Electronic Commerce and Internationalization: Empirical Evidence from the Wireless Communication Sector

Par : Pierre-Majorique Léger
Luc Cassivi

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Pierre-Majorique Léger
Technologies de l’information
HEC Montréal
3000, chemin de la Côte-Ste-Catherine
Montréal, Québec, Canada H3T 2A7
tél : (514) 340-7013
fax : (514) 340-6132
pierre-majorique.leger@hec.ca

Luc Cassivi
Management et technologie
Université du Québec à Montréal
C.P. 8888, succursale Centre-ville
Montréal, Québec, Canada H3C 3P8
cassivi.luc@uqam.ca

Prière de faire parvenir toute correspondance à :
pierre-majorique.leger@hec.ca
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Résumé

Très peu d’études empiriques se sont attardées simultanément aux phénomènes du commerce électronique et du commerce international. L’objectif de cet article exploratoire consiste à développer une compréhension préliminaire des firmes ayant des comportements similaires en matière d’internationalisation et d’utilisation du commerce électronique. Basée sur une enquête statistique conduite auprès de 159 gestionnaires exécutifs dans l’industrie des communications sans-fil au Canada et en Scandinavie, cet article révèle cinq configurations de firmes présentant des niveaux comparables d’utilisation du commerce électronique à l’international. Afin de raffiner ces profils, les cinq groupes sont comparés entre eux en ce qui a trait aux différentes caractéristiques organisationnelles et industrielles. Le groupe de firmes les plus impliquées tant en ce qui concerne le commerce électronique que le commerce international i) repose davantage sur la logistique physique que les autres groupes, ii) interagit avec moins de clients finaux que les groupes se concentrant sur les marchés locaux, et iii) est composé de firmes de plus petite taille comparativement au groupe de firmes n’utilisant pas le commerce électronique à l’international. L’article conclut avec différentes recommandations quant aux prochaines initiatives de recherche dans le domaine du commerce électronique international.

Abstract

Very few empirical studies have examined the dual phenomenon of electronic and international commerce. The goal of this exploratory paper is to develop a preliminary understanding of firms presenting similar behaviours both in terms of internationalization and electronic commerce usage. Based on an electronic survey conducted with 159 executive managers from the Canadian and Scandinavian wireless communication sector, this paper reveals five configurations of firms according to the level of electronic and international commerce. In order to refine the configuration profiles, the five groups are then compared over several firm and market characteristics. The group of firms highly involved in both international trade and electronic commerce i) relies proportionally more on physical logistics than the other groups, ii) deals with less individual customers than the groups specializing in local markets, and iii) is composed of firms of smaller size when compared to international non electronic commerce firms. The paper concludes with recommendations for future research on international electronic commerce.

Mot-clés : International Business (BA05) 
Inter-organizational Systems (HA07)
1. Introduction

It has been argued that electronic commerce opens up international opportunities for firms of all sizes (Lal, 2002). Many anecdotal accounts exist on these opportunities, but very few empirical studies have looked into the dual phenomenon of electronic commerce and the development of imports and exports (internationalization). The goal of this exploratory paper is to develop a preliminary understanding of the characteristics of firms according to both their level of electronic and international commerce. More specifically, the objective of this study is to induce configurations of firms presenting similar behaviours in terms of internationalization and electronic commerce usage, and to compare them according to different organizational, product and market characteristics.

The next section presents the theoretical background of this study by reviewing the literature on the determinants of internationalization and electronic commerce adoption, as well as the main obstacles to international electronic commerce. The paper then presents the research question and methodology, followed by the analysis and discussion of the results. The paper concludes with recommendations for future research on international electronic commerce.

2. Study background

2.1 Determinants of internationalization and electronic commerce

In our increasingly global economies, the ability to compete on international markets is a key factor in the growth and profitability of many organizations. For more than twenty years, researchers have highlighted the main determinants of internationalization. This empirical literature is particularly rich and highlights a large number of characteristics and factors associated with internationalization. Some of these determinants relate to the demographic characteristics of firms such as size (e.g. Verwaal and Donkers, 2002; Wagner, 1995). Managerial skills, organizational capabilities and strategic market orientations have also been found to be positively correlated to export performance (e.g. Rose and Shoham, 2002). Other authors have suggested that R&D-intensive organizations are more likely to be active on international markets (Lefebvre et al, 1998; Nassimbeni, 2001). Finally, it seems that some export assistance programs, offered by local governmental agencies, can positively impact the international performance of firms, especially the performance of small- and medium-sized enterprises (SMEs) (Crick and Czinzota, 1995).

While electronic commerce is a far more recent phenomenon, several authors have examined the factors influencing its adoption by organizations. For instance, Iacovou et al. (1995) identified three major determinants of EDI adoption: readiness, perceived benefits, and external pressure. The work of Chwelos et al. (2001) provides further support for these factors, while indicating that external pressure and readiness are considered to be more important than perceived benefits. In parallel, some authors have studied the adoption of electronic commerce by targeting specific categories of firms such as SMEs (e.g. Merthens et al., 2001) or by looking at particular electronic tools such as electronic procurement (Osmonbekov et al., 2002), collaboration tools (Lefebvre et al., 2003) and corporate websites (Beatty et al., 2001).

However, very few empirical studies have addressed the implication of using electronic commerce on an international basis. Dou et al. (2002) highlights important website attributes that contribute to the performance of exports. Prasad et al. (2001) suggests that the integration of Internet technologies may increase market orientation, which contributes positively to export
performance. Other authors, such as Kim (2003), examine the internationalization process of Internet companies. Most of the work in this field is still at the conceptualization stage (e.g. Sheldon and Strader, 2002; Rudraswamy and Vance, 2001; Williamson, 1999), and a more comprehensive understanding of the use of electronic commerce in the international markets is definitely needed.

2.2 Opportunities and obstacles to international electronic commerce

The empirical and conceptual literature focusing on internationalization and electronic commerce has mostly studied the underlying opportunities and obstacles in the area. The rise of Internet has allowed firms of all sizes to access international markets. By creating a simple web page, any firm can offer a virtual shop window easily accessible from all over the world at any time of the day. This may provide an advantage to SMEs as well as firms in developing countries since some barriers to entering international markets are now lowered (Lal, 2002; Moodley, 2002). Internet may also be very useful when it comes to gathering information about new export markets (Williamson, 1999). Opportunities also arise on the suppliers’ side where many firms report having found foreign competitive business partners over the Internet.

However, cross-border electronic commerce faces numerous challenges. First, there are logistic hurdles. As Drucker (1999:106) asserts, one of the most important challenges facing firms using electronic commerce is not to “sell what they make” but to “sell what they can deliver.” The statement is even more valid in the case of international trade. For the international delivery of small parcels to end-customers, costs and delays can often be highly prohibitive. In the case of transnational business-to-business (B2B) electronic commerce, many third parties (multimodal logistic providers, insurers, banks, etc.) are often required for the completion of transactions; it involves tight interactions with these parties, which are sometimes difficult to automate, especially for occasional and irregular transactions (Fontanella, 1999). It should also be noted that international trade of physical goods is made more complex by the numerous documents required by local and foreign authorities. Many of these forms, such as the bill of lading, the certificate of origin, the commercial invoice, the export licence and the insurance certificate, are only available in paper format.

Socio-cultural and internationalization issues also affect the business growth of firms involved in foreign markets (Knopper, 1998). Apart from the language and cultural barriers that slow down the internationalization of trade in general, some firms need to work on their websites to make them appealing and intelligible to international audiences (Sheldon and Strader, 2002). For example, information such as telephone numbers, currency, measurement or dates may not be understood the same way by the international community since different formats are used. Moreover, in some industry segments, the mobility of professional resources and the importance of being physically close to the customer may also be a major constraint for both electronic commerce and international trade.

Problems related to international payments and taxation, international insurances, legal issues related to Incoterms, consumer protection and fear of foreign fraud also make up barriers to international commerce (for more detail, see Sheldon and Strader, 2002).

3. Research question and methodology

This research paper is exploratory in nature. We aim at developing a better understanding of the firms that successfully overcome the hurdles of using electronic commerce at an international
level, and those that opt to focus on local markets. More specifically, this paper explores patterns of behaviours in terms of both electronic and international commerce, as we try to answer the two following questions:

i) Are there configurations of firms presenting similar behaviours in terms of internationalization and electronic commerce usage?

ii) If so, do these configurations differ in terms of the nature of the offerings, the market orientation and the firm size?

To answer these questions, this paper seeks to induce, through a hierarchical clustering method, a set of configurations based on four independent variables related to both electronic and international commerce. The first two are related to internationalization and measure respectively the percentage of sales that are exported (exports) and the percentage of purchases that are imported (imports). This article innovates as it looks at the internationalization of firms from both the customer’s and the supplier’s perspectives. The other two variables relate to the level of electronic commerce carried out. **Electronic sales** measure the percentage of sales realized through electronic commerce and **electronic purchases** assess the percentage of purchases realized through electronic commerce.

If configurations are found, the next step in this study is to analyze the composition of the groups. The anticipated configurations will then be compared over three dimensions: i) the nature of the product/service offerings, ii) the market orientation and iii) the firm size.

- The nature of the offerings refers to the intrinsic characteristics of the firm’s main line of business. More specifically, this paper looks at two characteristics regarding the nature of the offerings: the physical nature of the offerings (physical logistics) and whether the offerings are services or not (service). A positive physical logistics variable indicates that the product or service involves physical logistics-related activities to complete the transaction. Services is also a binary variable that stands for firms that offer professional services such as business and technological consulting, content development, etc. It should be noted that these two variables are not mutually exclusive; a service firm can require physical logistics activities such as equipment maintenance or installation.

- Market orientation refers to the customer segment targeted by the firms. In this paper, we will use the dummy variable B2C to identify whether the firm targets individuals (1) or corporate customers and supply chain intermediaries (0).

- Finally, this paper will use the number of employees to measure the size of the firm.

This study is based on data obtained from a sample of executive managers of the wireless communication sector in both Canada and Scandinavia (Finland, Sweden, Norway, Denmark and Iceland). The wireless communication sector encompasses the whole industry value chain, ranging from hardware manufacturers, software developers, wireless operators, retailers & distributors, wireless content providers to business and technical consultants for the wireless industry. It should be noted that the wireless communication industry includes firms in both fixed and mobile wireless technologies. The decision to focus on a specific sector was mainly motivated by the objective of developing a preliminary understanding of a new phenomenon. A specific industrial context is needed to appreciate the internal dynamics of the expected
configuration. Moreover, the wireless communication sector was chosen because of the well-known high penetration of electronic commerce in this area (Bell, 1998; McKinsey & Company, 2002). Canada and the five Scandinavian countries were selected for their similar economies and their important level of Internet and electronic commerce penetration. When comparing the two regions, no significant differences concerning the levels of internationalization and electronic commerce penetration were found.

Data collection was conducted in December 2001 and January 2002 via an electronic survey. Respondents were solicited by email and offered a benchmarking feedback for their collaboration in the study. Of the 1078 respondents contacted, 159 completed the survey (15.1% response rate). A chi-square test was performed to ensure that our sample was representative of the total population. No significant difference in the proportion of Canadian vs. Scandinavian respondents appears when compared to the overall population sampled (p=0.8569).

4. Results

4.1 Descriptive statistics

Of the 159 respondents, 138 answered all of the items related to the variables used in this study. Table 1 and 2 present the descriptive statistics of the research variables. Firms in our sample export significantly more than they import (Test Wilcoxon p = 0.000), while there are no significant differences between electronic sales and electronic purchases. Based on the description statistics of the control variables, the sample is composed of i) 42.8% of Canadian respondents, ii) 29.7% of firms relying on physical logistics for the delivery of their products or services, iii) 15.9% of firms dealing with individual customers and iv) 23.2% of firms offering some sort of services. The mean size of firms indicates that the majority of our respondents are SMEs, while the standard deviation also points out that some of our respondents are large organizations.

<table>
<thead>
<tr>
<th>Table 1 - Descriptive statistics</th>
<th>Table 2 - Descriptive statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent variables (n=138)</td>
<td>Control variables (n=138)</td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Exports</td>
<td>39.7%</td>
</tr>
<tr>
<td>Imports</td>
<td>27.4%</td>
</tr>
<tr>
<td>Electronic sales</td>
<td>15.7%</td>
</tr>
<tr>
<td>Electronic purchases</td>
<td>16.8%</td>
</tr>
</tbody>
</table>

4.2 Group creation and profiling

This research being exploratory in nature, a cluster analysis procedure was undertaken using the four independent variables, i.e. exports, imports, electronic sales and electronic purchases. A cluster analysis is a multivariate statistical approach aiming at regrouping together respondents
presenting similar characteristics over a set of predefined variables. Each resulting cluster of respondents should have a high level of intra-group homogeneity and a high level of inter-group heterogeneity.

To determine the optimal number of groups, hierarchical classifications with 3, 4 and 5 groups were considered. There is no benchmark regarding the selection of the most optimal solution. Hair et al. (1995) suggest selecting the optimal solution based on either theoretical or practical grounds. In the present case, the five groups solution appeared best to depict the sector. In the four groups solution, the 3rd and 5th clusters were agglomerated; in the three groups solution, the 2nd and 4th clusters were merged.

Table 3 presents the summary of the cluster analysis. A Kruskal-Willis test was carried out to compare the groups over each of the four independent variables; it confirms that a significant difference exists on all dimensions. A discriminant analysis was also carried out to assess the capacity of the four independent variables to predict the classification of firms within clusters. The discriminant function correctly classified 94.9% of the original grouped cases.

Table 3 Summary of the cluster analysis

<table>
<thead>
<tr>
<th></th>
<th>Gr. 1</th>
<th>Gr. 2</th>
<th>Gr. 3</th>
<th>Gr. 4</th>
<th>Gr. 5</th>
<th>p value^b</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean^a</td>
<td>Mean^a</td>
<td>Mean^a</td>
<td>Mean^a</td>
<td>Mean^a</td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>87.5</td>
<td>84.6</td>
<td>3.7</td>
<td>24.0</td>
<td>27.6</td>
<td>****</td>
</tr>
<tr>
<td>Imports</td>
<td>54.7</td>
<td>57.7</td>
<td>3.0</td>
<td>11.0</td>
<td>27.1</td>
<td>****</td>
</tr>
<tr>
<td>Electronic sales</td>
<td>3.3</td>
<td>68.6</td>
<td>2.6</td>
<td>71.0</td>
<td>3.9</td>
<td>****</td>
</tr>
<tr>
<td>Electronic purchases</td>
<td>8.3</td>
<td>47.7</td>
<td>2.6</td>
<td>59.3</td>
<td>14.7</td>
<td>****</td>
</tr>
<tr>
<td>Number of cases</td>
<td>35</td>
<td>11</td>
<td>42</td>
<td>15</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>% of respondents</td>
<td>25.4%</td>
<td>8.0%</td>
<td>30.4%</td>
<td>10.8%</td>
<td>25.4%</td>
<td></td>
</tr>
</tbody>
</table>

Ward method, ^a p < 0.10  ** p < 0.05  *** p < 0.01  **** p < 0.001
^a % of group carrying out these actions, ^b Kruskal-Wallis Test

Based on the mean differences between the groups, the profile of each cluster was established. Each group corresponds to a specific behaviour pattern with respect to internationalization and electronic commerce usage:

1) The global brick configuration is formed of firms highly involved in both imports and exports, with a low usage of electronic commerce when dealing with customers and suppliers. Almost 90% of sales realized by these firms are exported, while only half of the purchases are imported.
2) The *global click* configuration is composed of a small number of firms (8% of respondents), which are considerably drawn into international electronic commerce. As in the first configuration, the percentage of exports and electronic sales is significantly higher than the percentage of imports and electronic purchases. This suggests that *global click* firms are slightly skewed on the customer side when it comes to international electronic commerce.

3) The third group scores the lowest on all four independent variables. The firms in this *local brick* configuration are engaged almost exclusively on local markets while doing business in a traditional manner. In this industry, it is common to find a certain number of companies (e.g. installation, maintenance, retail, etc) that mainly operate nationally.

4) The *local click* configuration is made of firms realizing both electronic sales and purchases. However, most of their business activities are conducted locally, except for a moderate level of exports.

5) The *transitioners* configuration is very similar to the *local brick* except for the fact that it reaches a significantly higher level of imports (27.1%) and exports (27.6%). As in the *global brick* group, the *transitioners* firms have a moderate level of electronic purchases (14.7%) that is however higher than their level of electronic sales (3.9%).

### 4.3 Inter-group comparisons

The cluster analysis provides four distinct configurations that need to be further understood. The objective of this second step is to comprehend the characteristics of each group and to distinguish the firms that carry out international ecommerce from the others. As mentioned earlier, the identity of the groups will be refined using the firm size, the market orientation (B2C), and the nature of the product/service offerings (physical logistics and services). Table 4 shows the results of the overall comparisons between the groups based on the four control variables. Although only three of the four variables indicate overall differences, a closer group-by-group analysis highlights significant differences between the groups for all four variables:

**Size:** When comparing the average number of employees, the *brick* configurations have up to 10 times more employees than the ecommerce configurations (709.8 vs. 62.4 for *global* and 175.4 vs. 18.20 for *local*). The average number of employees in the *global brick* group is significantly higher than in all other groups.

**B2C:** The prohibitive cost of international logistics of small parcels, the socio-cultural aspect of international trade, the complexity of international electronic payments and the grey areas in international consumer laws are all challenges that need to be overcome when dealing internationally with individuals. In this context, it is interesting to observe that the *global click* group has one of the highest numbers of firms dealing with customer in its composition (18.2%). This group significantly differs from the *global brick* group, which appears to be mostly targeting business-to-business relationships.

**Physical logistics:** The two international groups (*global brick* and *global click*) have the highest composition of firms selling products and services that are physical in nature. This implies that an important number of firms in these groups are engaging in some form of logistical activities to deliver their offerings to foreign customers. In contrast, the composition of the *local click* group, with regards to the physical nature of offerings, differs significantly from the two *global* configurations. It implies a strong focus on non-physical products and services, (i.e. virtual
product and service) by local click firms, which capitalize on the Internet to digitally deliver these offerings. Local click firms, paradoxically, should possess a logistical advantage when exporting their virtual products/services, but they do not seem to benefit entirely from the opportunities offered by the Internet.

**Services:** Local brick, local click and transitioners are in good part composed of service-oriented firms (between 26% and 34%). The low levels of professional service offerings on international markets (11.4% for non-ecommerce and 0% for ecommerce) may be due to the difficulties surrounding customer relationships (physical presence). It can also be affected by the cultural challenges of content commercialization.

In light of the previous analysis, the group profiles have been refined. Table 5 presents a summary of the composition of the five configurations.
### Table 4 Intergroup comparison

#### Size

<table>
<thead>
<tr>
<th>Gr. 1</th>
<th>Gr. 2</th>
<th>Gr. 3</th>
<th>Gr. 4</th>
<th>Gr. 5</th>
<th>p-value $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global brick</td>
<td>Global click</td>
<td>Local brick</td>
<td>Local click</td>
<td>Transitioners</td>
<td>709.8</td>
</tr>
</tbody>
</table>

Average number of employees per group:

- 1 Global brick: -
- 2 Global click: * -
- 3 Local brick: ** NS -
- 4 Local click: **** NS NS NS -
- 5 Transitioners: ** NS NS NS -

#### B2C

<table>
<thead>
<tr>
<th>Gr. 1</th>
<th>Gr. 2</th>
<th>Gr. 3</th>
<th>Gr. 4</th>
<th>Gr. 5</th>
<th>p-value $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global brick</td>
<td>Global click</td>
<td>Local brick</td>
<td>Local click</td>
<td>Transitioners</td>
<td>2.9</td>
</tr>
</tbody>
</table>

% of group selling to individuals:

- 1 Global brick: -
- 2 Global click: * -
- 3 Local brick: *** NS -
- 4 Local click: NS NS NS -
- 5 Transitioners: ** NS NS NS -

#### Physical logistics

<table>
<thead>
<tr>
<th>Gr. 1</th>
<th>Gr. 2</th>
<th>Gr. 3</th>
<th>Gr. 4</th>
<th>Gr. 5</th>
<th>p-value $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global brick</td>
<td>Global click</td>
<td>Local brick</td>
<td>Local click</td>
<td>Transitioners</td>
<td>40.0</td>
</tr>
</tbody>
</table>

% of group carrying out physical logistics:

- 1 Global brick: -
- 2 Global click: NS -
- 3 Local brick: NS NS -
- 4 Local click: * * NS -
- 5 Transitioners: NS NS NS NS -

#### Services

<table>
<thead>
<tr>
<th>Gr. 1</th>
<th>Gr. 2</th>
<th>Gr. 3</th>
<th>Gr. 4</th>
<th>Gr. 5</th>
<th>p-value $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global brick</td>
<td>Global click</td>
<td>Local brick</td>
<td>Local click</td>
<td>Transitioners</td>
<td>11.4</td>
</tr>
</tbody>
</table>

% of group offering services:

- 1 Global brick: -
- 2 Global click: NS -
- 3 Local brick: ** ** -
- 4 Local click: NS * NS -
- 5 Transitioners: * ** NS NS -

*Mann-Whitney tests, * p < 0.10 ** p < 0.05 *** p < 0.01 **** p < 0.001, $^a$ Kruskal-Wallis Test, $^b$ Measure by number of employees.
Table 5 Detailed group profiles

<table>
<thead>
<tr>
<th></th>
<th>Global brick</th>
<th>Global click</th>
<th>Local brick</th>
<th>Local click</th>
<th>Transitioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of international commerce</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Level of electronic commerce</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Average size of firm</td>
<td>Large</td>
<td>Small</td>
<td>Medium</td>
<td>Very small</td>
<td>Small</td>
</tr>
<tr>
<td>Proportion of B2C commerce</td>
<td>Almost none</td>
<td>Significant proportion</td>
<td>Significant proportion</td>
<td>Very few</td>
<td>Almost none</td>
</tr>
<tr>
<td>Proportion of physical logistics</td>
<td>Moderate (physical and virtual)</td>
<td>Moderate (physical and virtual)</td>
<td>Skewed toward non physical</td>
<td>Low (mostly virtual)</td>
<td>Skewed toward non physical</td>
</tr>
<tr>
<td>Proportion of service offerings</td>
<td>Low proportion</td>
<td>None</td>
<td>Moderate proportion</td>
<td>Moderate proportion</td>
<td>Moderate proportion</td>
</tr>
</tbody>
</table>

5. Discussion

The main findings of this study are discussed in this section. In order to fully understand, compare and highlight the different internationalization and ecommerce issues presented in this paper, the following three themes are detailed: the paradoxes of physical logistics activities and B2C international ecommerce, the role of size in internationalization and the differences between electronic and non-electronic service offerings.

5.1 The paradoxes of physical logistics activities and B2C international ecommerce

The configuration of firms carrying out high levels of electronic and international trade (global click) is characterized by a higher proportion of trade involving physical logistics than local click configuration. This result is even more surprising when paired with the fact that the global click group is highly involved with individual customers. Two different factors might explain these results. First, it is possible that members of this global click configuration have developed successful logistical strategies for the international market, such as the outsourcing of the physical back office management and the development of cooperation strategies with local distributors (e.g. parcel depots) and 3PL (3rd party logistics). Future research in this field should pay particular attention to the logistical strategies used by these global click firms.

Second, the physical logistics differences found between the global and local click groups may be explained by the particular characteristics of the sector. The results indicate that the local click group is mostly composed of Scandinavian countries. This region of the world is well known for the innovative content offerings and mobile commerce capabilities offered to cellular phone users (Anckar and D’Incau, 2002). For example, in Scandinavia, the mobile phone is increasingly becoming an electronic wallet as it is used to pay for parking meters in downtown Helsinki (Delaney, 2002). These virtual products and services are designed for a local market and deeply
rooted in a culture that is hardly accessible due to language barriers (i.e., Scandinavian languages). Consequently, many firms in the local click groups do not seem to be able to benefit from the international opportunities offered by electronic commerce. Further research is needed in different sectors to confirm the generalizability of these results.

5.2 The role of size in internationalization

Our finding regarding the larger size of global brick firms is consistent with the results of previous empirical studies. Many authors have identified size as a determinant of internationalization (Verwaal and Donkers, 2002; Wagner, 1995) and our results confirm the role of this variable. However, global click firms, being smaller than their global brick counterparts, may indicate that SMEs benefit more from the new opportunities arising from international electronic commerce. This might be related in part to the more flexible business processes of the mid-sized firms and their capacity and motivation to rapidly incorporate new market segments. However, with the growing automation of international trade logistics by enterprise software (Wheatley, 2002), this trend could be reversed in the future by favouring larger firms. Future studies should monitor the growing adoption of ERP modules specifically configured for international trade.

5.3 Local service offerings: mobility and cultural obstacles

Groups highly involved in service appear to focus on the local markets to sell and buy products/services. Clearly, the challenges related to mobility and customer contact in professional services affect the capacity to use electronic commerce and also the development of international relations.

Culture might also play an important role in impeding international relations; the local click group probably being a good example. Composed to a greater proportion of Scandinavian firms, this group offers non physical product and service, and sells locally through electronic means. Among this group, we could probably find mobile phone content providers to which language barriers probably limit the capacity to export to foreign markets. If these language and cultural barriers were broken, these firms would gradually shift towards the global click group. Future research projects should attempt to measure the different types of service offerings in order to understand the underlying dynamics of the service offerings’ segments.

6. Concluding remarks

This paper aims at developing a preliminary understanding of the characteristics of firms involved in both international trade and electronic commerce. The paper illustrates how firms in a highly technological industry, such as the wireless communication sector, may be categorized according to their level of international and electronic commerce. Based on different firm and market characteristics, this paper identifies several interesting distinctions between the different configurations of firms. It appears that the group of firms highly involved in both international trade and electronic commerce i) relies proportionally more on physical logistics than the other groups, ii) deals with less individual customers than the groups specializing in local markets, and iii) is composed of firms of smaller size when compared to international non electronic commerce firms (global brick). Moreover, the highly innovative wireless products and services, offered by Scandinavian firms, seem to affect their success on international markets; the cultural and language barriers lead them to focus on local markets. Finally, service firms seem less likely to reach international markets through either electronic or non-electronic channels.
This study is exploratory and has its limitations. While the focus on one particular sector was necessary to get a preliminary understanding of the phenomenon, it obviously restricts the generalization of the results to other sectors. Nevertheless, with the high-level of electronic commerce adoption in the wireless sector, this study offers interesting insights into the future state of many other sectors. The fact that internationalization and electronic commerce were treated separately also limits this study, as the proportion of international electronic commerce realized by the firms is not available. However, the separate measurement of these two dimensions was necessary to develop a multivariate understanding of the phenomenon. Future research should try to examine the two variables jointly in order to directly measure the level of international electronic commerce.

The research on international electronic commerce is at a preliminary stage. With clearer and less ambiguous legislative and taxation environments for customers, and with increasingly digitalized international trade documents, international electronic commerce will soon become a day-to-day reality for organizations of all sizes. A better understanding of the determinants of this phenomenon will prove to be helpful to both policy makers developing internalization incentives and managers looking to benefit from the international opportunities created by electronic commerce practices.
Electronic Commerce and Internationalization:
Empirical Evidence from the Wireless Communication Sector
Pierre-Majorique Léger and Luc Cassivi

References


