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The human factor: Investments in employee human capital, productivity, and SME internationalization

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ABSTRACT

Internationalization offers many strategic benefits to SMEs, but is not easy to accomplish. In contrast to much of the work on SME internationalization, which focuses on the role of the entrepreneur in the internationalization process, the premise of this study is that in SMEs, the investment in the human capital of the entire organization pays off when it is carefully calibrated with the chosen internationalization strategy. We find that firm-level investments in employee human capital are critical for the labor productivity and internationalization in fast internationalizers, but not for those firms that internationalize more slowly.

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1. Introduction

Over the past twenty years, world trade has registered an average annual growth of 5.3% (World Trade Organization, 2014), suggesting that the world is becoming economically more integrated, leading to more opportunities for firms to benefit from internationalization. Firms with a higher degree of international involvement are likely to generate higher revenues from large international markets, realize economies of scale and scope, recoup their research and development investments faster, and gain critical knowledge and skills when working with demanding customers and with leading producers overseas (Hitt et al., 2006). Economic models (Bernard et al., 2003; Melitz, 2003) demonstrate that firms whose productivity is above a certain cut-off point will find it profitable to incur the sunk costs of exporting and internationalize.

Internationalization is defined as “the foreign market servicing strategy of the firm” (Buckley et al., 1992). Despite the benefits from a higher degree of internationalization, most small-and-medium-sized firms are not actively engaged in international markets. Evidence from the OECD indicates that the largest amount of export activity is concentrated among the top 1000 exporters, which represent approximately 72% of all EU external trade (Araújo and Gonnard, 2011). Therefore, while achieving a higher degree of internationalization is significant for all firms, it is especially critical for small and medium-sized enterprises (SMEs), as they are less likely to have the resources or prior managerial experience necessary to compete in the international arena (Acs et al., 2001; Wright and Etemad, 2001; Hessels and Parker, 2013).

In this study, we bridge the theory of SME internationalization and the economic models of exporting in order to explore the effect of investments in employee human capital on labor productivity, and the role of labor productivity in SME internationalization. In doing so, we address gaps in both of these bodies of research. On the one hand, in the SME internationalization literature, much of

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**Productivity Effects on Internationalization Scope:
Accelerated vs Gradual Internationalizers**



Fig. 1. Productivity effects on internationalization scope: accelerated vs gradual internationalizers.

the research has focused on the effect of the human capital of the entrepreneur or manager in the internationalization process (Cavusgil, 1993; Bijmolt and Zwart, 1994; Reuber and Fisher, 1997; Knight, 2001; Manolova et al., 2002; Dhanaraj and Beamish, 2003; Loane et al., 2007; Ganotakis and Love, 2012), while the role of employee human capital has been less well explored. This is surprising given that in resource-constrained SMEs, the employee talent pool provides the foundation for development of firm-level capabilities, and investments in employee human capital can result in a productivity advantage necessary for successful internationalization (Benfratello and Razzolini, 2008; Mefford, 2009).

On the other hand, there is a debate in the international economics literature as to the direction of the causality between productivity and internationalization (Bernard et al., 2007). The question is whether higher-productivity firms self-select into exporting, or whether exporting firms learn from the exporting experience and this new learning causes productivity growth. Some recent work in international economics reports evidence that exporting raises productivity for sub-Saharan African manufacturing firms (Van Biesebroeck, 2005). However, the bulk of empirical work has found a positive relationship between a firm's productivity level and its export activities (Bernard and Jensen, 1999; Aw et al., 2000; Delgado et al., 2002; Bernard et al., 2003; Melitz, 2003; Merino, 2004; Benfratello and Razzolini, 2008; Monreal-Pérez et al., 2012). The logic is that there is a sunk cost of entry into export markets, and that only the most productive firms find it profitable to incur those costs (Roberts and Tybout, 1997).

To develop our argument, we complement the dominant perspective in international economics on the relationship between firm level productivity and internationalization (Bernard et al., 2003; Melitz, 2003; Merino, 2004) with insights from the resource-based view of the firm (Barney, 1991; Dierickx and Cool, 1989). We focus specifically on the endogenous effects of firm-level investment in employee human capital, in the form of wages and on-the-job training, on firm level productivity, in our case, value-added per employee. We hypothesize that higher levels of investment in employee human capital lead to enhanced labor productivity, which, in turn, is positively associated with the degree of internationalization of the SME, measured in two ways, as export intensity and as the number of foreign markets serviced by the SME.

Next, we hypothesize that the magnitude of these effects will differ depending on the internationalization strategy of the firm. Theory suggests that there are at least two fundamentally different SME internationalization strategies. Some firms follow a strategy of internationalization through a gradual and carefully controlled series of incremental commitments from physically and culturally close markets to markets with greater psychic distance. This pattern of internationalization is explained by international marketing theories, such as the classic Uppsala model (Johanson and Vahlne, 1977). In contrast, work in international entrepreneurship has advanced a framework that seeks to explain why some ventures internationalize early and fast (McDougall et al., 1994; Knight and Cavusgil, 1997). Since accelerated internationalizers have to overcome the sunk costs of simultaneous entry into multiple foreign markets, they need an ex-ante productivity advantage to a much greater degree than gradual internationalizers. Hence, we surmise that the effect of the investments in employee human capital on productivity and the subsequent effect of productivity on the firm's degree of internationalization will be higher for accelerated internationalizers compared to gradual internationalizers.

We test our hypotheses with data from a panel study of Belgian manufacturing SMEs over an eight-year period (1998–2005). Belgium provides an interesting setting in which to examine internationalization in that cross-border activity is often a necessity given the limited domestic market size. In addition, similar to other European countries, Belgium is an open economy with a highly educated workforce. In Belgium, the relatively tightly regulated labor markets in the country make human talent costly to hire, and even costlier to fire, thus tying employees to firms for longer periods. Results from statistical tests validate our initial premise that investments in employee human capital lead to greater labor productivity and that labor productivity, in turn, leads to a higher degree of internationalization. This effect, however, is contingent on the SME's internationalization strategy. Specifically, investments in human capital are critical for labor productivity and internationalization for accelerated internationalizers, but not for gradual

internationalizers. This suggests SMEs need to carefully calibrate their investments in employee human capital depending on their internationalization strategy.

Our study makes three contributions. First, we contribute to SME internationalization theory by systematically evaluating the effect of investment in employee human capital on SME productivity and the effect of firm productivity on SME internationalization. In doing so we suggest that the human capital of the entire organization matters for SME internationalization, not just the human capital of the owner or founder as discussed in other studies. Second, we contribute to the resource-based view of the firm by suggesting that the effect of firm resources (employee human capital) and capabilities (firm-level productivity) on export performance outcomes (in our case, export intensity, and number of foreign markets served) is moderated by the internationalization strategy of the firm. Empirically, we study a nationally representative sample of Belgian manufacturing SMEs, allowing for possible generalizations to other medium-sized innovation-driven European Union economies such as the Netherlands or Denmark.

The paper proceeds as follows. First, we review the literatures on human capital and the link between productivity and internationalization to develop our hypotheses. Next, we report our methods and results from statistical testing. We go on to discuss our findings and their theoretical and practitioner implications.

2. Theory and hypotheses

2.1. Investments in human capital for enhanced labor productivity

The resource-based view of the firm focuses on understanding the link between valuable, rare, and costly-to-imitate (idiosyncratic) firm resources, firm performance, and sustained competitive advantage (Barney, 1991). There are two underlying assumptions to this theory. First, firms in an industry or industry group are heterogeneous with respect to the strategic resources that they control (Wernerfelt, 1984). Second, these resources are not perfectly mobile across firms; thus, the heterogeneity may be long lasting (Barney, 1991, p. 101). In other words, idiosyncratic resources lead to firm heterogeneity; firm heterogeneity can lead to competitive advantage, if the firm can retain the surplus from the exploitation of its valuable resources; and this competitive advantage is expected to be sustainable, because the valuable resources cannot be easily transferred to, or productively deployed by rival firms (Peteraf, 1993). One such idiosyncratic resource is human capital, or the intangible resources embedded in individuals (Becker, 1962). These intangible resources include the stock of competencies, knowledge, skills, expertise, and connections that individuals gain through education and experience (Becker, 1993). Investments in human capital, in turn, are activities, such as schooling, on-the-job training, medical care, or acquiring information about the economic system, which influence future real income (Schultz, 1961; Becker, 1962; Novos and Waldman, 1997). Strategic human resource management scholars theorize that through their human resource practices, such as staffing or training, organizations create a particular form of aggregate knowledge, skills, and abilities (or aggregate human capital) which in turn contributes to organization-level performance (Barney and Wright, 1998; Ployhart et al., 2009).

The development of most productivity-enhancing skills can be obtained partly from general education and experience and partly from work experience (Becker, 1962). Many employees increase their productivity by learning new skills on the job while applying knowledge and perfecting skills acquired in school or through experience in previous occupations. In this sense, the human capital accumulated through education and experience, as well as the general abilities and skills of the employees serve as a foundation for the development of additional skills and abilities through on-the-job training (Ployhart et al., 2011). Firms build their employee human capital by paying competitive wages to attract and retain well-educated, experienced, and skilled employees and by investing in training programs to develop firm-specific employee skills and abilities (Hashimoto, 1981; Black and Lynch, 1996).

SMEs typically position themselves as niche differentiators (Miller and Toulouse, 1986), deriving competitive advantages from superior innovation or superior quality, and careful specialization within the industry value chain. Knowledge-intensive SMEs, in particular, compete globally by leveraging their relatively superior R&D capabilities and choosing a strategic configuration that allows them to compete internationally despite their relatively inferior capabilities in marketing and production activities (Almor and Hashai, 2004). Higher levels of knowledge, abilities, and skills allow employees to engage in complex and non-routine tasks and perform them efficiently while conforming to high quality standards, thus increasing the value added by the firm. These are precisely the tasks leading to productivity improvements in advanced economies such as Belgium, in which competition is knowledge-based and businesses compete by producing new and different goods using the most sophisticated production processes (Schwab, 2011). As Schultz (1961, p. 3) argued in his treatise on economic growth from human capital, “the acquisition of knowledge and skills that have economic value... predominantly account for the productive superiority of technically advanced countries”. In sum, the investments in a well-qualified workforce gained through paying competitive wages and on-the-job training is essential for enhancing SME labor productivity in advanced economies such as Belgium.

Hence, we suggest:

For Belgian manufacturing SMEs:

H1. Investments in employee human capital will be positively associated with labor productivity.

2.2. The relationship between productivity and internationalization

Although advances in technology and declining government barriers have made it easier and less expensive for firms to start exporting (Lu and Beamish, 2001), selling goods in foreign markets still entails substantial and non-recoverable costs. In addition

to transportation costs and currency risks, firms need to do market research, adjust products to foreign tastes, and set up distribution networks. These fixed costs to enter foreign markets provide a significant barrier that only the more productive firms can overcome (Bernard et al., 2003; Melitz, 2003).

A large body of empirical research has provided support for the link between firm-level productivity and the decision to export (e.g., Clerides et al., 1998; Bernard and Jensen, 1999; Wagner, 2007). Models developed by Helpman et al. (2004), and Head and Ries (2004) show that productivity is the main determinant of internationalization choice. In order to export, firms must possess a productivity level higher than the one necessary to survive in the domestic market and an even higher threshold exists for the decision to engage in foreign direct investment (Benfratello and Razzolini, 2008). In essence, a self-selection mechanism is in place, through which the more productive firms self-select into export markets (Wagner, 2007).

We continue this line of reasoning by arguing that SME productivity is also positively associated with the degree of internationalization of the firm, as measured of the scope of internationalization (or number of foreign markets to which the firm exports) and scale of internationalization (percent of foreign sales in the total sales of the company, also known as export intensity). As markets become more distant, transportation costs increase. European firms, in particular, confront currency risk as they expand their scope outside of the Eurozone and face tariff and non-tariff trade barriers as products are sold beyond the EU's internal market. In addition, firms setting up distribution networks in countries with a less developed physical infrastructure and/or less transparent regulatory regimes, face increased risks and costs of doing business. Thus, maintaining high productivity levels is essential when the firm needs to cover the sunk costs of entering multiple markets (Nordström and Vahlne, 1994; Kuivalainen et al., 2007). Further, following the arguments of the firm-specific advantage theory of internationalization (Hymer, 1976), we expect a positive relationship between firm productivity and scale of internationalization (export intensity, or foreign sales as a percent of total sales). The firm-specific advantage theory of internationalization proposes that firms need a firm-specific (monopolistic) advantage to overcome the liability of foreignness, or inherent disadvantage of competing with the indigenous firms in a host market (Hymer, 1976). In other words, firms internationalize when they can use their established domestic advantages in foreign countries at little or no additional cost (Caves, 1971). Higher productivity is one of these sources of firm-specific advantage. Higher productivity allows the firm to absorb information search costs and market risks and to improve its opportunities to generate revenues in foreign markets. For example, Ganotakis and Love (2012), in their study of UK technology firms, found that productive firms are both more likely to enter export markets, and to be export intensive. Recall that the firms in our sample are manufacturing SMEs, niche players limited by a small domestic market. By default, export-led growth will thus result in higher export intensity, or percentage foreign sales in the overall firm revenues. Formally:

For Belgian manufacturing SMEs:

H2. Productivity will be positively associated with the degree of internationalization.

H2a. Productivity will be positively associated with the number of export markets.

H2b. Productivity will be positively associated with export intensity.

2.3. The contingent effect of internationalization strategies

Traditional theories of internationalization, such as the Uppsala model (Johanson and Vahlne, 1977), or the innovation model (Cavusgil, 1980) have a theoretical base in the behavioral theory of the firm (Cyert and March, 1963; Aharoni, 1966) and Penrose's (1959) theory of the growth of the firm. They explore the patterns of internationalization of new and small companies, maintaining an internal perspective and focusing on firm-specific factors. In the lens of internationalization process theory, international expansion is a gradual and carefully controlled series of incrementally escalating commitments, moving from physically and culturally close markets to markets with greater psychic distance, and from low involvement modes of foreign market entry to more committed modes. In terms of spatial expansion, firms start their internationalization in markets with the lowest perceived market uncertainty, in other words, markets they can understand, often in neighboring countries.

Related to this stream of research is recent work in international marketing which considers the patterns of internationalization (more specifically, product introductions) across international markets (Kalish et al., 1995; Stremersch and Tellis, 2004; Sleuwaegen and Onkelinx, 2014). This stream of literature juxtaposes accelerated internationalization to a more gradual approach akin to the traditional Uppsala model of internationalization. Taking account of the high (sunk) cost of committing resources, few firms can internationalize simultaneously in all regions. Especially for young SMEs, a global approach is often not an option. SMEs are more likely to gradually move from a successful domestic launch towards entering more advanced countries and in a later stage to less developed economies. Using a gradual international strategy, firms can limit their investments as the new product is introduced in a limited number of countries. If the product is unsuccessful, the firm can learn from their previous experiences and refrain from making investments in other countries. However, if the product launch is successful, income from the first market is to invest in subsequent markets. Consequently, a gradual internationalization strategy can lower the pressure on cash flow and is thus less risky than an accelerated internationalization strategy.

In contrast, other SMEs follow a strategy of accelerated internationalization and so need to develop high levels of absorptive capacity in order to process and internalize market information faster. They need to compensate for the lack of organizational experiential knowledge with the knowledge and experience of employees (Sapienza et al., 2006). Extending this argument further,

Gabrielsson et al. (2008) proposed that sustainable “born globals” (e.g., firms pursuing a sustainable accelerated internationalization strategy) would establish a deliberate system to acquire organizational learning. An important element in this system is the attraction and retention of key employees with prior export experience or knowledge about specific markets (Reuber and Fisher, 1997; Chandra et al., 2009).

Accelerated internationalizers need to obtain a certain productivity level necessary to simultaneously enter and compete in multiple foreign markets (e.g., Bernard et al., 2006). When firms rapidly internationalize to multiple markets, they do not have the opportunity to learn from small mistakes and adjust their strategy accordingly, which increases the risk of rapid internationalization. In other words, fast internationalizers must also be able to learn fast. Small firms that have a resource base of better-educated and trained employees, however, can significantly facilitate their learning capability. In dynamic and complex environments the aggregate human capital of the SME can improve the firm's ability to sense changes in the environment, devise more effective strategies in response to environmental changes, and implement them quickly and efficiently (Wright et al., 1994). As in one example, developing an organization-wide system for generating market intelligence regarding customer needs, has been found to be a critical capability of rapidly internationalizing SMEs (Armario, et al., 2008).

Industries with higher knowledge intensity require more complex knowledge-related learning processes (Saarenketo et al., 2004), which leads to a higher dependence on employee knowledge and skills. Employee human capital enhances the firm's process of innovation (Subramaniam and Youndt, 2005), stimulates knowledge creation capabilities (McKelvie and Davidsson, 2009), and increases the rate of new product introductions (Smith et al., 2005). As the requirements for employee education and skills increase as the knowledge intensity of the industry increases, so do the benefits derived from the aggregate employee human capital. Thus, we surmise that the relationship between investments in human capital, productivity, and internationalization will be contingent on the internationalization strategy chosen by the firm. Given these contingencies, we posit that the effects of employee human capital on accelerated and slow internationalizers will be different. Formally:

For Belgian manufacturing SMEs:

H3. The effect of productivity on internationalization will be stronger for accelerated internationalizers, compared to gradual internationalizers.

3. Data and methods

3.1. Context

Belgium is an innovation-driven economy with a 2013 per capita GDP of \$37,800 (ranked 31st in the world) (World Factbook, 2014) and is a founding member of the European Union. Its labor market is relatively tightly regulated and offers limited flexibility (World Bank, 2010). The “creative class”, e.g., individuals who engage in expert thinking and complex communication at work, such as scientists, engineers, artists, cultural creatives, managers and professionals, account for 30% of the Belgian workforce, at par with Australia (30%) and just below Ireland (34%) (Florida, 2007). In other words, Belgium possesses a highly skilled workforce.

SMEs account for 69.25% of the country's formal employment (Ayyagari et al., 2007), comparable to similar-sized advanced market economies in Europe, such as Denmark (78.40%) or the Netherlands (58.50%). According to the European Commission (2010), about 33% of the SMEs in Belgium recorded exports in 2006–2008 (slightly after the time window of our study), which is well above the average for the European Union (25%). Belgium was also far above the average for the European Union in terms of the share of SME revenue resulting from foreign subsidiaries (11% as compared to 4%) and the share of SMEs gaining any income from joint ventures abroad (10% as compared to 3%) (European Commission, 2007a).

3.2. Data

In collaboration with the National Bank of Belgium (NBB), we constructed a comprehensive dataset linking firm-level trade data to annual accounts and social balance sheet data. Foreign trade data are based on customs data for extra-EU trade and the Intrastat inquiry for intra-EU trade. These data contain the value of exported and imported goods and are broken down by country of destination or origin and by type of good. Export products are classified following the European Commission's (2007b) Combined Nomenclature (CN). Hence, the database contains detailed data on the value of each product type a firm exported to every single export destination.

Annual accounts data are collected through the Central Balance Sheet Office of the NBB. These data comprise all items from the balance sheets, the income statements, and the social balance sheets. Examples of data from these different sources are fixed assets, sales, and wages. Data were available for 1998–2005. Thus, all manufacturing SMEs incorporated in Belgium with at least 10 full time equivalent (FTE) employees (in at least one year between 1998 and 2005) were included in the dataset, for a total of 7771 SMEs. SMEs were selected using the employment criterion of the Eurostat definition: firms with fewer than 250 FTE employees (European Commission, 2009). However, consistent with the European Commission's own research (e.g., European Commission, 2010) we did not impose any restrictions in terms of turnover or balance sheet total.

3.3. Sample description

For the purpose of this study, we selected only those SMEs that started exporting between 1998 and 2005, to a final usable sample of 1922 SMEs. The oldest manufacturing SME in the dataset was established in 1897; 571 firms were created in 1998 or later; 152 had ceased activities by 2005. About half of these exits were the result of mergers and acquisitions; the other 50% were due to the cessation of activities. Small firms (fewer than 50 employees) accounted for 74% of our sample and 26% were medium sized firms (50–249 employees). An overview of the distribution of firms across four broad classes, based on the average technology intensity in the industry, is presented in Table 1. Additional industry information at the 2-digit level is available from the authors upon request.

Following the 4-digit classification of products (CN), 1279 different types of products were exported to 249 different countries. The average exporting firm exported seven products to ten countries. However, there was a great disparity between these newly exporting SMEs. Some firms focused on a narrow range of products and a limited number of countries, while others were highly diversified in terms of range of exported products (up to 126 product types), and the geographical scope (up to 157 countries) of their exports. One hundred fifty-one SMEs exported one single product to just one country, 164 SMEs sold their products in >50 countries, and 140 firms exported >50 different products. A wider product range was often associated with a broader geographical scope (correlation: 0.51). Notable exceptions were a firm exporting a single product to as many as 57 countries and another firm exporting 36 different products to only one country. Table 2 presents the descriptive statistics for all variables entered in the statistical analysis. Where log transformation was undertaken, we report the log-transformed values. In the log transformation, we added 1 to the initial value, so an initial value of 0 will be 0 after log transformation, while negative values will become “missing”. The negative values in the dataset are outliers (and only possible for a limited number of variables, such as profit or value added). After log transformation, these observations were not included in the regression specification.

3.4. Measures

3.4.1. Dependent variable

3.4.1.1. Degree of internationalization. We explore two aspects of the degree of internationalization, scale and scope (Kuivalainen et al., 2007). Scale of internationalization is measured as the ratio of export to total sales. This measure captures the revenue exposure of the firm to foreign markets. Scope of internationalization is measured as the number of countries to which a firm exports and captures the complexity of internationalization. Each additional market a firm decides to enter exposes the firm to the competition in this foreign market. Furthermore, the firm will need to bear additional costs to enter the market, such as carrying out market research, and adjusting the product and packaging to local customer preferences and legal requirements.

3.4.2. Independent variable

3.4.2.1. Labor productivity. Following De Loecker (2007), labor productivity is measured as value added per worker (full time equivalent (FTE) employees).

3.4.3. Instrumental variables

3.4.3.1. Wages. Following Dumont (2008) who found a linear relationship between earnings and experience in a sample of Belgian firms, we use wages to proxy the investment in employee human capital embedded in the employees. Du Caju et al. (2009) found a positive relationship between employees' level of education and wages. These authors also found a significant and positive relationship between wages and seniority in the company, resulting from the almost automatic increase in wages as a function of seniority in Belgium. In that sense, wage levels may be considered to reflect the human capital embodied in the employee (education and experience). In our study, average wage levels were calculated by dividing the total wages by the number of FTE employees.

3.4.3.2. Training costs. We calculated training cost per employee as the total spending on training divided by the number of FTE employees.

A large number of firms did not report any spending on training, resulting in a large number of dropped observations in the regression analysis. As a sensitivity analysis, we replaced these missing values by zeros (0.001 to allow log transformation), since it is likely that firms not reporting any spending on training did not have any training to report given that they can be fined for not reporting. We also used

Table 1
OECD industry classification.

OECD class	Industry	Frequency (firm-year observations)	Percent
HT	High-technology industries	1681	5%
MHT	High-technology industries	7291	20%
MLT	Medium-low-technology industries	10,425	29%
LT	Low-technology industries	17,011	47%
		36,408	

Table 2
Descriptive Statistics.

Variable	# Obs	Mean	St. dev	Min	Max
Number of export countries	7378	10.61	14.77	1.00	157.00
ln Value added per employee	6543	10.92	0.56	5.26	13.44
ln Number of employees	8446	3.65	1.21	−2.30	5.65
ln Firm age	8489	2.86	0.83	0.00	4.68
ln Import relative to industry mean	6867	1.82	2.26	0.00	4.42
ln Intangible assets	8422	10.72	2.49	0.69	21.66
ln Number of export products	7378	1.61	1.14	0.69	4.84
ln Training cost per employee	2347	6.31	2.71	0.00	9.61
ln Wages per employee	8446	10.51	0.35	7.54	13.17
Accelerated internationalization (dummy)	8543	0.43	0.49	0	1
Gradual internationalization (dummy)	8543	0.57	0.49	0	1

Stata's *impute* command to generate the missing values. All three procedures yielded similar results in terms of signs, size, and significance of the coefficients. We report the results of the regression where missing values were replaced by zeros, as this most closely reflects reality.

3.4.4. Moderating variables

3.4.4.1. *International strategy.* Following Kalish et al. (1995) and Sleuwaegen and Onkelinx (2014), we classified firms as following an accelerated internationalization or a gradual internationalization strategy, according to the scope of their initial export. Accelerated internationalizers are SMEs that export to at least five countries, including one outside the EU, within five years of their first export activity. Traditional or gradual internationalizers are SMEs that export to fewer than five countries within five years of their first export activity. We used a dummy variable, which took a value of “1”, if the strategy was an accelerated internationalization and “0” otherwise. 702 SMEs in our dataset used an accelerated approach and 1220 SMEs followed a traditional internationalization pattern. It is important to note that not all firms export in every single year following their first export. As a result, some firms do not report export in one or more years. Similarly, other variables may not be observed for every single firm in every single year.

3.4.5. Control variables

We followed the economics literature on exporting and productivity (e.g., Bernard and Jensen, 1999; Arnold and Hussinger, 2005) and controlled for firm size (*number of FTE employees*) and *firm age*. Additional firm-level controls include *number of export products*, the *value of import relative to the industry mean* and *intangible assets*. Correlations are presented in Table 3.

3.5. Statistical procedure

We used STATA 11.0 and ran OLS regressions for panel data (*xtreg*) and generalized two-stage least squares regressions (*xtivreg*) for panel data to test our hypotheses. We dropped single year observations from the analysis. Since productivity may be endogenous in the internationalization regression, we tested for endogeneity using a Hausman-Wu test (Davidson and MacKinnon, 1993). This

Table 3
Correlations.

	Number of firm-year observations	1	2	3	4	5	6	7	8	9	10	11	12	
1	Number of export countries	33,081	1											
2	Value added per employee	36,110	0.02*	1										
3	Number of employees	36,112	0.44*	0.01	1									
4	Export/total sales	23,385	0.13*	−0.00	0.02*	1								
5	Firm age	36,354	0.16*	0.00	0.17*	−0.00	1							
6	Import relative to industry mean	31,687	0.39*	0.02*	0.53*	0.09*	0.09*	1						
7	Number of export products	33,081	0.56*	0.01*	0.48*	0.06*	0.16*	0.40*	1					
8	Intangible assets	14,419	0.20*	0.14*	0.30*	0.01	−0.05*	0.20*	0.26*	1				
9	Training cost per employee	11,978	−0.02	0.00	−0.01	−0.00	−0.02*	−0.02*	−0.01	0.00	1			
10	Wages per employee	36,112	0.12*	0.24*	0.09*	0.01	0.04*	0.17*	0.10*	0.09*	0.04*	1		
11	Accelerated internationalization (d)	36,408	0.51*	0.01	0.18*	0.12*	0.08*	0.17*	0.32*	0.12*	0.00	0.07*	1	
12	Gradual internationalization (d)	36,408	−0.51*	−0.01	−0.18	−0.12*	−0.08	−0.17	−0.32	−0.12*	−0.00	−0.07	−1.00	1

(d) = dummy variable.

* p < 0.05.

test rejected the null hypothesis of exogeneity, with a p-value of 0.0001 ($\chi^2(1) = 16.26$). Based on this result, we implemented the two-stage instrumental variables (2SLS) approach. Two-stage least-squares regression procedures require the introduction of an instrumental variable for endogenous regressors in the first regression. Following Heckman et al. (2006), the instrumental variable should have the following properties: (1.) changes in the instrument should be associated with changes in productivity, but (2.) should not lead to a change in internationalization, other than the indirect change resulting from the change in productivity. More formally, the instrument should be correlated with the regressor (in the second stage) and uncorrelated with the error term.

We use our measures of investments in employee human capital: training cost and wages, as instruments. In order to empirically test the suitability of these instruments, we used the Sargan overidentification test. The Sargan-Hansen statistic produced by this test fails to reject the null hypothesis of instrument validity with a p-value of 0.70 for the whole sample, and 0.82 and 0.19 for the accelerated internationalizer and gradual internationalizer subsamples respectively.

All variables (except the dummy variables) were log transformed (natural logarithm). Since we did not expect a contemporaneous impact of productivity on internationalization, a one-year lag was introduced between the independent, instrumental and control variables and the dependent variables. The results of the fixed effects estimation are presented in Table 3 and Table 4. To test for the appropriateness of a fixed effects model, we ran the model using fixed and random effects and performed a Hausman specification test. Based on the Hausman statistic, we reject the null hypothesis that the difference in coefficients is not systematic ($p = 0.000$), indicating that a fixed effects model is appropriate. One benefit of using a fixed effects model is that fixed effects regression eliminates all time-invariant omitted variable bias (e.g. industry-specific effects).

To correct for survival bias, we ran a Heckman selection model. In the selection equation, we ran a probit model to estimate the probability that a firm will continue to export (i.e. survive), using labor productivity as an instrument. In the second stage, we estimated the firms' export to sales ratio conditional on export survival. Labor productivity (LP) is significant in the first stage, indicating more productive firms are more likely to survive (continue exporting), indicating there is indeed a survival bias. The results in the second stage show that, after correcting for this bias, the results still hold. Results from this test are available from the authors upon request.

Table 4
G2SLS IV regression: productivity and internationalization.

	First stage: labor productivity			Second stage: export scope (1 year lag)			Second stage: export scale (1 year lag)		
	Full sample	Accelerated	Gradual	Full sample	Accelerated	Gradual	Full sample	Accelerated	Gradual
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Labor productivity				1.52*** (0.41)	2.00*** (0.56)	0.24 (0.42)	0.02** (0.07)	0.06** (0.03)	0.04 (0.03)
Age	-0.01 (0.01)	-0.03** (0.01)	0.05** (0.02)	0.89*** (0.18)	0.66** (0.24)	1.72*** (0.21)	0.05** (0.02)	-0.03** (0.01)	0.02* (0.01)
Size (employees)	-0.25*** (0.01)	-0.26*** (0.01)	-0.25*** (0.01)	3.99*** (0.20)	4.96*** (0.29)	0.178*** (0.20)	0.22*** (0.05)	0.07*** (0.02)	0.02** (0.01)
# export products	0.00 (0.00)	0.00 (0.00)	-0.00 (0.01)	1.02*** (0.08)	1.34*** (0.12)	0.65*** (0.06)	0.14*** (0.02)	0.02*** (0.01)	0.02 (0.02)
Import relative to industry	0.04*** (0.00)	0.04*** (0.00)	0.03*** (0.00)	0.39*** (0.05)	0.55*** (0.08)	0.18*** (0.04)	0.04** (0.01)	0.02*** (0.00)	0.03*** (0.00)
Intangible assets	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.03** (0.01)	0.04** (0.02)	0.01 (0.01)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Training cost per employee	0.00*** (0.00)	0.00** (0.00)	0.00 (0.00)						
Average wages	0.69*** (0.01)	0.69*** (0.02)	0.67*** (0.02)						
Intercept	4.79*** (0.16)	4.92*** (0.20)	4.65*** (0.26)	-19.99*** (4.90)	-24.73*** (6.89)	-20.19*** (4.79)	-0.46 (0.64)	-0.36 (0.35)	0.12 (0.41)
	Full sample	Acc Int	Grad Int	Full sample	Acc Int	Grad Int	Full sample	Acc Int	Grad Int
Number of obs	3833	2442	1391	3833	2442	1391	3833	2442	139
Number of groups	856	498	358	856	498	358	856	498	358
Obs per group: min	2	2	2	2	2	2	2	2	2
avg	4.5	4.9	3.9	4.5	4.9	3.9	4.5	4.9	3.9
max	7	7	7	7	7	7	7	7	7
F (6,1933)	212	142	73						
Prob > F	0.00	0.00	0.00						
Wald chi ² (30)				114,209	379	9057	114,209	7113	9057
Prob > chi ²				0.00	0.00	0.00	0.00	0.00	0.00
R ² (overall)				0.24	0.24	0.07	0.24	0.49	0.07

* p < 0.1.
** p < 0.05.
*** p < 0.001.

4. Results

Table 4 presents the results from the 2SLS regressions. The results from the single equation (OLS) model are not discussed in this section, since the Hausman-Wu test suggested productivity was endogenous in the internationalization equation, and estimates may thus be biased. We ran the two-stage least squares regressions for the whole sample, as well as separately for accelerated internationalizers and gradual internationalizers. Table 4 shows the results from the first and second stage regressions using instrumental variables.

Both of the variables measuring employee human capital (wages and training costs) were positively and significantly associated with productivity (Table 4, Model 1). This indicates that investing in employee human capital leads to increased productivity in the following year. Hence, we have support for Hypothesis 1. Among the control variables, firm age was not significant, while the control for size was negative and significant. The number of export products was not significantly related to productivity. The control for import (relative to the industry mean) was positive and significant. Foreign sourcing of inputs or intermediary products positively affected productivity. In the second-stage least-squares regression (Table 4, Models 4 and 7), which report the results from the regression estimation for the whole sample, the association of labor productivity with the respective measures of degree of internationalization is positive and significant. Thus, our Hypotheses 2a and 2b are also supported.

In the first stage of the regression model we estimated the impact of employee human capital on labor productivity. For firms following an accelerated internationalization strategy (Table 4, Model 2), results are largely in line with those for the full sample. Employee human capital variables (wages and training) were positively and significantly associated with productivity. Firms following an accelerated internationalization strategy upgraded the overall employee human capital by investing in training, and by paying high wages, suggesting relatively high levels of education and seniority (Du Caju et al., 2009). For SMEs following a gradual internationalization strategy, the coefficient for wages is positive and significant, while training is not significant (Table 4, column 3).

Models 5–6 and 8–9 in Table 4 show the results of the second stage of the regression for accelerated internationalizers and gradual internationalizers. Labor productivity is positively and significantly associated with internationalization for SMEs following an accelerated internationalization strategy. The control for age is positive and significant. Firm size, the number of export products, and import are all positively and significantly associated with the degree of internationalization. The early and rapid internationalization of these firms fits the internationalization pattern of the so-called international new ventures (Oviatt and McDougall, 1994), or “born-globals” (Rennie, 1993). Firms exporting a larger number of products also export to a larger number of countries, as indicated by the positive and significant coefficient for the number of export products.

For SMEs following a gradual internationalization strategy, productivity is not significantly associated with internationalization in the second stage regression. In contrast, the relationship between firm age and internationalization is positive for gradual internationalizers. This is consistent with the Uppsala model and reflects the rather traditional, stepwise internationalization approach these firms follow (Johanson and Vahlne, 1977, 2009). Their internationalization evolves gradually, as these firms become older and more experienced. Experiential learning from international markets allows them to enter additional markets over time. Other controls are similar to accelerated internationalizers in sign and significance. It is interesting to note also that the number of observations in the two stage regression for gradual internationalizers is limited (1391 observations), reflecting these firms' limited commitment to exporting (i.e. not recording exports every single year). When these firms do engage in export activities, their export behavior appears to be reactive and ad hoc in that not all of them continue exporting over time (Bell et al., 2003). As a robustness check, in line with internationalization theory, we also ran our models, using the more traditional measure in the literature of 25% export intensity since inception, finding no significant differences. Results are available from the authors upon request.

In sum, the relationships between human capital and productivity, and productivity and degree of internationalization are significant for accelerated internationalizers, but not significant for gradual internationalizers, in support of Hypothesis 3. We plot the relationship between productivity and internationalization for the two groups of firms in Fig. 1 below.

To further explore the temporal dynamics between investments in employee human capital, productivity, and internationalization, we reran our estimations using two and three-year time lags between the independent and dependent variables.¹ Results are reported in Table 5.

Results suggest that investments in employee human capital continue to enhance productivity over extended time periods (two-to-three years, in our case). At the same time, the effect of productivity on the scope and scale of internationalization (number of foreign markets and percent foreign sales, respectively), is more immediate. An alternative explanation for the non-significant lagged effects of productivity may be the limited sample size. Since we only observe firms for a maximum of eight years, and we have an unbalanced panel (not all firms export in every year of the observation period), we lose a number of observations due to the additional lags.

5. Discussion

Exporting is a significant strategic decision that is likely to influence the future endeavors of a small firm. Much of the recent research on SME internationalization has focused the entrepreneur or manager in decisions that affect export performance (Baird et al., 1994; Reuber and Fisher, 1997; Manolova et al., 2002). In this paper, we shift that focus away from the entrepreneur or manager to the importance of the human capital of the employee, suggesting that in SMEs employees have multiple boundary spanning roles that influence the productivity of the entire enterprise. We take a fine-grained perspective, by splitting firms into two groups; those firms that pursue an

¹ We would like to thank two anonymous reviewers for this suggestion.

accelerated internationalization strategy and those firms that pursue a gradual, stepwise internationalization strategy. We develop and test a model that explores the effects of investments in employee human capital on productivity and the subsequent effect of productivity on the firm's degree of internationalization, which we surmise will differ depending on the firm's internationalization strategy. In doing so, we highlight the vital role played by the aggregate employee human capital for the SME's degree of internationalization.

5.1. Theoretical implications

5.1.1. Employee human capital leads to higher productivity, which enables internationalization

Our findings indicate that firms that invest in their employees through wages or training are more likely to have higher levels of labor productivity. Labor productivity is critical for small internationalizing firms as only the most productive firms can overcome the liability of smallness and foreignness and successfully compete in foreign markets. Small firms are faced with limited slack resources and access to financing, and a lack of knowledge and experience in international markets (Caves, 1971; Bell, 1997). They need to increase productivity in order to bear the extra costs of entering foreign markets (Bernard et al., 2003). Investing in employee human capital can give rise to higher productivity levels, enabling SMEs to increase the scope and scale of their internationalization.

5.1.2. Employee human capital driven productivity varies based on SME internationalization strategy

When looking at our entire population of SME internationalizers, we found support for the relationship between employee human capital and productivity, and for the relationship between productivity and SME internationalization. However, when we did a finer grained analysis based on internationalization strategy, differences emerged. For those small firms following an accelerated pattern of internationalization, higher productivity levels, which are derived from investments in employee human capital, were critical. Several authors have observed that rapidly internationalizing small firms tend to be clustered in knowledge intensive industries (Autio et al., 2000; Zahra et al., 2000), with narrow windows of opportunity in which to enter and establish a competitive position (Abell, 1978). Technological competence derived from investments in employee human capital, encourages new ventures to pursue rapid international expansion. To be successful, these firms need to have the most talented employees on-board.

However, when we examined the gradual internationalizers, we found different results. Many of these firms are ethnocentric, i.e. not interested in international growth per se, sometimes described as “reluctant internationalizers” (Morgan-Thomas and Jones, 2009). Consequently, these firms appear to be less interested in investing in internationalization, or in assets related to internationalization, be it employee human capital or other intangible assets (recall that in our regression estimations reported in Table 4, neither labor productivity nor intangible assets were associated with gradual internationalizers' scale or scope of internationalization). These firms follow a traditional approach, starting to export in nearby markets where the costs and risks associated with internationalization are much lower. Due to the physical proximity of nearby markets, transportation costs are lower, and trade barriers, tariffs, and currency risks are significantly reduced. Consequently, these firms do not need superior productivity levels in order to start exporting, and, as our findings indicate, their investments in employee human capital are unrelated to their internationalization. Once these gradual internationalizers venture abroad, further international expansion does not appear to rely on increased labor productivity, but rather increases with firm age, as suggested by the stage models of internationalization (Johanson and Wiedersheim-Paul, 1975; Johanson and Vahlne, 1977; Cavusgil, 1980).

While we expected the effect of productivity on the degree of internationalization to be stronger for accelerated internationalizers compared with gradual internationalizers, we were surprised to find that productivity does not appear to significantly affect the degree of internationalization of gradual internationalizers. One reason for this may be found in the nature of the products that the accelerated and gradual internationalizers are exporting. Accelerated internationalizers tend to be in capital and skill intensive industries, where firms have specialized knowledge, and are exporting that knowledge in the form of unique products or services (Bernard et al., 2006). This type of export fits more closely with traditional theories of comparative advantage. New theories of trade however, recognize that in some industries firms are engaged in horizontal or “intra-industry” trade (Krugman, 1980; Helpman and Krugman, 1985). These firms, which more closely resemble slow internationalizers, are likely to be in more labor-intensive industries where there is little new knowledge generation. In these firms, it is less likely that productivity gains are driving internationalization, but instead consumer demand for a wider variety of products drives internationalization decisions.

In addition to the explanations for this non-significant result presented above, we also attribute the result on the nature of our sample. By sampling on the initial scope of internationalization (e.g., fewer than five countries in the first five years of export operations), we may have captured some reluctant internationalizers, e.g., SMEs who take advantage of a serendipitous one-time opportunity to sell overseas (Morgan-Thomas and Jones, 2009) and some captive internationalizers, e.g., captive suppliers who follow their clients overseas (Bell et al., 2003). In both cases, the internationalization process of these SMEs is reactive and hence much less likely to be driven by prior gains in productivity.

Although our differentiation between accelerated and gradual internationalization strategy may appear to indicate that SMEs have complete freedom of choice, we hasten to caution against such conclusions. The intensity of market competition, the nature of inter-organizational collaborative relationships, prior commitments, partner network contingencies, and the pace of technological change shape to a considerable extent (and sometimes completely dictate) the choice of SME internationalization strategy.² At one extreme, “captive internationalizers” follow their major clients as the clients expand or do not expand internationally (Bell et al., 2001). In the case of Belgian SMEs, in particular, many firms operate as suppliers to big German companies, and, depending on the

² We are indebted to an anonymous reviewer for suggesting this important line of influence.

Table 5
Regression results using different time lags.

	First stage: labor productivity			Second stage: export scope			Second stage: export scale		
	1 year lag	2 year lag	3 year lag	1 year lag	2 year lag	3 year lag	1 year lag	2 year lag	3 year lag
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Labor productivity				1.57*** (0.40)	0.54 (0.47)	0.83 (0.56)	0.015** (0.07)	-0.02 (0.04)	-0.10 (0.04)
Age	-0.01 (0.01)	-0.03 (0.01)	-0.00 (0.01)	0.90*** (0.18)	0.41* (0.22)	0.13 (0.28)	0.05** (0.02)	-0.05** (0.02)	0.00 (0.02)
Size (employees)	-0.25*** (0.01)	-0.25*** (0.01)	-0.28*** (0.01)	4.04*** (0.20)	3.01*** (0.25)	1.87*** (0.32)	0.22*** (0.05)	0.14*** (0.02)	0.02 (0.02)
# export products	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	1.03*** (0.08)	0.33*** (0.09)	0.15*** (0.10)	0.14*** (0.02)	-0.14 (0.01)	-0.01 (0.01)
Import relative to industry	0.04*** (0.00)	0.04*** (0.00)	0.04*** (0.00)	0.39*** (0.05)	0.14** (0.06)	0.05** (0.07)	0.04*** (0.01)	0.00 (0.00)	0.02** (0.00)
Intangible assets	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.03** (0.01)	0.00 (0.01)	0.01 (0.02)	0.00 (0.01)	0.00 (0.01)	-0.00 (0.00)
Training cost per employee	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)						
Average wages	0.69*** (0.01)	0.71*** (0.02)	0.70*** (0.02)						
intercept	4.79*** (0.16)	4.62*** (0.18)	4.73*** (0.20)	-20.68*** (4.90)	-3.04*** (0.60)	-0.89 (6.86)	1.82*** (0.05)	0.20 (0.46)	1.50 (0.49)
Number of obs	22,723	18,691	14,980	22,723	18,691	14,980	23,474	10,262	8196
Number of groups	4554	4223	3884	4554	4223	3884	4756	2651	2399
Obs per group: min	1	1	1	1	1	1	1	1	1
avg	5.0	4.4	3.9	5.0	4.4	3.9	4.9	3.9	3.4
max	7	6	5	7	6	5	7	6	5
F	833	646	529						
Prob > F	0.00	0.00	0.00						
Wald chi ²				302,574	250,442	211,672	12,152	41,216	39,148
Prob > chi ²				0.00	0.00	0.00	0.00	0.00	0.00
R ² (overall)				0.33	0.29	0.29	0.24	0.03	0.01
Number of obs	22,723	18,691	14,980	22,723	18,691	14,980	23,474	10,262	8196
Number of groups	4554	4223	3884	4554	4223	3884	4756	2651	2399
Obs per group: min	1	1	1	1	1	1	1	1	1
avg	5.0	4.4	3.9	5.0	4.4	3.9	4.9	3.9	3.4
max	7	6	5	7	6	5	7	6	5
F	833	646	529						
Prob > F	0.00	0.00	0.00						
Wald chi ²				302,574	250,442	211,672	12,152	41,216	39,148
Prob > chi ²				0.00	0.00	0.00	0.00	0.00	0.00
R ² (overall)				0.33	0.29	0.29	0.24	0.03	0.01

* p < 0.1.
** p < 0.05.
*** p < 0.001.

contract arrangements, may direct a large portion of their output to a single client in a single foreign market (Germany). At the other extreme, in product/markets characterized by rapid technological change, SMEs may be pressed to rush and use narrow windows of opportunity in which to enter and establish a competitive position in multiple international markets simultaneously (Abell, 1978).

5.2. Public policy implications

In addition to enhancing our theoretical understanding of SME internationalization, the results of our inquiry have practical and public policy implications. Our findings indicate that SMEs with a higher level of employee human capital are more likely to achieve a higher degree of internationalization. The costs associated with the simultaneous entry in multiple international markets calls for high levels of labor productivity, which in turns begs for a well-educated and highly trained workforce; as the quality of the employee human capital is likely to influence the productivity of the firm.

However, if rapid escalation of international activity is either not desirable, or not feasible for the small manufacturing firm, the requirements for employee human capital change substantially. In particular, for firms in Belgium that choose to operate within the EU's internal market, the risk inherent in internationalizing is much lower, as there is less uncertainty and internationalization costs are much less. At the same time, as discussed above, in many industrial and technological settings, gradual internationalization is the default mode of internationalization, and experiential learning is the only, if slow, way forward.³ Public policy makers, therefore, should

³ We are indebted to an anonymous reviewer for this insight.

encourage and facilitate a variety of education and training programs attuned to the specific international ambitions and strategies of manufacturing SMEs.

6. Limitations, future research directions and conclusions

In this paper, we develop and test a model that explores the effect of employee human capital on SME productivity and the subsequent effect of SME productivity on the firm's degree of internationalization. Our findings indicate that the employee human capital requirements of rapidly and gradually internationalizing SMEs are very different. Firms pursuing a rapid internationalization strategy need employees with high levels of education and training to increase their overall productivity. This is not the same as those firms pursuing a slow internationalization strategy, where labor productivity is less critical.

While we are confident in our findings, our study would benefit from a stronger operationalization of human capital. In particular, although researchers have used wages as a proxy for education and experience in Belgium (e.g., Dumont, 2008); richer data on education, previous international work experience, and industry experience would enhance our work. In particular, a disaggregation of the effects of education, experience, and tenure/seniority would allow a finer-grained analysis of the relative importance of different aspects of human capital. Furthermore, while we have generic information on employee training, (i.e. total cost, number of hours, number of employees involved) we do not have information about the content of the training activities. Specific training related to internationalization/export may have a direct impact on the degree of internationalization, especially in SMEs. In addition, because the dataset was stripped of any firm identifiers, we could not augment it with matching data on top management team characteristics, such as degree of ethnocentricity, prior international or industry experience, or international business skills. This precluded us from controlling for the effect of the top management team characteristics.

In dividing the sample into accelerated and gradual internationalizers, we used cut-offs that may appear somewhat arbitrary. In order to be classified as accelerated internationalizers, firms need to export to at least five countries, including one outside the EU, within five years after their first export. A robustness check revealed the results were not particularly sensitive to the chosen thresholds. However, due to the limited observation window (1998–2005), data are both left and right censored. As a result, not all firms can be observed for at least five years after their first export. Those firms observed for fewer than five years after their first export (i.e. starting to export in 2002 or later) are classified according to their export scope in the observed timeframe.

In addition, our data are restricted to SMEs in Belgium. While we are confident that there are a number of institutional contexts within the European Union that face similar constraints to those found in Belgium, we do not have the data to make a comparison. Future researchers could expand this study to other institutional contexts, including emerging markets and developing economies, thus extending our knowledge of the impact of human capital in SME internationalization.

Limitations notwithstanding, this study provides a fresh perspective on the determinants of SME internationalization by focusing on the human capital of the firm's employees. In doing so, it contributes to the conversation around SME internationalization, and provides a finer-grained analysis of the employee human capital choices inherent in different internationalization strategies. Given the importance of internationalization as a growth strategy for small firms, this paper provides important empirical evidence that enhances both our theoretical as well as our practical understanding of this phenomenon.

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