Export behavior in MNC suppliers networks: the Spanish automotive industry case

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Abstract

Purpose – The purpose of this paper is to analyze the transference of managerial skills from the multinational corporation (MNC) to local companies related to the exporting process. In particular, small- and medium-sized companies.

Design/methodology/approach – A local productive system was selected, involved in the manufacturing of lighting systems for automobiles (main and auxiliary headlamps and rear lighting), and made up of small- and medium-sized companies led by a single MNC which contracts out to the local industry. The analysis includes both suppliers to the multinational as well as non-suppliers.

Findings – This paper shows that the existence of knowledge transfer of intangible resources and the existence of organizational learning are associated with the nature of the vertical network in a system of suppliers, and a horizontal network with an industrial agglomeration. The volume of knowledge transferred depends on the quality of the channels of communication which exist within the network, the geographical proximity, the frequency of exchange of ideas in the network, and the spatial proximity, among others.

Originality/value – This paper identifies the key factors that influence the performance of the knowledge transfer into MNC supplier's networks.

Keywords Automotive industry, Channel relationships, Multinational companies, Suppliers, Knowledge transfer, Spain

Paper type Research paper

1. Introduction

Productive (Fujita *et al.*, 1999) and spatial (Barry and Bradley, 1997) interaction of companies can constitute a highly valuable source of knowledge and managerial skills transfer.

A large part of recent research on regional development has centered its attention on the transfer of knowledge associated with spatial proximity between companies (Bunnel and Coe, 2002; Howells, 2002; Forsman and Solitander, 2003). In this sense, geographical location can provide small- and medium-sized enterprises (SMEs) with a quantity of valuable intangible resources. Some studies have also shown that companies grouped in clusters present a higher level of internationalization (Fernhaber *et al.*, 2003).

However, research on business administration has focused on the study of knowledge transfer in business networks and in other similar cooperative efforts (Forsman and Solitander, 2003) without taking into account the territory.

Reality shows that both phenomena can occur simultaneously. Thus, companies belonging to a vertical network (a system of suppliers to a large company) which are located in a geographical industrial grouping by sector, such as a cluster, can benefit from the double flow of knowledge transfer.

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The aim of this study is to advance understanding regarding the influence that belonging to a network of suppliers to multinationals and being located in industrial clusters can have on the exporting process of local small- and medium-sized companies. In particular, we analyze the transference of managerial skills, related to the exporting process, from the multinational corporation (MNC) to local companies. The study also looks at whether geographic proximity to other companies in the same sector, as well as the frequency of the exchange of ideas with other business people in the same setting, have any influence on the exportation volume of local companies. Likewise, the study evaluates to what extent the quality of the channels of communication, which exist within company networks, determines the degree of the development process of international expansion of local companies.

This paper is divided into four sections. Section 1 presents the conceptual framework and the hypotheses put forward in the study. In Section 2, the methodology and data used were explained. Next, in Sections 3 and 4, the research results and principal conclusions are given.

2. Theoretical framework

SMEs can learn and improve their competitiveness through cooperative relationships (Tikkanen, 1998; Forsman and Solitander, 2003).

Cooperation between companies can be formal or informal. Formal cooperation occurs in productive relationships established through business networks, in general, and in supplier networks, specifically.

Networks are groups of business which cooperate in the development of a common project, specializing and complementing each other, with the goal of solving common problems and reaching a collective efficiency greater than what could be achieved individually (Forsman and Solitander, 2003).

The network is characterized by the companies which comprise it and establish cooperative relationships with other companies so as to have access to the resources of the network (Johanson and Mattsson, 1987). In other words, companies with ties to the cooperative network can acquire resources that they would not otherwise possess by themselves.

With networks, knowledge transfer occurs through the establishment of long-term formal relationships based on cooperation, mutual trust and the explicit exchange of resources in order to carry out common business objectives. Networks are horizontal when they are formed by SMEs only, and vertical when large companies also form part (Bisso, 2003).

Cooperation can also be informal. This is the case of clusters. According to Cooke (2001), a cluster is a geographical agglomeration of companies, with horizontal and vertical relationships, involved in a common company support infrastructure, with a vision of a common business development based on competition and cooperation in a specific productive area.

Clusters are characterized by the existence of a pool of specialized labor, the existence of specialized suppliers and finally, by the rapid transfer of knowledge and ideas within the cluster (Marshall, 1920).

The transfer of knowledge into the cluster is produced by the geographic proximity effect (Maskell, 2001; Shaver and Flyer, 2000). The transfer is generated through informal cooperative relationships (Forsman and Solitander, 2003). Some studies have

proven that companies located in clusters show faster organizational learning (Shaver and Flyer, 2000).

2.1 The multinational corporation, supplier networks, and clusters

The location of a MNC can generate in the host territory a local network of suppliers which form a cluster (Figure 1). This occurs when the MNC decides to externalize certain parts of the production process of its subsidiary and subcontract them to a company located in the area (Lorenzoni and Ornati, 1998), either because of the nature of the production process or the frequency of delivery established in the just-in-time system.

In the same way, the location of a foreign corporation can reinforce the entrepreneurial process in the area and, as a result, reinforce the cluster. This occurs when local business people detect a market opportunity and decide to create their own company in order to satisfy an existing need (Fernhaber *et al.*, 2003).

In the case of a local network of suppliers to a MNC associated with a cluster, the knowledge transfer to the local companies is produced by the presence of both types of cooperation. First, there is the formal supplier-multinational cooperation and supplier-supplier (between suppliers of the foreign corporation); and second, the informal cooperation brought about by geographical proximity.

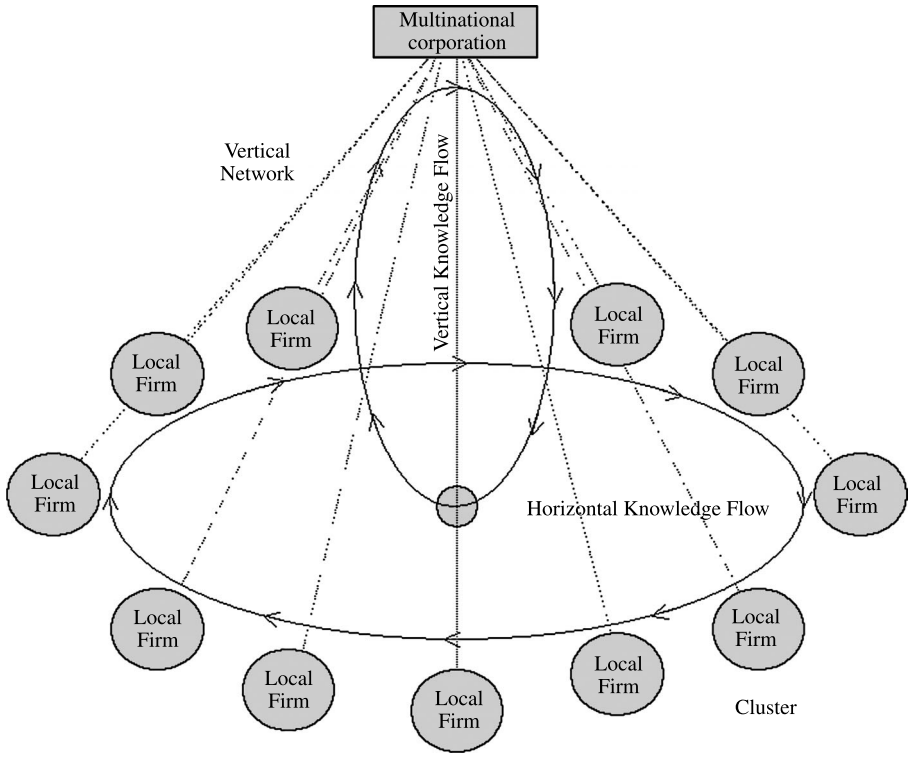

Figure 1.
Knowledge transfer into the network and the cluster

Source: This author on Dupuy and Gilly (1997)

2.2 The multinational corporation, local firms, and the exporting process

Studies which deal with the relationship between the location of companies and their exporting process are somewhat scarce (Fernhaber *et al.*, 2003; Buckley, 2002; Dunning, 1998). Nevertheless, some studies have shown how new companies which are set up in geographical locations with high concentrations of a given industry present higher levels of exportation (Fernhaber *et al.*, 2003).

The internationalization of the company requires relying on a set of important resources and specific capabilities (Kogut and Zander, 1993; Hitt *et al.*, 1997). The international experience of the company's executives is, among others, a determining factor for the development of the exporting process (Miesenbock, 1988; Reid, 1981; McDougall *et al.*, 1994; Oviatt and McDougall, 1994; Reuber and Fischer, 1997).

SMEs have limited capabilities and managerial resources (Buckley, 1989), which quite often means that these companies lack the necessary skills for undertaking a successful exporting process.

The successful internationalization process of a company is achieved when a significant combination of decisive and specific resources are present (Kogut and Zander, 1993; Hitt *et al.*, 1997). This makes internationalization possibly one of the most complex strategies a company will have to face (Aitken *et al.*, 1997; Fernández and Nieto, 2002).

The availability of information on foreign markets and the ways to enter them make up one of the fundamental resources which can influence both the decision to initiate the exporting process as well as its subsequent success (Aitken *et al.*, 1997; Eriksson *et al.*, 1997).

Thus, inter-company, client and supplier relationships can play an important part in the internationalization process of SMEs (Lindqvist, 1988; Bonaccorsi, 1992).

In this way, cooperation within the network will have a beneficial effect on the exporting process of the small company (Bell, 1995). Network relationships influence the selection of foreign markets and the entry mode, as well as the development of the product and market diversification (Sharma and Johanson, 1987; Bonaccorsi, 1992; Sharma, 1993; Bell, 1995; Coviello and Munro, 1997).

Studies carried out up until now have found a positive relationship between a company's decision to export and the exporting activities of nearby companies (Lin, 2000). Similarly, a significant relationship has been detected between the concentration of exporting activity of foreign companies and the volume of exporting of local companies (Bedi and Cieslik, 2000). Likewise, there seems to be a proven correlation between the spatial concentration of companies and the probability that they are involved in exporting (Becchetti and Rossi, 2000).

The work of Aitken *et al.* (1997) demonstrates the existing correlation between the spatial proximity of the foreign plant and the increase in local companies' propensity to export. They also point out the reduction of market access costs as one of the principal externalities being generated. Sousa *et al.* (2000), in their study found, in the case of the UK, the existence of positive externalities of the MNCs both in the local companies' decision to export, as well as in their propensity to export.

Often, part of the necessary knowledge for the internationalization of companies comes from their links to customers and suppliers. The availability of accurate information on foreign markets lessens the perceived risk on the part of the suppliers (Henderson *et al.*, 1995) and they decide to initiate the exporting process.

Lautanen (2000) finds that one of the principal stimuli for small business owners when it comes to exporting is the transmission of information gained through relationships with other business people. Thus, the proximity in the local community, the ease of communication and the relationships between foreign companies and local SMEs suppliers facilitate the transmission of information from one to the other (Henderson *et al.*, 1995).

A MNC can influence the exporting activity of local companies in three ways:

(1) generation of externalities through labor rotation;

(2) through the demonstration effect; and

(3) generation of externalities of information relative to exporting through productive ties.

The first two channels are associated with geographic proximity and thus, with the cluster configuration itself, while the third channel is associated with the organization of the network within the supply chain.

2.2.1 Knowledge transfer through labor rotation. The transmission of information is also produced through the hiring of workers and executives trained and prepared in the subsidiary (Gorg and Strobl, 2002), or when these same employees form their own companies.

According to Katz (1987), local business owners in Latin America frequently begin their professional careers in subsidiaries of MNCs, where they are trained and acquire the necessary skills. Bonaccorsi (1992) proves that, in the case of Italy, many of the companies established in the 1980s were created by entrepreneurs who had worked in factories belonging to MNCs and had frequently received help from the company that had employed them previously.

Gorg and Strobl (2002) also show that companies created by former employees of MNCs show greater productivity than those of other local companies, which means that these workers are incorporating knowledge acquired in their previous employment to their new companies. In this case, the transference would be helped by the rotation of labor and/or with the adoption of downsizing strategies that imply a reduction of the workforce.

Thus, it is expected that those companies founded by former workers and/or executives of the MNC count on a greater quantity of strategic skills than those companies founded by entrepreneurs in the territory. Likewise, it is supposed that companies which have hired workers and/or executives who were employed by the MNC can count on strategic skills which are superior to those of companies which have not hired this type of employee. This is due to the fact that former executives/workers incorporate the training received from the MNC into the new company, and consequently, have and apply executive skills which are superior to those being applied by other entrepreneurs in the territory.

2.2.2 Knowledge transfer through observation. Another way that local companies can learn about foreign markets is by observing the exporting activities of other companies who have successfully carried out the process of internationalization (Aitken *et al.*, 1997).

In this way, the exporting activities of the MNC can generate externalities which improve the exporting prospects for local companies (Rhee and Belot, 1990; Bedi and Cieslik, 2000; Lin, 2000; Bernard and Bradford, 2001), since the imitation strategy

would use the foreign company as a point of reference. Thus, local companies would adopt the more advanced practices being used by the foreign company (Kathuria, 2000). The benefits obtained through this imitation would in themselves constitute a market access spillover (Blomström and Kokko, 1998).

Knowledge transfer generated through the two abovementioned channels are due to a type of informal cooperation between local business people. Thus, the degree to which the executives of local companies make use of the externalities generated is in accordance with their ability to identify advantages, detect opportunities and learn from their surroundings.

Therefore, it is to be expected that local companies which value and know-how to take advantage of externalities and benefits derived from locating in a cluster, will exchange ideas with other local entrepreneurs more often and, hence, will present a higher level of internationalization. This means that they will show a greater propensity for exporting and a wider geographical dispersion of clients. As a result, we can put forth the following set of hypotheses:

H1. There is a positive relationship between local companies' propensity to export and the value that their executives place on the importance of geographical proximity to producers of similar products.

H2. There is a positive relationship between geographical dispersion of clients of local companies and the value that their executives place on the importance of geographical proximity to producers of similar products.

H3. There is a positive relationship between the local company's propensity to export and the frequency with which its directors exchange ideas with other executives in the area.

2.2.3 Knowledge transfer through productive linkages. Information about exporting can be transferred to local suppliers using a channel of communication which opens up when a strategic relationship is established between the MNC and local suppliers.

The MNC may be interested in transferring this knowledge to its local suppliers (Smarzynska, 2002) since the absence of spillovers would cause significant disparities in productivity between foreign and local companies (Kathuria, 2000).

For that reason, occasionally, it is the foreign company itself which motivates and provides incentives to local business owners to adopt internationalization strategies both in production (diversification of clients) and in supply (diversification of suppliers), thus generating an improvement in the competitiveness of the value system.

Local companies can apply the knowledge acquired in this way to products, processes and foreign market conditions in order to carry out their own exportations (Aitken *et al.*, 1997; Blomström and Kokko, 1998).

In this sense, it seems logical to think that those companies which show closer and more direct productive ties with the MNC will have access to greater amounts of information related to international markets than other companies in the area and, therefore, will show a higher level of internationalization. Based on this, we put forth the following hypotheses:

H4. There is a positive relationship between local companies' propensity to export and the quality of their ties with the MNC.

H5. There is a positive relationship between local companies' geographic dispersion of clients and the quality of ties they have with the MNC.

3. Methodology

3.1 Characteristics of the sample

The data used in this study originates from a larger study whose objective is to study the influence of a MNC on the productive network of the host territory. Specifically, it attempts to analyze the nature and intensity of the impact and to detect which are the acting mechanisms and the determining factors in the process.

With this goal in mind, a local productive system (LPS) was selected from Martos (Jaén), which is located in the region of Andalusia in the south of Spain. This LPS, involved in the production of lighting systems for automobiles (main and auxiliary headlamps and rear lighting), is made up of small- and medium-sized companies and led by a single MNC which contracts out to the local industry. This analysis includes both suppliers to the multinational as well as non-suppliers.

Research began with the design of a questionnaire, based on the review of available literature. The first version underwent a pre-test where it was sent to a small number of companies in the LPS; suppliers and non-suppliers to the MNC. The results from these interviews provided significant improvements to the questionnaire.

In April 2001, the final questionnaire was sent to all auxiliary companies which make up the LPS (25), using this as a sample of the population. The questionnaire was to be answered by the highest ranking executive in the company (technical data were shown in Table I).

The response rate was 84 percent. The sample utilized for the statistical analysis included around 95 percent of the industrial employment generated by the auxiliary companies and approximately 98 percent of the total turnover of this type of company. Non-production companies were not included in the analysis. Table II shows the principal characteristics of the sample.

3.2 Variables analyzed

In order to prove the hypotheses put forward, a set of variables was used which was related to the nature of the ties which bind auxiliary companies to the MNC.

In this respect, the independent variables used were those related to the strategic importance, or not, of the local company's production process for the foreign plant, the past labor relations of its founder or part of its executive staff with the MNC,

Characteristics	Survey
Objective universe	Industrial auxiliary firms
Geographical domain	LPS of Martos (Jaén-España)
Time domain	Period 2001
Sample unit	Firms
Sample number	20
Sampling error	$E = 0.075$
Fieldwork time	1 April 2002 and 15 May 2002
Survey subject	Managing director

Table I.
Technical data

Number of employees	*Percentage of companies*		*Number of companies*
1-50	55.0		11
51-100	25.0		5
More than 100	20.0		4
Mean		60.20	
SD		55.54	
Total billing (€ million)	*Percentage of companies* [a]		*Number of companies*
0-1.50	53.0		9
1.51-3.00	23.5		4
More than 3.00	23.5		4
Mean		4.27	
SD		6.57	
Industrial segment	*Percentage of companies*		*Number of companies*
Injectors	30.0		6
Molds and matrices	45.0		9
Final assembly and pre-assembly	10.0		2
Embossing	5.0		1
Others	10.0		2

Note: [a]Valid percentage

Table II.
Sample characteristics

the perception of the influence of geographical proximity on the development of the business and the frequency of exchange of ideas within the LPS.

The propensity to export and geographic dispersion of clients were used as dependent variables. The first was calculated with the quotient obtained by dividing the exporting volume by turnover volume. The second was calculated by dividing the number of clients in Europe by the total number of clients, and the number of clients in the rest of the world by total number of clients.

Before proceeding to the verification of the hypotheses, Cronbach's α was calculated as a measure of internal consistency of the variables used. The variables used in this study are shown in Table III. The results related to the reliability analysis of the scale were quite satisfactory, with a Cronbach's α of 0.8199 obtained for the scale used in the first factorial analysis (Table IV) and 0.7964 for the scale used in the second factorial analysis (Table V).

4. Results

First, a factorial analysis was conducted, using the principal components analysis, in order to group the available information into our scale (see variables in Table III, and scale in Table IV). The results obtained serve to establish the number of groups for the cluster analysis which is presented below.

The Kaiser-Meyer-Olkin sampling adequacy show a rate of 0.722, above the 0.5 needed to validate it, with a level of significance equal to 0.001. The variables used are divided into two factors which present an accumulated percentage of total variance explained of 90.343 percent. The results are shown in Table IV.

Factor 2 contains information related to the perception local companies' executives as to the importance of externalities derived from the geographical proximity of companies, inherent in a local supplier's network, for the internationalization process of their companies. Likewise, this encompasses information related to the geographic diversification of their clients worldwide.

		Items used	
Variables			
Direct supplier	1	Yes	
	0	No	
Main supplier	1	Yes	
	0	No	
Former labor links with firm owner	1	Owner is a MNC former executive or worker	
	0	Owner is not a MNC former executive or worker	
Former labor links with executives	1	At least one local firm executive is a former MNC executive	
	0	None local firm executive is a former MNC executive	
Other variables			
		Volume of percentage of exports	
Exporting propensity	0	0	
	1	$0 < x \leq 10$	
	2	$10 < x \leq 20$	
	3	>20	
Billing	Million €		
Geographical proximity	Likert scale 1-5	1	Low influence
		5	High influence
Ideas exchange frequency	Likert scale 1-5	1	Low frequency
		5	High frequency
		Percentage	
Customers localized in Europe	0	0	
	1	$0 < x \leq 10$	
	2	>10	
Customers localized in he rest of the world	0	0	
	1	$0 < x \leq 10$	
	2	>10	

Table III.
Variables scales used

Next, we used a cluster analysis to detect whether companies can be grouped according to the geographical dispersion of their clients located in Europe and in the rest of the world, the perception of local executives regarding the importance of geographical proximity, exporting propensity and past labor ties of local executives with the MNC. Results are given in Table VI.

Cluster 2 had the highest score on all the variables. The companies belonging to this cluster showed the greatest propensity to export of the entire supplier network and the highest degree of geographic dispersion of clients, both in Europe as well as in the rest of the world. Executives of these companies placed a high value on the influence which the geographic proximity of the local suppliers' network has on the development of their business. A similar characteristic was that the executives had worked previously in the MNC. In other words, there was direct knowledge transfer from the multinational to these companies when they hired former employees of the foreign plant as executives.

Factor	Labor links with executives	Geographical proximity	Export propensity	Customers in Europe	Customers in the rest of the world	Sum of squared saturations of rotation Total	Percentage of the variance	Accumulated percentage
1	0.673	0.098	0.964	0.975	0.934	3.216	64.316	64.316
2	− 0.591	0.943	− 0.128	− 0.045	0.211	1.301	26.026	90.343
Barlett test	χ^2 49.686		Degree of freedom 10		Significance 0.000		Kaiser-Meyer-Olkin 0.722	

Table IV.
Factorial analysis

	t-Test Variables		Levene test *F*	Significance	*t*-Test *t*	Degree of freedom
			Ideas exchange frequency			
Clusters	Clusters 1 and 2		5.241	0.048	0.471	9
	Clusters 1 and 3		0.965	0.359	−0.882	7
	Clusters 2 and 3		0.692	0.430	−2.169	8
			Exporting propensity			
Clusters	Clusters 1 and 2		1.282	0.290	−3.780	8
	Clusters 1 and 3		7.111	0.029	1.000	8
	Clusters 2 and 3		4.696	0.062	4.491	8
			Customers localized in Europe			
Clusters	Clusters 1 and 2		1.073	0.327	−2.513	9
	Clusters 1 and 3		5.531	0.051	0.882	7
	Clusters 2 and 3		6.038	0.039	3.037	8

Table V.
Results of *t*-test for mean comparison

Cluster		Labor links with executives	Customers in Europe	Customers in the rest of the world	Export propensity	Geographical proximity	Percentage of companies[a]
1		0	0.37	0.00	1.02	3.33	69.23
2		1	33.50	15.20	19.00	4.00	7.69
3		1	8.67	0.33	5.36	1.33	23.08
ANOVA	Mean	607	522,577	105,593	152,861	5,128	
	Degree of freedom	2	2	2	2	2	
	Significance	0.005	0.000	0.000	0.000	0.003	

Note: [a]Valid percentage

Table VI.
Typology of companies according to the customer's geographical dispersion

These companies maintain close cooperative ties with the other companies in the LPS and understand that these relationships are a strategic asset in their development. These are the companies which have understood the importance of the externalities generated within the network, and are situated at the centre of network relationships, contributing to revitalizing the exchange of ideas and information within it. We call this cluster central network suppliers.

Cluster 3 is comprised of those companies which, despite the fact that their executive staffs includes former executives of the MNC, show less propensity to export and less geographical dispersion of clients. In this case, the presence of clients in Europe is, on average, four times lower than that shown by companies in cluster 2. Likewise, the presence of clients in the rest of the world is insignificant.

As opposed to what was seen in cluster 2, these companies placed less importance on the influence of geographic proximity of the network on the development of their business. That is to say, they did not consider that being geographically closer to other suppliers in the network afforded a significant-added value to innovation, product development, or access to new markets, among others. As a result, these companies do not know how to take advantage of the externalities derived from the network and hence,

show less capacity for absorbing the knowledge than the firms comprising cluster 2. We call this cluster secondary network suppliers.

Finally, cluster 1 encompasses all those companies whose executive staffs does not include any former executives of the MNC, and thus, their directors do not possess the knowledge and superior skills acquired in the foreign plant. These companies are characterized by little propensity to export as well as a reduced geographic dispersion of clients. These companies showed certain indifference regarding the importance of geographic proximity. This implies that they do not consider the exchange of ideas among companies in the network as strategic, and thus fail to see how this can contribute to the development of their international strategies. This is the largest group in the network, encompassing 69.23 percent of the companies. This cluster is called peripheral network suppliers.

The results from the cluster analysis show that those companies which consider geographic proximity to other companies in the supplier network as strategic and moreover, have hired former executives of the MNC, have benefited from the positive externalities of information derived from the network, and show a greater propensity to export and a greater dispersion of clients. Based on the above, we can assert that *H1* and *H2* are fulfilled.

Nevertheless, the results from cluster 3 seem to indicate that the internationalization process of local companies is determined by a mixture of information generated and transferred into the network and that which has been incorporated from the foreign plant in the form of hiring former plant executives.

In order to prove whether the frequency of idea exchange into the network significantly influences the internationalization process of the companies which comprise the local network, we performed a *t*-test for independent samples so as to compare the means of the different clusters in this respect.

The results obtained show that there are significant differences between clusters 1 and 2. That is, cluster 2, which shows a greater propensity for exporting and greater geographic dispersion of clients than cluster 1, also gives more importance to the frequency of idea and information exchange within the network than cluster 2 does.

However, there are no significant differences between how clusters 2 and 3 value the importance of that exchange. As a result, we can state that the frequency of exchange of ideas within the local network significantly influences the internationalization process of local companies. This allows us to assert that *H3* is fulfilled. The results are given in Table V.

Nevertheless, the success of said process also depends, in this case, on the transfer of information coming from the foreign plant and, accordingly, on the channel of communication established with the MNC.

Next, we used a new scale in which we included variables related to the type of relationship which local companies have with the foreign plant. This will help us understand the possible relationship between the quality of the ties which the local company has with the MNC and the development of its internationalization process (Table III). This was done using a factorial analysis and the Bartlett test confirms the adequacy of the model. The results of the analysis show a Kaiser-Meyer-Olkin sampling adequacy of 0.556, higher than the 0.5 needed to validate, with a level of significance equal to 0.001. The variables used are divided in two factors which have an accumulated percentage of total variance explained of 79.959. Results are given in Table VII.

Factor	Direct supplier	Main supplier	V_i labor links with owner	Labor links with executives	Exporting propensity	Sum of squared saturations of rotation		
						Total	Percentage of the variance	Accumulated percentage
1	0.735	0.795	0.635	0.728	0.776	2.169	43.383	43.383
2	0.572	−0.154	0.683	−0.465	−0.507	1.829	36.576	79.959
Barlett test	χ^2 29.980		Degree of freedom 10		Significance 0.001		Kaiser-Meyer-Olkin 0.556	

Table VII.
Factorial analysis

Results obtained in the second factorial analysis show, on one hand, the existence, or absence, of a direct channel of communication or information transfer from the MNC to the local company and, on the other hand, the quality of that channel.

Thus, factor 2 groups the variables related to the existence of a direct or indirect supplier relationship, as well as to the ties, or lack thereof, which the founder of the local company has with the multinational. Factor 1 includes the variables which determine the quality of the channel of communication. That is, whether the local company is regarded as a principal supplier to the MNC and whether the executives of the local company have had a past working relationship with the MNC.

In order to detect whether there are different groups of companies as far as the existence or not of a direct channel of communication and the quality of that channel, we conducted a cluster analysis. The results are shown in Table VIII.

Cluster 2 contains 40 percent of the companies which make up the local network. This cluster has the highest values for all the variables. In other words, these companies have productive ties with the MNC and are regarded as principal suppliers and hence, are exposed to a greater volume of information. Likewise, among their executive staff are former executives of the MNC and, by hiring them they have incorporated a large volume of superior skills and knowledge from the foreign plant. Therefore, these companies can be characterized by the fact that they maintain direct channels of communication and thus, knowledge transfer and quality channels with the MNC. We call this cluster companies with a channel of information transfer which is direct and of high quality.

Clusters 1 and 3 show levels of propensity to export which are of little significance. Cluster 3 contains the companies which maintain a channel of direct information transfer, but not one of high quality. They are direct suppliers, but are not regarded as principal suppliers and, as a result, they are exposed to a lesser amount of information. Moreover, they do not have any former executives of the MNC among their executive staff. This cluster is called companies with a direct channel of information transfer, but not one of high quality.

Finally, cluster 1 encompasses all those companies which have neither a direct productive relationship with the foreign plant nor a direct channel of communication or quality.

Results obtained in the cluster analysis seem to show evidence that the type of information transfer channel established with the foreign plant can have a bearing on local companies' propensity to export.

Nevertheless, in order to prove the influence of the existence or absence of the channel of communication on the exporting activity of the local companies, we ran a *t*-test for independent samples so as to compare the means of clusters 1 and 3. We used a Levene test which gave a result for F equal to 7.111, with a level of significance of 0.029. Thus, we can state that there are significant differences between the groups with respect to exporting propensities. In other words, the existence of a direct channel influences exporting activities. This does not, however, provide information about the quality of that channel. The results are shown in Table V.

In order to prove a possible effect of the quality of the information transfer channel, we carried out a new *t*-test for independent samples so as to compare the means of the different groups according to the type of ties they have with the MNC. The results of the Levene test applied to principal suppliers versus secondary suppliers were F equal to 8.554,

Table VIII.
Typology of companies according to the relation with the MNC

Cluster		Labor links with owner	Labor links with executives	Direct supplier	Main supplier	Exporting propensity	Percentage of companies[a]
1		0	0	0	0	0.00	26.66
2		1	1	1	1	1.17	40.00
3		1	0	1	0	0.00	33.33
ANOVA	Mean	1.250	0.800	0.825	0.983	2.450	
	Degree of freedom	2	2	2	2	2	
	Significance	0.000	0.009	0.001	0.009	0.000	

Note: [a]Valid percentage

with a level of significance of 0.012. In the Levene test applied to suppliers, who have hired former executives of the multinational versus those who have not done so, the results were F equal to 7.880, with a level of significance of 0.015. The results are given in Table IX.

The results show the existence of significant differences for the comparison of means of those companies which are regarded as principal suppliers to the foreign plant and have former executives of the foreign plant working there. As a result of this, we can state that *H4* is fulfilled.

In the case of *H5*, we first set up a contingency table in order to prove whether there are differences in the location of clients in Europe. The results show that 50 percent of the local companies which have hired executives from the foreign plant have a percentage of clients in Europe above 10 percent, whereas, the analysis shows that the companies which have not hired former executives show percentages of less than 10 percent. The results are shown in Table X.

Next, in order to complete the information about the quality of the channel, a *t*-test was conducted for independent samples to compare whether there are significant differences regarding the dispersion of clients according to the type of ties which are maintained with the MNC. The results of the comparison between principal and secondary suppliers with respect to clients situated in Europe for the Levene test gave F equal to 13.474 with a level of significance of 0.002.

When comparing suppliers which had hired former executives of the MNC and suppliers which had only hired local personnel with respect to geographic dispersion of clients around the world, the results for the Levene test showed F equal to 16.430, with a level of significance of 0.001. Therefore, we can state that there are significant differences between the two groups as far as the geographic dispersion of clients. Thus, *H5* is validated. The results are shown in Tables IX and XI.

Table IX. Results of *t*-test for exporting propensity mean comparison

		Exporting propensity			
	t-Test	Levene test		*t*-Test	
	Variables	F	Significance	t	Degree of freedom
Clusters	Direct suppliers vs indirect	3.265	0.94	1.097	13
	Main suppliers vs auxiliary	8.554	0.012	2.884	13
	Labor links with owner	4.980	0.044	1.282	13
	Labor links with executives	7.880	0.015	3.809	13

Table X. Contingency table between the customers' geographical dispersion and the MNC-local firms relationship

		Customers localized in Europe (percent)			
		0	$0 < x \leq 10$	≥ 10	Total
Relation with MNC	Labor links with executives	25.0	25.0	50.0	100.0
	Not labor links with executives	53.3	46.7	0.0	100.0
χ^2 Pearson	Value	Degree of freedom	Significance		
	8.387	2	0.015		

Table XI.
Results of *t*-test for customers geographical dispersion mean comparison

	t-Test Variables		Levene test		*t*-Test	
		F	Significance	*t*	Degree of freedom
		Customers localized in the rest of the world			
Clusters	Direct suppliers vs indirect	2.936	0.105	0.768	17
	Main suppliers vs auxiliary	13.474	0.002	1.475	17
	Labor links with owner	1.613	0.221	0.572	17
	Labor links with executives	37.911	0.000	2.072	17
		Customers localized in Europe			
Clusters	Direct suppliers vs indirect	3.112	0.096	1.039	17
	Main suppliers vs auxiliary	5.308	0.034	1.466	17
	Labor links with owner	1.856	0.191	1.219	17
	Labor links with executives	16.430	0.001	3.279	17

5. Conclusions

This paper studies the influence that cooperation, both formal and informal, can have on the exporting activity of local companies. In particular, it studies the effect which belonging to a vertical network (system of suppliers to a MNC) as well as the geographical location in a cluster, can have on the internationalization process of companies in the area.

In order to analyze the existence of knowledge transfer, significant differences were shown in the level of internationalization of local companies according to the perception that their executives have regarding the importance of spatial proximity to other companies in their sector on the development of their international expansion; the frequency with which they exchange ideas with other entrepreneurs in the area; and finally, the quality of the channels of communication which exist within the network.

The results show that local companies with a greater propensity to export state that geographical proximity to other suppliers (belonging to a cluster or LPS) has an important influence on their internationalization process, the diffusion of ideas in the area, and knowledge about foreign markets. Likewise, local entrepreneurs who state that they regularly exchange ideas with others also show a greater propensity for exporting than other companies in the same LPS.

A priori, exporting propensity only provides information as to the percentage of international sales over total sales of the company. This means that the company could have a high-exporting propensity and yet have its sales concentrated in only one or few countries.

Following the model proposed by Johanson and Vahlne (1977), we know that, initially, these internationalization activities are directed towards geographically closer markets, whereas, when the company gains more experience in foreign markets, and as a result, increases and improves its knowledge about them, it will begin its expansion towards more geographically distant markets.

When analyzing the geographic dispersion of companies' clients, we find that the local companies which show a greater dispersion of clients are precisely those which, on the one hand, state that they exchange ideas with other entrepreneurs in the same LPS more often and, on the other hand, recognize the importance that spatial proximity to other producers in the same sector has for the development of their business in

general, and for the development of international expansion, in particular. Likewise, those companies which have a greater geographic dispersion of clients have, as part of their executive staff, executives who previously worked for the MNC.

Therefore, through informal cooperation between entrepreneurs in the territory, geographical location, a grouping of industries belonging to the same sector generates a transmission of highly valuable intangible resources; ones which are associated with choosing and opening up new markets.

Regarding the influence of the network on the internationalization of local companies, we found that the companies which have greater exporting propensity and greater geographic dispersion of clients are those which maintain direct productive ties and quality channels of communication with the MNC.

This implies an important flow of information into the center of the vertical network, from the foreign plant to its local suppliers. Nevertheless, the magnitude of information transferred from the foreign plant to the local suppliers is in accordance with the quality of the channels of communication which they maintain with the foreign plant.

In any case, this paper shows that the existence of knowledge transfer of intangible resources and the existence of organizational learning are associated with the nature of the vertical network in a system of suppliers, and a horizontal network with an industrial agglomeration.

The limitations of this work can be found in the fact that the analysis focused only on a vertical network and, particularly that the companies which comprise it are all located in a LPS. As a result, the size of the sample is small and does not allow for generalizations.

For future research it would be interesting to carry out a study of similar characteristics, comparing experiences in a larger number of vertical networks, with geographical locations in different clusters and under more distant organizational cultures.

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