

	1	2	3	4	5	6	7	8	9	10	11
1. Rate of export growth	1										
2. Hiring manager with export experience <sub>t-1</sub>	0.0279	1									
3. Hiring manager without export experience <sub>t-1</sub>	<b>-0.0011</b>	0.061	1								
4. Internal promotion	<b>0.0144</b>	0.1771	0.0603	1							
5. Nb of export markets (destinations) <sub>t-1</sub>	0.0681	0.2501	0.0403	0.208	1						
6. Nb of years of firm-level export experience <sub>t-1</sub>	0.0219	0.0255	<b>0.0041</b>	-0.0193	0.1309	1					
7. TMT size	0.0266	0.2628	0.1994	0.2359	0.3533	<b>-0.0117</b>	1				
8. Nb of foreigners in the management team <sub>t-1</sub>	<b>-0.004</b>	0.034	<b>0.0063</b>	0.0254	0.0444	<b>-0.0024</b>	0.0257	1			
9. Firm size (ln) <sub>t-1</sub>	0.0341	0.3403	0.114	0.327	0.5586	0.0246	0.464	0.048	1		
10. Labor productivity (ln) <sub>t-1</sub>	0.037	0.056	0.017	0.0781	0.167	<b>-0.0048</b>	0.0928	<b>0.0032</b>	0.1118	1	
11. Average wage (ln) <sub>t-1</sub>	<b>0.0054</b>	0.0818	0.0555	0.0684	0.1416	0.1312	0.0756	0.0226	0.1101	0.4362	1

Note: bold correlations indicates that the correlation has a p-value  $\geq 0.1$

**Table 3: Results, baseline and moderated models**

	Baseline model	Moderated model - breadth of export experience		Split sample - depth of export experience	
	(i)	(ii)	(iii)	(iv) < 5 years of export experience	(v) 5 years of export experience and more
<b><i>variables of interest</i></b>					
hiring with export experience	0.033 (0.043)	0.029 (0.043)	-0.06 (0.064)	0.015 (0.073)	0.067 (0.068)
hiring without export experience	0.073 (0.099)	0.071 (0.099)	0.074 (0.099)	-0.167 (0.136)	0.134 (0.167)
internal promotion	0.02 (0.035)	0.021 (0.035)	0.019 (0.035)	0.048 (0.052)	-0.035 (0.059)
<b><i>controls</i></b>					
tmt size	0.002 (0.002)	0.001 (0.002)	0.001 (0.002)	-0.007 (0.005)	0.007** (0.003)
firm size	-0.071 (0.061)	-0.036 (0.062)	-0.032 (0.062)	-0.104 (0.12)	-0.05 (0.128)
productivity	-0.032 (0.052)	-0.02 (0.052)	-0.02 (0.052)	-0.149* (0.088)	0.091 (0.106)
average wage	-0.186 (0.163)	-0.161 (0.162)	-0.148 (0.162)	-0.045 (0.368)	-0.233 (0.207)
<b><i>moderators</i></b>					
Number of exporting markets		-0.008*** (0.003)	-0.009*** (0.003)		
<b><i>moderating effects</i></b>					
hiring*nb of export markets			0.003** (0.002)		
Industry dummies	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes
Firm fixed-effects	yes	yes	yes	yes	yes
Nb obs.	6357	6357	6357	3292	3065
Nb firms	1354	1354	1354	1353	854
within R2	0.007	0.009	0.009	0.021	0.009

Notes: All models are fixed-effects linear regression models. All standard errors are clustered at the firm-level. \*\*\* p<0.01;\*\* p<0.05;\* p<0.1

**Table 4: Robustness checks**

PANEL 1	No size condition			
	(i) Direct effect model	(ii) Moderated model	(iii) Split sample; < 5 years export experience	(iv) Split sample; >=5 years export exporting
<i>variables of interest</i>				
hiring with export experience	0.026 (0.043)	-0.072 (0.063)	0.001 (0.072)	0.062 (0.067)
hiring without export experience	0.072 (0.099)	0.074 (0.099)	-0.16 (0.136)	0.122 (0.167)
internal promotion	0.017 (0.035)	0.015 (0.035)	0.041 (0.051)	-0.038 (0.059)
<i>moderators</i>				
Number of exporting markets		-0.01*** (0.003)		
<i>moderating effects</i>				
hiring*nb of export markets		0.003** (0.002)		
Nb obs.	6827	6827	3590	3237
Nb firms	1488	1488	1487	915
Within R-squared	0.01	0.0106	0.022	0.0088
PANEL 2	Relaxing condition 2			
	(i) Direct effect model	(ii) Moderated model	(iii) Split sample; < 5 years export experience	(iv) Split sample; >=5 years export exporting
<i>variables of interest</i>				
hiring with export experience	-0.005 (0.038)	-0.089 (0.056)	0.022 (0.067)	-0.018 (0.058)
hiring without export experience	0.075 (0.085)	0.076 (0.085)	-0.106 (0.129)	0.103 (0.134)
internal promotion	-0.009 (0.034)	-0.009 (0.034)	0.03 (0.051)	-0.05 (0.054)
<i>moderators</i>				
Number of exporting markets		-0.009*** (0.003)		
<i>moderating effects</i>				
hiring*nb of export markets		0.003** (0.001)		
Nb obs.	6357	6357	3292	3065
Nb firms	1354	1354	1353	854
Within R-squared	0.0073	0.0093	0.0204	0.0086
PANEL 3	Relaxing conditions 1 & 2			
	(i) Direct effect model	(ii) Moderated model	(iii) Split sample; < 5 years export experience	(iv) Split sample; >=5 years export exporting
<i>variables of interest</i>				
hiring with export experience	-0.013 (-0.034)	-0.097* (-0.051)	-0.013 (0.066)	-0.019 (0.056)
hiring without export experience	0.012 (0)	0.012 (0)	0.012 (0.122)	-0.002 (0.114)
internal promotion	0.013 (0)	0.011 (0)	0.013 (0.05)	-0.033 (0.053)
<i>moderators</i>				
Number of exporting markets		-0.009*** (0)		
<i>moderating effects</i>				
hiring*nb of export markets		0.003** (0)		
Nb obs.	6357	6357	3292	3065
Nb firms	1354	1354	1353	854
Within R-squared	0.0072	0.0092	0.0212	0.0081

Notes: All models are fixed-effects linear regression models and include firm-level controls but are not shown in the table. All standard errors are clustered at the firm-level. \*\*\* p<0.01; \*\* p<0.05; \* p<0.1.

## CHAPTER 4: Export Spillovers - Opening the Black Box<sup>15</sup>

### ABSTRACT

This paper studies the importance of export spillovers in a firm's decision to enter a specific export market and extends the current state of the literature by assessing different mechanisms through which they may occur, namely; (i) labor movement, (ii) intra-industry spillovers, and (iii) inter-industry linkages. We do so by exploiting a unique transaction level export data set of all manufacturing firms in Denmark over the period 1995-2006, which we merge with firm accounting data, employer-employee linked data and combine with information from yearly input-output tables. We corroborate the literature on export spillovers by presenting robust evidence of destination-specific export spillovers. We find strong evidence for the importance of labor mobility, intra-industry and backward linkages as channels for export spillovers. We find that intra-industry spillovers are particularly relevant for smaller firms, that backward linkages are particularly important for medium-sized firms, while relatively larger firms mainly benefit from foreign market specific information transmitted by recently hired employees. We, furthermore, find that export spillovers are most relevant for less developed countries suggesting that information related to less obvious export markets is particularly valuable in the export decision.

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## 1. INTRODUCTION

Numerous papers in the international trade literature analyzing the determinants of firms' export behavior have concluded that the sunk costs to enter a foreign market play an important role in firms' export decisions<sup>16</sup>. As part of this literature, scholars have tried to uncover what reduces the importance of these costs to better understand what pushes firms to internationalize. One factor that has been identified in previous research is export spillovers (Aitken, Hanson, & Harrison, 1997), i.e. the effect of the presence of firms involved in international trade on the export decisions of (nearby) non-exporting firms. The bulk of the empirical literature on export spillovers consists of firm-level studies focusing on the effect of foreign owned firms on domestic firms' export decision<sup>17</sup>. Firm-level studies on how the exporting activities of surrounding firms affect domestic firms' export decision are less common and present mixed evidence; while some provide support for the presence of positive export spillovers (Barrios, Görg, & Strobl, 2003; Clerides, Lach, & Tybout, 1998; Greenaway & Kneller, 2008), others reject their relevance (Aitken, et al., 1997; Bernard & Jensen, 2004; Lawless, 2010). More recently, studies based on transaction-level trade data provide evidence for destination-specific export spillovers. These studies show that a firm's decision to start exporting to a particular market is influenced by the presence of other firms exporting to that market in its surrounding. This relationship has been established for Spain (Castillo Gimenez, Serrano, & Requena Silvente, 2011; Requena Silvente & Giménez, 2007), France (Koenig, 2009; Koenig, Mayneris, & Poncet, 2010), Russia and the US (Cassey & Schneider, 2011).

While evidence for destination-specific export spillovers becomes increasingly available, the specific mechanisms behind this phenomenon are subject to speculations. The common identification strategy of export spillovers is to regress a dummy variable indicating whether a firm

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<sup>16</sup> See Wagner (2007) for a survey of the literature.

<sup>17</sup> See Greenaway and Kneller (2008) for a recent survey of the literature on export spillovers.

starts to export to a specific country on the mass of firms in a region exporting to that market while controlling for a variety of observed and unobserved factors. We extend the current state of literature in two ways. First, we specifically allow for alternative hypotheses that may explain the positive relationship between the mass of firms exporting to a specific market and a firm's decision to enter that market. Second, we have access to rich data which allows us to open the black box of export spillovers by distinguishing different channels through which these spillovers may occur. In particular, we can track the movement of employees between firms enabling us to investigate the effect of hiring a person that has previously worked for a firm exporting to a specific market on the probability that the new firm starts to export to this market in the following years. Beside the labor mobility channel, we consider two additional channels which we term intra-industry and inter-industry linkages. An example of the former channel is the signaling of a business opportunity in a particular export market by firms selling similar products. Inter-industry linkages can result in export spillovers through interactions between buyers and suppliers.

The empirical analysis is based on a unique transaction-level trade data set of all manufacturing firms in Denmark over the period 1995-2006, which we merge with firm accounting data and employer-employee linked data and combine with information from input-output tables. The availability of transaction-level trade data allows us to follow the recent literature on export spillovers and account for their destination specificity. The linked employer-employee data is the key to identifying the labor mobility channel, while we use yearly input-output tables to construct measures of the interconnectedness of different industries to investigate the inter-industry channels. We estimate a binary choice fixed effect logit model and present a careful identification strategy where we control for a variety of observed and unobserved heterogeneity in order to identify export spillovers.

Our results corroborate the existing literature in that we find evidence for export spillovers once we allow them to be destination specific. In addition to controlling for many observed and unobserved factors in our estimations, we would like to distinguish this effect from other explanations for why firms adopt similar export expansion patterns. We therefore allow for the following two alternative hypotheses; (i) change in comparative advantage and (ii) sequential exporting. The first hypothesis expresses the view that contemporaneous changes in comparative advantage of a region in Denmark and/or in a foreign market drive the effect. We address this concern in two ways. First, we add region- and country-specific trends to the estimations which allow for different trends over time in Danish regions and foreign markets. Second, we assess whether the effect is driven by continuously exporting firms or rather export starters. If mainly the latter firms were responsible for the finding, one should indeed worry that some kind of contemporaneous shock drives the results. However, in both cases, our results remain unchanged which suggests that our findings are not driven by changes in comparative advantage. The second hypothesis builds on the recent literature on sequential exporting (Albornoz, Calvo Pardo, Corcos, & Ornelas, 2010; Morales, Sheu, & Zahler, 2011) which documents that firms enter markets in a specific order and learn about potential markets which are similar in certain characteristics to markets they already serve. If all firms in Denmark act in this way, our results would simply capture this sequencing of expansions to new export markets. To address this concern, we add detailed information on firms' past export activities in different regions of the world to our estimations and again do not find any change with respect to the spillover variable.

We therefore conclude that our findings are suggestive of the presence of export spillovers and continue with exploring the channels through which they may occur. First, our results point towards the importance of labor mobility in the realization of export spillovers. We find that firms hiring employees with knowledge about specific export destinations acquired in previous jobs are

significantly more likely to start exporting to these countries. This result is robust to allowing the hiring decision to be endogenous using an instrumental variable approach. Moreover, our results suggest that intra-industry and backward linkages are also important for explaining export spillovers. We find that intra-industry spillovers are characterized by spatial decay suggesting that firms mainly observe their direct environment. In contrast, we do not find evidence for spatial decay in case of inter-industry spillovers. Inter-industry spillovers are fully driven by backward linkages indicating that firms receive foreign market specific information from their buyers. Sub-sample estimations show that intra-industry spillovers are particularly important for smaller firms and that backward linkages are only experienced by firms with less than 100 employees, while relatively larger firms mainly benefit from foreign market specific information transmitted by recently hired employees. Furthermore, we find that export spillovers are most relevant for less developed countries suggesting that information related to less obvious export markets is particularly valuable in the export decision.

The rest of the paper is structured as follows. In section 2 we define export spillovers and motivate the different channels of export spillovers. Section 3 presents the econometric model and identification strategy. In section 4 we present the data and section 5 contains the results. Section 6 concludes.

## **2. A CONCEPTUAL FRAMEWORK FOR EXPORT SPILLOVERS**

Differences across export markets make it difficult for firms to properly assess the potential costs and benefits related to the decision of starting to export to a specific country. For this reason, firms generally need to gather information about business practices, customers' tastes, competition and legal environments, as well as to find distributors for their products in the foreign market they intend to serve in order to be successful. Gathering such information can be costly for firms,

especially since the majority of these costs are sunk. As a result only a fraction of firms are able to afford exporting. A lot of focus in the trade literature has been on productivity differences as the main explanation for the selection of firms into exporting, as more productive firms are better equipped to face the sunk costs associated with exporting (Melitz, 2003).

Parallel to this literature, an interest has emerged in studying the presence of other firms involved in international trade as a factor that could induce domestic firms<sup>18</sup> to export, working partly through the reduction of (information gathering) sunk costs<sup>19</sup>. This phenomenon is termed export spillovers in the international trade literature and has been explained via three main mechanisms; information spillovers/externalities, competition effects and cost-sharing between firms at proximity (Aitken, et al., 1997). More recently, such spillovers have been studied more formally. Koenig (2009) provides a simple model à la Roberts and Tybout (1997) to rationalize the link between destination-specific export spillovers related to information flows and sunk costs. Cassey and Schmeiser (2011) develop a model based on Chaney (2008) showing that destination-specific export spillovers can also work through the intensive margin via a cost-sharing mechanism.

In this paper, we are particularly interested in export spillovers coming from information externalities and refer to export spillovers when the presence of exporting firms leads to export market entry by previously non-exporting firms. In this context, we define spillovers as the transfer of knowledge<sup>20</sup> between two firms which is not internalized by the sending firm, without assuming anything about the firms' intentions of transferring the information (De Clercq, Hessels, & van Stel,

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<sup>18</sup> In this paper, we use the term domestic firms and non-exporting firms interchangeably.

<sup>19</sup> It could also work through technological transfer or productivity spillovers between exporting and non-exporting firms. Studies have previously shown support to the learning-by-exporting hypothesis, which may result in productivity spillovers between exporting and non-exporting firms.

<sup>20</sup> It is not possible to distinguish between the types of knowledge transferred, for instance whether it is knowledge about international markets or technological knowledge. The latter could help firms to increase their productivity and their probability of being able to export. However, focusing our analysis at the destination-level, we believe that the first type of knowledge to be the most relevant. Technological knowledge transfer is likely to result in higher productivity for the recipient firm and therefore a higher chance of exporting, though not necessarily in a particular market.

2007). The literature on export spillover is largely silent on how the information is transmitted from one firm to the other. In this paper, we attempt at opening this black box by motivating three channels through which the information may flow and showing for which destination markets and firms the different channels are particularly relevant.

A first channel is inter-firm labor movement; in our case the movement of one employee from a manufacturing firm exporting to a specific market to a manufacturing firm not exporting to that market. We assume that while working in an exporting firm before, this employee has gained information about how to conduct business in the countries the firm was active in. Hence, this employee may use his knowledge about (and contacts in) the foreign markets and help the focal firm to start exporting to the same markets. This channel may be of special importance in a country like Denmark which is known for its flexible labor market inducing high labor mobility. The consequences of labor mobility on firm performance have been studied in other literature streams. For instance, in the body of research focusing on the consequences of FDI for hosting economies, the movement of people from foreign owned to domestically owned firms has been identified as a channel for knowledge transfer between the two entities resulting in higher productivity and wages in the domestic firms (Balsvik, 2011; Poole, forthcoming). This is in line with a wider stream of literature which focuses on the effect of labor mobility on different measures of firm performance providing evidence of learning-by-hiring (Parrotta & Pozzoli, 2012). Closer to our paper, evidence of a positive relationship between hiring managers (or employees) from an exporting firm and the recruiting firm's propensity to start exporting in subsequent years has been recently found (Andersen & Choquette, 2012; Mion & Opromolla, 2011; Molina & Muendler, 2009). Hence, this evidence points towards the importance of labor mobility in explaining how export spillovers work at the firm level.

A second channel via which export spillovers may occur relates to intra-industry linkages. For instance, information externalities may be experienced through the signaling of market opportunities by exporting firms, also termed as demonstration effect in the literature (Greenaway, Sousa, & Wakelin, 2004). If a firm is successful in a foreign market, this may induce other firms to imitate their strategy and try to export to that country. Such a signaling effect relates to the notion of mimetic behavior developed by institutional theory scholars; in situations of uncertainty firms tend to mimic the behavior of firms that are similar to them or that they see as models as it may be an inexpensive way for firms to assess potential opportunities (DiMaggio & Powell, 1983). Evidence of such mimetic behavior has been found in relation to the presence of multinational firms and its effect on domestically owned firms' export involvement (Belderbos, Olfen, & Zou, 2010).

Similarly, legitimacy may push firms to enter specific markets in order to prevent being seen as laggards and missing on opportunities that similar firms are exploiting (Clerides & Kassinis, 2009).

Export spillovers may also be an outcome of industrial linkages between firms from different industries, as found in the literature on productivity spillovers from FDI (Javorcik, 2004; Kneller & Pisu, 2007). Buyer-supplier relationships may open the door for knowledge exchange about international markets. Knowledge exchange could for instance take place when a buyer specifies product characteristics that are tailored to a specific export market. This way, the supplier learns about the taste, technical requirements as well as opportunities in this market which may result in subsequent market entry. Additionally, anecdotal evidence documents that when customers establish a subsidiary in a foreign country, they may ask their suppliers to "follow" them and serve the foreign market. This may lead to export market entry if the suppliers choose to adopt this entry

mode. Hence, inter-firm linkages may increase the recipient's awareness about opportunities in a specific export market and subsequently lead to the decision of entering it<sup>21</sup>.

Export spillovers have generally been studied in relation to geographical proximity; although proximity may matter more for certain channels than for others. For instance, it may be easier to monitor competitors' strategies on international markets when they are located close by. Inter-industry linkages may also be accentuated by geographical proximity where face-to-face contact and information exchange may be more frequent and easier. On the other hand, industrial linkages are not necessarily geographically bounded as buyer-supplier relationships imply frequent contacts, whether they are located at proximity or not (Kneller & Pisu, 2007). Hence we would expect the effect of intra-industry linkages to be amplified by geographical proximity, but not necessarily the one of inter-industry linkages.

As a final exercise in this paper, we investigate whether the importance of the mentioned channels varies across destination markets and firm size. Information requirements for export market entry into culturally and geographically more distant markets are likely to be higher which is why we expect that export spillovers are particularly relevant for such markets. Moreover, smaller firms may be more prone to observe the behavior of competitors and open to information from business partners as they have less capacity for conducting their own market research. On the other hand, larger firms tend to have a higher employee turnover and are perhaps better equipped in terms of resources to fully exploit the knowledge of their new employees. Hence, we would expect them to benefit more from the labor mobility channel compared to smaller firms.

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<sup>21</sup> Another reason for export spillovers, which we do not consider in our analysis, is public export promotion programs related to trade fairs where firms can share experiences and advice on how to approach a specific market. Evidence for such effects is weak (Bernard & Jensen, 2004).

### 3. ECONOMETRIC APPROACH

#### 3.1. Estimator

We model firm-level export initiation to individual markets in a way similar to Koenig et al. (2010). We assume that firm  $i$  starts exporting to country  $j$  in period  $t$  if the realized sum of profits abroad is larger than zero, where export profits positively depend on the supply capacities of the firm (e.g. productivity, size) as well as on demand capacities of the foreign market (e.g. size of the market) and decrease in trade frictions (e.g. geographical distance between Denmark and the foreign market). We model the probability that firm  $i$  starts exporting to market  $j$  as:

$$P(y_{ijt} = 1 | x_{ijt}, \varepsilon_{ijt}) = \Lambda(x'_{ijt}\beta + \alpha_{ij} + \mu_t); \quad (1)$$

where  $y_{ijt}$  is an indicator variable for export market entry and  $x_{ijt}$  contains firm-, region-, and destination-level covariates. The composite error term  $\varepsilon_{ijt}$  consists of a transitory component  $w_{ijt}$  and a time constant component  $\alpha_{ij}$ .  $\Lambda$  is the logistic cumulative distribution function indicating that we estimate the model by fixed effect logit. This estimator exploits the sufficient statistic

$\sum_t y_{ijt} = c$  (with  $1 < c < T$ ) in order to eliminate the firm-country pair fixed effect  $\alpha_{ij}$ .

Consequently, our sample only includes firm-destination pairs for which there is at least one switch from non-exporting to exporting over the period observed, leaving out firm-destination pairs in which a firm is continuously non-exporting or continuously exporting to a destination. Note also that controlling for firm-country-pair fixed effects implies also controlling for firm, region, and destination fixed effects. Hence, this estimator allows us to control for a large amount of unobserved heterogeneity.  $\mu_t$  is a time fixed effect controlling for yearly shocks common to all firms, e.g. related to the business cycle. We cluster our standard errors at the regional level as suggested by (Moulton, 1990) and (Cameron, Gelbach, & Millet, 2006).

### 3.2. Identification of Export Spillovers

The identification of export spillovers and their channels requires a careful assessment of other factors which may influence a firm's export decisions as well as of econometric issues related to simultaneity and reverse causality biases.

On the firm-level, we control for firm productivity<sup>22</sup> as we expect more productive firms to export because they can overcome the fixed costs of exporting easier (Melitz, 2003). Moreover, as more productive firms may self-select into denser areas (Melitz & Ottaviano, 2008), controlling for firm productivity prevents an upward bias of the coefficient estimate of the spillover variable. Similarly, we expect larger firms and firms with a more qualified labor force to be more likely to export which is why we control for firm size and average wage. We also include a dummy controlling for whether a firm imported from country  $j$  in period  $t-1$ . Importing from market  $j$  provides a firm with foreign market specific knowledge which may influence its decision to export to this market.

It is important to stress that we are interested in export spillovers related to information flows rather than general agglomeration effects related to urbanization. That is why we account for the degree of regional industrial agglomeration and the general level of competition within a region. Otherwise, our export spillover variable may identify industrial agglomeration or general competition effects rather than export spillovers. We measure industrial agglomeration as the region-industry (2-digit) share of national industrial activity. To control for situations where the region-industry share is large because the region is large, we normalize by the region share of national manufacturing activity as suggested by (Aitken, et al., 1997). The general level of competition is proxied by the total number of manufacturing firms in the region. We, furthermore, control for population at the regional level. The effect of regional population on firms' exporting behavior is ambiguous and may

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<sup>22</sup> Labor productivity is measured as the deflated value added over number of employees.

bias the spillover variable if not accounted for. On the one hand, a larger population could indicate a larger "domestic" market, which could reduce the propensity of exporting (Koenig, et al., 2010). On the other hand, a larger regional population possibly leads to a larger pool of qualified workers which could increase the productivity of firms in the region and consequently positively influence their export propensity.

Moreover, we control for the destination countries' market potentials by their GDP and population noting that the effect of market potential on exports is ambiguous depending on whether the market opportunity or the competition effect dominates (Melitz & Ottaviano, 2008). We also control for changes in the nominal bilateral exchange rate between Denmark and the destination market to capture changes in comparative advantage related to exchange rate movements<sup>23</sup>.

Besides controlling for observable factors, we also control for a variety of unobserved heterogeneity by firm-destination-pair fixed effects, which also subsume firm, region, and destination fixed effects separately. The firm fixed effects capture any time constant firm heterogeneity. Note that controlling for firm fixed effects implies controlling for region fixed effects as our sample does not contain firms which change location. Region fixed effects imply controlling for time-constant region characteristics; e.g. related to transportation infrastructure. Thus we prevent a bias of our spillover variable from picking up the effect of firms that agglomerate because they export rather than firms that export because of agglomeration. By controlling for country fixed effects, we allow for time constant differences in trade costs between Denmark and destination markets; e.g. related to a common border. Firm-country-pair fixed effects additionally allow for time constant special relations between a firm and a destination country, e.g. through FDI or employees from that country.

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<sup>23</sup> Foreign currency over Danish Krone (year 2000 = 1).

Finally, to address remaining endogeneity concerns, we lag all spillover and firm-level control variables by one year. First of all, this prevents a reverse-causality bias between firm controls and their exporting decisions. Moreover, lagging the spillover variables prevents a simultaneity bias of the spillover variable related to supply and demand shocks affecting firm  $i$ 's and the surrounding firms' export status simultaneously (Koenig, et al., 2010). Also, a potential reverse causality bias is addressed related to the fact that if firm  $i$ 's export behavior is impacted by surrounding firms' export status, the surrounding firms' export status is impacted by firm  $i$ 's export behavior.

### **3.3. Data**

Our data set is based on the population of manufacturing firms in Denmark for the period from 1995 to 2006. The trade data comes from the Danish customs and provides us with yearly information on export and import values for trading firms in Denmark at the firm-destination level. We merge the trade data with firm-level data available from Statistics Denmark for the same period using a unique identifier common to both data sets. Moreover, we merge regional information available from Statistics Denmark and destination market information to the data set. The data for destination market GDP and population comes from the World Development Indicator (WDI) database<sup>24</sup> and data on bilateral exchange rates is taken from Penn World Tables. Table 1 presents summary statistics of our variables.

We base the analysis on exports from Danish firms to 81 countries. These countries belong to the 95 per cent of Denmark's most important export destinations in terms of number of firm-country

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<sup>24</sup> Except for Taiwan for which the information is available from Penn World Tables.

relations<sup>25</sup>. Further note that we drop firms which change location during the sample period because these cases often appear to be data mistakes<sup>26</sup>.

As we investigate whether export spillovers are geographically bounded, the definition of regions is critical. Instead of focusing on administrative regions, we define regions according to functional-economic areas in Denmark (Anderson, 2000). In particular, we base the regional definition on the commuting areas in Denmark, in which municipalities are grouped together according to where most people live and work. We use this classification for two reasons: first, the administrative classification in Denmark is very detailed resulting in a large amount of "regions" including very few firms. Second, we believe that commuting areas classification provide a less random division of the territory. This classification identifies 51 regions (compared to over 270 municipalities) for our analysis, which is nevertheless very detailed compared to other studies on export spillovers. Note that the smallest unit of observation is the municipality, meaning that a municipality is never divided into two commuting areas and consequently that a commuting area is never smaller than a municipality (Anderson, 2000). Hence, we can be sure in which commuting area a firm is located by using a correspondence table between municipality and commuting areas.

Our final data set contains information on 4,511 firms that start exporting during 1995 and 2006, amounting to 248,793 firm-country-year observations.

### **3.4. Definitions of Variables**

#### ***Dependent Variables***

We are interested in the effect of export spillovers and their channels on the probability to start exporting to a specific market. Export market entry is modeled with the help of a dummy variable

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<sup>25</sup> One exemption is the Faroe-Islands which we drop due to data limitations. Another small restriction is that firms located on Bornholm are excluded from our analysis.

<sup>26</sup> This implies dropping 334 firms that enter at least one export market over the period.

equal to 1 if a firm is exporting to country  $j$  at time  $t$  but was not exporting to country  $j$  in the previous period, and equal to 0 when a firm is not exporting to country  $j$  in both  $t - 1$  and  $t$ .

Observations for subsequent years after which a firm starts exporting to a specific country are coded as missing<sup>27</sup>.

### ***Spillover Variables***

We construct several export spillover variables, each of which accounts for spillovers at different aggregation levels. The most aggregated export spillover variable is constructed as the number of exporting firms in a region in year  $t$ . We define the second spillover variable as the number of exporting firms within the same region and the same 2-digit industry firm  $i$  operates in to capture industry-specific spillovers (intra-industry spillovers). The third variable is computed by counting the number of exporting firms within a region which are exporting to the same market  $j$  at time  $t$  belonging to a different 2-digit industry than firm  $i$ . Thus this variable captures foreign-market-specific inter-industry spillovers. The fourth variable accounts for country- and industry-specific spillovers and is constructed as the number of firms within the same region and 2-digit industry exporting to the same country  $j$  in year  $t$  (destination-specific intra-industry spillovers). As firm from the same 2-digit industry are more likely to be competitors, this variable would for instance capture the signaling effect mentioned earlier.

### ***Channel Variables***

To further disentangle inter-industry export spillovers, we follow the literature on spillovers from multinational firms (Javorcik, 2004) and create two variables for forward and backward linkages using yearly input-output tables from Statistics Denmark. Forward linkages represent relations

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<sup>27</sup> A firm may be considered to start exporting to a specific country more than once over the period, for instance if it stopped exporting for at least two years and then started again.

between a firm and its supplier(s) while backward linkages represent relations between a firm and its buyer(s). Backward linkages are defined as:

$$Back_{kt} = \sum_s a_{kst} * Spill_{jst} \text{ for } s \neq k ; \quad (2)$$

where  $a_{kst}$  represents the amount of interconnectedness between two industries (2-digits). It is constructed as the share of the output produced by firms in sector  $k$  that is sold to firms in sector  $s \neq k$ .  $a_{kst}$  is multiplied by the number of firms exporting to market  $j$  in industry  $s$  and summed across all sector  $s \neq k$ .

Similarly, the forward linkages variable is computed as:

$$For_{kt} = \sum_h b_{hkt} * Spill_{jht} \text{ for } h \neq k ; \quad (3)$$

where  $b_{hkt}$  represents the share of total input bought by sector  $k$  from sector  $h \neq k$ , which is multiplied by the number of firms exporting to a specific market  $j$  in industry  $h$  and summed across all sectors  $h \neq k$ .

Finally, we account for the labor movement channel by exploiting a linked employer-employee data set. We are interested in the effect of hiring a person who has previously worked in a manufacturing firm exporting to a specific market on the probability that the new firm starts exporting to this market in the subsequent years. Such effects are most likely only related to the hiring of workers who have some influence on a firm's decision process. That is why we only consider the hiring of individuals that have earned a wage above firm-average at their previous and their current employer<sup>28</sup>. In particular, we construct the labor mobility variable by counting the number of above

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<sup>28</sup> To prevent that our results are driven by spinoffs or M&A activities, we replace the mobility variable with a zero if either of the following two conditions are met: 1) a firm hires more than 10 employees in a given year and 65per cent of the newly hired labor force comes from the same firm; 2) a firm hires more than 76 individuals in a given year. These

average wage employees firm  $i$  hires in period  $t$  who have worked in year  $t-1$  for a manufacturing firm exporting to market  $j$ . We call this variable  $Lmob_{ijt}$  in equation 4 below. To ensure that we capture the effect of hiring a person with foreign market specific knowledge rather than general hiring effects, we normalize this variable by the total number of workers (with above average wage in both previous and new firms) firm  $i$  hires in year  $t$  ( $Lmob_{it}$ ).

$$Lmob\_share_{ijt} = \frac{Lmob_{ijt}}{Lmob_{it}} \quad (4)$$

## 4. RESULTS

### 4.1. Export Spillovers and Export Market Entry

Before analyzing the channels of export spillovers motivated in section 2, we investigate whether we can at all document the presence of export spillovers in our data and if so how specific they are. We do so by introducing the four spillovers variables, one at a time, in columns (i) to (iv) of Table 2. Our results corroborate what previous studies have found and emphasize the importance of the destination dimension for identifying export spillovers (Koenig, 2009; Koenig, et al., 2010). We find evidence for positive and significant export spillovers only in columns (iii) and (iv) where we allow export spillovers to be destination specific. In column (v) we add both intra- and inter-industry destination-specific spillovers to the estimation equation and find that the marginal effect of one additional firm in the same industry located in the same region and exporting to a specific country is  $0.0018^{29}$ . This is equivalent to saying that an additional firm located in a specific region exporting to a particular market increases a firm's probability belonging to that industry and located

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conditions are based on the percentile distribution of firms' hiring activities and particularly, we set the cut-off at the 75<sup>th</sup> percentile. As robustness checks, we vary this threshold but the results remain the same. The estimates are presented in Table A3, in the Appendix.

<sup>29</sup> Train (2009) shows that the marginal effect in terms of percentage point changes of probability can be calculated as  $0.0018=0.013*0.159*(1-0.159)$ , where 0.159 is the average probability of starting to export to a specific country ( $P(y=1|x)$ ).

in that region to start exporting to that market by 1.11 per cent<sup>30</sup>. Inter-industry spillovers have a smaller (0.16 per cent) yet significant effect on the decision to start exporting. Hence, our findings suggest that intra-industry spillovers play an important role in the understanding of export spillovers.

The other covariates in Table 2 are as expected and indicate that larger and more productive firms have a higher probability of starting to export. Similarly, importing from a country increases the probability to also start exporting to it. Moreover, Danish firms start exporting to more developed and smaller countries.

To ensure that the findings above really capture export spillovers, we next consider alternative hypotheses which may also explain the effect of the spillover variables. First, we tackle the issue that firms may behave similarly simply because they are similarly affected by a change in comparative advantage. Despite controlling for region and destination market fixed effects and hence for time constant differences in the comparative advantage of a region in Denmark relative to foreign markets, the comparative advantage of a country or region may change over time. We address this concern by controlling for region and market specific linear time trends. Table 3 column (i) shows that our results are robust to the inclusion of these trends.

Second, we consider whether the intra- and inter-industry spillover effects we find come from continuously exporting firms or rather from export starters. Greenaway and Kneller (2008) point out that the effect of export spillovers may decay over time suggesting that information from new exporting firms may be more relevant for potential entrants. On the other hand, if the whole effect is driven by export starters, one may worry that the coefficient picks up contemporaneous shocks in foreign demand or policy changes. To investigate this issue, in column (ii) we distinguish the effect

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<sup>30</sup> We compute the percentage change in probability as  $1.11 = (0.0018/0.159) * 100$  (see e.g. Kneller and Pisu (2007)).

of export spillovers into those from export starters and continuous exporters. We consider as export starters firms that started to export in year  $t$  or  $t - 1$ . Hence continuous exporters are those that have exported to one market for at least 3 years. The results in column (ii) show that both types of firms are an almost equally important source of export spillovers.

Third, we address the issue that firms may enter the same markets simply because they follow a similar expansion path. Indeed, the emerging literature on sequential exporting shows that firms tend to expand gradually, gaining experience in one export market and afterwards expanding in similar markets (Morales, et al., 2011). To control for this, we group our 81 destination markets into regions, according to the UN geographical groupings (see Table A1 in the appendix), and include a dummy indicating firms' export participation in each of these regions. We find that most of these dummies are significant, indicating that indeed, previous exporting experience at the firm level matters for the decision to enter an additional export market close-by to a market already served. However, our results regarding the export spillovers remain unchanged in column (iii) of Table 3, suggesting that they are not driven by the sequential exporting phenomena.

Because our main results remain unchanged after controlling for alternative explanations, we conclude that the results are suggestive of export spillovers<sup>31</sup>.

### *Spatial decay*

As a final exercise before investigating the different channels of export spillovers, we assess how locally bounded export spillovers really are. In line with our previous discussion on the geographical proximity of spillovers, we test whether export spillovers are mainly driven by neighboring firms or whether they come from firms located anywhere in Denmark. As shown in

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<sup>31</sup> We also checked whether our results are driven by the fact that we use firm-level and not plant-level data. An implicit assumption made in this paper is that it is the presence of other headquarters that matters for export spillovers rather than the presence of specific plants. As a robustness check we therefore base our analysis on single plant firms only. Our results are robust to this check.

Table 4 column (i), we find that intra-industry spillovers from proximate firms play a large role in a firm's decision to enter a particular export market. Essentially, we find that both firms inside and outside the region are driving the intra-industry spillovers, but that the within-region effect is considerably larger. On the other hand, for inter-industry spillovers geographical proximity does not appear to be as important since both coefficients are of similar magnitude. This result supports the argument from section 2 that proximity is less relevant for inter-industry spillovers as buyer-seller relations are not confined by geography. In light of these results, in the remainder of the paper we will distinguish between within and outside region for intra-industry spillovers but will account for inter-industry spillovers across the entire country.

#### **4.2. Channels of Export Spillovers**

We continue with the investigation of the different channels through which export spillovers may occur. Note that we keep the region- and country-specific trends as well as the sequential exporting controls in the regressions that follow.

##### ***Inter-industry channels***

The results above suggest that intra-industry spillovers are an important source of export spillovers. Yet, inter-industry spillovers also matter and in this section we take a closer look at this channel by distinguishing between backward and forward linkages. As shown in Table 4 column (ii), we find that backward linkages entirely drive the significance of the inter-industry effect we previously found. This suggests that knowledge relevant to the export decision flows from buyers to suppliers but not the other way around, which is in line with anecdotal evidence. This in turn explains why on the aggregate, the effect of inter-industry spillovers was smaller.

### ***Labor mobility***

The final channel that we investigate is labor mobility. It is possible that the spillover effects which we have found so far are partly related to the movement of labor between firms rather than industrial linkages or signaling effects. To see whether our previous interpretation of the spillover variables is warranted and to what extent learning by hiring also exists with respect to exporting, we control for hiring of employees with foreign market specific experience. As noted before, we normalize this variable by total hiring and only consider those individuals that have earned above average wage in the previous and current firm.

As some time may be needed for the recruiting firm to exploit the knowledge of its new employees, we also introduce lagged hiring variables to assess when the effect appears. In particular, in Table 5 we introduce the hiring variables first without lags (column (i)) and then with one year and two years lag (columns (ii) and (iii) respectively). We find that the effect is positive and significant when hiring occurs in year  $t$  and/or time  $t-1$ , while it is insignificant when lagged by two years. One concern with the hiring variable in year  $t$  is that we do not observe the timing of events on a monthly basis; i.e. it is possible that a firm starts exporting to a market in March and hires the new worker only in May. As our data does not allow ruling out such cases, we focus on the one year lagged hiring variable in the remainder of the paper. In column (iv) of Table 5 this variable is significant at the 5% level and the magnitude of the coefficient suggests that a one percentage point increase in the share of newly hired employees with experienced in a market increases the probability to start exporting to this country by 5.3 per cent in the next period. Our results therefore suggest that labor mobility is an important channel for export spillovers. Moreover, we find that the other spillover variables are not affected by controlling for labor mobility suggesting that these variables indeed capture different mechanisms through which export spillovers occur.

As a robustness check, we exclude the greater Copenhagen area from the estimation sample (results reported in the last column of Table 5). Given the size of Denmark and the importance of its national capital (Copenhagen) in terms of population and agglomeration of firms, one may argue that the effect that we find is purely driven by this region. However, results in column (v) show that such concerns are not warranted; if anything, the results become stronger.

### ***Endogeneity of hiring***

If firms hire employees with foreign market specific experience because they want to start exporting to that market in the future, our results involving labor mobility may suffer from an endogeneity bias. We address this potential problem using an instrumental variables (IV) approach in a linear-probability framework. We instrument for firm  $i$ 's hiring of workers with foreign market-specific export experience by the total number of individuals hired by other firms within the same region with foreign-market-specific experience that earned above average wage in their previous employment. This variable gives an indication of the mobility of workers with this profile in a given year which likely increases the probability that a firm hires them while it does not directly affect a firm's export decision. The first stage estimation results presented in the appendix (Table A2) suggest that this instrument performs well as it is highly correlated with the endogenous variable. This is confirmed by the test of weak instruments and the reasonably high F-test of the excluded instrument presented in the bottom of Table 6.

We present the estimation results in Table 6. In column (i) we estimate a fixed effect linear probability model to compare the results to our fixed effect logit estimates from Table 5. We can see that the results are qualitatively similar. We believe that this justifies the application of the linear probability model here and comforts us that the findings for the IV strategy are not driven by the choice of model. In columns (ii) we then re-estimate the model while instrumenting for the

hiring variable. Note that we still account for firm-country pair fixed effects as well as region and country specific trends<sup>32</sup>. The results show that the coefficient of interest is highly significant while it increases in magnitude<sup>33</sup>. The coefficients of the other explanatory variables are hardly affected by the IV estimation. A test of endogeneity presented in the bottom of the table cannot reject the null hypotheses of exogeneity of the hiring decision.

Given these results and the good performance of our instrument, we conclude that our findings involving labor mobility are indeed robust and not driven by endogeneity considerations. Note that our instrument varies at the region as well as the destination dimension while we still control for region and destination-specific time trends. In columns (iii) and (iv) we repeat the estimations from the first two columns while dropping these trends. The results hardly change compared to those in columns (i) and (ii).

#### **4.3. Export Spillovers by Country Groups and Firm Size**

We conclude our analysis by investigating for which types of countries and for which firms export spillovers are particularly important. Intuitively, we would expect that export spillovers are particularly important for more geographically and culturally distant countries. These markets are less obvious export destinations and are most likely related to larger information requirements compared to e.g. EU countries. Moreover, if the effects of the different channels are fully driven by EU countries, one may wonder whether we really identify export spillovers or rather capture the fact that most exporting firms in Denmark will export to Germany, Sweden and Norway. Hence, we assess the importance of export spillovers for different groups of countries (neighboring countries, other EU15 countries, other high income countries and all other countries (medium and low income

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<sup>32</sup> We estimate the models by two-step IV-GMM and partial out the region and country specific time trends as well as the year fixed effects.

<sup>33</sup> The increase in magnitude may be explained by the fact that our instrument varies at the country and region dimension only which is why we may identify the local average treatment effect rather than the average treatment effect.

countries))<sup>34</sup>. As expected, in Table 7 we find the largest and most significant effects for medium and low income countries. All channels are important for this group of countries, while forward linkages have an unexpected negative and slightly significant effect. The labor mobility effect is fully driven by non-EU15 countries, while the intra-industry linkages matter for all groups of countries. These results comfort us in our belief of identifying information externalities.

Finally, in Table 8 we investigate whether the importance of export spillovers differs according to firm size and particularly if the importance of the investigated channels is specific to certain groups of firms. In the literature, it has been mentioned that smaller firms could be more affected by export spillovers (Bernard & Jensen, 2004), possibly because of their limited amount of internal resources constraining their ability to gather knowledge about international markets. We categorize firms in three groups: firms with less than 50 employees, firms with between 50 and 99 employees, and firms with 100 employees and more. The results confirm that intra-industry spillovers are most important for smaller firms, while they hardly impact medium sized and large firms. Similarly, backward linkages matter significantly for small firms. For medium sized firms, we also find that backward linkages are important, while labor mobility is relevant only for larger firms. This may be due to the fact that larger firms have more resources available to react upon the knowledge brought up by new employees than smaller enterprisers. Moreover, these firms have a higher turnover of employees than smaller firms increasing the probability of hiring people with market-specific knowledge and they may simply also have the financial resources needed to hire individuals with an international profile. Our results therefore to some extent support Bernard and Jensen's (2004) claim that smaller firms are more impacted by the presence of other exporting firms than larger ones.

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<sup>34</sup> Table A1 in the appendix contains a list of all countries included in our analysis and their classification according to the four groups.

## 5. CONCLUSION

In this paper we investigate the importance of information spillovers from exporting firms to non-exporting firms and distinguish between different channels through which such spillovers may occur. In particular, we consider export spillovers generated through (i) movement of labor between firms, (ii) intra-industry spillovers, and (iii) inter-industry linkages.

We corroborate the literature on export spillovers by presenting robust evidence of destination-specific export spillovers. When distinguishing between intra- and inter-industry spillovers, we find that both are important for a firm's decision to enter an export market, and that such spillovers are all the more important for firms below 100 employees and export markets outside the EU15 member countries. The results for intra-industry spillover imply that one additional firm in a region exporting to a specific market increases the probability of other close by firms from that industry to also start exporting to this market by 1.11 per cent. When considering the multiplier effect that our findings imply, this effect is also economically meaningful.

While export spillovers have generally been studied assuming that proximity between firms is a necessity, we find that depending on the channels we are looking at, proximity matters to a different extent. Indeed, intra-industry spillovers are mostly geographically confined while proximity does not seem to matter for inter-industry spillovers. Hence, by only focusing on surrounding firms, previous contributions have missed out the nuance in the role of proximity for the realization of export spillovers.

When further disentangling the channels of export spillovers, we find that inter-industry spillovers are entirely driven by backward linkages. Moreover, when looking at marginal effects, we understand that distinguishing between backward and forward linkages is crucial in understanding how export spillovers occur at the firm level as backward linkages appear to have a relatively large

impact on a firm's probability to start exporting to a specific market. Backward linkages and intra-industry spillovers remain highly significant after controlling for firm-level hiring of people with market-specific export experience. We find that learning-by-hiring is relevant with respect to exporting. In particular, hiring people with foreign market-specific knowledge significantly increases the probability that this firm starts to export to this market. This effect is most important for destination markets outside EU15 and for firms of above 100 employees. The magnitude of the effect is also considerable for these firms.

Overall, our results show strong evidence for the importance of export spillovers. Our results suggest that foreign market specific information is important for firms' export decisions and that such knowledge can come from other firms and labor mobility. From a policy perspective this means that the exchange of such information should be fostered; e.g. through the means of trade fairs. This point is particularly true for small firms. Moreover, policy makers should be aware that firms not targeted by export promotion initiatives may nevertheless be indirectly affected via spillover effects. Hence, including this multiplier effect into policy and program evaluation may result in higher expected benefits than otherwise forecasted if export spillovers are left out of the equation. Finally, our results are relevant in terms of labor market regulations. We find that labor mobility increases firms' exporting activities implying that a country's welfare is indirectly affected via this channel, not least in the case of Denmark.

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**Table 1: Summary Statistics**

	Nb obs.	Mean	Std. Dev.	Min	Max
<i>Spillover variables (t-1)</i>					
General, within region	248793	266.088	286.978	0	839
Intra-industry, within region	248793	40.2483	48.8482	0	200
Market-specific, intra-industry, within region	248793	7.37467	13.2875	0	142
Market-specific, inter-industry, within region	248793	38.1285	67.3238	0	588
<i>Spillover Channel</i>					
Market specific, backward linkages DK (t-1)	248793	7.67447	10.6351	0	142
Market specific, forward linkages DK (t-1)	248793	6.33648	8.04888	0	65
Market specific, mobility share DK (t)	248793	0.12417	0.28932	0	1
Market specific, mobility share DK (t-1)	212564	0.12177	0.28839	0	1
Market specific, mobility share DK (t-2)	167686	0.11692	0.28349	0	1
<i>Firm controls(t-1)</i>					
Log Labor Productivity	248793	12.9	0.49409	6.55069	16.7932
Log Employment	248793	3.82203	1.31365	0	9.45085
Log Wages	248793	5.1223	0.19208	2.04394	7.68139
Import Status	248793	0.10379	0.30499	0	1
<i>Regional Controls</i>					
Total number of firms (in Tsd)	248793	0.73537	0.86761	0.003	2.697
Industrial Agglomeration	248793	2.08949	3.54451	0.00112	84.8873
Population (in 10 Tsd)	248793	61.2665	77.9745	0.2266	197.875
<i>Country Controls</i>					
Log GDP	248793	25.4086	1.8929	20.6175	30.0689
Log Population	248793	16.4005	1.97057	10.9313	20.9941
Exchange rate	248793	1.11434	0.41822	0.02103	7.06494

**Table 2: Export Spillovers Variables – from General to Specific Definition**

	(i) General Spillovers	(ii) Industry-specific	(iii) Market-specific, intra- industry	(iv) Market-specific, inter- industry	(v) Market-specific, intra- & inter-industry
<i>Spillover Variables (t-1)</i>					
All Industries, All Markets	0.001 (0.001)				
Industry Specific, All Markets		0.002 (0.001)			
Market Specific, Intra-Industry			0.014*** (0.004)		0.013*** (0.003)
Market Specific, Inter-Industry				0.003*** (0.001)	0.002*** (0.001)
<i>Firm controls (t-1)</i>					
Log Labor Productivity	0.354*** (0.037)	0.353*** (0.037)	0.354*** (0.037)	0.354*** (0.037)	0.354*** (0.037)
Log Employment	0.827*** (0.045)	0.827*** (0.045)	0.828*** (0.045)	0.828*** (0.045)	0.828*** (0.045)
Log Wages	0.3*** (0.094)	0.299*** (0.094)	0.297*** (0.095)	0.297*** (0.094)	0.297*** (0.095)
Import Status	0.351*** (0.027)	0.351*** (0.027)	0.351*** (0.027)	0.35*** (0.027)	0.351*** (0.027)
<i>Regional Controls</i>					
Total number of firms	-0.323 (0.225)	-0.316 (0.255)	-0.287 (0.253)	-0.264 (0.262)	-0.268 (0.244)
Industrial Agglomeration	0.014* (0.008)	0.014* (0.008)	0.014* (0.008)	0.015* (0.008)	0.014* (0.008)
Population	-0.066* (0.037)	-0.074** (0.034)	-0.072** (0.032)	-0.069** (0.033)	-0.067** (0.031)
<i>Country Controls</i>					
Log GDP	1.758*** (0.097)	1.76*** (0.097)	1.673*** (0.104)	1.674*** (0.109)	1.622*** (0.115)
Log Population	-2.046*** (0.188)	-2.045*** (0.187)	-1.991*** (0.184)	-2.033*** (0.186)	-1.987*** (0.184)
Exchange rate	-0.018 (0.019)	-0.018 (0.019)	-0.022 (0.02)	-0.022 (0.02)	-0.025 (0.021)
Number Obs.	248793	248793	248793	248793	248793
Pseudo R <sup>2</sup>	0.0485	0.0486	0.0488	0.0486	0.0489

All regressions contain year dummies, clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

**Table 3: Testing Alternative Hypotheses**

	(i) Region & Country Trends	(ii) Starter vs Continuous Exporters	(iii) Sequential Exporting
<i>Spillover variables (t-1)</i>			
Market Specific, Intra-Industry	0.011*** (0.002)		0.011*** (0.002)
Market Specific, Inter-Industry	0.002*** (0.001)		0.002*** (0.001)
Market Specific, Intra-Industry STARTER		0.014** (0.006)	
Market Specific, Intra-Industry CONTINUOUS		0.012*** (0.002)	
Market Specific, Inter-Industry STARTER		0.004*** (0.001)	
Market Specific, Inter-Industry CONTINUOUS		0.004** (0.002)	
<i>Firm controls (t-1)</i>			
Log Labor Productivity	0.354*** (0.036)	0.379*** (0.053)	0.262*** (0.037)
Log Employment	0.821*** (0.046)	0.841*** (0.057)	0.652*** (0.044)
Log Wages	0.317*** (0.094)	0.193* (0.107)	0.265*** (0.094)
Import Status	0.351*** (0.029)	0.312*** (0.035)	0.324*** (0.027)
<i>Regional Controls</i>			
Total number of firms	-0.253 (0.183)	-0.336 (0.24)	-0.275 (0.169)
Industrial Agglomeration	0.012 (0.008)	0.016** (0.008)	0.01 (0.008)
Population	-0.024 (0.036)	-0.053 (0.095)	-0.021 (0.032)
<i>Country Controls</i>			
Log GDP	2.08*** (0.187)	1.897*** (0.413)	2.115*** (0.197)
Log Population	-2.677** (1.127)	0.209 (2.446)	-2.66** (1.12)
Exchange rate	-0.21*** (0.051)	-0.309*** (0.05)	-0.214*** (0.053)
Number Obs.	248793	145134	248793
Pseudo R <sup>2</sup>	0.0549	0.0617	0.0638

All regressions contain year dummies, as well as region and destination specific trends; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

**Table 4: Spatial Decay and Industrial Linkages**

	(i) Spatial Decay	(ii) Industrial Linkages
<i>Spillover variables (t-1)</i>		
Market specific, intra-industry within region	0.008*** (0.001)	0.009*** (0.002)
Market specific, intra-industry outside region	0.004*** (0.001)	0.004*** (0.001)
Market specific, inter-industry within region	0.002*** (0.001)	
Market specific, inter-industry outside region	0.002*** (0.0003)	
<i>Channels</i>		
Market specific, backward linkages DK (t-1)		0.015*** (0.003)
Market specific, forward linkages DK (t-1)		-0.005 (0.005)
<i>Firm controls (t-1)</i>		
Log Labor Productivity	0.263*** (0.038)	0.263*** (0.038)
Log Employment	0.655*** (0.044)	0.653*** (0.044)
Log Wages	0.268*** (0.094)	0.274*** (0.095)
Import Status	0.317*** (0.027)	0.321*** (0.027)
<i>Regional Controls</i>		
Total number of firms	-0.293* (0.166)	-0.292* (0.167)
Industrial Agglomeration	0.01 (0.008)	0.01 (0.008)
Population	-0.004 (0.032)	-0.004 (0.033)
<i>Country Controls</i>		
Log GDP	2.008*** (0.197)	2.071*** (0.193)
Log Population	-2.309** (1.121)	-2.596** (1.124)
Exchange rate	-0.193*** (0.051)	-0.203*** (0.05)
Number Obs.	248793	248793
Pseudo R <sup>2</sup>	0.0643	0.0642

All regressions contain year dummies, region and destination specific trends as well as sequential exporting controls; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

**Table 5: Labor Mobility and Assessing Sensitivity to Dropping Copenhagen Area**

	(i) Labor Mobility: no lag	(ii) Labor Mobility: no lag & one year lag	(iii) Labor Mobility: no lag, one year lag & two years lag	(iv) Labor Mobility: one year lag only	(iv) Drop Copenhagen Area
<i>Channels market specific (t-1)</i>					
Intra-ind. within region	0.009*** (0.002)	0.008*** (0.002)	0.013*** (0.002)	0.008*** (0.002)	0.014*** (0.004)
Intra-ind. outside region	0.004*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.004*** (0.001)
Backward linkages DK (t-1)	0.015*** (0.003)	0.013*** (0.004)	0.012** (0.006)	0.013*** (0.004)	0.014** (0.006)
Forward linkages DK (t-1)	-0.005 (0.005)	0.001 (0.006)	0.004 (0.007)	0.001 (0.006)	-0.0004 (0.009)
Mobility DK (t)	0.081*** (0.029)	0.085*** (0.03)	0.079** (0.031)		
Mobility DK (t-1)		0.077*** (0.024)	0.083*** (0.03)	0.064** (0.026)	0.08*** (0.028)
Mobility DK (t-2)			0.02 (0.035)		
<i>Firm controls (t-1)</i>					
Log Labor Productivity	0.262*** (0.038)	0.252*** (0.036)	0.3*** (0.039)	0.253*** (0.037)	0.249*** (0.052)
Log Employment	0.65*** (0.044)	0.644*** (0.046)	0.657*** (0.062)	0.648*** (0.046)	0.633*** (0.06)
Log Wages	0.275*** (0.095)	0.223** (0.107)	0.185* (0.099)	0.223** (0.106)	0.23 (0.16)
Import Status	0.322*** (0.027)	0.296*** (0.03)	0.295*** (0.034)	0.296*** (0.03)	0.316*** (0.036)
<i>Regional Controls</i>					
Total number of firms	-0.283* (0.168)	-0.241 (0.174)	-0.36* (0.199)	-0.251 (0.172)	0.126 (0.699)
Industrial Agglomeration	0.01 (0.008)	0.011 (0.008)	0.017*** (0.006)	0.011 (0.007)	0.012 (0.008)
Population	-0.004 (0.033)	0.011 (0.04)	-0.031 (0.061)	0.011 (0.04)	-0.096 (0.245)
<i>Country Controls</i>					
Log GDP	2.072*** (0.193)	2.327*** (0.221)	2.325*** (0.392)	2.326*** (0.221)	2.307*** (0.302)
Log Population	-2.594** (1.123)	-2.637* (1.441)	-1.646 (1.827)	-2.654* (1.437)	-1.878 (1.724)
Exchange rate	-0.203*** (0.05)	-0.198*** (0.049)	-0.262*** (0.049)	-0.198*** (0.049)	-0.238*** (0.058)
Number Obs.	248793	212564	167686	212564	159207
Pseudo R <sup>2</sup>	0.0643	0.0653	0.064	0.065	0.07

All regressions contain year dummies, region and destination specific trends as well as sequential exporting controls; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

**Table 6: Assessing the Endogeneity of the Hiring Decision - Instrumental Variables Estimations**

	(i) Linear Probability Model	(ii) Estimation with Instrumental Variables	(iii) Linear probability model: no country & region trends	(iv) Estimation with Instrumental Variables: no country & region trends
<i>Channels (t-1)</i>				
Market specific, intra-industry within region	0.002*** (0.0003)	0.002*** (0.0003)	0.002*** (0.0004)	0.002*** (0.0004)
Market specific, intra-industry outside region	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)
Market specific, backward linkages DK	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)
Market specific, forward linkages DK	0.0004 (0.001)	0.0001 (0.001)	-0.0019* (0.001)	-0.0021 (0.001)
Market specific, mobility DK	0.013*** (0.005)	0.186*** (0.033)	0.013*** (0.005)	0.179*** (0.036)
<i>Firm controls (t-1)</i>				
Log Labor Productivity	0.04*** (0.006)	0.042*** (0.005)	0.04*** (0.006)	0.042*** (0.006)
Log Employment	0.09*** (0.008)	0.08*** (0.009)	0.092*** (0.008)	0.081*** (0.009)
Log Wages	0.018 (0.023)	0.002 (0.021)	0.012 (0.023)	-0.003 (0.021)
Import Status	0.061*** (0.005)	0.061*** (0.005)	0.062*** (0.005)	0.062*** (0.004)
<i>Regional Controls</i>				
Total number of firms	-0.049 (0.03)	-0.055* (0.033)	-0.093** (0.035)	-0.088** (0.039)
Industrial Agglomeration	0.002* (0.001)	0.003** (0.001)	0.003** (0.001)	0.003*** (0.001)
Population	0.008 (0.008)	0.0054 (0.009)	-0.015*** (0.004)	-0.015*** (0.005)
<i>Country Controls</i>				
Log GDP	0.412*** (0.033)	0.403*** (0.034)	0.188*** (0.02)	0.182*** (0.02)
Log Population	-0.395 (0.248)	-0.35 (0.242)	-0.26*** (0.028)	-0.24*** (0.03)
Exchange rate	-0.032*** (0.008)	-0.032*** (0.008)	-0.011*** (0.003)	-0.01*** (0.003)
Number Obs.	212564	212564	212564	212564
Kleibergen-Paap Wald rk test (p-value)		0.000		0.000
F-test of excluded IV		71.05		59.87
Test of endogeneity (H0: exogeneity; p-value)		0.250		0.276
Country & region trends	yes	yes	no	no

All regressions contain year dummies, as well as region and destination specific trends; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

**Table 7: Differences across Country Groups**

	(i) Neighboring Countries	(ii) EU15 Countries	(iii) High Income Countries	(iv) Rest of the World
<i>Channels (t-1)</i>				
Market specific, intra-industry within region	0.008*** (0.002)	0.011*** (0.004)	0.008** (0.003)	0.008*** (0.003)
Market specific, intra-industry outside region	0.003 (0.002)	0.004 (0.002)	-0.001 (0.001)	0.008*** (0.001)
Market specific, backward linkages	0.005 (0.008)	0.008 (0.007)	0.005 (0.008)	0.042*** (0.008)
Market specific, forward linkages	0.011 (0.009)	-0.007 (0.012)	0.012 (0.011)	-0.028* (0.015)
Labor Mobility	-0.026 (0.06)	-0.032 (0.073)	0.103*** (0.025)	0.124** (0.049)
<i>Firm controls (t-1)</i>				
Log Labor Productivity	0.47*** (0.118)	0.396*** (0.065)	0.162*** (0.034)	0.204*** (0.052)
Log Employment	1.156*** (0.162)	0.915*** (0.113)	0.525*** (0.041)	0.522*** (0.058)
Log Wages	0.241 (0.199)	0.244 (0.273)	0.09 (0.237)	0.313** (0.143)
Import Status	0.194** (0.097)	0.27*** (0.043)	0.214*** (0.056)	0.389*** (0.055)
<i>Regional Controls</i>				
Total number of firms	0.628 (0.596)	-0.918** (0.429)	-0.649** (0.31)	0.174 (0.266)
Industrial Agglomeration	-0.032 (0.022)	-0.023 (0.03)	0.023*** (0.008)	0.018 (0.013)
Population	0.502*** (0.117)	0.153 (0.117)	-0.121** (0.059)	0.003 (0.075)
<i>Country Controls</i>				
Log GDP	10.586** (4.69)	4.082*** (1.203)	2.632*** (0.497)	2.281*** (0.438)
Log Population	3.847 (16.97)	13.404*** (4.239)	2.214 (2.966)	-9.043*** (3.055)
Exchange rate	0.259 (1.615)	-1.121 (0.948)	-0.829*** (0.13)	-0.163*** (0.038)
Number Obs.	13873	39613	59391	99687
Pseudo R <sup>2</sup>	0.1022	0.0931	0.054	0.0679

All regressions contain year dummies, as well as region and destination specific trends; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

**Table 8: Differences across Firm Groups (by number of employees)**

	(i) Firms with less than 50 employees	(ii) Firms with between 50 and 99 employees	(iii) Firms with 100 employees and more
<i>Channels (t-1)</i>			
Market specific, intra-industry within region	0.008*** (0.002)	0.005 (0.009)	0.011* (0.006)
Market specific, intra-industry outside region	0.004** (0.002)	0.003* (0.002)	0.002 (0.002)
Market specific, backward linkages	0.012*** (0.004)	0.033*** (0.009)	-0.012 (0.009)
Market specific, forward linkages	0 (0.006)	-0.007 (0.015)	0.026 (0.017)
Labor Mobility	0.06 (0.058)	-0.018 (0.046)	0.094*** (0.031)
<i>Firm controls (t-1)</i>			
Log Labor Productivity	0.346*** (0.049)	0.331*** (0.083)	0.21** (0.097)
Log Employment	0.955*** (0.081)	0.579*** (0.105)	0.337*** (0.1)
Log Wages	0.305*** (0.107)	0.161 (0.355)	0.291 (0.235)
Import Status	0.405*** (0.046)	0.302*** (0.079)	0.188 (0.117)
<i>Regional Controls</i>			
Total number of firms	-0.598* (0.326)	0.245 (0.834)	0.211 (0.413)
Industrial Agglomeration	-0.03** (0.014)	0.11*** (0.038)	0.022 (0.015)
Population	-0.006 (0.082)	0.22 (0.234)	-0.08 (0.09)
<i>Country Controls</i>			
Log GDP	2.407*** (0.388)	2.686*** (0.749)	2.354*** (0.416)
Log Population	-7.4*** (2.106)	2.379 (3.757)	0.957 (3.002)
Exchange rate	-0.241*** (0.068)	-0.105 (0.08)	-0.167** (0.072)
Number Obs.	113445	41835	57284
Pseudo R <sup>2</sup>	0.0657	0.0646	0.0662

All regressions contain year dummies, as well as region and destination specific trends; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

## APPENDIX

In this appendix we present three tables. First, in Table A1 we present the list of destination markets considered in the analysis. In the table we further show the number of export initiations in each market during the sample period and the geographic region the market is located in which we use to control for a firm's exporting experience in different regions of the world. Finally, the table shows the grouping of countries into neighbors, EU15, high income (HIC) and low income countries (LIC) which we use when performing sub-sample estimations. Table A2 depicts the results of the first stage estimation from the IV regressions presented in Table 6. In Table A3 we finally assess the sensitivity of our results regarding the labor mobility variable. We perform two sets of robustness checks. First, we check whether the results are driven by our approach of handling M&A and spinoff activities. Second, we present results based on absolute hiring instead of share of people hired with export market experience.

In our data, we do not observe directly whether two firms merge or a spinoff is established. We therefore have to make sure that we do not count such activities as hiring of new employees. As mentioned in footnote 22, we address this issue by imposing two conditions on the hiring variable. First, we do not consider as hiring if more than 65 per cent of the newly hired labor force comes from the same firm given that this firm hires more than 10 employees. We interpret hiring many people from the same firm as an indication of M&A or spinoff activities. Second, we replace the mobility variable with a zero when a firm hires more than 76 employees in one year. Given the size distribution of Danish firms with an overwhelming majority of small and medium sized firms (Parrota and Pozzoli, 2012), hiring many employees in one year is an indication of substantial restructuring such as M&A activities. We choose these cutoffs by looking at the distribution of these variables; in particular, in either case we cut the upper 25th percentiles of the distribution.

In Table A3 columns (i) to (iii) we show regressions results based on different cutoffs. First, in column (i) we present the results from the paper based on the lower 75th percentiles to ease comparisons. In column (ii) we then use a different cutoff condition for the share of the newly hired labor force coming from the same firm. One may argue that 65 per cent of newly hired employees coming from the same firm is still fairly high. We therefore now cut the upper 40th percentile of the distribution of this variable which corresponds to a share of 12 per cent. The results in column (ii) are robust to this change.

In column (iii) we change the condition of total amount of people hired. Instead of cutting the upper 75<sup>th</sup> percentile of this variable, we now cut the upper 10th percentile as one may argue that despite the size distribution of firms in Denmark, it is still possible that a firm hires more than 76 employees in one year. Cutting the upper 10th percentile amounts to not considering cases where firms hire more than 322 people in one year. The results in column (iii) are again robust.

In column (iv) we finally present results based on absolute hiring. In the paper we look at the share of people hired with foreign market specific experience out of total newly hired employees (conditioning on having earned above average wage in previous and new firms in both cases). We do so in order to control for general hiring effects. Alternatively, we can use the absolute number of newly hired employees with foreign market specific experience that have earned above average wage in the last and the new firm. To control for general hiring effects, we add the number of newly hired people that have earned above average wage in the last and the new firm without foreign market experience to the regression equation. The results in column (iv) show that the coefficient on the variable of newly hired employees with foreign market experience is highly significant and positive while the effect of hiring employees without this characteristic is insignificant. These results therefore support the robustness of our findings.

**Table A1: List of Countries**

Country	Number of Export Starters	Regions	Country Group	Country	Number of Export Starters	Regions	Country Group
ARE	688	w_asia	HIC	KOR	639	e_asia	HIC
ARG	372	s_america	LIC	KWT	370	w_asia	HIC
AUS	812	oceania	HIC	LBN	297	w_asia	LIC
AUT	834	w_europe	EU15	LKA	199	s_asia	LIC
BEL	970	w_europe	EU15	LTU	1060	n_europe	LIC
BGD	164	s_asia	LIC	LUX	523	w_europe	EU15
BGR	477	e_europe	LIC	LVA	916	n_europe	LIC
BHR	279	w_asia	HIC	MAR	251	n_africa	LIC
BLR	193	e_europe	LIC	MEX	484	c_america	LIC
BRA	488	s_america	LIC	MLT	366	s_europe	LIC
CAN	1014	n_america	HIC	MYS	507	se_asia	LIC
CHE	1520	w_europe	HIC	NGA	240	w_africa	LIC
CHL	413	s_america	LIC	NLD	1002	w_europe	EU15
CHN	928	e_asia	LIC	NOR	2140	n_europe	Neighbor
COL	207	s_america	LIC	NZL	516	oceania	HIC
CRI	176	c_america	LIC	OMN	206	w_asia	LIC
CYP	425	w_asia	HIC	PAK	246	s_asia	LIC
CZE	1009	e_europe	LIC	PER	196	s_america	LIC
DEU	940	w_europe	Neighbor	PHL	354	se_asia	LIC
ECU	192	s_america	LIC	POL	1582	e_europe	LIC
EGY	487	n_africa	LIC	PRT	734	s_europe	EU15
ESP	968	s_europe	EU15	ROM	572	e_europe	LIC
EST	1091	n_europe	LIC	RUS	946	e_europe	LIC
FIN	950	n_europe	EU15	SAU	635	w_asia	LIC
FRA	967	w_europe	EU15	SGP	690	se_asia	HIC
GBR	969	n_europe	EU15	SRB	349	s_europe	LIC
GRC	735	s_europe	EU15	SVK	607	e_europe	LIC
GRL	1533	n_america	HIC	SVN	628	s_europe	HIC
HKG	803	e_asia	HIC	SWE	958	n_europe	Neighbor
HRV	463	s_europe	LIC	SYR	177	w_asia	LIC
HUN	875	e_europe	LIC	THA	532	se_asia	LIC
IDN	396	se_asia	LIC	TUN	195	n_africa	LIC
IND	566	s_asia	LIC	TUR	881	w_asia	LIC
IRL	940	n_europe	EU15	TWN	505	e_asia	HIC
IRN	260	s_asia	LIC	UKR	518	e_europe	LIC
ISL	1541	n_europe	HIC	URY	186	s_america	LIC
ISR	728	w_asia	HIC	USA	1440	n_america	HIC
ITA	1067	s_europe	EU15	VEN	234	s_america	LIC
JOR	314	w_asia	LIC	VNM	311	se_asia	LIC
JPN	822	e_asia	HIC	ZAF	633	s_africa	LIC
KEN	223	e_africa	LIC				

**Table A2: First-Stage Estimation Results (see Table 6)**

	(i) With Trends	(ii) Without Trends
<i>Channels (t-1)</i>		
Market specific, intra-industry within region	-0.0005** (0.0002)	-0.0005** (0.0003)
Market specific, intra-industry outside region	-0.00009 (0.0001)	0 (0.0001)
Market specific, backward linkages	-0.0005 (0.001)	-0.0002 (0.001)
Market specific, forward linkages	0.0016 (0.001)	0.001 (0.001)
<i>Firm controls (t-1)</i>		
Log Labor Productivity	-0.011* (0.006)	-0.01* (0.006)
Log Employment	0.055*** (0.008)	0.056*** (0.008)
Log Wages	0.086*** (0.024)	0.086*** (0.024)
Import Status	0.001 (0.004)	0.001 (0.004)
<i>Regional Controls</i>		
Total number of firms	0.046 (0.049)	0.007 (0.044)
Industrial Agglomeration	-0.002 (0.001)	-0.001 (0.001)
Population	0.004 (0.011)	-0.003 (0.006)
<i>Country Controls</i>		
Log GDP	0.038 (0.034)	0.034** (0.015)
Log Population	-0.209 (0.159)	-0.105*** (0.024)
Exchange rate	0.003 (0.005)	-0.0044** (0.002)
<i>Excluded Instrument</i>		
Regional mobility	0.0005*** (0.00006)	0.0005*** (0.00007)

All regressions contain year dummies, as well as region and destination specific trends; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year

**Table A3: Assessing the Sensitivity of the Labor Mobility Variable**

	(i) Baseline Model	(ii) Alternative Hiring Cutoff	(iii) Alternative Hiring Cutoff	(iv) Alternative Mobility Measure
<i>Channels (t-1)</i>				
Market Specific, Within region Intra-Industry	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)
Market Specific, Outside region Intra-Industry	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
Market specific, backward linkages	0.013*** (0.004)	0.013*** (0.004)	0.013*** (0.004)	0.013*** (0.004)
Market specific, forward linkages	0.001 (0.006)	0.001 (0.006)	0.001 (0.006)	0.001 (0.006)
Mobility - share	0.064** (0.026)	0.061** (0.025)	0.06** (0.026)	
Mobility (absolute number) - without export experience				-0.008 (0.007)
Mobility (absolute number) - with export experience				0.023*** (0.006)
<i>Firm controls (t-1)</i>				
Log Labor Productivity	0.253*** (0.037)	0.253*** (0.037)	0.253*** (0.037)	0.253*** (0.037)
Log Employment	0.648*** (0.046)	0.648*** (0.046)	0.647*** (0.046)	0.65*** (0.048)
Log Wages	0.223** (0.106)	0.224** (0.106)	0.223** (0.106)	0.223** (0.106)
Import Status	0.296*** (0.03)	0.296*** (0.03)	0.296*** (0.03)	0.296*** (0.03)
<i>Regional Controls</i>				
Total number of firms	-0.251 (0.172)	-0.251 (0.172)	-0.25 (0.173)	-0.246 (0.175)
Industrial Agglomeration	0.011 (0.007)	0.011 (0.007)	0.011 (0.007)	0.011 (0.007)
Population	0.011 (0.04)	0.011 (0.04)	0.011 (0.04)	0.014 (0.041)
<i>Country Controls</i>				
Log GDP	2.326*** (0.221)	2.326*** (0.221)	2.327*** (0.221)	2.327*** (0.221)
Log Population	-2.654* (1.437)	-2.654* (1.438)	-2.657* (1.438)	-2.677* (1.437)
Exchange rate	-0.198*** (0.049)	-0.198*** (0.049)	-0.198*** (0.049)	-0.198*** (0.049)
Number Obs.	212564	212564	212564	212564
Pseudo R <sup>2</sup>	0.0652	0.0652	0.0652	0.0652

All regressions contain year dummies, as well as region and destination specific trends; clustered standard errors (region-level) in parentheses; \*\*\*, \*\* and \* denote significance at the 1, 5, and 10 per cent level; all LHS variables are lagged by one year.

## **CHAPTER 5: Inward-Outward Linkages in the Internationalization of Firms: Their Impact on Export Survival<sup>35</sup>**

### **ABSTRACT**

This study sets out to look at the relationship between firms' import experience and their decision to exit export markets. Drawing from two different literature streams; the knowledge view on firms' internationalization and the real option logic, competing hypotheses are formulated and tested in this paper. The results of duration analyses performed on an unbalanced panel of manufacturing firms located in Denmark reveal that firms have shorter export spells in markets in which they had import experience prior to export market entry. However, this result only hold for exports to developed countries whereas export survival in least developed countries appear to be higher for firms with prior import experience. Such findings suggest that the two competing reasoning co-exist, but that they apply to different types of export destination. The paper's contribution to the scant literature on inward-outward linkages in firms' internationalization is twofold: first it provides evidence of inward-outward linkages beyond export market entry, and second it introduces a so far neglected approach in the international business literature to understanding the impacts of inward-outward linkages. More generally, this paper also contributes to the internationalization literature by focusing on the underlying factors behind firm de-internationalization.

*Keywords: inward-outward linkages, export exit, duration analysis, sunk costs, real option*

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## 1. INTRODUCTION

Since the seminal work of Johanson and Vahlne (1977), the importance of knowledge and its role in explaining firms' internationalization process has been repeatedly in focus in the international business literature. Adept of this perspective see the internationalization of firms as an incremental learning process during which they become knowledgeable about foreign business environments and opportunities as well as how to organize and support their international activities (Forsgren, 2002; Johanson & Vahlne, 1977). This line of work has mainly focused on experiential knowledge to explain further resource commitment and international expansion (Johanson & Vahlne, 1977, 2009). Building on this work, recent theoretical developments have looked beyond firms' boundaries and have incorporated the notion of network into firms' internationalization, asserting that firms also tap into the resources available in their network when internationalizing (Hadley & Wilson, 2003; Johanson & Vahlne, 2009). Yet, firms may learn or gain knowledge about how to conduct international business activities and how to recognize and properly evaluate business opportunities in international markets in other or complementary ways (Fletcher & Harris, 2012).

One of the ways in which firms may develop this knowledge is through prior experience, not as exporters but importers. Welch and Luostarinen (1993) were among the first to devote attention to inward internationalization and its impact on outward international activities such as exports. In their case study, they provide evidence that firms make use of their contacts in and knowledge about the foreign business environment gained through importing activities when deciding to export to a specific market. This is corroborated in recent, large scale quantitative studies which provide evidence of firms' import experience being linked to a higher probability of export market entry (Choquette & Meinen, 2012; Meinen, 2012), higher export intensity and scope (Di Gregorio, Musteen, & Douglas, 2009), higher export sales (Bertrand, 2011) and larger export portfolio in terms of variety of exported products (Bas & Strauss-Kahn, 2011).

This study attempts to contribute to this literature by providing empirical evidence on the linkages between firms' inward and outward internationalization activities from a more dynamic perspective and beyond market entry (Welch & Luostarinen, 1993). Precisely, this paper draws from two different streams of literature, namely the knowledge perspective on firms' internationalization (Johanson and Vahlne, 1977) and the real option logic (Dixit, 1989), and tests competing hypotheses on the effect of prior import experience on a firm's likelihood of remaining on export markets.

Although scarce attention has been paid to export market exit (survival), especially when comparing to export propensity and intensity, doing so remains important, not least for policy makers. While it is vital to understand which firms internationalize, why and how they do it, it is also important to understand the factors that make firms remain and expand in export markets (Benito & Welch, 1997; Crick, 2002)<sup>36</sup>. A lot of government effort is devoted to developing public initiatives to support firms' internationalization and therefore a better understanding of which factors influence firms' decision to exit export markets may therefore result in more efficient export promotion programs and welfare gains.

The remainder of the paper is structured as follows. Section 2 contains a review of the literature and the theoretical background from which the hypotheses are developed. In section 3, the econometric model is presented and in section 4, I introduce the data and define the variables used in the

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<sup>36</sup> The aim of this paper is, however, not to discuss whether survival in international markets is a good measure of performance though the term survival could suggest higher performance. Indeed, survival has been used as a performance measure in many other fields, such as start-ups' performance (Audretsch, 1995; Santarelli & Vivarelli, 2007), early internationalizers' performance (Mudambi & Zahra, 2007; Sapienza, Autio, George, & Zahra, 2006), foreign-owned firms' performance in host countries (Alvarez & Goerg, 2009, 2012; Bandick, 2010; Kronborg & Thomsen, 2009; Mata & Freitas, 2012; Mata & Portugal, 2002; Zaheer & Mosakowski, 1997), and more generally firm performance (Bradley, Aldrich, Shepherd, & Wiklund, 2011). Yet survival may not necessarily be related to performance as earlier on emphasized by Welch and Wiedershien-Paul (1980) and Buckley and Casson (1998) that strategic considerations may push firms to fully or partially de-internationalize and use their internal resources more efficiently (Benito & Welch, 1997).

analysis. Section 5 presents descriptive evidence of the link between importing activities and export survival and discusses the results of the econometric analysis. Section 6 concludes.

## **2. CONCEPTUAL FRAMEWORK**

### **2.1. Prior Import Experience and Export Survival: A Knowledge and Network Argument**

Previous research documents that inward internationalization, for instance through international sourcing, facilitates and stimulates the outward part of a firm's internationalization process (Di Gregorio, Musteen, & Thomas, 2009; Karlsen, et al., 2003; Welch & Luostarinen, 1993). The literature has offered several explanations as to how firms' inward and outward international activities may be interlinked, both in the early phase of outward internationalization and in later stages (Welch & Luostarinen, 1993).

First, through their import experience, firms develop knowledge about opportunities and challenges of conducting international business and about their capabilities when it comes to dealing with foreign environments, and thereby increase their knowledge base (Eriksson, Johanson, Majkgard, & Deo Sharma, 1997). Experience from importing activities also enhances a firm's knowledge base in terms of experiential market knowledge, which encompasses both foreign business and institutional knowledge (Eriksson, et al., 1997).

Earlier research has emphasized unfamiliarity with international markets and the costs associated with internationalization as important factors explaining the reluctance of firms to engage in or expand their (outward) international activities (Ellis & Pecotich, 2001; Eriksson, et al., 1997; Forsgren, 2002; Johanson & Vahlne, 1977). The knowledge gained through import experience, be it market or internationalization knowledge, may reduce the perceived costs of exporting and consequently increase managers' openness to initiating or further investing in outward internationalization activities (Eriksson, et al., 1997). By enhancing managers' knowledge about

foreign markets, prior importing experience may also help recognize opportunities in international markets and more accurately evaluate them, thereby reducing the liability of foreignness associated with international market entry (Zaheer, 1995).

Second, contacts developed in import markets may help firms to better place their products once they decide to export, consequently assuring a better foothold in the market. Case study evidence confirms that by internationally sourcing inputs, firms develop relations in foreign markets and get access to a network of foreign actors, which is later used when contemplating outward activities in these markets (Welch & Luostarinen, 1993). Moreover, Welch and Luostarinen (1993) and Karlsen et al. (2003) find that by being present on foreign markets as importers, firms develop legitimacy in the eyes of governing authorities, which may later help them when “outward internationalizing” on these markets. In other words, import activities may help reduce firms’ liability of outsidership (Johanson and Vahlne, 2009), which refers to exporters or foreign firms being disadvantaged when entering a new market due to their lack of relations in the market.

Prior research on the internationalization process of firms emphasizes that firms go through a learning phase following the entry into foreign markets, though not completely dismissing pre-entry learning (Johanson & Vahlne, 1977; Pedersen & Petersen, 2004). It is argued here that prior import experience in a particular market provides a hedge to firms starting to export to that same market as it reduces the learning period a firm needs to go through to fully exploit its potential. Indeed, thanks to their import experience, firms (managers) may be better at assessing the fit between their capabilities/resources and foreign environments prior to entering export markets. They may also be faster at identifying and establishing relationships with key actors in the newly entered market. As a consequence one would not only expect inward internationalization to lead to a higher chance of involvement in outward internationalization activities, one would also expect importing firms to

make a more informed decision when selecting their export markets, thereby increasing their chance of success and survival in these markets.

Many of the arguments presented above are especially concerned with market knowledge which may be difficult to exploit in other [foreign] environments (Bertrand, 2011). For instance, relationships may generally be thought of as market specific. Moreover, through imports, firms may develop knowledge of the business environment, customers' taste and opportunities for their products in that particular foreign market, which may be of limited use in other export markets. Besides the fact that firms' gain knowledge through their outsourcing activities, intermediate inputs imported from a specific country are likely to already be tailored for this market, making it easier for firms to meet customers' demands in that same market (Bertrand, 2011). Evidence of the sunk costs associated with export market entry being reduced in markets where firms have import experience (Meinen, 2012) and of the effect of imports on export performance being larger if both activities are conducted in the same country (Bertrand, 2011) have earlier been provided and support this statement.

In light of the above, the following hypothesis is formulated:

**HYPOTHESIS 1:** Firms are less likely to exit export markets in which they had import experience prior to export market entry.

## **2.2. Prior Import Experience and Export Survival: A Sunk Costs and Real Option Argument**

From the international trade literature we know that firms' export entry and exit decisions depend on the fixed costs needed to be paid when entering a specific export market. In this literature, it is generally assumed that firms start exporting to a particular country when the expected profits to be earned from doing so are larger than the fixed costs associated with the entry decision (Roberts & Tybout, 1997). As such, the lower the fixed costs associated with entry, the smaller will be the

threshold in terms of revenues to be earned from exporting before a firm decides to enter a particular market (before it finds it profitable to do so). This may lead firms to enter export markets which are perhaps riskier and as a result could lead to higher chance of exit.

Moreover, the presence of fixed costs combined with the uncertainty surrounding export market conditions has been documented to affect firms' decision to exit (Roberts & Tybout, 1997).

Considering the hypothetical case where there would be no fixed costs associated with entering an export market, firms would be expected to instantly adjust their participation in export markets (entry and exit) on the basis of assessing whether non-negative profits from exporting to market  $j$  in time  $t$  are expected. However, in the presence of fixed export entry costs, the decision of ceasing exports to market  $j$  in year  $t$  implies that the fixed entry costs, or at least part of, would need to be repaid were the firm to decide to re-enter that market later on (Roberts & Tybouts, 1997). As such, the decision to remain on an export market can be understood from a real options perspective in that by continuing to export to a market, firms exercise their option of earning future profits from exporting to market  $j$  without bearing re-entry fixed costs. The higher the sunk costs, the higher will be the expected "tolerance" of firms towards less favorable conditions and as a result the higher will be the expected inertia (Dixit, 1989). Adopting this logic, one would expect firms with knowledge from a market prior to export entry to react more rapidly to changes in market conditions.

In light of the above and given that prior market knowledge developed through importing from a specific market is expected to reduce the fixed costs associated with export entry into that market, the following competing hypothesis is formulated:

**HYPOTHESIS 2:** Firms are more likely to exit export markets in which they had import experience prior to export market entry.

### 3. ECONOMETRIC APPROACH

As the focus of this paper is on assessing whether firms with import experience have longer export spells, meaning that they export for a longer period, the analysis is made using a duration model set-up. Duration models are widely used, for instance, in labor economics and in epidemiological research. In the export performance literature, such models have rarely been used though, reflecting the scant attention that has been devoted to understanding what affects export survival. Yet, duration models have been used in the field of International Business, for instance when investigating the presence of foreign-owned firms exit premium (Mata & Portugal, 2002; Park, Lee, & Hong, 2011).

Duration models, also referred to as survival analysis models, time-to-event models and hazard rate models are suited for analyzing the transition of subjects from one state-of-being to another, and not least for modeling the length of time before the transition occurs (Cleves, Gould, Gutierrez, & Marchenko, 2008). Such models have considerable advantages compared to the more widely used linear regression models (in which the dependent variable would be the number of days/months/years depending on the context before an event occurs) and binary outcome models (in which the dependent variable would be the “status” of a subject in every time period) (Jenkins, 2005). Compared to the former, duration models have the advantage of allowing the inclusion of time-varying covariates as well as being able to deal with right-censoring, which occurs when subjects do not “fail” but stop being observed. Regression models consider that all subjects fail, which is misleading and incorrect (Jenkins, 2005). Despite allowing accounting for right-censoring, binary outcome models are inefficient compared to duration model as the lapse of time since a subject first was at risk of failure is not accounted for when determining the probability of a subject changing status (Jenkins, 2005). In duration models, subjects are said to “fail” when they move

from one state-of-being to another. The fact that the word failure is used does not necessarily have a negative connotation though in this paper failure refers to firms' interruption of export activities.

In this paper, I employ a semi-parametric Cox proportional hazard model as the baseline model to estimate the factors influencing the hazard rate of firms in export markets. The hazard rate in this study represents a firm's probability of stopping its export activities to a specific market at time  $t$ , on the condition that it has "survived" until then. The hazard function for the  $i^{\text{th}}$  subject is defined as follows:

$$h(t|x_i) = h_0(t)\exp(x_i\beta_x); \quad (1)$$

where  $h_0(t)$  is the baseline hazard representing how the hazard function changes over time and  $\exp(x_i\beta_x)$  represents how the hazard functions changes according to different subject characteristics (Hosmer, Lemeshow, & May, 2008). The main advantage of this model is that it does not require any assumption regarding the functional form of the baseline hazard distribution over time ( $h_0(t)$ ) (Cleves, et al., 2008). On the other hand, the model assumes proportionality in hazard function across time, meaning that the effect of covariates on the hazard function is independent of time (Jenkins, 2005).

Duration models require the user to set up the data in a specific way, which differs from "regular" regression models. First, one has to indicate when a subject is at risk of failing. In this paper, subjects are at risk of failure once they enter a specific export market. The time at which a subject becomes at risk of failure constitutes the reference time from which the failure event will be compared to when computing the duration. It is therefore crucial to properly determine when a subject is at risk; though methods for dealing with left-censoring in statistical programs are available. As commonly seen in the literature, I only consider firms which enter a specific export market after 1995 so that the beginning of the period at risk is well defined, thereby excluding left-

censored subjects. Second, the importance of determining the failure time of a subject in this kind of analysis is obvious. As expressed later on, this is done by creating a dichotomous variable indicating whether a firm stops exporting in year  $t$  or not. Such variable enables me to include right-censored subjects in the analysis, i.e. firms for which the failure date is unknown as they were still exporting in the last year of observation.

When using duration analysis, the way the sample is selected, i.e. flow sampling versus stock sampling, is very important for the interpretation of the results. In this paper, the fact that the analysis is conducted at the firm-destination level implies that the sample consists of both stock and flow sampling. By considering only entries into export markets occurring after 1995, the sample is obtained through flow sampling. However, some of these flows correspond to new export starters, while others correspond to experienced exporters “simply” entering a new destination. As such, stock sampling also takes place. In the sample, most entries are characterized by the firm having previous export experience in at least one other destination, indicating that the sample is perhaps not as heterogeneous as expected. Nevertheless, previous export experience at the firm-level is included in the model.<sup>37</sup>

## 4. DATA

### 4.1. Data sources and sample

This study focuses on the case of manufacturing firms located in Denmark over the period from 1995 to 2006. Due to data availability, the study is limited to export and import of goods by manufacturing firms only. Data on export and import of services is simply not available for the period studied. The final data set used to test the two previously developed hypotheses is a

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<sup>37</sup> As a robustness check, the baseline model was ran on two different sample of export spells: one for export spells without prior export experience and one for export spells with prior export experience. The effect of the variable of interest remain qualitatively the same, though it is of a much larger magnitude for the sample of export spells without prior export experience.

combination of several data sources. The core of the data, the export and import data comes from the Foreign Trade statistics available via a restricted access to Statistics Denmark databases. In this paper, I use export and import figures at the destination level. Using a more disaggregated data set has the advantage of allowing the uncovering of offsetting effects of the covariates across export destinations which may appear to be insignificant once aggregated at the firm level.

The Foreign Trade statistics data set provides a good coverage in terms of export and import of goods across many years and destinations. However, one should be aware that the minimum threshold for firms' obligation to report their export activities varies depending on the destination. Particularly, non-EU destinations are subject to much stricter divulgation policies compared to EU destinations. Hence, the figures for these destinations are likely to be more accurate. Yet, the data set should cover around 97 per cent of total exports (Statistics Denmark data documentation). The duration analysis may, however, be influenced by these inconsistencies as they may affect the observed date of entry and exit in EU export markets. Consequently, the survival rate of exporting activities in EU member countries is possibly under-estimated and this should be kept in mind when interpreting the results.

The trade data are merged with firm registers, which provide yearly financial and company information, to create several of the control variables included in the analysis. Finally, the destination-level data set is merged with country information such as yearly GDP and GDP per capita figures taken from the World Development Indicator database.

Tables 1 to 3 present the characteristics of the final dataset, a summary statistics of the variables included in the model as well as a correlation matrix. The final sample contains 26 758 subjects, meaning firm-destination pairs, which amounts to 3 776 firms and 62 690 observations in total. 18 074 subjects are found to fail during the period while 8 684 subjects are right-censored. In the

baseline analysis, the sample only contains firm-destination pairs for which there is only one export spell. Robustness checks are conducted where multiple-spell subjects are included. The average length of an export spell is around 2 years, ranging from a minimum of 1 year to a maximum of 10 years. In the majority of cases, firms enter a destination and exit within the same year, a number that stresses the high level of dynamics in the sample. Firms are on average entering 7 destinations over the whole period, ranging from 1 destination only to 95 destinations. The distribution of firms over the number of destinations is quite skewed, with 75 percent of the firms being entering 10 destinations or less.

#### 4.2. Dependent Variable

Duration models estimate the hazard ratio across subjects based on the included covariates. To estimate this ratio requires the creation of a variable indicating whether a subject fails in each time period or not. Consequently, the following dichotomous variable is constructed:

$$failed_{ijt} = \begin{cases} 1, & \text{if firm } i \text{ ceases exporting to market } j \text{ in year } t \\ 0, & \text{otherwise} \end{cases} \quad (2)$$

Where firm-country pair  $ij$  is marked to fail in the year firm  $i$  ceases exporting to market  $j$ . In other words, a firm-destination pair is given the value 0 from the time it starts exporting and until it fails, where it then gets a value of 1.

#### 4.3. Variable of Interest

To test for the two hypotheses developed earlier in this paper, a dichotomous variable capturing firms' import experience prior to export market entry has been constructed in the following way:

$$prev\_imp_{ij} = \begin{cases} 1, & \text{if firm } i \text{ imported from market } j \text{ prior to exporting to market } j \\ 0, & \text{otherwise} \end{cases} \quad (3)$$

Where a firm-country pair  $ij$  is attributed the value one if the firm has importing experience from a specific market  $j$  prior to starting to export that same market  $j$ . This variable does not vary over time<sup>38</sup>.

#### 4.4. Control Variables

The subsequent analysis also includes a series of control variables that in earlier studies have been shown to be linked with export propensity, export performance or export survival. In line with the international trade literature, I control for firm productivity (labor productivity) as more productive firms may self-select into exporting (Melitz, 2003). Productivity could also influence the length of export relations between a firm and a destination market as more productive firms may be better equipped to face the competition in the foreign market. In the same line of thought, firm size is also controlled for as evidence has shown that exporters are generally larger (Bernard & Jensen, 2004) and that larger firms may have more resources to devote to international activities which may increase their chance of remaining involved in foreign activities. Moreover, average hourly wage is included as a proxy for the quality of the firm's labor force. This proxy has been extensively used in the international trade literature and the rationale is that firms with a more qualified labor force may be more competitive or have knowledge advantages and therefore are more likely to export (Bernard & Jensen, 2004). Conversely, if wages are not representative of the workers' ability, having higher wages, all else being equal, should lead to lower competitiveness and therefore lower export propensity and performance. Finally, in line with the Uppsala internationalization process model (Johanson & Vahlne, 1977), I control for firms' export experience in other countries as the knowledge they develop through such experience may be exploited in other markets, which may affect the length of their export spell (Delios & Beamish, 2001; Li, 1995). By the same token,

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<sup>38</sup> This holds for single-spell subjects. For subjects with multiple spells, which are included in a robustness check, a dichotomous variable accounting for previous import experience in market  $j$  is constructed for each spells.

controlling for previous export allows controlling for the fact that export spells are not homogeneous and that firms might have different level of export experience when entering a new market.

Drawing from the literature on the gravity equation in the context of international trade, variables at the destination level which may affect the length of export spells are also included. For instance, the export destination's GDP has been found to positively affect export survival (Fugazza & Molina, 2011), representing the potential demand for a firms' product. Similarly, a destination's GDP per capita is also controlled for.

Finally, I control for unobserved heterogeneity at the destination and industry levels by including destination and industry dummies in the baseline analysis and include year dummies to account for cyclical effects.

## **5. FINDINGS**

### **5.1. Descriptive Evidence on Market-Specific Export Survival**

Before moving on to the duration analysis, descriptive evidence of the baseline hazard function and descriptive evidence on the relationship between firms' prior import experience and their survival on export markets are presented. As seen from Figure 1, the cumulative baseline hazard has a convex shape meaning that with time firms are less and less likely to exit export markets. Hence, in the first years of exports to a specific destination, firms are more likely to exit compared to later years. To get a first glance as to whether firms with prior importing experience in a specific destination and those without are characterized by different hazard functions, the Kaplan-Meier estimator (Kaplan & Meier, 1958) is used. When dealing with duration data the conventional univariate analysis, such as mean-differences between two groups, is not meaningful (Cleves, et al., 2008). Indeed, the mean values do not deal with right-censoring. The Kaplan-Meier analysis show

that firms with prior import experience on a specific market have a higher survival rate (equivalent to saying a lower hazard rate) than firms without such experience at the moment of entry. This suggests that the learning effect which is expected from traditional international business literature would prevail. This preliminary analysis thereby suggests that the positive relationship between inward and outward internationalization activities found in previous research also holds when it comes to the duration of export activities in specific markets. Estimating a proportional Cox model with prior import experience as the only covariate presents the same result.

## **5.2. Results of the Econometric Analysis and Discussion**

Of course, the findings from these univariate analyses should be taken with caution; they are most likely biased as variables correlated with both firms' survival rate in a specific export market and prior import activities are not included.

In this section, the results of the duration analysis are presented and discussed, the main results of which are displayed in Table 4. The reported estimates are hazard ratios and should be interpreted as follows: when above one, subjects with a particular characteristic (or subjects with larger values for a specific covariate) are more likely to fail (exit the export market) and likewise, when below one, subjects are less likely to fail. In contrast to the Kaplan-Meier analysis performed above, I find that, after controlling for firm and destination characteristics, firms with import experience from a specific market prior to starting exporting to that market have a higher hazard than firms without such experience. More precisely, in this sample, firms are roughly 11% more likely to exit export markets in which they had import experience prior to export market entry than firms without such experience. In other words, firms with prior import experience have shorter export spells in the markets they gained their experience in. Such finding provides support to hypothesis 2 and indicates

that the sunk costs and real option logic is more appropriate for understanding the relationship between inward-outward linkages in the context of export survival.

Looking at the effects of the different control variables, they are very much in line with what is expected; larger and more productive firms have a lower probability of exiting export markets. The results furthermore show that a larger initial export value is associated with a lower probability of exit. This finding is in line with the logic that firms having a stronger foothold in a market from the start are less likely to exit. Following the sunk costs argument, one would expect higher initial export values to be seen in export markets presenting higher entry costs as firms need to sell more in order to generate non-negative profits. Hence, higher initial export values (indicating higher sunk costs) would be expected to be associated with lower probability of exit. Finally, destination characteristics do not appear to influence firms' probability to exit export markets. However, when running the model without destination dummies, the results indicate that firms are less likely to exit larger and richer countries (not shown here). As such, the "destination effects" on export survival appear to be picked up by the destination fixed effects that are included in the baseline specification.

To better understand the effect of prior import experience on export survival, it is relevant to see if the effect holds for all destinations. Table 1 columns (iii) to (vi) present the results for different destinations classified according to their level of economic development (developed, developing and least developed)<sup>39</sup>. Given that prior import experience might help reduce the fixed costs associated with export market entry and that the fixed costs are likely to be higher in very dissimilar destinations, one would expect less developed destinations to be more affected by prior importing experience. In contrast to this expectation, the results reveal that prior import experience in

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<sup>39</sup> Though not reported here, Kaplan-Meier analyses comparing the survival function of firms exporting to the different "types" of destinations show that the survival rate is repeatedly higher in developed countries, lower in developing countries and the lowest in least-developing countries.

developed countries increases the likelihood of exit whereas it substantially reduces the probability of exit in least developed destinations. Such results indicate that the effect of prior importing experience widely differs across destinations and that the competing hypotheses developed in the conceptual part of this paper might in fact co-exist rather than compete. These estimates suggest that the sunk costs and real option logic might better explain the exit decision in more developed countries while the learning hypothesis might be better suited to explain how prior importing experience affects the probability of export exit in more dissimilar countries.

### **5.3. Robustness Checks**

#### ***Disentangling the effect of prior and ongoing import experience***

The effect importing might have on export survival may not only be related to a firm's prior import experience but also to ongoing import activities. Prior research shows that efficiency seeking is one of the main motives, with prospects of cost reduction, for sourcing intermediate inputs from abroad (Di Gregorio, Musteen, & Douglas, 2009). In line with this evidence it is argued that sourcing strategies, besides increasing knowledge about foreign markets, may be linked to export activities through their impact on productivity (Bas & Strauss-Kahn, 2011). Firm-level evidence on the association between outsourcing and productivity gains supports the idea that importing intermediary input is beneficial for a firm's productivity (Görg & Hanley, 2005). For instance, access to better technology or inputs of a higher quality may be ways in which a firm's outsourcing behavior may lead to higher productivity (Bas & Strauss-Kahn, 2011; Di Gregorio, Musteen, & Douglas, 2009). Moreover, by expanding a firm's boundaries and creating opportunities for more efficient resource allocation and focusing on core activities, outsourcing may result in higher production capacities and economies of scale, and consequently in higher performance. Hence, ongoing importing activities may increase a firm's competitiveness in international markets (Di

Gregorio, Musteen, & Douglas, 2009), and consequently the likelihood of performing in export markets, hence experiencing a higher survival rate.

It could be that prior import experience affect export survival not only through the reduction of fixed exporting costs but also indirectly through increasing firms' probability to import in time  $t$ . As such, these two "types" of import experience variables are correlated and including only one of them in the analysis may lead to biased results confounding the effect of the two. To account for this, import status of firms in  $t-1$  is added to the list of control variables. As depicted in column (i) of Table 2, the effect of a priori market-specific import experience increases, so that firms with such experience 24 per cent more likely to stop exporting than firms without market-specific a priori import experience. Interestingly, I find a positive effect of ongoing import status on export duration, which provides support to the enhanced productivity thesis in which importing firms increase their productivity and as a result are more competitive and more likely to remain on the export market.

### ***Discrete time***

The proportional Cox model assumes and treats time as a continuous variable. However, as it is often the case in social sciences, subjects are not observed on a continuous basis but rather in a discrete, yearly manner. As the ranking of subjects in terms of failure time is crucial in duration models, the fact of having data grouped over a certain period of time (in the present grouped over one year) may be problematic if some subjects fail in the same period. It is then impossible to accurately establish the ranking of failures between two subjects who fail in the same year (Jenkins, 2005). An alternative is to apply a complementary log-log model, which is known to be the discrete version of the proportional hazard rate model. The results found earlier are robust to discrete time specification; the higher hazard rate for firms with import experience prior to export market entry remains (as presented in Table 2 column (ii)). Note that in this model, the estimation results are

coefficients (and not odd ratios) and should be interpreted as increasing the probability of export market exit when larger than zero and vice versa.

### ***Multiple spells***

Finally, I test whether the results found earlier are driven by the fact that only single-spell starters were included in the baseline analysis. Indeed, the number of spells may be related to a firm's previous import experience, for instance if firms who really need the import experience to be able to enter a specific export market also have a more volatile export path. For this reason, one should know to which group of subjects the results apply. I therefore run the analysis on the full sample and include an extra control variable which captures the fact that firms with multiple spells in one export destination naturally have a higher hazard rate. Not surprisingly, this variable is highly significant and the effect on the likelihood of exiting a market is very high (around 48%). The results are presented in Table 2 column (iii). Interestingly, the main results found previously do not hold on the full sample. The positive effect on the probability of firms to exit export markets in which they previously had import experience appear to apply only to single-spell subjects only.

## **6. CONCLUSION**

In this paper I extend the current literature on the linkages between inward and outward internationalization activities by looking at whether import experience is linked to market-specific export survival. I thereby provide a longer-term view of what inward activities mean for outward internationalization and move beyond the initial stage of internationalization.

Using a sample of exporters located in Denmark, the present study shows that import experience prior to export market entry increases firms' hazard rate in individual export markets. This effect is, however, particular to exports to developed countries. This finding provides support to the thesis that prior import experience facilitates export entry into a market by lowering the investment

required before entering, and that this reduction of sunk costs makes firms more footloose. In contrast, prior import experience considerably reduces the likelihood of export market exit in least developed destinations. This result is more in line with the knowledge perspective which would predict that prior experience would reduce information barriers encountered when wanting to start exporting to that specific market, enabling managers to make better informed decision and thereby increasing their chance of survival.

Besides extending the current academic discussion on the topic, the present study has implications for practice. By focusing mainly on outward international activities, policy makers may miss an important factor when developing export promotion programs which do not consider the previous involvement of firms in international markets as importers. Moreover, evidence shows that import activities, through potential efficiency gains, are linked with survival in export markets. This is to be considered when new regulations in favor of restricting access to imported products and protecting domestic production are designed.

This study could be expanded in several ways. Future research on the topic should account for whether a firm is completely ceasing all outward-oriented activities to a specific market when it ceases to export to it or whether a firm is simply increasing its commitment to that particular market by switching entry mode. Some of the findings of this paper could indeed be driven by the fact that firms with knowledge about a market prior to export market entry may be faster at switching to higher commitment entry modes, for instance by establishing their own subsidiary in the market they were previously exporting to. Moreover, it would be interesting to look at what the behavior of firms in terms of export market exit means for their overall performance and could help strengthen the arguments presented here. Particularly, looking at whether the conditions which lead to export market exit differ across firms with and without prior import experience in the particular market and whether this affect the link between export market exit and firm performance.

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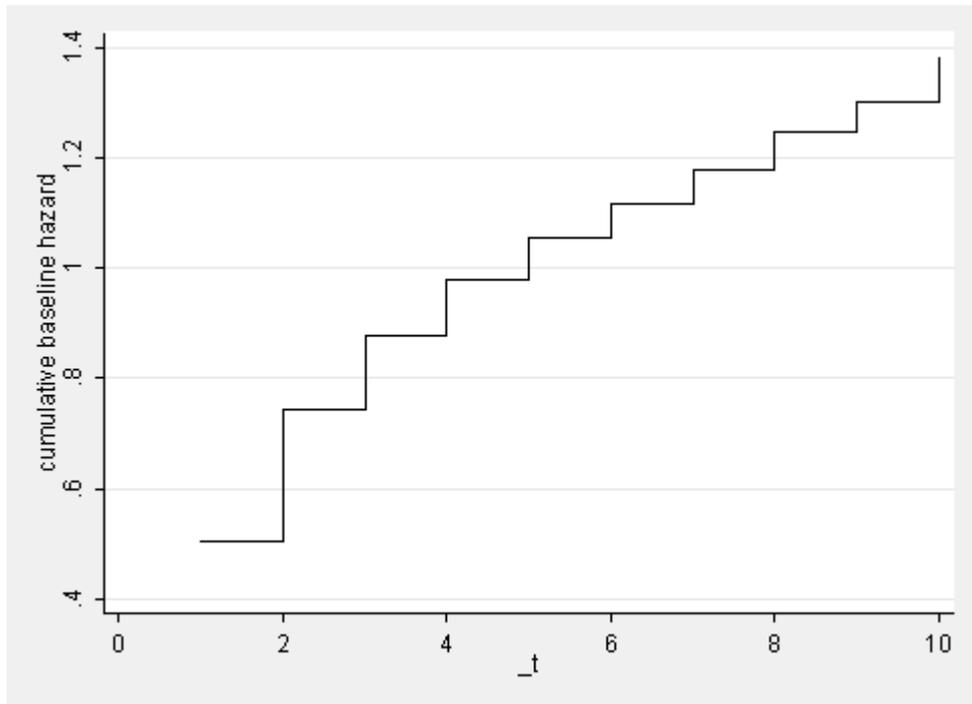
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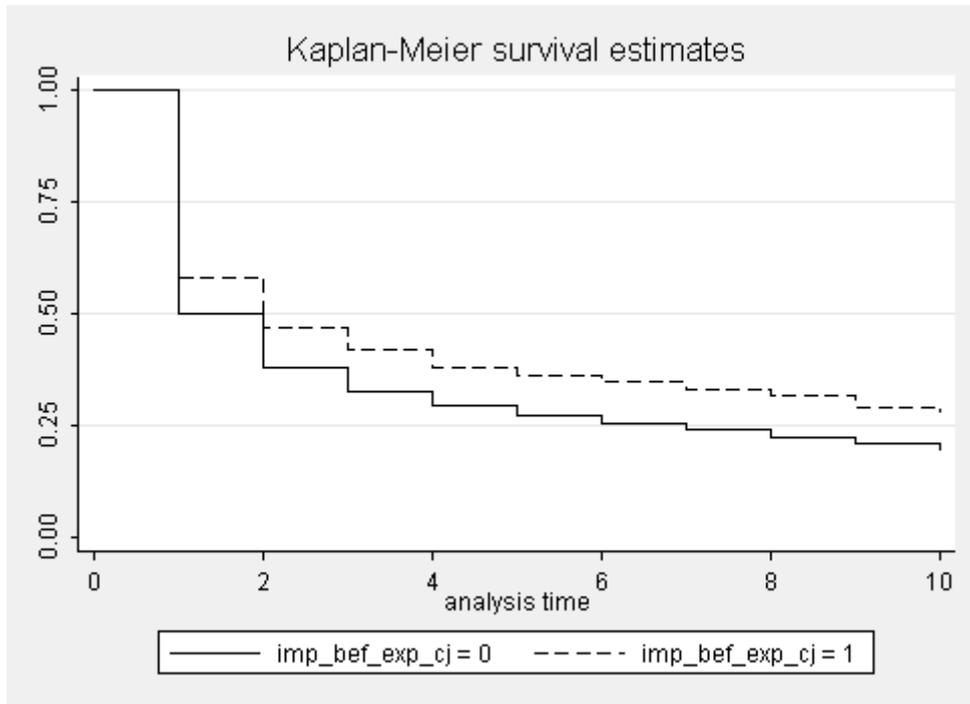
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**Figure 1: Baseline hazard function**



**Figure 2: Kaplan- Meier survival estimates**



**Table 1: Data summary**

Nb. firm-destination pairs (subjects)	26 758
Nb. firms	3 776
Nb. destinations	186
Nb. of destination per firm:	Ranging between [1,95]
Average	7
25th percentile	2
50th percentile	4
75th percentile	10
Nb. right-censored subjects	8 684
Nb. subjects with failure	18 074
Nb. observations	62 690
Nb. years:	
Average	2 years
1	15 350 (57.37%)
2	4040 (15.10%)
3	2169 (8.10%)
4	1403 (5.24%)
5	1026 (3.83%)
6	602 (2.23%)
7	556 (2.08%)
8	552 (2.06%)
9	509 (1.90%)
10	551 (2.06)

**Table 2. Summary statistics**

Variables	No. Obs	Mean	Std.dev	Min	Max
Export exit (Failure)	62690	0.288	0.453	0	1
<i>Imports before export</i>					
... same country	62690	0.147	0.354	0	1
<i>Import status</i>					
... same country	62690	0.250	0.433	0	1
<i>Controls</i>					
Initial export sales (ln)	62690	6.886	2.128	-4.710	15.469
Productivity (ln)	62690	8.349	0.443	4.232	12.188
Firm size (ln)	62690	4.195	1.439	0	9.451
Wages (ln)	62690	1.761	3.328	0.180	7.558
Previous export experience	62690	0.912	0.284	0	1
Real GDP (ln)	62690	25.355	2.053	17.797	30.043
Real GDP per capita (ln)	62690	9.020	1.345	4.191	11.099

**Table 3. Correlation matrix**

	1	2	3	4	5	6	7	8	9	10
1. Export exit (failure)	1									
2. Import before export, same country	-0.0523	1								
3. Import status, same country	-0.1666	0.4535	1							
4. Initial export sales	-0.2605	0.0177	0.1703	1						
5. Productivity	-0.0428	0.0387	0.0233	0.0722	1					
6. Firm size	-0.1077	0.0285	0.0817	0.1893	0.0871	1				
7. Wages	-0.0317	0.0139	0.0475	0.0723	0.3830	0.0808	1			
8. Previous export experience	0.0799	0.0332	-0.0646	-0.1399	0.0082	0.0455	-0.0133	1		
9. Real GDP	-0.1727	0.2559	0.2763	0.1335	-0.0464	-0.1708	-0.0094	-0.0721	1	
10. Real GDP per capita	-0.1994	0.1985	0.2152	0.0437	-0.0841	-0.2458	-0.00695	-0.1363	0.4670	1

Note: All pair-wise correlations are significant at the 10 per cent level.

**Table 1. Destination-level analysis of the relationship between importing experience and export market exit**

	Prior market-specific import experience (i)	Export experience in other markets at entry		Estimations by destination groups		
		(ii) with	(iii) without	(iii) Developed countries	(iv) Developing countries	(v) Least-developed countries
<i>Imports before export</i>						
... same country	1.109*** (0.027)	1.106 (0.027)	1.222* (0.128)	1.167*** (0.032)	0.98 (0.043)	0.593* (0.162)
<i>Controls</i>						
Initial export sales	0.892*** (0.004)	0.896 (0.004)	0.809*** (0.016)	0.871*** (0.005)	0.917*** (0.005)	0.95*** (0.009)
Productivity	0.89*** (0.023)	0.883 (0.023)	0.985 (0.087)	0.872*** (0.027)	0.907*** (0.028)	1.084* (0.048)
Firm size	0.879*** (0.009)	0.886 (0.008)	0.814*** (0.036)	0.842*** (0.01)	0.912*** (0.009)	0.987 (0.012)
Wages	1.016 (0.038)	1.024 (0.04)	0.937 (0.093)	1.001 (0.047)	1.047 (0.049)	0.912 (0.073)
Previous export experience	1.211*** (0.087)			1.109* (0.062)	1.735*** (0.276)	1.931** (0.512)
Real GDP	1.193 (0.239)	1.02 (0.208)	6.357 (8.147)	2.471* (1.324)	2.419*** (0.655)	4.764** (3.104)
Real GDP per capita	0.832 (0.154)	0.949 (0.179)	0.547 (0.56)	0.395** (0.192)	0.443*** (0.117)	0.238** (0.157)
Industry dummies	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes
Destination dummies	yes	yes	yes	yes	yes	yes
Nb. Obs	62690	57160	5530	42698	19987	2036
Nb. Subjects	26758	24902	1856	16086	10668	1448
Log Pseudolikelihood	-176127.95	-165713.02	-6564.54	-88045.75	-75518.87	-9022.27

Note: Hazard rate estimations using proportional Cox hazard model; estimates above 1 indicate larger probability of failure; standard errors are clustered at the firm level and presented in parentheses; \*\*\*, \*\* significant at the 1 and 5 percent level

**Table 2. Robustness checks**

	(i) Import status <sup>a</sup>	(ii) Discrete time <sup>b</sup>	(iii) Cox Model with Multiple spells <sup>a</sup>
<i>Imports before export</i>			
... same country	1.24*** (0.033)	0.127*** (0.031)	0.993 (0.013)
<i>Import status</i>			
... same country	0.794*** (0.021)		
<i>Controls</i>			
Multiple spells			1.483*** (0.015)
Initial export sales	0.893*** (0.004)	-0.166*** (0.006)	0.904*** (0.003)
Labor productivity	0.89*** (0.023)	-0.153*** (0.036)	0.902*** (0.016)
Firm size	0.883*** (0.009)	-0.177*** (0.013)	0.891*** (0.006)
Average wage	1.019 (0.038)	0.01 (0.054)	1.015 (0.028)
prev_exp	1.201*** (0.084)	0.227*** (0.081)	1.118** (0.063)
Real GDP	1.186 (0.238)	0.541* (0.305)	1.542*** (0.218)
Real GDP per capita	0.84 (0.155)	-0.539* (0.281)	0.55*** (0.072)
Nb. Obs.	62690	62666	122795
Nb. Subjects	26758		56809
Pseudo Loglikelihood	-176089.85	-28809.042	-435563.8

Note: standard errors presented in parentheses; standard errors are clustered by firm; \*\*\*, \*\*, \* significant at the 1, 5 and 10 percent level; <sup>a</sup>) reported results are odd ratios and should be interpreted as increasing the chance of survival when below 1 and decreasing chance of survival when above 1; <sup>b</sup>) reported results are coefficients and should be interpreted as increasing the chance of export market exit when above zero and vice versa; All models include industry, destination and year dummies.