Export Experience of Managers and the Internationalization of Firms

by

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Abstract

As the firm gravitates to the core analysis of international trade models, the possibilities to learn from the theory of the multinational enterprise developed in international business studies increase. The managerial resources and capabilities that are so emphasized in this theory for export initiation have largely been neglected in the empirical studies of international trade. Probably not because they are unimportant, but rather because of the challenge to identify and measure them. We exploit Danish employer-employee matched data to overcome this barrier and analyze the impact of managers' international experience together with other managerial characteristics on the likelihood that the firm starts exporting. We find that productivity and fixed costs associated to exporting are not the sole determinants of the selection of firms into international markets, but "managerial inputs" are as important. Our data allows us to identify managers' export experience based on the CEOs' historical career as documented in official registry statistics. This puts our study apart from earlier survey based studies which rely on self-assessments.

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1 Introduction

While managerial resources and capabilities are central to the theory of the (multinational) enterprise developed in the field of international business, they have received limited attention in the field of international economics. Even the empirical literature that has sprung from studies on firm heterogeneity has remained impermeable to the criticality of managerial influence on export initiation.[1] One reason for a limited contact across the two disciplines, among a number of other factors (see Rugman, 2011), must be found in the challenge of collecting extensive firm-level data with access to measurable managerial characteristics.

Exploiting a large and rich database of Danish manufacturing firms, we explore in this paper some of the insights from international business studies and the resource base view of the firm in an otherwise conventional empirical trade model.

There are mutual benefits for both sides of the literature in taking this approach. From the standpoint of international economics, "managerial inputs" can open new prospectives on how firms sort into the international economic activity, beyond the "self selection hypothesis" formulated by trade economists. According to this hypothesis, the productivity and the fixed costs of exporting determine the internationalization process of a firm. But we find that managerial capabilities are equally important in overcoming the liability of selling on international markets. From the standpoint of international business studies, this analysis uses an unprecedented number of firms, involving the whole population of Danish manufacturing firms, repeatedly observed for a decade. Such data dimension is, in our opinion, per se an interesting "test-bed" for the importance of the managerial influence and surpasses the typical dimension of empirical studies conducted in the international business literature.[2]

The trade-off, of course, is the type of characteristics that we can observe in such a data. Using the organizing framework adopted by Leonidou et al. (1998) we can observe "*objective-general*" characteristics (the age, the education, the gender, the nationality) as well "*objective-specific*" characteristics (the international experience). But we cannot dispose of "*subjective-general*" and "*subjective-specific*" characteristics such as the manager's risk tolerance, flexibility, commitment, dynamism, profit perception, growth perception, complexity perception.

Inspired by Barkema and Shvyrkov (2007) and Hambrick and Mason (1984), we take the view that management is a shared effort of the management team as a whole, rather than solely the experience of the CEO of the company. Making the assumptions that the CEO

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[1]See Greenaway and Kneller (2007) for an extensive review of this literature. Mion and Opromolla (2011) is an exception.

[2]See Leonidou et al. (1998) for a critical assessment of a large number of empirical studies in the international business literature.

is the top-payed person of the company, and the team of managers consists of the five top payed person in a company, we measure the above objective-general and objective-specific characteristics for each one of them.[3] The most important characteristic for our analysis is the international experience of the manager. A manager has qualified international experience in our data if she or he has ever held a similar position in an exporting company. As advocated by the resource base view of the firm, such experience distinguishes firms from others whose managers do not possess the same background, and it is a hard to imitate resource. Since it is valuable for exporting, firms are interested in acquiring it externally. Therefore, we hypothesize that the external promotion of managers is increasing the likelihood that a firm will start exporting.

The firm does not operate in isolation and the way a firm responds and adapts to the environment has been the subject of several studies in the international business literature and in the resource base view of the firm. For our analysis, we recognize that firms may learn through "link-alliances", informal or formal alliances between firms that facilitate symmetrical and asymmetrical knowledge or asset sharing. Exploiting the dimension of our large dataset, we try to capture, although imperfectly, these "link-alliances" with the share of firms exporting within a narrowed defined industry. The hypothesis is that the larger the number of firms exporting, the greater the potential knowledge that can be shared through formal or informal alliances.

"Managerial inputs" and "link alliances" are the variables which we bring into an otherwise standard empirical trade analysis of export initiation. The integration of these variables into the empirical framework is not without challenges. The impossibility to know about firms' intentions to export impedes to identify properly whether managers' international experience triggers firms' exports. Yet, plausibly, the firm may be hiring a manager with such credentials because of its intention to export. To attenuate, if not to solve such issues and give solidity to the analysis we rely on the richness of our data-set to control for an extensive number of confounding factors. In particular, we can use location-time fixed effects to capture relevant local shocks to the labor market: a tighter labor market making it increasingly difficult to hire managers would then be absorbed by the fixed effect. In addition we lag our covariates by one period to attenuate the simultaneity bias, and yet maintain a long time span. Overall, we believe there is a lot to learn from this exercise about the co-habitability and the interaction between these two fields of economics, although we recognize that sorting out the casual effects of these types of variables is still work in progress and needs refinement in the future research agenda.

To delineate our empirical specification we sketch briefly a theoretical model based on

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[3]Below we discuss other possible approaches to the identification of the companies' management.

the real option theory, a modeling approach that is common to both international economics and international business.[4] This framework offers some advantages. First, it naturally accommodates the fixed cost of exporting and their impact on the sorting of firms into international markets. Second, it allows to integrate Lucas' (1978) and Garicano's (2000) approach of modeling managerial ability and know-how. Third, it has implications for the sorting of firms along time. This implication is consistent with what we observe in our data, namely that firms initiate exporting at different stages of their life.

For a subsample of firms that have been founded within the time window of our data, we can investigate how quickly they come to exporting. We conjecture that firms that greatly delay exporting should be valuing the international experience of managers' less than firms that have planned for a fast entry in international markets. Importantly, for these subsamples of firms, the simultaneity bias should be even less stringent, or non existent, providing further robustness checks for our results.

We present this theoretical model together with our empirical strategy in the next section. Thereafter, we present our data and some descriptive statistics. We then present our results and finally conclude.

2 Empirical Strategy

Albeit simple and stylized, a parsimonious model of the export decision of the firm should contain three elements to be of valuable guidance in our empirical analysis. First, it should describe the selection of firms into exporting. Second, it should be compatible with evolving productivity, as observed in the data. Finally, it should explicitly allow for a manager role.

As demonstrated in the recent trade literature, the fixed costs of exporting jointly with firm's heterogeneity in productivity generate the sorting of firms in the international markets. And, in a dynamic context of growing productivity over time, firms enter in different periods, i.e. sorting also along the time dimension (Sala et al., 2010). To relate the firm's internationalization process to managerial inputs, we present here a simplified version of the model in Sala et al. (2010). Like in Lucas (1978), our "firm" consists of a single manager (or entrepreneur), l homogenous employees and k homogenous units of capital. In each period the manager manages resources l and k to produce output:

$$q = ca^{1-b}[f(k,l)]^b \tag{1}$$

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[4] For application of this model in international trade see Sala et. al (2010) and Bertola (2010). Li and Rugman (2007) apply real option theory to FDI research.

where the function f is homogenous of degree one and all variables are contemporaneous. The parameter c is common to all firms, representing therefore the country-wide productivity, or a country-specific-advantage (CSA), while a is idiosyncratic to the firm and therefore it represents a firm-specific-advantage (FSA), comprising factors as proprietary technology, product innovation or management know how.[5] Finally, b is the degree of diminishing returns at the plant level, the "span control" parameter in Lucas' original formulation. It is less than unity, so that that there are diminishing returns to controlling a firm, ensuring that a single manager cannot control all firms in an economy and a market for managers exists.

Without loss of generality, we abstain from considering the domestic activity of the firm as our purpose is to analyze the forces that determine selection into the export market. q will therefore refer to the potential sales on the foreign market, and the income v of the manager consists of the firm's variable profit

$$v(a) = pq^* - c(w, r, q^*, T) \tag{2}$$

where r and w are the rental prices of the input factors, p is the f.o.b price of output, q^* is the profit maximizing output satisfying foreign demand and T is the transportation cost.[6] $c(\cdot)$ is therefore the minimum cost of producing and shipping the q^* units of output.

A specific feature of the model, generally not shared with models of international trade, is that the term a evolves over time: we take the simplification that it grows deterministically at a constant rate.[7] Indexing with s the time, $v(a(s))$ denotes the variable profit in period s as determined by the value of a in that period. Because the idiosyncratic term a is the only growing term, the variable profit is also growing deterministically at a given constant rate which we henceforth denote with g.

Let $s = 0$ be the founding year of the company, $t \geq 0$ the period in which a company starts exporting, and E the fixed cost incurred to export. In the founding year the value of pursuing an exporting strategy at t is therefore the stream of discounted variable profits from t on net of the entry fixed cost E, or

$$V(v(a(0)), t) = \int_t^\infty v(a(s))e^{-rs}ds - Ee^{-rt} \tag{3}$$
$$= \int_t^\infty v(a(0))e^{gs}e^{-rs}ds - Ee^{-rt}, \quad r > g$$

where r is the discount rate equal to the return of a safe bond on the capital market. In

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[5]See Rugman (2011) for this terminology.

[6]We do not explicitly model demand here, but we do so in Sala et al. (2010).

[7]For an application of real options theory in international business see Li and Rugman (2007.)

this formulation, entry is considered an irreversible investment, but postponable. That is, firms are not confronted with a "now or never" option, but they can strategically choose the time of entry. Denoting with t^* the optimal entry time into a new market, the lapse of time between the founding year and the start of exporting is then t^* periods. Only when $t^* = 0$ firms enter the foreign market right from the founding year. Since entry entails the fixed cost E, delaying entry $(t^* > 0)$ allows also saving on the entry cost E. Investing this sum alternatively on a safe bond, yields a periodical yield of rE. Consequently, as a non-arbitrage condition, the real investment of expanding the economic activity into a foreign market at t^* should yield at least the same financial return, or

$$v(a(t^*)) \geq rE, \quad \text{with} = \text{if } t^* > 0 \tag{4}$$

which indeed equates the variable profit at entry to the user cost of capital.[8] Since the profit is growing while E is constant, with time the payoff from exporting will eventually exceed the option value of waiting and all firms in this model will find exporting optimal at a given point in time.[9] But firms with different values of a will find it optimal to enter the foreign market at different points in times, so that there is sorting along the time dimension too.

The sorting patterns implied by this model are simple: either firms export from the start, those with $v(a(0)) > rE$, or delay exporting to a future date t^*. Depending on a and its evolution over time, one would therefore observe three types of firms in a limited time-window: the continuously exporting firms, the continuously domestic firms, and the firms that start exporting during the considered time span.[10] In particular, the higher a, the more attractive is, *ceteris-paribus*, entry into the foreign market, and the faster profits grow (higher g), the more attractive the exporting strategy becomes for a firm that has not entered the market yet. As such, different managerial experiences, either translating in higher a or higher g, should then impact on the firm's decision of entry.

While this formulation can relate managerial "inputs" to the exporting decision of firms in the spirit of Atkeson and Kehoe (2005), who interpret a as organizational capital, or Garicano (2000), who models a as managerial know-how, it remains silent both on the nature of the tasks performed by the managers and the source of heterogeneity. To identify some of the channels through which managerial inputs matter in this context we turn to the richer

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[8]Formally, the optimal time solves

$$t^* = \underset{t \geq 0}{\arg\max}[V(v(a(0)), t)] \tag{5}$$

and (4) is the first order condition to this maximization problem.

[9]See Bertola (2010).

[10]The model in this basic formulation cannot predict firms quitting exporting in the time span. However, this setup is easily extendable to incorporate switching behavior, see Dixit and Pindyck (1994).

interpretations offered by the international business literature and the "resource base view" of the firm. The starting point is the recognition of international knowledge and experience as a valuable, unique, and hard-to-imitate resource that differentiates firms in global competition (Peng and York, 2001). Firms are not viewed as single entities, as in our model, but rather as a network of entities, and a prerogative of headquarters is transferring to subsidiaries the capability to exploit knowledge effectively (Dunning, 1993; Caves, 1996). Some of the necessary knowledge to ensure effective communication and to be successful on the international markets reside in managers' backgrounds and experiences. Being personal, it is also hard to copy or imitate by other firms whose top managers do not possess similar backgrounds (Carpenter et al., 2001). Executives' international experience results then attractive to other firms that are interested in acquiring this tacit knowledge (Daily et al., 2000), suggesting that external promotion of managers are highly desirable. However, how the managers team up is also a critical factor for the resulting firm's strategy because group dynamics affect the communication and the decision making processes. According to Barkema and Shvyrkov (2007), managers' diversity in term of education or tenure may lead to a wider range of strategic options than otherwise possible, but it could also reduce the novelty of the options considered if it generates emotional conflicts among the members. Environments where team diversity is coupled with age, race, or gender diversity may be more prone to the formation of hardened subgroups and therefore to this eventuality. However, through the constant interaction of the team, members learn with time to avoid or resolve emotional conflicts. But the interaction of the same members can also diminish the cognitive diversity which is essential to take novel and wider strategic options. This analysis conveys the importance to control for managerial characteristics like age, gender, nationality, tenure along with the promotion of new managers or their background.

Furthermore, international experience can rise from both formal and informal alliances. Formal alliances are designed to exploit relationship-specific assets strengthening a firm's competitive advantage (Dyer, 1996); informal alliances are means of sharing asymmetric knowledge (Mitchell, 2000). Finally, exporting is the outcome of a dynamic and longitudinal process where firms build on capabilities and experience from previous entries or multiple entries (Kogut, 1997). We extend therefore our analysis to include firms' dynamics on the international markets as well as informal networking as an attempt to capture part of this "link-alliances".

As a practical implementation, defining $y^*(t) \equiv v(a(t^*)) - rE$, the theory suggests that a firm will be exporting if

$$y(t) = \Gamma[y^*(t) \geq 0] \tag{6}$$

where $\Gamma[\cdot]$ denotes an indicator function taking value 1 if the expression in brackets is true.

Therefore, $y(t)$ is a unity indicator for the export status of the firm in period t, and y^* is the unobserved latent variable that triggers a firm's exports. Letting i be the firm index, j be the firm's industry index and l be the firm's location index, we assume

$$y_{it}^* = c + \mathbf{b}_1 \mathbf{m}_{it} + \mathbf{b}_2 \mathbf{p}_{it} + \mathbf{b}_3 \mathbf{n}_{it} + \mathbf{b}_4 \mathbf{x}_{it} + \mathbf{b}_5 \mathbf{z}_{jt} + \gamma_j + \gamma_t + \gamma_l + u_i + e_{it} \tag{7}$$

where $\mathbf{m}$ groups together the managers' international experience, age, gender, nationality and education while $\mathbf{p}$ indicates new managerial promotions through which the company may seek to acquire the relevant international expertise. The vector $\mathbf{n}$ includes variables that describe firms' dynamics to proxy for informal networking or "link-alliances". Inspired by the international business studies, these are the variables that we are able to measure for a large number of firms and we bring into a more traditional economic analysis. The vectors $\mathbf{x}$ and $\mathbf{z}$ control, respectively, for an extensive battery of firm and industry time varying characteristics as it is custom in this type of analysis; γ_t, γ_j and γ_l are, respectively, time, industry and location effects, and u_i is unobserved heterogeneity which is possibly correlated with our explanatory variables. Finally e is the error term and is independent of all explanatory variables. If G is the cdf of e and is symmetric about zero, then

$$P(y = 1 | \mathbf{X}) = G(c + \mathbf{b}_1 \mathbf{m}_{it} + \mathbf{b}_2 \mathbf{p}_{it} + \mathbf{b}_3 \mathbf{x}_{it} + \mathbf{b}_4 \mathbf{z}_{jt} + \gamma_j + \gamma_t + \gamma_l + u_i) \tag{8}$$

where $\mathbf{X}$ is the vector of all contemporaneous or lagged regressors. The probit model is simply the special case with $G(\cdot)$ being the cdf of a standard normal distribution, while the linear probability model is the special case with $G(\cdot)$ being the identity function. When accounting for unobserved heterogeneity, we use the within estimator (corrected for heteroskedasticity) for the linear probability model, while for the probit case we resort to partial maximum likelihood estimator in the Chamberlain (1980) formulation.

We regard as an advantage the possibility to account for unobserved heterogeneity parametrically in the linear probability model, even if the estimated response probability may not lie in the unit interval. This is achieved in the probit estimation at the cost of making some distributional assumptions on the unobserved heterogeneity to estimate consistently the parameters of interest. These assumptions however have interesting implications in our context. Specifically, in the Mundlak (1978) formulation it is assumed that

$$u_i = k + \mathbf{d}\bar{\mathbf{S}} + a_i \tag{9}$$

where $\bar{\mathbf{S}}$ is the row vector of the averages over the sample period of all time varying regressors and a_i is a random variable normally distributed with mean zero and variance σ_a^2. Then the coefficients in $\mathbf{d}$ allow us to relate unobserved heterogeneity to the elements of $\bar{\mathbf{S}}$. In particular, managerial "inputs" could have a direct impact on the likelihood of a firm to export through

$\mathbf{b_1}$ or $\mathbf{b_2}$; and likewise, through $\mathbf{d}$, they could confer to the firms those expertise that make the firm special among the others and successful on the international markets. Therefore, conditional on these distributional assumptions, we can conveniently identify to which extent managerial "inputs" drive the selection of firms on international markets. And a test of $\mathbf{H_0}$: $\mathbf{d} = \mathbf{0}$ would justify the random effect probit model that is vastly employed in the literature. In the linear probability model in contrast we can only account for u_i and we cannot relate them to the managerial variables.

3   Data

Using register data from Statistics Denmark we compile a large dataset of Danish manufacturing firms from 1995 to 2006.[11] The prominent feature of these registers is the possibility to link employer and employee data together (i.e. employer-employee matched data). Therefore, we have access not only to critical firms' statistics like the total sales revenue, the export revenue, the value added, the total fixed assets and the firm's accounting information, but also to the firms' employees' characteristics like the salary, the education level, the nationality, the age, the gender, and the occupation. This feature of the data is what enables us to identify the companies' CEO and reconstruct part of their backgrounds.

Due to inconsistent figures, as a first step some firms are eliminated. We regard the following cases as logical data inconsistencies: a total or a foreign negative turnover, export revenues greater than total revenues, non-current assets or total assets that are negative, a year of foundation subsequent to when the firm is first observed, value added and equity that are both negative.

Some industries are rather empty bins of firms at an industry classification as fine as five or four digits. As a rule, we drop industries at four or five digit classification in those years in which there are less than thirty observations. Furthermore, as common in many empirical studies, we discard the manufacturing sector of refined petroleum products.[12]

Following Wagner's (2011) guidelines we disregard firms in the bottom and in the top percentile of the labor productivity distribution to reduce pervasive outliers influence. But we do not fully embrace his proposal of focusing only on firms with more than twenty employees. Mainly because small and medium firms are numerous in the Danish economy and such a

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[11]Statistics Denmark is the official statistical institute of Denmark. We use several registers, mainly in "FIDA": the most important are Firmastatistik, Regnskabsstatistik, IDA arbejdssteder, IDA firmaer, IDA-ansættelser, IDA-personer, Elevregistret.

[12]This sector is so tiny in Denmark that would have not passed the minimum threshold of observation that we have set.

criteria would eliminate half of the observations.[13] But in order to exclude self-employment, we do eliminate firms with less than three employees, approximately the lowest percentile of the employment distribution. And we will make a point in our robust analysis to keep firms with ten or more employees only, corresponding to the top three quartiles of the employment distribution across firms.

We end up with a panel of about 70000 observations, circa 9000 firms. Because Denmark Statistics collects data on the whole population of firms, the unbalanced nature of our panel is to refer to the natural entry and exit dynamics of firms in an economy and not to sampling decisions. Table A.2 in the appendix presents the firm distribution of domestic and exporting firms on a yearly basis.

We follow Bell (2005) and identify managers on the basis of annual salaries where the person within a firm with the highest salary is assumed to be the chief executive officer (CEO). Smith et al. (2008) take the same route with similar data and cast some doubts on the reliability of using instead the occupational code, an alternative legitimate approach, for the identification of the company's management.[14]. Once a manager is identified, her or his years of education, nationality and age can be determined exploiting the matched employer-employee nature of the data.[15] To allow also for hierarchical organization structures and be open to the possibility of a delegation of strategic functions among a team of persons, we extend the narrow definition of a CEO, the single person with the highest wage (CEO-1), to a broader definition which include vice-presidents.[16] We identify them as the top five ranked persons in the firm's wage distribution (CEO-5).[17] In this case, years of education refer to the person with the longest education, nationality indicates whether at least one in the managerial board is a foreigner, and age is the average age of the CEO-5 team. Finally, we determine the share of women among the top-5 earners. These variables aim at capturing team diversity along age, gender, or race attributes and control in our analysis for those social processes that can be associated with distrust and emotional conflict (Jehn, 1997; Jehn et al., 1999).

But where the nature of our data excels is in the possibility of following people along the years and workplaces. Once we observe that new people in a given period are promoted into the board of CEO-5 offices, we can investigate whether they are internally promoted

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[13]Firms with 20 employees are exactly at the median of the employment distribution across firms.

[14]The two strategies yield nevertheless highly correlated definitions, ensuring us on the validity of our approach

[15]We opt for the years of education rather than the degree of education as a measure for education because we observe the former extensively and most reliably.

[16]Cf. also Hambrick and Mason (1984).

[17]Clearly, this approach also attenuates possible miss-matches of our identification strategy where the top payed person may not be the CEO.

from the same firm or externally promoted from other firms. We label this mobile group of managers from other companies the "*externally promoted managers*". In addition, if they have ever held a similar position in an exporting company, the company where they are hired from or a previous company for which they have worked in their career, we label them as "*externally promoted managers with exporting experience*". We hypothesize that this international experience that they possess and distinguish them from the "*externally promoted managers*" *tout-court* is the embedded tacit knowledge that companies are interested in acquiring. In table A.1 in the appendix we present an overview about firms' hiring of managers with international experience.

A positive export turnover defines our export status on a yearly basis. A high share of exporting firms in each year, over 60%, reflects that the Danish economy is a small open economy (cf. table A.2). In our data 48% of firms are exporters and 17% are domestic firms for the whole time span in which they are observed. We refer to these firms as the "*non-switchers*", amounting to about 65% of all firms.[18] The remaining share of firms transit at least once in or out of the export status during the sampled period, the "*switchers*". Interestingly, 31% of the *switchers* enter and exit the export status multiple times, suggesting, in line with Kogut (1997), that multiple entries may indeed lead to exporting for some firms. Unfortunately, the number of times a firm changes export status is time invariant and therefore we cannot test directly for this channel in our analysis. But we can proxy for "link-alliances" exploiting a theoretical proposition by Krautheim (2007).[19] The effect described is a network effect: as the share of firms exporting increases, informal contacts or "link-alliances" grow with a larger network. As export information diffuses, the fixed cost of exporting decreases for all firms. We will therefore interpret the share of exporting firms within the same five-digit industry (*share_industry*) as a proxy for the fixed cost of exporting (E) and informal alliances. This variable has both time and industry variation.[20] Even if it may only be done imperfectly, we believe it is important to account for "link-alliance", as we cannot observe firm ownership.

As implied by our model, companies pursue exporting with different timing. To measure the speed at which a company comes to exporting we need to know the past of a company and therefore we can only rely on those firms that are founded within our time window. We define "*start-up*" those firms that are not older than three years the first time we observe them in our data, about 16% of our firms. Half of the start-ups export already within the

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[18]Table A.3 illustrates the number of firms that export in each year of their presence, the number of permanently domestic staying firms, and switching firms between exporting and non-exporting.

[19]We refer to the working paper version of his work because it is the version that contains the micro-foundation of the network effect.

[20]The within-industry variation along time is however smaller than the between-industry variation.

three years from foundation, the "*fast exporters*", while 22% of them will take longer, but will eventually become exporters before the end of the sampled period, the "*slow exporter*". According to our model, this sorting into international markets should also reflect different managerial experiences, so that we can expect the international experience asset of some managers to be of different values for these types of companies. Table A.4 in the appendix gives an overview of the sub-samples we use in our analysis.

Productivity is a key variable in our analysis as it determines, according to the recent models of international trade, the sorting of firms into international activity. We use mainly labor productivity (the logarithm of value added divided by the number of employee), but, as robustness checks, will also include the logarithm of sales per employee and total factor productivity (TFP). We construct the latter from firms' accounting statistics (Regnskabs-sstatistikken) following Olley and Pakes (1996).

Finally, table A.5 presents the summary statistics of all variables that we use in our analysis.

4   Results

In presenting our results we like to think of them as the superimposition of two layers: one from the empirical literature in international economics on firm heterogeneity, the base-layer, the other from the insights of the international business studies and the resource base view of the firms, the new layer in the prospective of the international trade literature.[21]

Column 1 and Column 3 of table 1 present indeed the base layer: regardless of the estimation method, only the variables typically used in the empirical literature of international trade are included. The variables of most interest are the productivity of the firm (*lab. Prod.*) and the fixed costs of exporting (*share_industry*): together they determine the sorting of firms into the international activity. The purpose of all other variables is to control for as many as confounding factors as possible. The share of skilled workers (*share skilled*), the share of white collar workers (*share white collar*), the share of workers with a university degree (*share uni*) and the share of workers with a vocational education (*share vocational*) control for the quality of the labor force. Distance refers to the distance in km from the firm's municipality to the closest logistic infrastructure.[22] This variable is our attempt to capture part of the trade costs in the pooled regression and falls off in the fixed-effect regression because it is constant over time. Although not shown, all regressions additionally include a measure of

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[21]See Greenaway and Kneller (2007) for a survey of the (theoretical) and empirical trade literature on firm heterogeneity.

[22]The infrastructure considered is the closest between an airport, a harbor or a highway.

firm size, typically the number of employed people, industry and time fixed effects.

Insert table 1 about here

In all other columns we superimpose the second layer to the basic regression in the effort of capturing managerial "inputs", which are the variable of interest in our analysis. The merit of this approach is to investigate also how complementary can the explanations from the two strands of the literature be and to which degree they can coexist. Not surprisingly, we focus on the (external) promotion of a manager with exporting experience (*e-prom CEO-5 int. exp.*). Although interesting per-se, the other variables serve the purpose of controlling for those group dynamics that can potentially hinder the full potential of innovative strategy. Taken all together, these variables characterize the age, the gender, the nationality and the education composition of different managerial boards.

We interpret the results in table 1 as an indication of complementarity between the "*selection-hypothesis*" favored by the international economic literature and the "*managerial-input*" view advocated by the international business studies. Both our productivity and fixed cost measures are robustly significant, so it is the international experience of newly hired managers. They all affect positively the likelihood of a firm to start exporting: to put figures into prospectives, doubling productivity (a 100% increase in the logarithm of labor productivity) increases the probability of exporting of about 5%, whereas hiring a manager with exporting experience rises this probability of about 2% (cf. column 4). Without paying too close attention on the exact numbers, we deem this effect sizable, especially with reference to the effort necessary of doubling productivity. Interestingly, this effect is halved when we look only at the "*start-ups*" and doubled when we restrict our sample to the "*switchers*".[23] Some of the *switchers* may enter and exit the export status multiple times to seize a profit opportunity unexpectedly arisen on international markets. If we consider just the "*continuous*" exporters, those that export uninterruptedly for at least three years, the magnitude is closer again to the one we found when all firms are considered. The lowest coefficient for the "*start-ups*" may just indicate that these firms may be in search of their business model yet and leaded by their founder in the initial stages of their life. While these figures are compatible with the switchers valuing at most the international experience "asset" and the start-ups the least, they may well point to an econometric problem.

As econometricians we cannot observe firm's intensions: a firm may promote a manager with exporting experience precisely because it intends exporting. This leads to a simultaneity issue with the channel we would like to explore, namely the likelihood that a firm starts

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[23]*e-prom CEO-5 int. exp* is significant at about 12% confidence level for *start-ups*. Given the restricted number of observation in this subsample, we regard this level as significant.

exporting because the managers possess the necessary background and ability. To deal successfully with this issue, one would ideally need an instrument that would affect the hiring decision of a firm, but not its exporting decision. Since we lack a valid and good instrument, we resort to Bernard and Wagner's (2001) strategy instead and lag all our regressors by one period in table 2.[24] This approach should nevertheless attenuate the concern that our results are driven by the simultaneity problem.

Column 1 in table 2 shows that the promotion dummy and the labor productivity continue to be robust and highly significant, although their magnitudes drop slightly. These magnitudes remain very stable in column 2 and in column 3 when we add to our regression, respectively, location and time-location fixed effects. The location fixed effects consist of the province where the firm is located, and therefore control also for local labor market conditions on which the firm's hiring decision may hinge. Interacting these location fixed effects with time fixed effects, we can control for time varying shocks to the labor market. If the simultaneity issue mentioned before were to be serious, we would not expect our results to survive this robustness check. It is our measure of fixed cost that loses significance.

Insert table 2 about here

In the remaining columns in table 2 we continue in our battery of robustness checks: the purpose is to check that none of the variables we use as controls - none of the variable we use in the basic layer - drive the result we observe for our managerial variables. Column 4 restricts the analysis to firms with ten or more employees. Column 5 controls additionally for organizational capital: we proxy for it with the age of the firm as suggested in Atkeson and Kehoe (2005). Column 6 uses TFP instead of labor productivity while column 7 uses sales per employee (in logarithm) for productivity and total non-current assets (in logarithm) as a measure of firm size. Overall, we judge these results as a very robust outcome.

In table 3 we use the same control variables as in our baseline specification and perform some robustness checks on the managerial variables. Interestingly, as indirect evidence that the international experience of the manager is the tacit knowledge that firms are interested in acquiring, we find no statistical significance in column 1 of the promotion of "*externally promoted managers*" (*e-prom CEO-5*). Likewise, the export intensity of the company from which a manager is hired from is irrelevant for the proper qualification of export experience. With *e.prom CEO-5 int. exp. >25* we label a dummy indicating that a manager is externally promoted into the CEO-5 board and has held a similar position in a firm with an export intensity above 25%. It turns insignificant in col. 2. Whether the newly appointed manager is below the average age of the managerial board is also not influential (cf. *young CEO-5*,

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[24]See Mion and Opromolla (2011) for an attempt of resorting to an IV strategy.

col. 4). To sweep away any doubt that our variable may be capturing also the effects of internal promotions we add *i-prom CEO-5* to our regression in column 3. Not only *e-prom CEO-5 int. exp.* continues to be highly significant, but its magnitudes is even higher than in table 2.

Insert table 3 about here

Finally, in the last column (col. 5) we use, for each managerial variable, our narrow definition of management, *CEO-1*. Because we identify one CEO only, we can also observe her or his tenure in the company (*tenure CEO-1*). This variable is however censored as we cannot observe firms further back in time than 1995. While we were initially struck by the insignificance of our results, we are not longer surprised about them if we interpret our results in light of Barkema and Shvyrkov (2007). They emphasize that a firm's strategy is the outcome of a complex interaction among a group of persons. The innovation potential of a strategy has to be supported by an effective communication among the group in which the cognitive diversity of each member can be exploited rather than suffocated. The quality of top CEO is then meaningless out of the context in which it can be exercised.

Looking at the figures presented so far, the two variables about group dynamics that are consistently conducive to exporting are the age and the education composition of the board. A high mean age can reflect either situations in which some old managers are assisted by a few relatively young managers or situations in which a group of relatively old managers is put together. Long years of education in our data are only compatible with people pursuing at least an MBA or a Ph.D. The other variables appear generally insignificant.

Our model implies that firms that take longer to start exporting should also value the international experience of managers less than firms that come to export in less time. Table 4 is an attempt to look how selection into the export market change across different types of firms.[25] We deem interesting the following groups: "*Going locals*" are firms that quit exporting and remain domestic in course of their life; "*High-frequency switchers*" are switchers that get in and out of the exporting market at least two times in course of their life; "*sporadic*" exporters are switchers that have exported less than two years in the course of their life.[26] "*Going locals*" have opted out of the international market and "*Slow exporters*" are firms that take relatively long to export, while "*High-frequency switcher*" and "*Sporadic Exporters*" are firms that presumably have no deliberate strategy to be on international markets, but may nevertheless seize a profitable opportunity when it arises. In common, all these firms have the peculiarity that they should not be as much in the need of managers with exporting

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[25]Table A.4 list the number of observation in each sub-samples we use.

[26]These groups overlap and are not mutually exclusive.

experience as firms that are or will be quickly exporters. Table 4 confirms this prediction. While the promotion of managers for these firms is insignificant, interestingly productivity remains significant. Consistently with the "*self-selection*" *hypothesis*, the more productive firms can seize a profitable opportunity to export even if they may have not been part of a deliberate managerial strategy. However, our data do not support our intuition for the "*fast exporters*". In this column, all variables are surprisingly insignificant. Certainly, the reduced number of observations that these sub-samples have impacted the precision of our standard errors. Nevertheless, we interpret this result as the impossibility to fit the peculiarities of all types of firms.

Insert table 4 about here

Although we appreciate the flexibility of the linear probability model (LPM) in dealing with unobserved heterogeneity, to ensure that the response probability is within the unit interval we present the Chamberlain's random effects probit model and the logit fixed effect estimator in table 5. The logit estimator is a conditional maximum likelihood estimator and requires the assumption of time independence to obtain consistent estimates. Because we regard this assumption as strong for this context, the Chamberlain's method has our preference in this analysis as it is robust to scores that are serially correlated in time.[27]

Column 1 presents our preferred specification which already include industry and time fixed effects; in column 2 we augment this specification with province and province-time fixed effects too. Indeed, maximum likelihood estimates are subject to the same critique as estimates from the linear probability model were: firms self-select in their hiring process upon their unobserved intended export strategy. We are nevertheless confident that controlling for location and location-time fixed effects can control for shocks to the firm's labor market and, at least partially, control for this problem. The promotion of managers with international experience as well as labor productivity confirm their positive sign and their statistical significance. Moreover, the magnitudes of the coefficients prove highly stable in both columns. The most notable difference with the results obtained with the linear probability model is probably that the export share within 5 digit level result significant even when it is lagged.

Insert table 5 about here

In spite of some of its drawbacks, we present in column 3 the logit fixed effect estimator, which confirm our figures. Contrary to the Chamberlin's approach and like the LPM, the

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[27]Being the logit fixed effect a conditional maximum likelihood estimator, its convergence becomes increasingly difficult as the number of fixed effects included in the regression increases. The "Chamberlain's estimator" is a partial maximum likelihood estimator and can accommodate time, industry, province and province-time fixed effects.

logit fixed effect does not make any distributional assumption on unobserved heterogeneity. We take the fact that our estimates are confirmed as indirect evidence that this distributional assumption does not impact the estimates of our two variables of interest.

We conclude once more that elements coming from international business studies and the resource base view of the firm can enrich our understanding of the internationalization process of firms and open to new interpretations of the "self selection" hypothesis.

In this perspective, the results from the Chamberlain-Mundlak approach are interesting as they allow to disentangle the effects of time varying variables on the selection mechanisms. If the coefficients $\mathbf{d}$ of the elements of the vector $\bar{\mathbf{S}}$ in equation (9) are significant, they indicate that the mean of a time varying regressor has an impact on unobserved heterogeneity and contributes to make a firm "special" from the others. In table 5 we indicate that such a mean is statistically significant at conventional level with an upper index (b). For instance, in the first two columns the nationality of the manager (*foreign CEO-5*) results statistically insignificant, but its mean over time is statistically significant. It indicates that nationality may not have a direct impact on exporting, but it is a factor of distinction between different managerial boards. Because its coefficient is positive, it contributes indirectly to exporting by making u_i higher.[28] Among the variables controlling for group dynamics, the average age of the board and the longest available education are distinctive features of a firm, besides being conducive to an export strategy. As expected, the international experience of the management and the productivity of firms are crucial factors in the self-selection of firms on international markets. The significance of the mean of the industry export share over the sample points to heterogeneity of the fixed cost of exporting. This aspect can be conceptualized as firms having different "link-alliances" or networks.

One advantage of a maximum likelihood estimator over the linear probability model is the possibility to look exclusively at the "*non-switchers*". These are firms that are either exporters or domestic producers for the whole time span in which they are observed. We would argue that international experience is not as valuable for them as for the "*switchers*" who presumably have deliberated an export strategy. The "non-switchers" are either domestic firms that have no interest in penetrating an international market or exporters already from long time, and as such, they already possess in house the critical capabilities. This conjecture seems supported by the data (cf. column 4 and 5). The promotion of managers with exporting experience is only significant for the "*switchers*", but it continues to be a critical determinant of unobserved heterogeneity in both cases. Interestingly, the average age of the management board remains statistically significant for the "*non-switchers*": in light of Barkema and Shvyrkov (2007) this result may point to the possibility that successful ex-

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[28]The sign of the coefficient is not reported. However, all $\mathbf{d}$ that are significant are also positive.

porters may be those succeeding in establishing with time an effective communication that strikes the right balance between cognitive diversity and low emotional conflict. Finally, our results with "*continuous exporters*" and "*start-ups*" confirm our findings of table 1.

Conclusion

We draw on international business studies and on the resource base view of the firm to study how managerial resources and capabilities affect firms' selection into international markets. We do it in the context of the Danish manufacturing sector comprising about nine thousand firms observed along a decade.

Because we rely on register data, the managerial characteristics that we observe are limited to the objective category only. But we observe these characteristics for an unprecedented number of firms in international business studies. We can observe the gender, the age and the nationality of manager and reconstruct her or his international exporting experience.

Our findings show that "managerial inputs" deem to be considered in the same way as factors like productivity and the fixed costs of selling abroad in determining firms' selection into international markets. In this sense, they seem pushing further the "selection hypothesis", as typically formulated in international trade. Managerial resources and capabilities are as important as productivity to overcome the liability of operating in a foreign market.

We then attempt to investigate another form of selection that is suggested by our theoretical model and that has been largely ignored in the international trade literature, but considered in international business studies. As confirmed in our data, firms select along the time dimension too: they initiate exporting at different stages in the course of their life. Exploiting a subsample of firms that are founded within the ten years window, we can differentiate them along the speed with which they start to sell on international markets. Our conjecture that the slow exporters, those that delay longer selling abroad, should be less inclined to acquire international experience externally is confirmed.

The incorporation of these managerial factors into an otherwise standard empirical analysis of export initiation is not without challenges. Because we cannot possibly know the intentions of a firm to export, we cannot truly identify the casual effect of managers' international experience on export initiation. But we can attenuate this issue considerably to a level that we think is unproblematic for our analysis. Because we observe firms' location, we can control for location-time fixed effects and control for shocks to the local labor market where hiring occurs. Moreover, we lagged our regressors one period to solve the simultaneity bias. We acknowledge nevertheless that determining the casual impact of these types of variables should become the challenge of future research in this area.

With our effort, we hope to have showed that cross-disciplined studies are worth to undertake and can lead to mutual learning. With time and as the number of contacts between international economics and international business increase, integrating different frameworks and approaches should become easier.

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Appendix

A   Descriptives

Table A.1: Promotions of managers with international experience across years and firms.

	Firms which hire a manager with int. exp.		
	exporter	domestic firms	total
1995	1,029	0	1,029
1996	997	338	1,335
1997	902	374	1,276
1998	999	448	1,447
1999	1,177	474	1,651
2000	1,280	535	1,815
2001	1,250	485	1,735
2002	1,180	515	1,695
2003	1,100	452	1,552
2004	1,110	440	1,550
2005	1,159	420	1,579
2006	1,283	396	1,679
Total	13,466	4,877	18,343

Notes: int. exp. stands for international experience.
A manager has exporting experience if she/he has ever
held in her/his career a similar job in an exporting
company.

Table A.2: Export Status across years and firms.

	Observed number of firms			Share of		
year	domestic	exporting	total	domestic	exporting	firms
1995	2,034	3,590	5,624	36%	64%	100%
1996	2,088	3,794	5,882	35%	65%	100%
1997	2,095	3,804	5,899	36%	64%	100%
1998	2,126	3,863	5,989	35%	65%	100%
1999	2,181	4,186	6,367	34%	66%	100%
2000	2,189	4,100	6,289	35%	65%	100%
2001	2,049	4,087	6,136	33%	67%	100%
2002	1,990	3,937	5,927	34%	66%	100%
2003	1,880	3,849	5,729	33%	67%	100%
2004	1,781	3,750	5,531	32%	68%	100%
2005	1,643	3,605	5,248	31%	69%	100%
2006	1,523	3,463	4,986	31%	69%	100%
Total	23,579	46,028	69,607	34%	66%	100%

Table A.3: Export duration across firms

Years of export	Non-switchers (exporters)	Non-switchers (domestic)	Switchers
0	-	11,583	-
1	95	0	3,859
2	309	0	2,804
3	530	0	2,720
4	764	0	2,198
5	999	0	2,388
6	1,258	0	1,905
7	1,468	0	1,734
8	2,014	0	1,742
9	2,115	0	1,540
10	2,439	0	1,846
11	3,076	0	1,953
12	18,268	0	0
Column sum	33,335	11,583	24,689
Total		69,607	
Column sum/Total	48%	17%	35%

Notes: Switchers are firms that never change export status: they are either exporters or domestic firms in all years in which they are observed. Switchers transit in or out of the export status at least once during the sampled period.

Table A.4: Sub-samples of firms

sample name	Number of observations
going local	4416
continuous exporter	49057
start-ups	9286
slow exporter	2039
fast exporter	5157
switcher	44918
non-switscher	24689
high frequency switcher	3729
sporadic exporters	6576

Notes: *going local*: firms that quit exporting in course of their life time and remain thereafter domestic. *continuous exporter*: firms that export uninterruptedly for at least three years. *start-ups*: firms that are not older than three years the first time they are observed. *slow exporter*: start-ups that export after three years from their foundation. *fast exporter*: start-ups that export within three years of their foundation . *switcher* and *non-switcher*: see table A.3. *high frequency switcher*: switchers that change in and out of the export status at least two times in course of their life. *sporadic*: switchers that have exported for less than two years in the course of their life.

Table A.5: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
lab. Prod. (ln)	69607	12.67575	0.604921	8.260624	14.85047
distance (ln)	63477	3.208148	1.408947	0	5.379897
TFP (ln)	52794	3.548569	1.229093	0.956851	10.78329
sales per employee (ln)	69607	13.51835	0.680146	6.39693	17.6228
e-prom CEO-5	69607	0.2844829	0.451171	0	1
young CEO-5	69607	0.2088152	0.406465	0	1
e-prom CEO-5 int. exp.	69607	0.2635223	0.440546	0	1
e-prom CEO-5 int. exp. >25	69607	0.1580014	0.364745	0	1
e-prom CEO-1	69607	0.0750643	0.263497	0	1
young CEO-1	69553	0.0283381	0.165938	0	1
e-prom CEO-1 int. exp.	69607	0.0690448	0.253532	0	1
e-prom CEO-1 int. exp. >25	69607	0.0387174	0.192922	0	1
i-prom CEO-1	69607	0.228454	0.41984	0	1
i-prom CEO-5	69607	0.5297887	0.499115	0	1
age CEO-5	69607	43.47784	6.136898	11.5	84.4
foreign CEO-5	69607	0.137285	0.344151	0	1
women CEO-5	69607	0.0809689	0.272789	0	1
education CEO-5	69603	176.0173	17.93039	84	240
foreign CEO-1	69607	0.027684	0.164067	0	1
women CEO-1	69607	0.0101139	0.100059	0	1
education CEO-1	68659	159.5396	26.6675	72	240
tenure CEO-1	69553	1.63484	0.733021	1	3
firm age	57376	27.10856	26.80197	0	266
share industry	69607	0.6440662	0.121669	0.445378	0.865854
number of employees (ln)	69607	3.169526	1.222795	1.098612	10.46596
share skilled	69456	55.97712	25.93743	0	100
share white collar	69456	8.80222	11.54622	0	100
share uni	69607	0.0238755	0.063533	0	1
share vocational	69607	0.5665853	0.202992	0	1

B Marginal effects

Table B.1: Marginal effects (evaluated at the mean) for the regressions presented in table 5

Dep. variable *export status*	(1) Chamberlain	(2) Chamberlain	(4) Chamberlain Switcher	(5) Chamberlain Non-Switcher	(6) Chamberlain Continuous Exp.	(7) Chamberlain Start-ups
Lagged variables						
e-prom CEO-5 int. exp.	0.010***[b]	0.010***[b]	0.024***[b]	0.001[b]	0.012***[b]	0.01[b]
	(0.003)	(0.003)	(0.009)	(0.002)	(0.003)	(0.008)
age CEO-5	0.002***[b]	0.002***[b]	0.005***	0.001***[b]	0.002***	0.002*[b]
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
foreign CEO-5	-0.008[b]	-0.008[b]	0.005	-0.005[b]	0.000[b]	-0.015[b]
	(0.006)	(0.006)	(0.019)	(0.003)	(0.007)	(0.016)
women CEO-5	-0.004	-0.003	-0.019	0.002	-0.005	0.020
	(0.007)	(0.007)	(0.020)	(0.004)	(0.008)	(0.019)
education CEO-5	0.000**[b]	0.000**[b]	0.000*	0.000[b]	0.000	0.001*[b]
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
lab. Prod. (ln)	0.048***[b]	0.047***[b]	0.073***	0.015***[b]	0.040***[b]	0.048***[b]
	(0.004)	(0.004)	(0.034)	(0.003)	(0.004)	(0.011)
share industry	0.137**[b]	0.140**[b]	0.166	0.109**[b]	0.102*[b]	-0.016[b]
	(0.059)	(0.060)	(0.148)	(0.050)	(0.058)	(0.170)
N	59431	59431	16680	38108	42403	7739
pseudo R^2	0.211	0.212	0.040	0.368	0.100	0.186

Notes: This table presents the marginal effects for the coefficients listed in Table 5.
All columns contain the number of employees (ln), the share of skilled workers, the share of white-collar workers, the share of worker with a university degree, the share of workers with vocational training, time, industry and province fixed effects. In column 2, also province-time fixed effects are included. We use robust inference to account for serial dependence. In all columns the mean averages over time of all time-varying variables are included. For each regressor significant mean estimates are indicated by (b).
Standard error in parenthesis. Significant levels:* p<0.05, ** p<0.01, *** p<0.001.

Tables

Table 1: Sorting of firms into international markets
- linear probability model -

Dep. variable export status	(1) Pooled OLS	(2) Pooled OLS	(3) FE	(4) FE	(5) FE Switchers	(6) FE Continuous Exp.	(7) FE Start-ups
e-prom CEO-5 int. exp.		0.056*** (0.004)		0.019*** (0.003)	0.050*** (0.007)	0.019*** (0.003)	0.009 (0.007)
age CEO-5		0.006*** (0.000)		0.002*** (0.000)	0.004*** (0.001)	0.002*** (0.001)	0.003*** (0.001)
foreign CEO-5		0.040*** (0.005)		0.007 (0.005)	0.021 (0.015)	0.009 (0.006)	-0.004 (0.014)
women CEO-5		-0.018** (0.007)		-0.002 (0.007)	-0.002 (0.018)	-0.006 (0.010)	-0.018 (0.018)
education CEO-5		0.002*** (0.000)		0.001*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.001* (0.000)
lab. Prod. (ln)	0.112*** (0.003)	0.104*** (0.003)	0.047*** (0.004)	0.047*** (0.004)	0.108*** (0.009)	0.055*** (0.005)	0.057*** (0.009)
share industry	0.791*** (0.119)	0.803*** (0.118)	0.692*** (0.087)	0.696*** (0.086)	2.101*** (0.236)	0.602*** (0.107)	0.654** (0.280)
distance (ln)	0.018*** (0.001)	0.020*** (0.001)					
share skilled	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
share white collar	0.003*** (0.000)	0.003*** (0.000)	0.000** (0.000)	0.000** (0.000)	0.001* (0.000)	0.001** (0.000)	0.000 (0.000)
share uni	0.351*** (0.032)	0.095*** (0.035)	-0.020 (0.049)	-0.069 (0.050)	-0.158 (0.123)	-0.045 (0.062)	0.071 (0.113)
share vocational	-0.038*** (0.010)	-0.086*** (0.011)	0.021 (0.017)	0.007 (0.017)	0.021 (0.039)	0.002 (0.024)	-0.007 (0.042)
R^2	0.201	0.213	0.121	0.133	0.030	0.024	0.069
N	63335	63331	69456	69452	24640	48934	9266

Notes: All columns contain the number of employees (ln), industry and time fixed effects and use robust inference to account for heteroskedasticity.
Standard errors in parentheses. Significant levels:* $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 2: Sorting of firms into international markets - linear probability model - (lagged regressors)

Dep. variable export status	(1) FE	(2) FE	(3) FE	(4) FE, 10+	(5) FE	(6) FE	(7) FE
Lagged variables							
e-prom CEO-5 int. exp.	0.010*** (0.003)	0.010*** (0.003)	0.009*** (0.003)	0.010*** (0.003)	0.010*** (0.003)	0.004 (0.003)	0.012*** (0.003)
age CEO-5	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
foreign CEO-5	-0.004 (0.006)	-0.005 (0.006)	-0.005 (0.006)	-0.003 (0.006)	-0.003 (0.006)	-0.006 (0.006)	-0.002 (0.006)
women CEO-5	-0.004 (0.008)	-0.004 (0.008)	-0.004 (0.008)	0.006 (0.010)	-0.005 (0.009)	0.001 (0.009)	-0.012 (0.008)
education CEO-5	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000* (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)
lab. Prod. (ln)	0.034*** (0.004)	0.035*** (0.004)	0.034*** (0.004)	0.030*** (0.005)	0.035*** (0.005)		
TFP						0.029 (0.022)	
sales per employee							0.006* (0.004)
share industry	0.029 (0.052)	0.030 (0.052)	0.038 (0.051)	0.049 (0.056)	0.026 (0.057)	0.021 (0.060)	0.043 (0.052)
firm age					0.002* (0.001)		
R^2	0.125	0.102	0.114	0.063	0.108	0.112	0.094
N	59680	59431	59431	45996	49765	45518	59440

Notes: All columns contain the number of employees (ln), the share of skilled workers, the share of white-collar workers, the share of worker with a university degree, the share of workers with vocational training, time and industry fixed effects. Province fixed effects are included in col.2, col.3 and col.4. Col.3 includes additionally time-province fixed effects. Col.7 uses total non-current assets as measure of size. All regressions use robust standard error to account for heteroskedasticity.
Standard errors are in parentheses. Significant levels:* $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 3: Sorting of firms into international markets - linear probability model - (robustness checks)

Dep. variable export status	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE
Lagged variables					
e-prom CEO-5 int. exp.			0.012*** (0.003)		
i-prom CEO-5			0.009*** (0.003)		
e-prom CEO-5	0.001 (0.003)				
e-prom CEO-5 int. exp. >25		0.002 (0.003)			
young CEO-5				0.001 (0.003)	
e-prom CEO-1 int. exp.					0.003 (0.005)
age CEO-5	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	
foreign CEO-5	-0.005 (0.006)	-0.005 (0.006)	-0.005 (0.006)	-0.005 (0.006)	
women CEO-5	-0.005 (0.008)	-0.005 (0.008)	-0.004 (0.008)	-0.005 (0.008)	
education CEO-5	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	
foreign CEO-1					-0.004 (0.011)
women CEO-1					0.031 (0.021)
education CEO-1					0.000 (0.000)
tenure CEO-1					-0.003 (0.003)
R^2	0.101	0.101	0.103	0.101	0.091
N	59431	59431	59431	59431	58623

Notes: All columns contain the number of employees (ln), the share of skilled workers, the share of white-collar workers, the share of worker with a university degree, the share of workers with vocational training, time, industry and province fixed effects. All regressions use robust standard error to account for heteroskedasticity.
Standard errors are in parentheses. Significant levels:* p<0.1, ** p<0.05, *** p<0.01.

Table 4: Sorting of firms into international markets across different types of firms
- linear probability model -

Dep. variable export status	(1) FE GoingLocal	(2) FE High frequency Switcher	(3) FE Slow Exporter	(4) FE Fast Exporter	(5) FE Sporadic Exporter
Lagged variables					
e-prom CEO-5 int. exp.	0.015	-0.034	0.030	-0.000	0.010
	(0.013)	(0.023)	(0.023)	(0.010)	(0.014)
age CEO-5	0.003	0.005*	0.002	0.001	0.002
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
foreign CEO-5	-0.049*	0.036	-0.029	-0.017	-0.013
	(0.028)	(0.037)	(0.045)	(0.015)	(0.025)
women CEO-5	-0.003	0.042	0.003	0.044	0.006
	(0.031)	(0.047)	(0.045)	(0.029)	(0.029)
education CEO-5	0.000	0.001	0.001	0.001**	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
lab. Prod. (ln)	0.035*	0.078***	0.108***	0.016	0.015
	(0.019)	(0.028)	(0.031)	(0.012)	(0.019)
share industry	0.015	-0.401	0.061	-0.059	-0.147
	(0.237)	(0.338)	(0.348)	(0.158)	(0.287)
R^2	0.170	0.004	0.099	0.003	0.003
N	3724	3338	1770	4267	5326

Notes: All columns contain the number of employees (ln), the share of skilled workers, the share of white-collar workers, the share of worker with a university degree, the share of workers with vocational training, time and industry fixed effects. All regressions use robust standard error to account for heteroskedasticity.
Standard errors (in parentheses). Significant levels:* $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Table 5: Sorting of firms into international markets - Chamberlain's random effects probit model -

Dep. variable export status	(1) Chamberlain	(2) Chamberlain	(3) Conditonal FE-Logit	(4) Chamberlain Switcher	(5) Chamberlain Non-Switcher	(6) Chamberlain Continuous Exp.	(7) Chamberlain Start-ups
Lagged variables							
e-prom CEO-5 int. exp.	$0.038^{***(b)}$	$0.037^{***(b)}$	0.153^{***}	$0.064^{***(b)}$	$0.007^{(b)}$	$0.079^{***(b)}$	$0.045^{(b)}$
	(0.011)	(0.011)	(0.045)	(0.024)	(0.011)	(0.021)	(0.028)
age CEO-5	$0.008^{***(b)}$	$0.008^{***(b)}$	0.029^{***}	0.015^{***}	$0.005^{***(b)}$	0.013^{***}	$0.008^{*(b)}$
	(0.002)	(0.002)	(0.005)	(0.003)	(0.002)	(0.003)	(0.004)
foreign CEO-5	$-0.028^{(b)}$	$-0.029^{(b)}$	-0.060	0.015	$-0.027^{(b)}$	$0.002^{(b)}$	$-0.049^{(b)}$
	(0.023)	(0.023)	(0.081)	(0.047)	(0.017)	(0.044)	(0.052)
women CEO-5	-0.014	-0.012	-0.030	-0.050	0.015	-0.037	0.066
	(0.026)	(0.026)	(0.097)	(0.054)	(0.023)	(0.051)	(0.062)
education CEO-5	$0.001^{**(b)}$	$0.001^{**(b)}$	0.007^{***}	0.002^{*}	$0.000^{(b)}$	0.001	$0.003^{*(b)}$
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
lab. Prod. (ln)	$0.170^{***(b)}$	$0.167^{***(b)}$	0.526^{***}	0.192^{***}	$0.079^{***(b)}$	$0.252^{***(b)}$	$0.156^{***(b)}$
	(0.017)	(0.017)	(0.054)	(0.034)	(0.016)	(0.029)	(0.036)
share industry	$0.482^{**(b)}$	$0.495^{**(b)}$	0.669	0.438	$0.543^{**(b)}$	$0.631^{*(b)}$	$-0.053^{(b)}$
	(0.210)	(0.211)	(0.727)	(0.389)	(0.252)	(0.362)	(0.545)
N	59431	59431	18201	16680	38108	42403	7739
pseudo R^2	0.211	0.212	0.024	0.040	0.368	0.100	0.186

Notes: All columns contain the number of employees (ln), the share of skilled workers, the share of white-collar workers, the share of worker with a university degree, the share of workers with vocational training, time, industry and province fixed effects. Only the conditional fixed effect logit (col.3) has no province fixed effects included. In col. 2, also province-time fixed effects are included. The probit estimates uses robust inference to account for serial dependence. Following Chamberlain (1980), they also include the mean averages over time of all time-varying variables. For each regressor significant mean estimates are indicated by (b).
Standard errors in parenthesis. Significant levels:* p<0.05, ** p<0.01, *** p<0.001.
Table B.1 in the appendix presents the marginal effects of each coefficient.