

# **The impact of first-order Internet deployment capabilities on the export performance of internationalizing SMEs**

*ABSTRACT: The existence of rapidly internationalising small to medium sized firms has been widely documented in the literature. Liberalisation of markets and the emergence of new Information and Communication Technologies (ICT) are the most frequently cited enablers of this phenomenon. However, despite their unprecedented potential to reach customers and reduce trade barriers, the anticipated positive impact of ICTs on firm performance has not been empirically supported to the expected degree. This study addresses this topical issue and investigates the effect of online media deployment capabilities on export performance by using multivariate statistical analysis on data drawn from a survey of 115 UK-based SMEs.*

*KEYWORDS: born-global; SME; ICT; Internationalization; Performance*

# 1 Introduction

The emergence and spread of Information and Communication Technologies (ICT) gave rise to speculations about their potential impact in many walks of life. Interestingly, despite the rapidly growing literature on e-commerce, research on the Internet's impact on firm internationalisation is comparatively limited. In a recent review of 45 empirical studies, Morgan-Thomas et al. (2009) identifies two major streams within the “online internationalisation” literature, a) the internationalisation of e-commerce corporations and b) the impact of the Internet on the internationalisation of non-Internet-based firms. The present study focuses on firms which belong to the latter category.

The beginning of empirical International Business (IB) research on ICT issues dates back to the seminal work of Hamill and Gregory (1997: 9) predicting a “revolutionary impact on the conduct of international trade”. Macro-level studies, correlating Internet access with international trade growth (e.g. Freund and Weinhold 2004) seem to confirm this prediction. Furthermore, anecdotal evidence about the export opportunity enhancing nature of the Internet in developing countries (e.g. Wheeler, Dasgupta, and Lall 2004) was supported by empirical results indicating a higher propensity to export among firms with Internet access in Eastern Europe and Central Asia (Clarke 2008). Yet, these results merely indicate that ICT, more precisely the Internet, play an important role in facilitating international trade without conveying a specific link about their contribution to export performance.

As pointed out by Anna Morgan-Thomas (2009), given the Internet's unprecedented potential to reach foreign customers (Schlegelmilch and Sinkovics 1998; Yamin and Sinkovics 2006), and the trend towards increased e-enablement (Morrison, Bouquet, and Beck 2004), it is surprising how limited research is on the direct contribution of ICT to export performance. Finding out *when* ICTs matter is even more pressing as they are approaching the end of their build-out phase (Carr 2003). This means that these are becoming widely available at affordable prices, erasing the potential for financial benefits by their mere adoption. Today, “[t]he key question is not whether to deploy Internet technology but “how” to deploy it... companies have no choice if they want to stay competitive” (Porter 2001: 64).

Furthermore, not only is the number of empirical studies on this subject matter limited, the results are highly inconsistent calling for more investigation. In addition, while existing studies have - to varying degrees - covered ICT deployment dimensions such as “complementary IT resources” (Morgan-Thomas 2009), “relationship building” (e.g. Morgan-Thomas and

Bridgewater 2004), “investment into IT” (Morgan-Thomas and Bridgewater 2004), “communication” (Raymond, Bergeron, and Blili 2005), “online transactions” (e.g. Moen, Madsen, and Aspelund 2008), “market intelligence” (e.g. Moon and Jain 2007), “product services” (e.g. Moon and Jain 2007), “cost reduction” (e.g. Lu and Julian 2007), to date there is no empirical study testing the impact of the Internet as an alternative to physical foreign market entry mode on export performance. To this end, this study aims to fill this gap and to contribute to a better understanding of which Internet-deployment practices actually contribute to an enhanced export performance.

The question of “how” to deploy the Internet cannot be separated from the context of deployment. There is empirical evidence, that young and fast growing firms, also termed as “born globals” are highly relying on ICT as a growth facilitator (e.g. Arenius, Sasi, and Gabrielsson 2005; Hodgkinson 2008; Servais, Madsen, and Rasmussen 2007). However, rapid growth cannot be equated with better financial performance. Thus, the present study also aims at investigating whether ICT deployment contributes more to born global firms’ export performance than to the export performance of enterprises that follow a slower internationalization pattern.

## **2 Literature Review**

### ***2.1 ICT deployment and export performance***

Following a comprehensive survey of the literature on ICT and export performance using online databases such as ABI/Inform and EBSCO, we identified nine empirical studies measuring the impact of the Internet on export performance (see Table 1). Eight of these studies directly correlated Internet use with performance measures, and one study investigated the mediating impact of Internet-integration into marketing activities on export performance. While two of the studies operationalized Internet use very broadly by measuring it as “Internet sales” and “Internet access” respectively (see Clarke 2008; Hodgkinson 2008), the rest of the papers attempted to capture Internet use by devising multiple categories.

Morgan-Thomas (2009) and Morgan-Thomas and Bridgewater (2004) investigated the impact of ‘complementary IT resources’ and ‘IT capability development’ efforts on the online contribution to export performance. The former category encompasses factors such as the sophistication of IT infrastructure and IT staff as well as heavy investments in IT systems and applications. IT capability efforts include high time and resource investments into Internet deployment, a high ongoing Internet budget, and substantial planning of Internet activities. Marketing activities replaced by the Internet were measured by examining company websites. The

web contents have been classified into four categories, i.e. information content, relationship building features, online transaction features, and sophistication of the website. Prasad et al. (2001), Raymond et al. (2005) as well as Moen et al. (2008) broke down ICT deployment into three main dimensions, i.e. market research, sales/transaction functions, and relationship development. In contrast to Morgan Thomas (2009) and Morgan-Thomas and Bridgewater (2004), these authors used Likert-type scale items to measure the relational dimension. While also accounting for marketing research and online transaction dimensions, Moon and Jain (2007) operationalized ICT deployment by additionally measuring the firm's dependence on the Internet for new product development, advertising, and for providing product service support. Lu and Julian (2007) complemented the list of dimensions by adding "cost reduction", "networking", "image enhancement", and "competitive advantage".

Although there seems to be a convergence in terms the categorisation of ICT deployment (information/relationship building/transactions), the results of the studies are controversial. Seven out of the nine studies directly investigate the relationship between the transaction dimension of Internet use and export performance. Contrary to expectations, only Hodgkinson (2008) found a positive significant relationship. The results indicated that fast growth firms also known as born globals tend to use e-commerce as an early-stage internationalisation mode. However, in that study export performance is solely operationalized as fast/good/modest/negative export growth not accounting for the financial dimension. While Raymond et al. (2005) also found a significant positive relationship between online transactions/collaboration and sales growth, the export sales ratio (export sales/total sales) remained unaffected.

There is only limited evidence for the relationship building potential of ICT (Morgan-Thomas 2009). Resource commitment to Internet deployment in terms of allocated time, budget, and planning activities seem to positively influence export performance (Morgan-Thomas 2009; Morgan-Thomas and Bridgewater 2004). The sophistication of the website, i.e. the existence of multiple pages, regular content updates, different language versions, own domain name, as well as the registration with major search engines also appear to have a positive impact on export success of virtual channels (Morgan-Thomas and Bridgewater 2004).

The use of the Internet for business intelligence purposes yielded controversial results. While Raymond et al. (2005) found that prospecting for clients and developing competitive intelligence through online media can damage the export sales ratio, Moon and Jain (2007) identified a positive relationship between Internet marketing research and export profit. However, it needs to be noted, that in Moon and Jain's (2007) study, Internet marketing research was

operationalized as the company's dependence on the Internet for carrying out marketing intelligence as well as the quality of the company's capability to carry out marketing research on the Internet. The same operationalization strategy was applied to two further constructs displaying a positive impact on export profits, i.e. promotion and product support.

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*Insert Table 1 about here*

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The above review of existing empirical studies indicates that results on the contribution of ICT deployment to export performance are contradictory. These inconsistencies partially stem from differences in the operationalization of the identified dimensions. A further reason might be attributed to the time frame of data collection. It seems that a large part of the data was gathered prior to 2005. Given the maturation and rapid expansion of the Internet infrastructure, and the incorporation of IT in the education systems, it can be expected that external pressure to engage in e-business is increasing rapidly. Consequently, there is need for further testing.

## **2.2 ICT deployment and born global firms**

Although there is some empirical evidence that Internet use positively correlates with firm internationalization, the causality of this relationship could not be sufficiently determined (Clarke 2008). In response to the causality question, the born global stream of the internationalization literature posits that the Internet acts as an internationalization enabler. The underlying assumption is that born global firms are relatively small and limited in terms of their resource endowments (Hodgkinson 2008). Hence, they are suggested to deploy the Internet in order to proactively counterbalance these initial limitations (Kotha, Rindova, and Rothaermel 2001; Servais, Madsen, and Rasmussen 2007). Given the importance of technology leadership, including the reliance on ICT for the success of born globals (Knight and Cavusgil 2005), the number of empirical studies investigating their ICT deployment strategies is surprisingly limited (Gabrielsson and Gabrielsson).

While Arenius et al. (2005) and Gabrielsson and Gabrielsson (2010) mainly focused on the qualities of the Internet as a sales channel, Moen et al. (2003) and Loane (2005) identified a wide range of ICT use dimensions ranging from e-mail communication to competitor analysis. Servais et al. (2007) went beyond a simple deployment analysis and investigated the difference between born global and non-born global firms in terms of Internet use. Their results show that born global firms rely on the Internet more intensively than their non-born global counterparts. Other studies

examined the facilitating effect of the Internet on firm internationalization (e.g. Hodgkinson 2008; Kotha, Rindova, and Rothaermel 2001; Loane, McNaughton, and Bell 2004), however, to our best knowledge there are no studies investigating the impact of Internet use on born-global performance.

In this study we define born globals as firms that internationalize within three years of their inception, have an export ratio of at least 25%, and operate in three or more different continents (Sundqvist, Kuivalainen, and Cadogan 2010).

### **3 Conceptual framework and hypotheses**

The inconsistency in existing empirical results on the relationship between internet deployment practices and export performance (as pointed out in section 2.1) may be due to the way these dimensions have been operationalized. By that we primarily mean the underlying theoretical assumptions. Although no theory has been explicitly indicated, those dimensions which have been found to have a significant positive or negative impact on export performance were implicitly or explicitly connected to capability development (Moon and Jain 2007; Morgan-Thomas 2009; Morgan-Thomas and Bridgewater 2004) or to the expectation that the Internet represents a resource-advantage (Lu and Julian 2007).

Based on these empirical results, among the currently existing theories in international business, the resource-based view would seem to be the one with the greatest explanatory value. However, as pointed out by Wu et al. (2006), Internet use alone does not satisfy the criteria demanded by RBV (Barney 1991). Reliance on the Internet and other ICT is more of a strategic necessity than a source of sustainable competitive advantage. (Clemons and Row 1991; Powell and Dent-Micallef 1997). Powell and Dent-Micallef (1997) established that IT resources need to be embedded into an organization in order to contribute to value creation. Their results showed that *“ITs can produce competitive advantage by leveraging or exploiting Human and Business resources”* (Powell and Dent-Micallef 1997: 392). Also building on RBV, Wu et al. (2006: 494) proposed and found empirical evidence that when IT technology is embedded in a firm’s supply chain processes, IT can contribute to the development of *“higher-order organizational capabilities [...] which are firm specific and hard to duplicate across organizations”*. Similarly, Prasad et al. (2001) found evidence that the integration of Internet technology into marketing activities enhance marketing capabilities, and through these enhanced capabilities it contributes to export performance.

In contrast to Wu et al. (2006) and Prasad et al. (2001), in this study, we are more

concerned with Internet-based first-order capabilities. While, as repeatedly suggested empirically, ICT integration into business activities has the potential to enhance the development or effectiveness of higher order capabilities (e.g. Powell and Dent-Micallef 1997), they may also be influenced by a number of other factors not accounted for. In order to better understand the effect of Internet-integration on financial performance, it is important to investigate the relevance of first-order Internet-facilitated capabilities. Consequently, we propose that those firms that develop superior capabilities in terms of communication with customers, relationship-building, reaching potential customers, bypassing costly physical presence in foreign markets, market research, being a front-runner in employing advanced export management technology, and cost reduction through Internet deployment will experience enhanced export performance.

Morgan-Thomas and Bridgewater (2004) found evidence that a high ongoing Internet budget, substantial planning for Internet activities, as well as high investment in terms of time and resources lead to enhanced export performance. In a later publication, using the same data set, Morgan-Thomas (2009) renamed the construct “web investment” into “capability development effort”. This is in line with Porter’s (2001) argument that IT investment needs to be aligned with a strategy. We take this argument a step further and propose that those firms that develop the capability to identify the most advanced technology available and integrate it into their export management process will witness higher export performance.

*H1: The integration of advanced IT technology into a firm’s export management processes contribute to enhanced export performance*

Although responsiveness in a world of zero-tolerance is a necessary condition to firm survival (Reeves 2000), there is no empirical evidence that using the Internet for communication purposes has a direct significant impact on export performance by its own merit. However, if through relying on Internet communication a firm achieves a competitive advantage (Lu and Julian 2007), financial benefits can be expected.

*H2: A firm’s Internet-based communication capabilities contribute to enhanced export performance.*

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*Insert Figure 1 about here*

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Relationship building/maintaining capabilities have been shown to positively impact on firms’ export performance. While Morgan-Thomas (2009) focused on website features such as order tracking, online customer service, visitor recognition, etc., Raymond et al. (2005)

emphasized the collaboration function of Internet technology. Moon and Jain (2007) found a positive relationship between online product service and enhanced profits. We propose that in addition to these dimensions, when a firm uses the Internet as an alternative to physical market entry, it needs to be able to achieve at least the same level of customer satisfaction that it would have achieved by offline market entry.

*H3: A firm's Internet-based relationship building capabilities contribute to enhanced export performance.*

There seems to be an agreement in the literature regarding the Internet's unprecedented potential to reach customers (Schlegelmilch and Sinkovics 1998; Yamin and Sinkovics 2006). Using the Internet to generate sales leads (Bennett 1997), or setting up a website to serve as a virtual shopping window (Loane 2005) are examples for numerous possibilities. We propose that firms that identify ways to use the Internet to reach more potential foreign customers will experience better export performance.

*H4: A firm's capability to reach foreign customers contributes to enhanced export performance.*

While there is empirical evidence that firms do carry out market research online (Bennett 1997; Loane 2005), when looking at the impact of these activities on export performance, the results are controversial. Prasad et al. (2001) found that online marketing research positively influences the development of marketing capabilities, Raymond et al. (2005) found a negative relationship between e-business intelligence and export performance measured in terms of export sales ratio. Moon and Jain's results (2007), on the other hand, show that Internet marketing research positively impacts profits, sales, as well as firms' market share. This inconsistency calls for further testing. Thus we hypothesize that:

*H5: Internet-based market research capabilities positively impact firms' export performance.*

Using the Internet as a direct sales channel can be used as an alternative or complement to physical market entry (e.g. Gabrielsson and Gabrielsson 2010). Although there is empirical evidence that using the Internet for online transactions does not have a significant direct impact on firms' export performance (e.g. Moen, Madsen, and Aspelund 2008), there are no studies investigating the impact of the Internet as an alternative market entry mechanism on export performance. Gabrielsson and Gabrielsson (2010) found that Internet-based multiple channels can reduce the liability of foreignness and newness. Nevertheless, earlier research points to firms' conviction that the Internet is an appropriate way to counterbalance the lack of export experience



(Bennett 1997). This is in line with Morgan-Thomas and Bridgewater's (2004) suggestion that the lack of extensive exporting experience in SMEs may lead to a higher level of commitment to online internationalization. Comparable to the effects of the psychic distance paradox (O' Grady and Lane 1996), firms that are aware of their lack of export experience will attempt to compensate through the development of online capabilities.

*H6: Internet-based capabilities that allow firms to avoid or reduce physical presence in a foreign market will experience enhanced export performance.*

Despite the expectation that the Internet can help reducing the cost of various business activities (e.g. Bennett 1997), Lu and Julian (2007) did not find a significant positive relationship between the cost reducing use of the Internet and export performance. As to our best knowledge there are no other studies testing this relationship, we deem the inclusion of this dimension in our study appropriate.

*H7: Internet-based cost reduction capabilities contribute to enhanced export performance.*

As pointed out in Section 2.2, existing empirical results seem to indicate a difference in Internet reliance between born globals and non-born globals (Servais, Madsen, and Rasmussen 2007). Also industry sector, export experience (Vahlne and Johanson 2002) and Internet technology experience (Berry and Brock 2004) may have a potential impact on the success of firms' performance. Consequently, these factors need to be controlled for.

## **4 Method**

### **4.1 Measures**

As a first step, we conducted semi-structured telephone interviews with managing directors of five UK-based firms involved in active online internationalization (Yamin and Sinkovics 2006). The website of the selected companies (1) displayed information that indicated an attempt to actively target foreign markets e.g. pricing in various currencies, website translations, cultural specific information, and (2) was transactional rather than purely informative in nature.

These interviews have been used for scale development where no suitable measurement items were found in existing studies (see Table 2). We used seven-point Likert-type multiple-item scales to operationalize all constructs and variables.

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*Insert Table 2 about here*

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#### **4.2 Sampling frame and data collection**

The target population was defined as UK based SMEs involved in exporting activities disposing of a website. SMEs were determined using the definition of the European Commission, “the category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million”(European Commission 2003). In the first step, the criteria were entered into the FAME (Bureau van Dijk) database. It provides detailed, financial, descriptive and ownership information on over 3.1 million public and private companies in the UK and Ireland. In order to determine whether the companies were involved in exporting, we examined whether their profit and loss account contained the position "overseas turnover". The database contained 8,605 companies corresponding to the above mentioned specifications. We drew a random sample of 1,000 companies. The next step involved the website inspection of the selected companies. Those with non-functioning sites or with no explicit exporting activities had to be replaced. As contact person the Marketing, Export or Sales Manager or, in case the formers were not indicated in FAME, the Managing Director was selected.

#### **4.3 Survey response and informant evaluation**

The first round was in the form of a postal mail out of 1,000 questionnaires. After two weeks only 35 completed questionnaires were received back. In order to increase the response rate, the sample companies were called one by one. By the fifth week after the mail-out, 74 responses were returned. To further improve the response rate, a reminder email was sent out to all managers who agreed on the phone to complete the survey. In total, we received 115 usable questionnaires back, accounting for a response rate of 11.5%.

A random sample of 82 companies was drawn from amongst the non-respondents (who explicitly indicated a non-willingness to respond per post, email or phone) in order to test for non-response bias. The majority of non-respondents gave their shortage of time as the major reason for non-response, while merely 6% indicated being discouraged by the length of the questionnaire (the original questionnaire had 252 scale items). 27% stated that their company policy would prohibit any participation in surveys. The remaining companies revealed their lack of interest in the topic or other reasons (for example new manager, bankruptcy of the company etc.) for their

reluctance to reply. However, none of the declines were due to the substance of the questionnaire. Finally, we further assessed non-response bias by comparing selected attribute means of early-respondents with those of late-respondents (Armstrong and Overton 1977). The comparison of the means yielded no significant differences.

#### **4.4 Common method bias**

We assessed common method bias by applying two separate procedures. In a first step, we utilized the Harman one-factor test (Podsakoff and Organ 1986) by performing a principal component analysis of all the items included in the study. Since no dominant factor emerged, we conclude that there is no evidence suggesting the presence of common method bias in the study.

A more advanced step in examining common method bias involved correlating objective data with subjective data on the same variable. The survey included a question where respondents were asked to indicate their export ratio. We subsequently downloaded the information about the selected firms' export ratio from the FAME database. The test yielded a significant and positive correlation coefficient of 0.675, again providing support for the assumption that no common method bias was limiting generalizations from our findings.

### **5 Assessment of the research model and hypotheses**

#### **5.1 Measurement model assessment**

First, we examined the loadings of the individual items with their respective constructs (see Table 2). All measurement items with loadings above 0.4 were retained (Ainuddin et al. 2007). The loadings for all measures range from 0.446 to 0.954, with most items exceeding the threshold level of 0.7 recommended by Fornell and Larcker (1981). In a second step, we examined both the Cronbach's Alpha and the Composite Reliability values for each latent variable. Both measures suggest reasonable reliability with all values exceeding the 0.7 threshold (Nunnally and Bernstein 1994).

Convergent validity was assessed by using the average variance extracted (AVE) (see Table 5) as suggested by Fornell and Larcker (1981). Convergent validity was found satisfactory as all the values are greater than 0.5 (Henseler, Ringle, and Sinkovics 2009). We checked discriminant validity by using two methods, i.e. the Fornell-Larcker criterion (1981) and the cross loadings of items. As for each variable, the AVE is higher than its highest squared correlation with any other variable we can assume an adequate level of discriminant validity. This is supported by the crossloadings. The loading of each indicator is greater than all of its cross-loadings (Henseler,

Ringle, and Sinkovics 2009).

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*Insert Table 5*

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## **5.2 Structural model assessment**

After ensuring that the outer model is both reliable and valid, we examined the inner path model using SmartPLS (Ringle, Wende, and Will 2005). The explanatory power of a PLS model is determined by the extent of variance explained ( $R^2$ ) by the endogenous latent variables (Henseler, Ringle, and Sinkovics 2009). The  $R^2$  value for export performance is 0.345. Chin (1998) sets the thresholds at 0.67, 0.33, and 0.19 for substantial, moderate, and weak inner path models respectively. Henseler et al. (2009) state that if an endogenous latent variable is explained by only one or two exogenous latent variables, already a “moderate”  $R^2$  value is acceptable. Although our coefficients for determination is medium, as the prediction capability of the model is sufficiently high (cv redundancy = 0.149; cv communality = 0.755) our results can be deemed as relevant and indicative for future research. To check the prediction capability of the model, we used Stone-Geisser’s  $Q^2$  suggested in Henseler et al. (2009) applying the blindfolding method (Tenenhaus et al. 2005)

## **5.3 Results and discussion**

Table 3 and Table 4 display the characteristics of the respondent firms. 50.43% of the respondents can be categorized as true born globals. These firms have internationalized within three years from their establishment and are exporting more than 25% of their total sales to at least three continents. In terms of industry affiliation 53.04% of the cases belong to the high-tech sector (e.g. software, engineering, and computing) and 46.96% to the low-tech sector (e.g. food and beverages and clothing)

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After performing a chi-square test of independence we conclude that there is no significant

association between industry affiliation and born-globalness. Moreover, an independent sample t-test does not show differences between born-globals and non-born-globals in terms of their Internet experience measured in years of Internet use. This indicates that the comparison between born-global and non-born global firms will not be affected by the firms' Internet experience or Industry-affiliation.

The average firm age indicates that although born-globals in our sample are still "younger" than non-born globals with an average of 29 and 31 years in the low-tech and high-tech industry respectively, they are past their start-up phase. In order to test whether this fact hampers inferences from the comparison between born globals and non-born globals, we again conducted an independent sample t-test which indicated that the mean difference in firm age was significant. From this we take that even though some of the born global firms have already developed into more mature organizations, we are still able to find relevant differences in terms of the impact of Internet-based capabilities on export performance between born globals and non-born globals.

Our overall results suggest that while certain Internet-based capabilities have indeed the potential to significantly enhance firms' export performance, other Internet deployment dimensions can have a negative effect. Although previous empirical findings indicated such potential damaging impact (e.g. Powell and Dent-Micallef 1997), those results were not significant.

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*Figure 2Table 4 about here*

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Figure 2 shows the results of our analysis carried out on the full sample of 115 SMEs. From our hypotheses only H1 and H4 could be fully supported. H1 stated that those firms that succeed at developing capabilities to integrate the most advanced IT technology available their industries into their export management processes will experience enhanced export performance. In line with the literature, H4 proposed that the Internet has an unprecedented potential to reach potential customers worldwide, and those firms that develop the know-how and skills to harness that potential will benefit through higher financial returns. Our findings allow us to go beyond previous inferences based on empirical evidence that ICT integration only facilitates higher-order capability development (e.g. Powell and Dent-Micallef 1997; Wu et al. 2006). The results seem to confirm that the new technologies can also play an important role in the development of first-order capabilities. However, as can be seen in the case of H2 and H6, the use of ICT for active online internationalization bears its own set of risks (Pezderka and Sinkovics 2010). H2 suggested that Internet-based capabilities which allow a firm to overcome language barriers, harvest consumer feedback (Sinkovics, Penz, and Molina Castillo 2009), and to enhance interaction with foreign customers will have an improved performance. However, contrary to our expectations, the results reveal a significant negative relationship between Internet-based communication capabilities and export performance. The analysis of H6 proposing a positive relationship between the use of the Internet as an alternative to physical presence in foreign countries and firm performance yielded similarly negative results. One possible explanation for these disadvantageous effects may be Yamin and Sinkovics's "virtuality trap". This is in essence the managerial perception that the exploration of "underlying market conditions" can be sufficiently carried out by the sole reliance on ICT (Yamin and Sinkovics 2006: 349). H3, H5 and H7 were not supported.

In a subsequent step, we controlled for firms' born globalness, industry affiliation, degree of export experience, as well as Internet experience by adopting Jaccard and Turrissi's approach (2003). We measured industry affiliation by dividing our sample of 115 companies into two categories, i.e. low-tech and high-tech respectively. Export experience was operationalized using firms' indicated export ratio. We used the number of years a firm has been using the Internet as a proxy for Internet experience. Table 6 summarizes the results.

Whereas industry affiliation and Internet experience do not seem to have any significant impact on our main findings, the analysis revealed that born globalness and export experience require closer attention.

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*Insert Table 6Table 4 about here*

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While none of the ICT deployment dimensions had a significant contribution to non-global firms' performance, in the case of born globals Internet-based communication capabilities indicated a negative significant effect.

An even more interesting finding emerged when we controlled for how the degree of export experience influences export performance. In line with our main findings before splitting the sample, firms with less export experience (<50% export ratio) seem to suffer financial losses when relying on the Internet as an alternative to physical market entry. Surprisingly, their export performance was also affected when they integrated advanced information technologies into their export management processes. Companies with more export experience (>50% export ratio), on the other hand, displayed enhanced export performance for the same Internet deployment dimensions.

A possible explanation for the controversial impact of IT integration may be that investment in advanced IT systems for export management needs to be aligned with the company's export intensity. In this case, the advancement of IT systems can be regarded as a proxy to the amount invested in that system. However, if firms invest more than their return on investment on that particular information technology, this will lead to losses at the profit level.

The second finding may be attributed to two issues. Firstly, as mentioned earlier, online internationalization has its own array of risks. Despite the expectation that virtual market entry eliminates traditional international risks, most of these risks reemerge in a transformed manner (Pezderka and Sinkovics 2010). Secondly, the importance of relationships in the target country (Gabrielsson and Gabrielsson 2010) can be easily underestimated due to the virtuality trap (Yamin and Sinkovics 2006). Firms with increased export experience can be expected to have developed the capabilities to manage international e-risks as well as to have found ways to counterbalance the negative effects of the virtuality trap.

## **6 Conclusion and Limitations**

In the 1990s numerous papers concluded that SMEs were not deploying the Internet to their potential (e.g. Hamill and Gregory 1997). After the turn of the century, research attention gradually turned to the pitfalls of overreliance on ICT such as the virtuality trap (Yamin and Sinkovics 2006), overinvestment (Carr 2003), and the lack of a clear deployment strategy (Porter



2001). The present paper set out to investigate in how far deploying the Internet contributed to small internationalizing firms' export performance. Our findings support the relevance of these new emerging concerns. Although born globals seem to be more susceptible to fall into the communication dimension of the virtuality trap than other types of firms, a positive or negative contribution to export performance appears to be mostly influenced by a firm's export experience. Our results suggest that firms with more export experience ( $> 50\%$  export ratio) have already developed the capabilities to transcend the virtuality trap, and thus experience enhanced export performance. On the other hand, firms with less export experience ( $< 50\%$  export ratio), seem to overestimate the importance of IT investments and neglect the relevance of their offline/physical market experience. In summary, based on the outcome of our analysis we conclude that the Internet can be best compared to a double edge sword. It has indeed the potential to enhance the development of first-order capabilities that can contribute to enhanced export performance. Yet, when its use is not aligned with strategy (Porter 2001) it can lead to financial damage.

The main limitation of this study is the small sample size. Although PLS is a powerful tool in dealing with small samples (Graham, Mintu, and Rodgers 1994), a larger sample would allow for more variations in terms of splitting the data. A further limitation is that some of the firms that qualified as born globals are already past their start-up phase. Although, we can still draw inferences from the results, future research may look into testing our findings with a subset of born-globals in their infancy. Future research may also consider further investigating the circumstances under which ICT deployment directly contributes to firm performance.

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## 8 Appendix – Tables and Figures

**Table 1: Empirical studies investigating the relationship between ICT use and export performance**

<i>Author/Location of sample firms</i>	<i>Main research objective</i>	<i>ICT deployment operationalized as</i>	<i>Export performance operationalized as</i>	<i>Findings</i>
Hodgkinson (2008) Australia	Determining the relationship between export growth performance and a series of market orientated and internal resource variables	Internet sales	Export growth (fast/good/modest/negative)	Fast growth firms that are relatively small in size and have limited business and export experience are more likely to use Internet sales as an early stage entry mode
Clarke (2008) Eastern Europe and Central Asia	Does Internet access affect export performance?	Internet access	Enterprise exports Exports as percent of sales for enterprises that export	Firms with Internet access are more likely to export, however they do not export more than non-Internet user exporters
Morgan-Thomas (2009) UK	Investigation of antecedents to online contribution to export performance (OCEP)	Complementary IT resources (advancement of IT, IT expertise of staff, investment in IT technology) Online capabilities (relationship/transaction elements of website) Capability development effort (resource allocation to Internet deployment)	Perceived contribution of Internet to <ul style="list-style-type: none"> <li>• Export profits</li> <li>• # of foreign markets served</li> <li>• Export sales</li> <li>• Overall performance</li> </ul>	Capability development effort (beta=0.19; , relational capability (0.08) have positive significant impact on OCEP Complementary IT resources and transaction capability have no significant impact on OCEP Length of export experience has a negative significant impact on OCEP Own export department and export intensity have a positive significant impact on OCEP
Morgan-Thomas and Bridgewater (2004) UK	Identification of the factors that influence success in using virtual channels to export markets	Investment in virtual channels Sophistication of the technology used Technological experience Transaction capability Relationship capability	Perceived impact of virtual export channels on export sales, export profit, number of markets served and overall performance	Investment and Sophistication have a positive impact on virtual export channel success
Prasad, Ramamurthy and Naidu (2001) USA	Investigation of the extent to which the integration of the Internet into marketing activities mediates the impact of market orientation on firms' marketing	Customer related marketing activities Field sales and channel member related marketing activities Marketing research related	Building awareness and image overseas Entering key markets abroad Sales growth Gaining new technology/expertise Improve market share position	Greater integration of the Internet into marketing strengthens the relationship between competitor orientation and marketing competencies, and interfunctional orientation and marketing competencies of exporting firms Greater integration of the Internet into

	competencies	and management communication activities	Profitability	marketing does not strengthen the relationship between customer orientation and marketing competencies of exporting firms
Raymond, Bergeron, and Blili (2005) Canada	Investigation of the extent to which e-business assimilation contributes to the growth and internationalization of manufacturing SMEs	Communicational/Informational use Business intelligence use Transactional/collaborative use	% of sales growth % of sales exported	There is a positive significant relationship between transaction/collaborative use of the Internet and sales growth. There is a significant but <b>negative</b> relationship between the use of e-business intelligence and export performance.
Moon and Jain (2007) USA	Investigation of the determinants and outcomes of Internet marketing activities of large and small-sized exporting firms	Internet marketing research Internet product development Internet promotion Internet distribution Internet product services	Profit Sales Market share	Internet marketing research, promotion and product services positively impact profits Internet marketing research, promotion and product services positively impact sales Internet marketing research and promotion positively impact market share
Lu and Julian (2007) Australia	Investigation of the link between the Internet and export marketing performance	Communication Networking Market research Increasing sales volume Image enhancement Cost reduction Competitive advantage	Composite scale measure of: <ul style="list-style-type: none"> <li>Economic export performance</li> <li>Strategic export performance</li> <li>Satisfaction with the performance of the export market venture</li> </ul>	Only achieving a competitive advantage with the help of the internet has a positive significant impact on export performance
Moen, Madsen and Aspelund (2008) Denmark, Norway	Investigation of ICT use on market performance	Information search Sales activities Relationship development	New market knowledge: <ul style="list-style-type: none"> <li>of distribution channels</li> <li>of competitor strategies</li> <li>competence development through cooperation</li> <li>ability to operate in new markets</li> </ul> Performance in international markets: <ul style="list-style-type: none"> <li>Market share</li> <li>Sales growth</li> <li>Sales growth vs. competitors</li> <li>Profitability</li> <li>Overall performance assessment</li> </ul>	No direct impact on performance, however direct and significant impact on new market knowledge Information search and relationship development positive impact on new market knowledge Sales activities negative impact on new market knowledge

**Table 2: Measurement scales**

<i>Original version</i>	<i>Adapted version</i>	<i>Loading</i>	<i>t-value</i>
Communication (CR = 0.7704)			
Inability to read, speak, and understand the languages of potential foreign markets (Bennett 1997)	The internet enables us to overcome difficulties in reading, speaking and understanding the languages of potential foreign export markets	0.687	7.555
<i>Creates a good business image (Bennett 1997)</i>	<b><i>The internet allows us to effortlessly communicate a good business image to foreign customers</i></b>		
Generates useful feedback from foreign customers (Bennett 1997)	<b>The internet has helped us to gain</b> useful feedback <b>about our products</b> from foreign customers	0.829	13.313
Self-developed	The internet enhances interactivity with our foreign customers	0.611	3.235
Self-developed	Using the internet, we can interact with foreign customers much quicker	0.561	2.968
Relationship building (CR = 0.8086)			
<i>Makes it easy for foreign customers to order goods (Bennett 1997)</i>	<b><i>The internet makes it easier for our foreign customers to order goods</i></b>		
Creates ongoing relationships with customers (Bennett 1997)	<b>The internet improves our ability to</b> create relationships with customers <b>in our target foreign markets</b>	0.882	9.782
Self-developed	The internet facilitates exchange relationships with customers (e.g. feedback, comments and after-sales services)	0.802	5.030
We support customers online and customers seem happy with that (F1 L20-21**)	<b>The internet improves foreign customer satisfaction</b>	0.698	3.923
<i>Self-developed</i>	<i>Our ability to customise products and services is dramatically improved by the internet</i>		
We support customers online and customers seem happy with that (F1 L20-21)	<b>Dealing with</b> customers online <b>makes it easier for us to satisfy them to our maximum potential</b>	0.446	2.773
Reaching foreign customers (CR = 0.8491)			
<i>Creates sales leads (Bennett 1997)</i>	<b><i>The internet improves our ability to generate foreign sales leads</i></b>		
It's [the Internet/ our website] a very good shop window, getting our products in front of a lot more people (F1 L23-24)	<b>The internet helps us to reach more potential foreign customers</b>	0.834	2.393
<i>Self-developed</i>	<i>Because of the internet we get unsolicited enquiries from foreign customers</i>		
Gives the firm a competitive edge over rivals (Bennett 1997)	<b>Using the internet to target foreign markets gives our company</b> a competitive edge over rivals	0.884	2.683
Alternative to physical presence (CR = 0.7193)			
<i>The net has taken some of that [need to go out to the foreign market] away though, making the world a lot more level than it used to be (F3 L73-75)</i>	<b><i>Because of the internet, country visits for exporting purposes are less important than they used to be</i></b>		
<i>Self-developed</i>	<i>Any future investment we might make, will go towards having an agent in our foreign markets</i>		
<i>Self-developed</i>	<i>Enhancing our physical presence in our foreign markets is our key objective</i>		

Need to obtain foreign representation (Bennett 1997)	<b>The internet helps us to avoid</b> obtaining foreign representation <b>in our export markets</b>	0.751	5.626
The visits over there help you to see things that you weren't specifically being told about by customers (F3 L83-84)	<b>Face-to-face contacts have given us a much better understanding of our industry in our target foreign markets</b>	0.637	3.239
We have had some circumstances where internet could never have given us the same level of understanding of our hardware and software market and enable us to help our customers with big projects to implement our product properly. But most of the time, especially for small customers this is not the case (F5 L55-56)	<b>When visiting foreign markets, the physical interaction allows us to see things that we wouldn't have seen via online interaction</b>	0.537	2.235
<i>There have been one or two occasions when we have not gained a client because we don't have a physical presence (F1 L65-67)</i>	<i><b>Our company would not have gained the customers we have, had it not been for our physical presence in our foreign market</b></i>		
We shouldn't ever completely ditch meeting and greeting the odd supplier or customer from time to time (F3 L96-96)	We should never completely <b>stop</b> meeting our <b>foreign</b> customers <b>in person</b>	0.566	3.205
Market research (CR = 0.9303)			
Self-developed	Industry changes in our export markets are easily spotted using the internet	0.686	3.166
It [the internet] has allowed us to find out what our global competitors are doing (F3 L34)	The internet <b>has improved our ability</b> to find out what our <b>foreign</b> competitors are doing	0.688	2.762
Lack of business knowledge about competitors, clients and markets abroad (Eriksson et al. 1997)	<b>The internet allows us to gather</b> business knowledge about <b>foreign</b> clients	0.948	7.240
	<b>The internet allows us to gather</b> business knowledge about <b>foreign markets</b>	0.954	7.013
	<b>The internet allows us to gather</b> business knowledge about competitors abroad	0.954	7.311
Cost reduction (CR = 0.9806)			
Self-developed	The internet is an inexpensive way of communicating with customers	0.991	9.544
Lowers the cost of international marketing (Bennett 1997)	<b>Using the internet to market our products and services internationally</b> lowers our <b>overall</b> marketing cost	0.991	5.320
Lack of management time to devote to export matters (Bennett 1997)	<b>The internet helps us overcome problems associated with</b> lack of management time to devote to export matters	0.791	2.412
Financial costs of exporting additional to those for domestic sales (Bennett 1997)	<b>The internet helps us to reduce the</b> financial costs <b>associated with</b> exporting	0.990	4.449
Any future resources we might have will go towards that [our online business] rather than anywhere else (F3 L108-109)	<b>In the future we will devote more</b> resources to our online business	0.991	2.859
Advanced export management technology (CR = 0.9113)			
My business unit uses the most advanced IT for supply chain communication system (Wu et al. 2006)	<b>Our company</b> uses the most advanced IT <b>systems to interact with our foreign customers</b>	0.860	9.494
Our IT for supply chain communication system is always state-of-art technology (Wu et al. 2006)	Our IT for <b>management of our international operations</b> is always state-of-the-art technology	0.861	9.486
Relative to our competitors, our supply chain communication systems are	Relative to our competitors, our <b>IT for export management</b> is more advanced	0.864	8.612

more advanced (Wu et al. 2006)			
My business unit is always first to use new IT for supply chain communication system in our industry (Wu et al. 2006)	<b>In our industry, our company</b> is always first to use new IT for <b>management of our international operations</b>	0.871	8.328
My business unit is regarded as an IT leader in our industry for supply chain communication system (Wu et al. 2006)	<b>In our industry, our company</b> is regarded as an IT leader <b>for export management</b>	0.625	3.205
Export performance (CR = 0.9392)			
<b>How satisfied are you with the results of your exporting activities?</b>			
Export sales growth (Katsikeas, Leonidou, and Morgan 2000)		0.882	37.706
Export sales volume (Katsikeas, Leonidou, and Morgan 2000)		0.917	61.295
Contribution of exporting to profits (Katsikeas, Leonidou, and Morgan 2000)		0.806	16.473
Export market share (Katsikeas, Leonidou, and Morgan 2000)		0.834	21.042
Overall export performance (Katsikeas, Leonidou, and Morgan 2000)		0.903	49.961

*\*7-point Likert Scale (strongly disagree =1; strongly agree =7)*

*\*\*items taken directly from the interview transcripts(2006) F= Firm and L=Lines (of the interview transcript)*



**Table 3: Company characteristics organised by industry and born-globalness of firms**

<i>Industry</i>	<i>Born-globalness</i>	<i>Internet experience (in years) Mean</i>	<i>Firm age (in years) Mean</i>	<i>Export experience (in years) Mean</i>	<i>Export ratio (%) Mean</i>	<i>Revenue (in million £) Mean</i>
		<i>Mean</i>	<i>Mean</i>	<i>Mean</i>	<i>Mean</i>	<i>Mean</i>
<i>Low-tech</i>	<i>Non-BG</i>	11	47	28	32.99%	10.70
	<i>BG</i>	9	29	24	48.80%	11.85
<i>High-tech</i>	<i>Non-BG</i>	10	60	29	32.22%	16.66
	<i>BG</i>	11	31	31	63.08%	9.97

**Table 4: Company characteristics**

<i>Dimension</i>		<i>Number of firms</i>	<i>Percentage of firms</i>
<i>Born-globalness</i>	<i>BG</i>	58	50.43%
	<i>non-BG</i>	57	49.57%
<i>Industry</i>	<i>Low-tech</i>	54	46.96%
	<i>High-tech</i>	61	53.04%
<i>Employees</i>	<i>1-9</i>	2	1.74%
	<i>10-49</i>	27	23.48%
	<i>50-149</i>	63	54.78%
	<i>150-250</i>	22	19.13%
<i>Export ratio</i>	<i>&lt;10m</i>	13	11.30%
	<i>10-24.99m</i>	18	15.65%
	<i>25-49.99m</i>	33	28.70%
	<i>50-74.99m</i>	30	26.09%
	<i>&gt;75m</i>	19	16.52%
<i>Revenue</i>	<i>1.00 &lt; 1m</i>	2	1.74%
	<i>2.00 1m - 4.99m</i>	21	18.26%
	<i>3.00 5m - 9.99m</i>	31	26.96%
	<i>4.00 10m - 24.99m</i>	36	31.30%
	<i>5.00 25m - 50m</i>	19	16.52%

**Table 5: Overall model evaluation**

	<i>AVE</i>	<i>Highest squared correlation</i>	<i>Composite Reliability</i>	<i>Cranach's Alpha</i>	<i>R Square</i>
<i>alt. phys. presence</i>	0.5946	0.10896601	0.7193	0.7671	0
<i>cost reduction</i>	0.9106	0.41615401	0.9806	0.9736	0
<i>communication</i>	0.4618	0.32455809	0.7704	0.6636	0
<i>reaching new customers</i>	0.7379	0.15031129	0.8491	0.6469	0
<i>export management</i>	0.6756	0.06120676	0.9113	0.8855	0
<i>market research</i>	0.7322	0.41615401	0.9303	0.9396	0
<i>performance</i>	0.756	0.06120676	0.9392	0.9187	0.3447
<i>relationship building</i>	0.5268	0.32455809	0.8086	0.7014	0

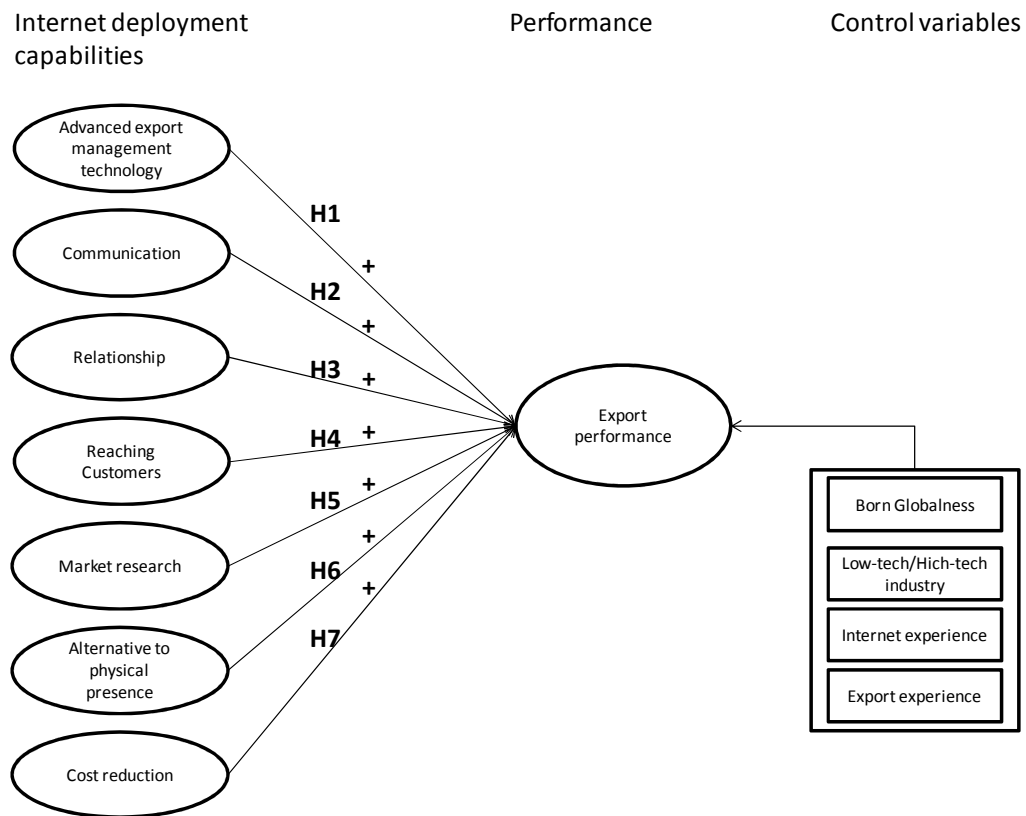
**Table 6: Control variables**

		<i>Control variables</i>							
		<i>Born globalness</i>		<i>Industry</i>		<i>Export experience (export ratio)</i>		<i>Internet experience (yrs)</i>	
		<i>BG</i>	<i>non-BG</i>	<i>low-tech</i>	<i>high-tech</i>	<i>less 50%</i>	<i>more 50%</i>	<i>&lt; 10 yrs</i>	<i>&gt; 10 yrs</i>
<i>Export performance</i>	N = 115 R <sup>2</sup> = 0.345	N = 58 R <sup>2</sup> = 0.382	N = 57 R <sup>2</sup> = 0.141	N = 54 R <sup>2</sup> = 0.284	N = 61 R <sup>2</sup> = 0.256	N = 65 R <sup>2</sup> = 0.730	N = 50 R <sup>2</sup> = 0.434	N = 46 R = 0.292	N = 69 R <sup>2</sup> = 0.104
<i>Communication</i>	<b>-0.223*</b>	<b>-0.386*</b>	-0.063	0.064	-0.170	0.049	-0.053	0.122	-0.014
<i>Cost reduction</i>	0.082	0.009	-0.017	0.163	-0.120	0.042	-0.033	-0.124	-0.021
<i>Reaching new customers</i>	<b>0.164*</b>	0.238	0.143	0.082	0.146	0.061	-0.055	-0.010	0.117
<i>Adv. export management technology</i>	<b>0.264*</b>	0.183	0.210	0.109	0.189	<b>-0.556*</b>	<b>0.172*</b>	0.019	-0.009
<i>Market research</i>	0.091	0.141	-0.024	-0.125	0.276	0.034	-0.007	0.194	-0.028
<i>Alternative physical presence</i>	<b>-0.360*</b>	-0.238	0.260	0.464	-0.290	<b>-0.638*</b>	<b>0.688*</b>	-0.291	0.274
<i>Relationship building</i>	<b>-0.183<sup>a</sup></b>	-0.116	-0.043	-0.078	-0.078	0.040	0.064	-0.201	-0.111

\*... significant at the 0.05 level.

<sup>a</sup>... significant at the 0.10 level

**Figure 1: Conceptual Framework**



**Figure 2 Results of the PLS structural model for N = 115**

