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Breda Kenny

Mairéad Clohessy

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Organisational Factors Determining Export Performance and Electronic Commerce Adoption: An Empirical Investigation

Dr Breda Kenny and Mairéad Clohessy

Abstract

Ireland's economic performance over the past two decades was largely driven by the exporting sector of the economy. Vigorous export growth largely reflected the success of the economy in securing inward foreign direct investments flows, mainly from the United States (Central Bank and Financial Services Authority of Ireland, 2009). Given that Ireland has a population of just over 4.23 million (CSO, 2006) it is imperative that Irish organisations expand into foreign markets to gain a larger market base.

It is against this background of international trade that this paper is set. This is a study of export performance and electronic commerce and it seeks to ascertain the extent to which organisational factors impact on export performance and electronic commerce adoption in the Information and Communications Technology (ICT) sector in Ireland.

The core objectives of this study are: to identify the internal organisational characteristics of both export performance and electronic commerce adoption and to examine the key organisational internal determinants of export performance in the ICT sector in Ireland. The empirical findings provide evidence of a relation between organisational age, managerial education, international experience and export performance, and electronic commerce adoption.

Keywords: *Export Performance, Organisational Age, Managerial Education, International Experience, Electronic Commerce Adoption*

Introduction

The importance of export as an economic activity and a driver of growth are well established in relevant literature. As international competition has become more innovation and knowledge-based, understanding trade performance has gone beyond the parameters of trade theories and now incorporates the role of technology in affecting international competitiveness. Given that Ireland has a population of just over 4.23 million (CSO, 2006) it is imperative that Irish organisations expand into foreign markets to gain a larger market base. Internationally a site on the internet gives a small organisation a vast potential reach, while the same message can penetrate the narrowest of niche markets among information seekers (Bennett, 1997). In the current economic climate both in Ireland and globally international trade and specifically exporting is of increasing importance for Ireland, as recent figures show that net export has increased in from 2009 to 2010 by €4954 million (CSO, 2011).

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It is against this background of international business and internet penetration that this study is set. This paper focuses specifically on the key determinants of export performance and electronic commerce adoption amongst small and medium sized organisations (SMEs) in the information and communications technology (ICT) sector. SMEs are the focus of this study as they are a key economic sector in Ireland, where they constitute 97% of enterprises and contribute to the flexibility and resilience of the economy as well being active in international markets. This study draws on research from high tech small and medium firms (HTSMEs) in the ICT sector in Ireland.

The internationalisation process of small and specialised high-technology firms is often different from that of more mature industries (Saarenketo *et al.* 2004). In dynamic high-tech markets, one of the factors influencing high performance appears to be speed of internationalisation. Research has shown that these firms are growing and expanding their operations to other countries at a relatively faster pace than others (Fan and Phan, 2007). These firms are often driven to become international at or near inception as a result of the idiosyncrasy of the sector. Previous empirical research indicate that SMEs operating in the ICT sector are frequently required to engage in early internationalisation in order to survive, grow and succeed (Oakley, 1996; Johnson, 2004). Furthermore, Oakley (1996) and Johnson, (2004) found that intense international competition and the extensive internationalisation of their high technology industries necessitated rapid internationalisation.

Consequently, HTSMEs may not necessarily have the time to integrate prior knowledge and to fully develop their international strategies before implementing them as suggested by Johanson and Vahlne (1977). Instead, these companies need to react rapidly, develop mechanisms to assess opportunities quickly and allocate resources to take advantage of them. The results of these actions, some being previously labelled 'reactive strategies' have become the basis for survival in dynamic environments (Eisenhardt and Martin, 2000). SMEs face internal scarcity of information, capital, and management time and experience (Lu and Beamish, 2001), while externally these firms face constraints arising from their exposure to environmental changes. These constraints inflate the liabilities of foreignness (Hymer, 1979) and of newness (Stinchcombe, 1965) and make internationalisation a challenge.

The paper is organised as follows: First, the theoretical and conceptual considerations and framework are outlined. Second, the research method and the empirical results are outlined. The final section provides a discussion of these findings along with some limitations and areas of further research.

Electronic Commerce

One of the continuing issues of electronic commerce adoption is that of identifying the factors that cause people or organisations to accept and make use of systems developed and implemented by others (King and He, 2006). Identifying why and how organisations adopt

technological innovations, and more specifically 'information technology', is fundamental for ensuring a successful adoption process (Swanson and Wang, 2005). A research stream has identified variables that can explain why organisations adopt information technology with different intensities and speeds (Mehrtens *et al.* 2001; Teo and Pian, 2003). However, there has been little research on the factors inducing SMEs to introduce electronic commerce (Riemenschneider *et al.* 2003; Morgan *et al.*, 2006).

According to Katz and Murray (2002) the use of electronic commerce enables SMEs to improve their efficiency and develop new ways to co-ordinate their activities often in an international context. The internet offers such organisations an invaluable resource for use in international activities, as at a stroke of a key they may have global reach via a website (Sloane, 2006). The internet offers a new means of maintaining and developing relations with clients, channel partners, suppliers and network partners, and provides organisations with the means to co-ordinate and maintain communication across many locations easily and effectively (Herbig and Hale, 1997). Fletcher (2000) found that the effect of the internet on the SME sector led to firms becoming global more quickly in their business development than was the case previously, which has added to the notion of the 'born global' phenomenon.

According to the Central Statistics Office (2009) access to the internet using broadband remained high in 2009 with 84 percent of all enterprises having a broadband connection. High-speed DSL broadband was used by 45 percent of enterprises compared with 41 percent in 2008. As a consequence there has been a decline in the use of lower-speed DSL broadband and other fixed connections (e.g. cable, leased line).

Export Performance and E-Commerce

The globalisation of organisations is heralded as a key driver of electronic commerce adoption and diffusion (Steinfeld and Klein, 1999). It can be expected that highly global organisations are likely to employ electronic commerce more intensively than less global organisations, for two main reasons. First, organisations facing foreign competition are under greater pressure to adopt technologies such as electronic commerce that enable them to protect or expand market share and operate more efficiently. Second, organisations doing business outside their own country may be more motivated to lower their transaction costs (such as search for information, negotiation, and monitoring of performance) by using information technology (Malone *et al.* 1987). Finally, organisations that buy and sell in international markets are under pressure from trading partners to adopt electronic commerce (especially B2B) to improve coordination with other members of the value chain. This is especially true in the case of global production networks dominated by multi-national organisations that may require partners to adopt ecommerce in order to do business with other organisations (Chen, 2002).

Conceptual Framework

The conceptual framework outlined in Figure 1 has been developed based on the literature pertaining to internationalisation and electronic commerce adoption. The framework proposes that two contextual groups namely internal and external determinants of export performance and electronic commerce adoption.

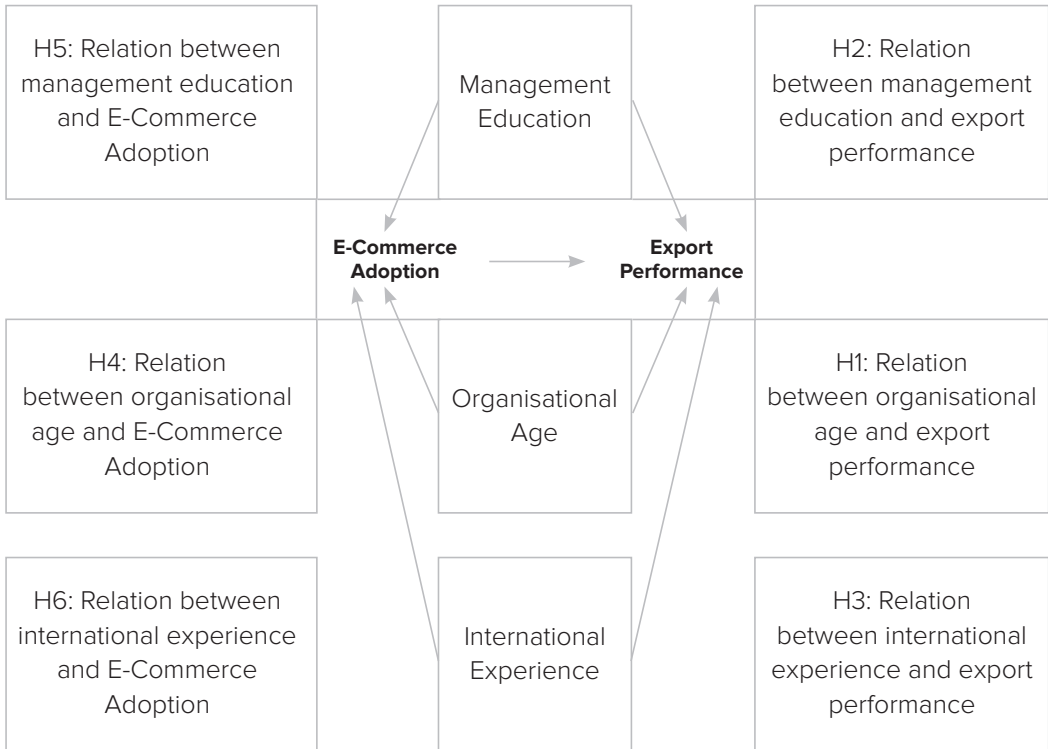


Figure 1: Conceptual Framework

The overall research question is to investigate the effect of internal organisational factors on export performance and electronic commerce adoption amongst SMEs. This is achieved by examining the effect of the following organisational characteristics on the export performance and electronic commerce adoption: organisation age, international experience and management education.

Method

The population consists of organisations operating in the SME sector within the ICT sector in Ireland from a list made available from the Irish Internet Association. This was chosen as it contained the most up-to-date and detailed listing of companies operating within the sector. This study was based on a mail survey of 364 SMEs drawn from this population. The focus was on a single industry in one country to control for industry- and country-specific factors affecting export performance. A valid response rate of 25 percent was attained. The questionnaire underwent multiple pre-tests. Whenever possible, multiple-item measures were used to minimize measurement error and to enhance the content coverage for constructs. Statement-style items were measured on six-point Likert-scales.

Using an independent sample t-test, early and late respondents were compared on several key characteristics such as, number of employees, level of education attained, access to the internet, percentage of total purchases and total turnover via the internet, export experience and number of countries exported to. No significant difference was found at the 0.05 level. Thus based on these results and considering that the response rate was relatively high, it was concluded that non-response bias does not appear to be a significant problem.

Method of Analysis

The questionnaire was designed for analysis using the statistical package SPSS. Questions were analysed using descriptive statistics, most notably frequencies, cross-tabs and comparisons of means. The Pearson's r and the Spearman's ρ , most commonly used methods of comparing proportions, were employed to identify findings that were significantly related to each other, to the extent of the relation between variables was not explained by coincidence. With the Pearson's correlation coefficient it is assumed that the joint distribution of the variables in the population is normal, which is that the sample is from a bivariate normal distribution. In the analysis of this data, Spearman rank order correlation was used for ordinal variables, such as organisational age.

Measured Used

Table 1 outlines the measures used in this research for each of the key variables.

Variables	Measures used	Why variables were chosen
Organisation Age	<i>The measure employed for organisation age in this study is the number of years in operation.</i>	Previous studies have shown conflicting results between organisational age and both export performance and electronic commerce adoption
International experience	<i>Two fundamental dimensions of an organisation's exporting experience are considered in this study. Length is operationalised as the number of years the manufacturer had been engaged in exporting activities. The scope of an organisation's exporting experience is operationalised as the number of countries that the organisation is involved in through regular exporting operations.</i>	International experience was chosen as a variable as it is an importance factor when examining export performance and has not been studied to a great deal when examining the determinates of electronic commerce adoption
Management Education	<i>The measure employed for management education in this study was the highest qualification level attained, ranging from secondary school education to doctorate level.</i>	Little research has been done in resent years in relation to management education and export performance
Export Performance	<i>This study employs the three dimensions of the EXPERF scale for the measurement of export performance, these measures are financial export performance, strategic export performance and satisfaction with export programme</i>	While there has been a great deal of research in both export performance and electronic commerce adoption, little has been carried out on whether they impact on each other.
Electronic Commerce Adoption	<i>Electronic commerce adoption was measured through two measures, percentage of total purchases carried out through the internet, and percentage of total turnover via the internet.</i>	

Table 1: Measures of organisational characteristics, export performance and electronic commerce adoption

Findings

The organisational variables were examined by testing seven main hypotheses, which were broken into sub hypotheses dealing with the issue of export performance and electronic commerce adoption. Table 2 outlines a summary of the findings and also indicates whether or not a relation was established between the organisational variables and export performance and/or electronic commerce adoption.

Summary of Findings		
	<i>Export Performance</i>	<i>Electronic Commerce Adoption</i>
Organisation Age	(H1) Partial Negative Relation <ul style="list-style-type: none"> • Significant negative relation exists between organisational age and export sales as a percentage of total sales • No relation exists between organisational age and international sales growth 	(H4) Partial Positive relation <ul style="list-style-type: none"> • Significant positive relation exists between organisational age and percentage of total purchases via the internet • No relation exists between organisational age and percentage of total turnover via the internet
Management Education	(H2) Partial Positive relation <ul style="list-style-type: none"> • Significant positive relation exists between management education and export sales as a percentage of total sales • No relation exists between management education and international sales growth 	(H5) Partial Negative relation <ul style="list-style-type: none"> • Significant positive relation exists between management education and percentage of total purchases via the internet • No relation exists between management education and percentage of total turnover via the internet
International Experience	(H3) Partial Positive relation <ul style="list-style-type: none"> • Significant positive relation exists between international experience or number of countries exported to and export sales as a percentage of total sales • No relation exists between export experience or number of countries exported to and international sales growth 	(H6) Partial Positive relation <ul style="list-style-type: none"> • Significant positive relation exists between number of countries exported to and percentage of both total purchases and total turnover via the internet • No relation exists between export experience and either percentage of total purchases or turnover via the internet

Table 2 continued overleaf

<p>Export Performance</p>		<p>(H7) Partial Positive relation</p> <ul style="list-style-type: none"> • Significant positive relation exists between export sales as a percentage of total sales and percentage of total purchases via the internet and also between international sales growth and percentage of total purchases via the internet • No relation exists between satisfaction with export performance and percentage of total purchases and turnover via the internet
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Table 2: Measures of organisational characteristics, export performance and electronic commerce adoption

Discussion

Organisational Age and Export Performance

This study found that a negative relation exists between organisational age and export sales as a percentage of total sales. Research evidence exploring the relation between organisational age and exporting is mixed since both positive (Westhead, 1995; Burgel *et al.* 2001), and negative (Balabanis and Katsikea, 2002; Westhead *et al.* 2002) associations have been found between organisation age and export performance.

Management Education and Export Performance

This study found a partial relation between managerial education and the level of export performance. A positive relation was found between the level of managerial education and export sales as a percentage of total sales, however, no relation was found between managerial education and international sales growth or satisfaction with export performance. In other words, as the level of managerial education increases so too does the organisational level of export sales as a percentage of total sales. There is little empirical evidence on the relation between management education and export performance. However, better educated decision makers are expected to be more open-minded and interested in foreign affairs, thus being more willing to objectively evaluate the benefits and disadvantages of exporting (Garnier, 1982).

International Experience and Export Performance

The results on the relation between international experience and export performance were mixed. Strong positive relations were found to exist between export experience and number of countries exported to and export sales as a percentage of total sales. While no significant relations were found between export experience and international sales growth or satisfaction with export performance and between number of countries export to and international sales growth or satisfaction with export performance. The positive relation between international experience and export performance as measured by export sales as a percentage of total sales may be due to the fact that organisations that have more international experience have a better understanding of foreign markets, which may help the organisation to identify opportunities while avoiding threats in international markets. A great deal of research has been carried out on the relation between international experience and export performance and international experience has emerged as a key determinant of export performance (Sousa *et al.* 2008). In previous studies, both positive (O’Cass and Julian, 2003; Lado *et al.* 2004) and no associations (Katsikeas *et al.*, 1996; Mavrogiannis *et al.* 2008) have been found between international experience and export performance.

Organisational Level Determinants of Electronic Commerce Adoption

Identifying why and how organisations adopt technological innovations, and more specifically ‘information technology’, is fundamental for ensuring a successful adoption process (Swanson and Wang, 2005). A research stream has identified variables that can explain why organisations adopt information technology with different intensities and speeds (Mehrtens *et al.* 2001; Teo and Pian, 2003). There has been little research carried out on the factors that induce SMEs to introduce information technology (Premkumar, 2003; Morgan *et al.* 2006). Given the lack of consensus on the internal organisational determinants of electronic commerce adoption and usage it was deemed appropriate to examine the extent organisation age, international experience, and management education are determinants of the level of internet adoption and usage in this study.

Organisational Age and Electronic Commerce Adoption

In contrast to the finding of Goode and Stevens (2000), and in support of the findings of Winklhofer (2006) this study found a positive relation between organisational age and electronic commerce adoption under the measure of percentage of purchases via the internet. Little empirical evidence is available on the relation between organisational age and electronic commerce adoption. Goode and Stevens (2000), however, hypothesised that as the greater the level of experience in terms of the number of years in operation the more likely the organisation was to adopt new technologies. Interestingly, research conducted by Goode and Stevens (2000) proved the opposite; it was younger organisation that had a highest propensity to adopt new technologies.

Management Education and Electronic Commerce Adoption

It was found that a negative relation exists between the level of managerial education and the percentage of total purchases via the internet. Considering the sector in which this study was set it would be expected that electronic commerce adoption would be positively related to the level of managerial education, as managers would have specialised training and education in internet technologies and would be aware of the benefits of adopting such technologies. High-skilled workers can make electronic commerce investment and adoption easier (Arvanitis, 2005; Fabiani *et al.* 2005) because their higher educational level enhances electronic commerce usage and impacts. There are a small number of studies in which only a weak relation (Maliranta and Rouvinen, 2004), or not at all (Rai and Patnayakuni, 1996), is found between educational level and electronic commerce adoption.

International Experience and Electronic Commerce Adoption

The findings of this study supports earlier studies carried out by Braga and Willmore, (1991), Kumar and Saqib, (1996) and Hollenstein (2004) in that positive relations were found between number of years exporting and number of countries exported to and percentage of total turnover via the internet. However, no relations were found between export experience and number of countries exported to and percentage of total purchases via the Internet. The empirical literature on technological innovation reveals a positive relation between exports and innovation (Braga and Willmore, 1991; Kumar and Saqib, 1996), due to the fact that internationalisation implies growth in competitiveness and market size. Website development may be aimed at raising the organisation's visibility and attracting new customers. This is especially relevant when customers are far away, as is the case in organisations exporting a high percentage of their sales (Teo and Pian, 2003).

Export Performance and Electronic Commerce Adoption

From this study it was found that organisations tend to use the Internet primarily for the following activities: market monitoring, marketing products, providing after sales support and facilitating access to product catalogues and price lists. Further to this, 76 percent of those surveyed believed that using the Internet and electronic commerce would enable their organisation to accomplish specific tasks in a more productive manner. The findings of this study shows that a partial relation exists between export performance and electronic commerce adoption, in that it was found that a moderate negative relation exists between export sales as a percentage of total sales and percentage of total purchases via the Internet, which would suggest that as the level of export sales increases the level of back end value chain electronic commerce diminishes. However, a positive relation between export sales as a percentage of total sales and percentage of total turnover via the internet, which suggests that the more an organisation exports the higher the level of turnover via the internet. This is an important finding as it would suggest that electronic commerce adoption and usage are a key aspect of successful export performance.

No associations, however, were found between international sales growth or performance of organisation's international activities over the past three years and percentage of total purchases via the Internet or percentage of total turnover via the Internet. This would suggest that whether an organisation is actively involved in electronic commerce or not does not have a significant bearing on the level of international sales growth.

The cost of adoption and maintenance of system is indeed an important factor for SMEs (Alam *et al.* 2011). SMEs will not be interested in the adoption of electronic commerce unless the benefits outweigh the costs of developing and maintaining the system (Vatanasakdakul *et al.* 2004). They argue that SMEs are generally concerned about the costs of establishing and maintaining e-commerce since they generally suffer from budget constraints and are less sure of the expected returns on the investment. Given that the population of this study contained companies in the ICT sector a surprising finding of the study was that management were cautious in their investment in additional electronic commerce infrastructure. When export marketing strategies are co-aligned in the context of an export venture, positive performance can be expected for the venture (Cavusgil and Zou, 1994; Morgan *et al.* 2004).

Limitations and Further Research Opportunities

As with any research, certain limitations must be noted. First, the external validity of this study may be limited to the type of firm under investigation. This single context is, however, considered appropriate to control for industry effects. A cross sectoral study would shed further light on possible differences in firm level determinants of both export performance and of electronic commerce adoption.

This study followed the approach of Contractor *et al.* (2005) in asking CEOs or their equivalents to rate the relative importance of export performance in their organisation and Hong and Zhu (2006) in seeking information from managers about the levels of electronic commerce adoption and usage patterns. The study is, therefore, limited to the views of these single informants, but, it is believed that these key informants are best placed to make an overall judgement of both the organisations electronic commerce adoption and usage rates and the overall export performance levels. While it was deemed appropriate to use a single respondent during the research instrument development future research could look at the possibility of carrying out research with number of high end managers specific to the area for example, export or international market manager, and IT managers to gain a holistic view of the operation within the respondent organisations.

The focus of this study was primarily on the internationalisation and electronic commerce adoption of SMEs a comparative study on the extent of the differences between the internationalisation and electronic commerce adoption rates of large organisations and SMEs could also be a fruitful area of further research.

Conclusion

This study examined the micro issues of export performance and electronic commerce adoption in Irish SMEs operating in the ICT sector in Ireland. The empirical findings presented here provide evidence of a relation between organisational age, managerial education, international experience and export performance and electronic commerce adoption. These findings have some practical implications. In terms of this study an interesting finding was that a positive relation exists between organisational age and purchases via the Internet but no relation exists between organisational age and sales via the Internet, this implies that companies are willing to carry out purchases via the Internet but are not succeeding in terms of sales via the Internet.

Another interesting finding was that in terms of both international sales growth and performance of the organisation's international activities no associations were found with percentage of total purchases via the internet or percentage of total turnover via the Internet. This would suggest that whether an organisation is actively involved in electronic commerce or not does not have a significant bearing on the level of international sales growth. A possible reason for this finding is that the organisation may have reached full international potential with their product or service, or may have reached a level of maturity in the products life cycle therefore negating the potential of electronic commerce for increases in international sales growth.

Before taking any adoption initiatives SMEs need to execute an incisive and comprehensive investigation of the external pressures that they are facing. Firms operating in this sector need to leverage their resources to ensure that they are utilising their capabilities and attaining an optimum level of success from the technology which they adopt. Organisations must ensure that they adopt technologies best suited to them and not adopting technologies due to the bandwagon effect. For successful adoption and implementation of a technology it must be tailored to the needs of the organisation and compatible with other value chain members, particularly in the international trade arena.

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