

The Journal of Entrepreneurial Finance

Volume 7
Issue 1 *Spring 2002*

Article 8

December 2002

Inter-firm Networking Propensity in Small and Medium-sized Enterprises (SMEs)

Jean-Marie Nkongolo-Bakenda
University of Regina

Follow this and additional works at: <https://digitalcommons.pepperdine.edu/jef>

Recommended Citation

Nkongolo-Bakenda, Jean-Marie (2002) "Inter-firm Networking Propensity in Small and Medium-sized Enterprises (SMEs)," *Journal of Entrepreneurial Finance and Business Ventures*: Vol. 7: Iss. 1, pp. 99-122.
Available at: <https://digitalcommons.pepperdine.edu/jef/vol7/iss1/8>

This Article is brought to you for free and open access by the Graziadio School of Business and Management at Pepperdine Digital Commons. It has been accepted for inclusion in The Journal of Entrepreneurial Finance by an authorized editor of Pepperdine Digital Commons. For more information, please contact josias.bartram@pepperdine.edu , anna.speth@pepperdine.edu.

Inter-firm Networking Propensity in Small and Medium-sized Enterprises (SMEs)

Jean-Marie Nkongolo-Bakenda, Ph.D.
University of Regina

INTRODUCTION

In the past decade, market globalization has not only been a threat for small and medium-sized enterprises (SMEs), but also an opportunity to expand their activities in many countries (Murphy and al., 1991). In fact, some of SMEs are worldwide leaders in their sectors (Simon, 1990; Entreprise, 1995). Moreover, few of these worldwide SME leaders started businesses directly on an international level (Christensen, 1991; Brush, 1992; McDougall and al., 1994). This suggests that these SMEs use many processes to overcome resource and competency constraints, which would otherwise impede the success of a transnational business in the new global environment (Barlett and Ghoshal, 1987; Fombrun and Wally, 1992). Some studies have identified co-operation as one of the most powerful means an SME operating across borders can use to overcome its constraints (Olleros and Macdonald, 1988; McDougall and al., 1994; Scully and Fawcett, 1994).

To face the complexity, diversity, dynamism and change characterizing the global market, SMEs need to form strong and sustainable ties with other organizations (Forrest, 1990; Harry, 1990). These ties can be made with big, medium-sized or other small enterprises (Shutt and Whittington, 1987; Lorenzoni and Ornati, 1988; Stevens, 1992; Darréon and Faïçal, 1993; Fernandez and Noël, 1994). The balance of power between partners is very important in this kind of inter-firm relationship. SMEs have fewer resources than their partners, and yet their owner-managers prefer autonomy. Then, how do SMEs reconcile the apparent contradictory necessity to cooperate due to resource constraints with their desire for autonomy? What is the ideal quantity of activities that can be devoted to the partnership without threatening the organization itself?

The purpose of this paper is to examine propensity of transnational SMEs to subcontract, to outsource (prime contract) or to collaborate on an equivalent basis with other businesses. It is important therefore, to first review the literature related to small business networking. Second, a summary of the methodology and results will follow. Third, propositions will be stated followed by conclusions.

Literature review

In academic literature, networking is generally considered as one of the means that allow SMEs to concentrate on what they can do better and outsource other activities for which they lack outstanding competencies (Barney and Ringleb, 1992; Guilhon, 1993; Szarka, 1990; Lorenzoni and Ornati, 1988; Shutt and Whittington, 1987). One stream of literature states that in the new global environment, SMEs should be natural subcontractors of huge multinational companies (Barringer, 1997; Oakey, 1993; Rothwell, 1991; Lorenzoni and Ornati, 1988; Unger,

1988; Fauré and al., 1979). This stream echoes much published literature focused on the necessity for large multinational companies to achieve their vertical integration while adapting their products to domestic cultural and social requirements in different countries (Harrigan, 1988; Balakrishnan and Wernerfelt, 1986; Butler and Carney, 1986). Small businesses have been acknowledged to be closer to customers and more locally oriented than big organizations. It is therefore believed that SMEs can adapt their products more easily and quickly to domestic conditions.

Another stream of literature states that in the new global environment, SMEs should not be limited to subcontracting activities. Indeed, some of them can have a core competence that enables them to make an outstanding product and to be more responsive than large businesses can be to the new fast changing environment. In this case, an SME can face competition from big businesses as well as other small businesses or occupy a niche that is neglected by big companies (Shutt and Whittington, 1987). An SME in this situation can become itself an outsourcer of some of its activities (Christensen, 1991; Szarka, 1990; Ollerros and Macdonald, 1988).

Networking is also considered as a means that allows small and medium-sized enterprises to make up their relatively limited resources and to overcome emerging challenges from the global market (Faucon and Levratto, 1994; Larson, 1992; Furukawa and al., 1990). Via partnership, SMEs can carry out activities that require many resources that, otherwise, would be beyond their capacities (Estades and Ramani, 1997; Farrel and Doutriaux, 1996; Géniaux, 1994; Hara and Kanai, 1994; McDougall and al., 1994; Scully and Fawcett, 1994; Esposito and Raffa, 1992; Rothwell, 1991; Dodgson and Rothwell, 1991; Forrest, 1990). A case to the point would be with research and development as well as internationalisation of activities. In their resource-supplying role, network activities in small and medium-sized enterprises can go beyond the subcontracting or outsourcing relationships, which are based on hierarchy and dependency. Indeed, SMEs can be involved in a shared enterprise in which different partners draw from their respective strengths to better face the competition (Ollerros and Macdonald, 1988; Bull, Pitt, and Szarka, 1991; Julien, 1994).

A review of numerous studies dealing with networking practices in SMEs reveals that most studies relate them to conditions of success and advantages. Some studies have examined conditions and factors to ensure a success for a partnership between SME and big enterprises (Holmlund and Kock, 1996; Jones, 1996; Dubost, 1996; Belley and al., 1995; Larue de Tournemine, 1994; Darréon and Faïçal, 1993; Esposito and Raffa, 1992; Lorenzoni and Ornati, 1988; Fauré and al., 1979). Holmlund and Kock (1996), for example, observed that while small-sized suppliers frequently believed their relationships with big and dominant buyers were secure, they were in fact strongly dependent on them. Other studies have examined advantages SMEs receive from networking to face other categories of businesses (Barringer, 1997; Paché, 1996; Simons and Kerr, 1993; Harry and Dent, 1990). Barringer (1997) and Miles et al. (1999) for example, after observing many positive aspects of relational exchanges, identify their disadvantages that threaten the traditional strengths of small businesses, such as the loss of their autonomy and the difficulty to fully capture their share from alliance relationships. The research about limits and benefits arising from industrial district practice can also be attached to this stream (Lecoq, 1995; DeMott, 1994; Héraud and Nanopoulos, 1994; Lipnack and Stamps, 1993; Bull and al., 1991).

Although researchers and practitioners consider networking by SMEs as a necessary practice as well as a threat to business survival in the current environment, few studies have

explored the ideal quantity, nature and location of activities that can be dedicated to the networking partners without endangering the SME itself (Jarillo, 1988). A few of the studies that examined these aspects suggest that SME networking activities should be a low ratio of their whole activities (Larson, 1992; Simon, 1990). Other studies, namely those interested in new technology development, assert that SMEs outsource during the pre-competitive stage of research and development and aim to maintain some autonomy during the marketing and sales stages (Larue and Tournemine, 1994; Easton and al., 1993). However, these affirmations need more investigation because some authors have identified SMEs that successfully outsourced most of their activities, mainly at the sales stage (Farrell and Doutriaux, 1996).

Considering the dearth of studies that systematically focus on the ideal relative importance of an SME's networking activities in highly competitive, global market, the purpose of this study is, first, to determine the SME network propensity, meaning the ideal quantity of networking activities an SME should undertake, and the location of these activities in the industry value chain. Second, this study will deduce several guiding principles for managing transnational SME's networking activities from the association between the activities suggested and the industry, organization and owner-manager characteristics.

Methodology

To understand transnational SME networking propensity better, I the author consulted people who lead transnational SMEs involved successfully in global activities. Owner-managers of transnational SMEs (independents, with less than 500 employees, no subsidiaries, managed by owners) from the Province of Quebec (Canada) were chosen according to their recognized reputation in specialized magazines dealing with business, the number of countries where they are doing business, and the relative success of their organizations in recent years.

Two consultations that utilized an adapted form of Delphi decision-making technique (Dalkey, 1972, Nadeau, 1982) took place from June 1996 to February 1997. In the first consultation, a questionnaire was sent to 86 owner-managers previously contacted by phone. Every respondent was invited to give information about his/her industry, his/her organization, and himself/herself. Also, the respondent was invited to suggest subcontracting, collaborative, and outsourcing activities that he/she considered necessary for success in the global marketplace.

Thirteen explanatory variables were used. Each of them was binary in the sense that only two categories were considered. They were derived from previous studies and were related to the industry, the organization and the owner-manager's characteristics. The industry was described by five variables: the nature of the demand (standardized or customized), the scope of the product use (specialized or general use), the target market (industrial/institutional or end-user consumers), the development stage (emerging or mature), and the level of technology intensity (lower or higher). The organization was described by four variables, namely, its age (young if five years old or less, and old if more than five years old), its size (small if less than 100 employees, or medium if 100 or more employees), its required core competencies for success (technological-based or human resource-based), and its organizational structure (organic or mechanistic). Finally, four explanatory variables described the owner-manager. These were: age (young if 45 years old or less, and old if more than 45 years old), experience (low if less than one year since first contact with the industry and the moment of taking charge of current position, and higher if more than one year elapsed since first contact with the industry and the moment of getting in charge of current position), educational level achieved (university graduate or not), and

specialization (low if no prior training in the area of the main product or service, and high if prior training received in the area of the main product or service).

Networking activities were measured according to the nature of the co-operative effort, the level of dependency on networks, the number of partners (Pitt and al. 1991; Rothwell, 1991; Larson, 1992) and, finally, the location of their activities on the industry value chain (Jarillo, 1988). Three types of cooperative effort were distinguished. These were: subcontracting, collaborative and outsourcing (Pitt and al., 1991; Lorenzoni and Ornati, 1988). The level of dependency of the SME on the network is determined by the proportion of activities dedicated to co-operation compared to the whole yearly value of the SME's activities (Baudry, 1995). The proportion of activities an SME could dedicate to any of the three types of co-operation was classified into six categories: none (0 %), very low (1-9%), low (10-24 %), moderate (25-49 %), high (50-74 %), and very high (75-100 %)¹. The number of partners was categorized as: none (0) few (1-5), moderate (6-10), and many (more than 10). Finally, the location of networking activities on the industry value chain could be product conception, research & development, purchasing and procurement, manufacturing, and marketing and sales.

At the first consultation, questions about networking activities were open and stated as follow: to make a sustainable success in the global marketplace, do you think that a firm like yours should subcontract activities from other companies? Outsource to other companies a part of its activities? Collaborate in a balanced and equivalent manner on a long-term basis with other partners? Also, for a "yes" answer at each of these questions, the respondent was invited to list activities that should be dedicated to the co-operation.

Forty-seven respondents returned their questionnaire after the first consultation. But two of them were discarded because their enterprise profiles did not match the criteria used in this study. Answers from the 45 remaining owner-managers were analysed by the NUD*IST software (Richards and Richards, 1998). This enabled us to identify and categorize networking activities and explanatory variables. Statistics from this analysis were returned to each of the respondents in frequency table forms with their own answers for a second consultation. The questionnaire for this second consultation also had closed questions on details about the quantity of suggested networking activities. At this step, respondents were asked to modify, if necessary, their previous answers. Forty respondents returned the questionnaire following the second consultation². Four respondents out of five who did not return their questionnaire were away from their headquarters and the fifth one chose to withdraw from the study. Data from the second consultation were analysed by HOMALS (analysis of homogeneity by altering least squares), a type of multiple correspondence analysis (Greenacre and Blasius, 1994).

HOMALS was used to identify associations in a qualitative multivariate analysis. Indeed, in addition to its few requirements about the nature of data and the distribution structure, HOMALS allows users to analyse linear as well as non-linear associations on multiple qualitative variables (Strutton and Pelton, 1994; Heisser and Meulman, 1994; Hoffman and Franke, 1986).

¹ Generally, with 25% or higher quantity of activities dedicated to its network, an organization can be considered as dependent (Baudry, 1995: 45).

² Between the SMEs studied, 80 % extend their activities at least in three countries, profit ratios of those that have furnished related information for the 1990-94 period were better than the averages of their respective sectors, and finally, 42% of SMEs studied have been at least two times favourably reported in business magazines during the 1990-96 period. The magazines examined included *Les Affaires*, *Commerce*, *PME*, and *Le Guide Québec Inc.* of *Journal Économique de Québec*.

Its graphic representation is also simple, allowing the essential information to be displayed on two or three axes (Gifi, 1990). Homogeneity analysis is considered to be a more appropriate technique to use to analyze multivariate data than the traditional multiple correspondence analysis, and the HOMALS program found in the SPSS software does it well (Greenacre, 1994; 1993; 1991)³.

For each type of network relationship (subcontracting, collaborating or outsourcing), the association between networking activities and the explanatory variables was examined. For each analysis carried out, two axes could be retained (Greenacre, 1993: 158). However, the two axes were retained only if the eigenvalue was more than $1/Q$ (Q = number of variables). On each dimension, a category of networking activities was retained for interpretation only if its discrimination measure (squared correlations) was, at least, equal to the corresponding eigenvalue (Greenacre, 1991; Gifi, 1990; Jambu, 1989; Lebart and al., 1984)⁴. In addition, care was taken to ensure that the discrimination measures on the two dimensions retained were unrelated to satisfy the usual orthogonality condition between the two principal axes (Bryant and Yarnold, 1995: 104-106; Greenacre, 1993: 158)⁵.

Furthermore, referring to Gifi (1990: 391), the associations identified were subjected to informal verification of stability (Heiser and Meulman, 204; Van de Geer, 1993: 107-108). Associations were initially found between suggested networking activities and variables belonging to all three groups of explanatory characteristics (industry, organization and owner-manager characteristics). Thereafter, associations were found between suggested networking activities and explanatory characteristics belonging only to one of the three groups. Associations were considered to be consistent only if they were found at the two levels of analysis⁶.

Results

Profile of SMEs studied

According to the industry environment, 69% of SMEs faced a standardized demand, 87% had a specialized product, and 80% targeted industrial customers. Fifty-six of SMEs studied faced a mature industry environment, while 60% faced a higher level of technology intensity. Considering organizational characteristics, 89% of SMEs studied were old, 53% were medium-sized, and 71% had a human resource-based success. Most of them (56%) had a mechanistic structure, although they were highly decentralized and employed participatory management techniques.

Most owner-managers of these SMEs (69%) were mature. Less than half (47%) had lengthy experience with the principal product/service. However, 53% of owner-managers had worked in the same industry sector for at least 20 years. Most of the owner-managers (71%) were

³ In HOMALS, "each principal inertia is interpreted as a squared correlation, which is judged on its own and not with respect to the total inertia. The interpretation of the contributions, which are components of inertia, is difficult to justify, especially the relative contribution" (Greenacre, 1993: 145, 156-157). These particularities of Homals require that its results be interpreted in a different way than it is done for a traditional multiple correspondence analysis (quality based on the percentage of variance). The quality of successive dimensions retained is assessed relatively to an external standard and not to a notion of total variance or percentage in some hypothetical high-dimensional space (Greenacre, 1991).

⁴ The eigenvalue is also the average of all discrimination measures.

⁵ These conditions are subjective, but conservative in comparison with many criteria suggested by many researchers (Jambu, 1989: 217-218; Lebart et al., 1984: 106-109; Blasius, 1994: 47). In fact, it is generally recommended to dismiss categories that have a low score (Celeux et Nakache, 1994: 135-136; Van de Geer, 1993: 22; Lebart et al., 1984: 92-93).

⁶ Eigenvalues and graphics analyses cannot be presented in this paper for the space constraints, but they are available from the author.

university graduates, but only 42% had taken specialized training related to their principal product/service.

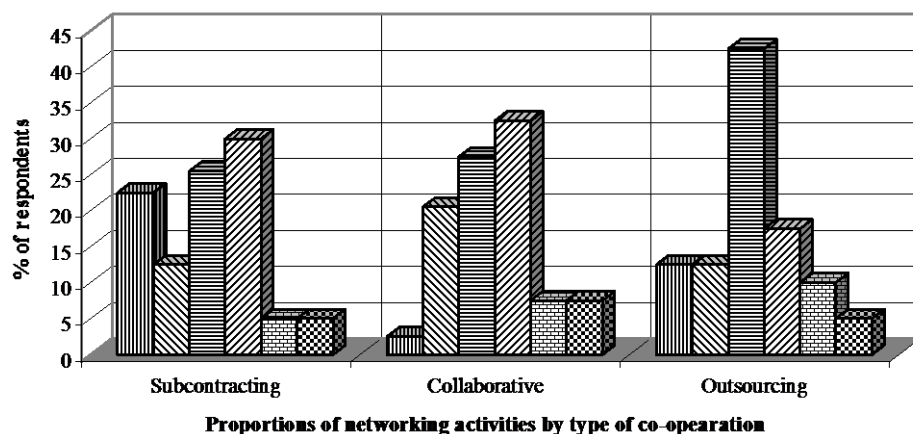
Importance, nature and quantity of ideal networking activities

To ensure an SME sustainable success in the global marketplace, 27%, 91% and 80% respectively of owner-managers asserted that, subcontracting, collaborating, and outsourcing were necessary (see Annex1). Owner-managers who suggested that the quantity of network activities should be equal to or more than 25% of annual activities represented 40%, 48% and 33% of all respondents for, respectively, the subcontracting, the collaborating and the outsourcing co-operation (see Table 1 and Figure 1). Fifty-five percent of respondents suggested that 10-49% of annual activities should be dedicated to subcontracting. Sixty percent of respondents suggested that the same quantity of networking activities should be dedicated to collaborating as well as outsourcing.

In the light of these results, most owner-managers considered networking activities, particularly in the area of collaborating and outsourcing, as necessary to the sustainable success of SMEs like theirs in the global marketplace. Conversely, the majority felt that subcontracting was unnecessary. Furthermore, for all types of networking activities (including collaborating and outsourcing), the relative quantity of activities believed to be ideally dedicated to the cooperation was low for most of the respondents, as illustrated in Figure 1. This shows a strong desire of owner-managers to conserve their autonomy while benefiting from networking practice. Moreover, most of the owner-managers suggested that the number of partners in their networking activities would ideally be less than five. In fact, 30% of owner-managers wanted fewer than five partners for outsourcing and subcontracting, while only 18% and 13% respectively suggested 10 partners or more for, respectively, outsourcing and subcontracting⁷.

Figure 1: Proportions of suggested networking activities

⁷ The ideal number of partners for collaborative cooperation has not been given by respondents



▨ No one (0 %)	▨ Very low (1-9 %)	▨ Low (10-24 %)
▨ Moderate (25-49 %)	▨ High (50-74 %)	▨ Very high (75-100 %)

Networking activity location on the industry chain of value

The number of respondents who suggested that SMEs like theirs should subcontract activities for other companies in the areas of manufacturing, distribution and conception represented, respectively, 15%, 8%, and 3% of all respondents (see Annex 1). With regard to collaborative cooperation, 51%, 34%, 32%, 20%, and 15% respectively, of respondents recommended cooperate in the areas of manufacturing, purchasing and procurement, distribution, conception, and research and development. With respect to the chain of value system, it is clear that most respondents recommended subcontracting for other companies in the areas of inbound logistics, manufacturing, and research and development⁸.

As far as outsourcing was concerned, 68% of respondents recommended outsourcing manufacturing. Outsourcing of accounting, marketing, and maintenance, was recommended only by few respondents.

Association between networking activities and the industry, organization, and manager characteristics

Nature and quantity of networking activities

The HOMALS results (Table 1)⁹, suggested that more than 25% of an SME's annual activities should be directed toward subcontracting when the environment is at an emerging stage with a higher level of technology intensity and when customers were industrial or institutional. Managers of these SMEs tended to be generally young. In contrast, respondents indicated that less than 25% of an SME's annual activities should be directed toward subcontracting when the

⁸ The total of percentages is more than 100% because some respondents have suggested more than one area of collaborating. Indeed, 40% of respondents suggest more than one area of collaborating, 35% suggest collaborating in one of the following areas: purchasing and procurement, conception, and research and development. Only 18% and 5% suggest collaborating respectively in manufacturing and distribution.

⁹ HOMALS' output for these analyses contained 12 graphics with the same number of tables of variable labels, marginal frequencies, eigenvalues, discrimination measures, and category quantifications. Because of space limits, only conclusions are presented on table 1.

environment and the managers had the same characteristics as above, but customers were end-user consumers. However, it is interesting to observe that mature managers did not want to subcontract even if customers were end-users.

Concerning collaboration, the recommendation was that more than 25% of an SME's annual activities should be directed to collaboration when the environment was at a higher level of technology intensity. By contrast, less than 25% of an SME's annual activities needed to be directed to collaboration when the environment had a lower level of technology intensity.

With regards to the outsourcing, it was recommended that more than 25% of an SME's annual activities should be directed toward outsourcing when the environment was at an emerging stage, the level of technology intensity was higher, and when the SME was young and small-sized. It was also suggested that these activities should be subcontracted to more than five partners. In contrast, respondents indicated that less than 25% of an SME's annual activities should be directed toward outsourcing when the industrial environment was mature and the level of technology intensity was low. It was also suggested that these activities be subcontracted to less than five partners.

For the three types of co-operation, it seems that the quantity of activities recommended was directly proportional to the level of technology intensity.

Location of activities on the chain of value

No association has been carried out for suggested subcontracting activities of co-operation because of their fewness and dispersion through many categories of location. Concerning collaboration, co-operation in manufacturing was mostly recommended when the industrial environment had a higher level of technology intensity while the co-operation in the area of product conception was suggested when the industrial environment had a lower level of technology intensity. There were no consistent associations for other categories of locations.

Regarding outsourcing, co-operation in manufacturing were suggested for an SME whose industrial environment had a higher level of technology intensity while co-operation in product conception was suggested when the level of technology was low. Again, as observed above for collaboration, other categories of location did not show a consistent association with a particular explanatory variable.

Explanation of associations found in the light of previous studies

Results presented above about networking activities for transnational SMEs are partially in accordance with some observations from previous studies. Thus, the higher desire to co-operate and the direct proportional association of the quantity of co-operation activities with the level of technology intensity and the industry development stage are congruent with results in previous studies (Rothwell, 1991; Harrigan, 1988; Shut and Wittington, 1987; Balakrishnan and Wernerfelt, 1986; Butler and Carney, 1886). The location of most co-operation activities in the inbound logistics and manufacturing segments of the chain of value has also been observed in previous studies (Larue and Tournemine, 1994).

The most surprising aspect of the results of this study is related to the few quantity of co-operation activities, the weak desire to be subcontractor, and the higher level of co-operation activities in small-sized and emerging companies in comparison with medium-sized and mature ones. However, these results are, in the most part, congruent with four necessary and sufficient elements identified by Oviatt and McDougall (1997) for a sustainable international new venture.

The four elements identified by these authors were the internalization of some transactions, the alternative governance structures (co-operation), the foreign location advantage by the presence of a private knowledge and the control on the unique resources. In contrast to the results of the present study, Oviatt and McDougall (1997: 117) asserted that international new ventures were characterized by the minimal use of internalization and the greater use of co-operation. But, elsewhere in the same paper, these authors brought to the fore (p. 119) the cautious use of co-operation activities to limit the expropriation of venture unique knowledge as observed in the current study.

The desire to keep the autonomy has also been observed by Simon (1990) on German transnational SMEs. These successful SMEs were self-trustful and tried to resolve their problems inside, outsourcing only minimal activities to co-operation. Larson (1992: 100) also has observed that SMEs use a dense, but limited quantity of exchanges to ensure their growth. In the same way, Farrell and Doutriaux (1996: 41) have observed that young SMEs in the higher technology sector had a higher level of networking propensity than that of traditional SMEs. This observation is congruent with Rothwell (1991)'s assertion about emerging high technology SMEs that used to outsource to other companies some of their activities.

In addition to the autonomy search and technology intensity to explain the level of networking propensity in some SMEs studied, it seems that the SME's main activity sector can also be one of the reasons. The multiple, but cautious networking activities observed in this study can also be related to the fact that most SMEs considered belong to the manufacturing sector. Indeed, Dean et al. (1997) had observed that servicing SMEs had a higher level of networking propensity than manufacturing ones. Moreover, if we consider that most SMEs (60%) considered in this study are facing a higher level of technology intensity, we can deduce that most of them belong to the knowledge-based sector. In this sector, the investment and time necessary to carry out products is sometimes relatively very low compared to other sectors (Oakey and Cooper, 1991: 82). For example, to make software, knowledge is more important than financial investment. An SME producing software can remain small, limiting its main activities to their conception (the content) and outsourcing to other companies the production of related supports like compact disks or floppies. This can explain the higher level of networking propensity in small and emerging companies observed in this study. However, these explanations are still speculative and necessitate more investigations to be qualified.

The fact that most of the respondents did not favour subcontracting activities can be explained by the SME sample used in this study. It contained only international ventures.

Results from this study do not support some conclusions drawn mainly in the light of the growth stages of SMEs. According to some studies, organizations in an emerging environment where the competition is still low aim to realize the internal integration of their activities (Balakrishnan and Wernerfelt, 1986; Baudry, 1995; Barringer, 1997). It is also advanced that successful networking relationships require minimal exchanges between partners to reduce transaction costs. However, these studies do not give enough attention to the importance of flexibility and the fact that small firm power is generally originated from its expertise and rarely from the quantity of other kind of available resources. Therefore, while networking activities can increase flexibility, they also can increase the vulnerability of a SME (Barringer, 1997: 70).

According to the results presented above, most owner-managers of transnational SMEs give great importance to the necessity of flexibility as well as to that of securing the expertise property of their firms. Thus, by spreading out to many partners' tasks that do not belong to their

exclusive core competencies (Rothwell, 1991; Farrell and Doutriaux, 1996: 42), they avoid to be captive and ensure relative security to their expertise while benefiting from co-operation. This is facilitated by the fact that most of these companies have generally their own product, or complete solution, to be sold to other companies or end-user consumers (Larue de Tournemine, 1994; Géniaux, 1994). They are not acting as subcontractors even if most of them are selling to other companies. However, most previous studies generally consider SMEs as natural subcontractors of big businesses in the new global context (Barringer, 1997: 67; Oakey, 1993; Rothwell, 1991; Lorenzoni and Ornati, 1988; Fauré and al., 1979). This is not still the case when the worldwide competition is no longer related only to the quantity of resources, but also to unique human resource or technology competency (quality) that can be possessed by any company.

Associations from HOMALS have showed that networking propensity in transnational SMEs depends on some characteristics of the industry environment, organization and owner-manager. In depth examination of these associations also showed that networking propensity in transnational SMEs is related to the tasks to be carried out compared to available resources, the need of flexibility, and to the vulnerability and security risk for the SME unique core competence. In the following part of the paper, we will advance and discuss some propositions linking these factors.

Propositions and discussion

Networking propensity decision-making in transnational SMEs is a complex phenomenon that is economic as well as social, psychological, and emotional (Tallman and Shenkar, 1997). Many variables and propositions related to this phenomenon have been developed in previous studies. In this part of this paper, propositions and discussion are limited to factors identified above, namely, resources available, the need of flexibility and the desire to control the core competency.

Proposition 1: Transnational SMEs are most likely to act as outsourcer or collaborating members than subcontractor ones in their co-operative relationships

It has been observed that only few respondents (27%) consider subcontracting as necessary for the success of an SME as their own. But this proposition is also suggested by strong affirmations advanced by some respondents asserting that subcontracting could never be part of their activities.

According to their relatively limited resources, most transnational SMEs adopt a global strategy rather than a multidomestic one (Porter, 1986). This is facilitated by the fact that most of them have an industrial product for a specialized use and a geographically concentrated configuration of activities. They have a limited number of industrial customers whose needs can be easily identified through direct contacts or other ways like trade shows for a better adaptation of products. But these adaptations are minor because the product demand is, for most of them, the same (standard product) and requires lower level of pressures toward localization. Nonetheless, because their success is more related to the added value of their products rather than to the foreign investment, they need more flexibility and higher product quality. These are certainly performed through collaborative coalitions or outsourcing co-operation (Gunasekaran and al. 1996). By contrast, the situation would be different if the product needed many adaptations. In this case, firms would choose a multidomestic strategy and SME would act as a subcontractor of a big multinational company for the product localization at a domestic level. Consequently:

Proposition 1a: The more the SME product is standardized, the more likely the SME will be transnational with a global strategy

Proposition 1b: The less the SME product is standardized, the more the SME will be subcontractor at a domestic level.

Proposition 2: In Transnational SMEs, networking propensity to outsource or collaborate is related to the quantity of activities to carry out in comparison with the quantity of resources available, the need for flexibility and the risk of security.

It has been observed from results above that great quantity of outsourcing activities was suggested to small firms in an emerging industry than to medium-sized firms in a mature industry. Both, small-sized firms and medium-sized ones need to overcome the risk expropriation of their exclusive private knowledge and avoid being captive of one partner. Medium-sized firms have more resources and can internalize many activities. However, small firms have lesser resources and cannot internalize many activities such as medium-sized companies use to do. They must outsource relatively more activities than medium-sized firms. In addition, to ensure the control on their core competency and maintain their independence, they co-operate with many partners.

On the other hand, the level of technology intensity conveys the need of flexibility. When the level of technology intensity is higher, SME need more flexibility to adapt quickly to the fast changing environment. This is achieved more easily if different specialized partners carry out different tasks than when they are done by one partner. That is why a great quantity of outsourcing activities were recommended to firms in an industrial environment with higher level of technology intensity than to those in an industrial environment with a lower level of technology intensity. Seemingly, the need for flexibility can also justify the fact that more outsourcing activities are suggested to transnational SME with end-user product for a standardized demand or to those with industrial product for customized demand. Consequently:

Proposition 2a: When a transnational SME possesses limited resources, the more likely it will outsource selected activities, and the more a transnational SME has sufficient resources to be autonomous, the less likely it will outsource its activities.

Proposition 2b: The more the core competence of a transnational SME can be imitated, the more higher the number of partners to whom the SME will outsource its activities.

Proposition 2c: The more higher the level of technology intensity of a transnational SME environment, the more the SME will outsource its activities.

Proposition 3: The location of cooperative activities in the value chain of a transnational SME is related to the level of technology intensity.

It has been shown that the collaborating or outsourcing activities at the manufacturing level are mostly recommended to transnational SME in an environment with a high level of

technology intensity while the outsourcing activities at a the level of product/service conception were recommended mostly to transnational SMEs in an environment with a lower level of technology intensity. This surprising observation can be explained by the fact that transnational SMEs in high intensity technology environments are generally small and young. They may, for example, hold proprietary knowledge in a specific area such as software development. However, they may lack sufficient resources to manufacture. By contrast, transnational SMEs in an environment with a low intensity technology are generally medium-sized. They can have the necessary equipment to manufacture, but often use ideas conceived externally. Consequently:

Proposition 3a: The higher the level of technology intensity, the more likely that the networking activities of a transnational SME will be located at the manufacturing level.

Proposition 3b: The lower the technological intensity, the more likely the networking activities of a transnational SME will be located at the product/service conception level.

Conclusions and directions for future research

The scope of activities in comparison with available resources, flexibility need, and security concern for the core competency control are suggested by this study as important factors to consider in determining the quantity and nature of networking propensity in transnational SMEs. These results imply that the negotiating power between networking partners do not stem from available resources only, but also from the expertise (Thorelli, 1986). The expertise of transnational SMEs is based on their unique core competency that they try to protect through threatening, but unavoidable and advantageous networking activities.

On the other hand, results above show the complexity of inter-firms networking activities and related factors. As previously observed, this practice cannot be sufficiently explained by one theory (Baudry, 1995). It is by contrast at the crossroad of many theories related to areas such as the hierarchy and market (Williamson, 1975; Aoki, 1986), the organizational learning (Dodgson, 1993; Ingham, 1994) and the strategic ambition (Kogut, 1988). Its success necessitates taking into account the complex nature of its factors as such as the power (Thorelli, 1986), the reputation, the trust and the reciprocity (Lorenzoni and Ornati, 1988; Kataoka, 1994), and the adequacy between its structure and advantages for partners (Parkhe, 1993; Mohr and Speckman, 1994).

Results from this study should however be considered as explorative. Their use must take into account the small size of the sample and the unique source of SMEs studied (transnational SME from Quebec). There maybe, additional factors, over and above the ones identified by this study. Nevertheless, they give new insights into networking propensity of transnational SMEs. These factors should receive more attention in future research and practice. Future research can also deepen the relative importance of flexibility and security according to the industrial, the organizational and the managerial characteristics of the transnational SME. The situation of subcontractor SMEs also needs closer examination. Practitioners can try to answer the following questions when making decisions about networking activities: what are the core competences of the firm? What competences the firm can outsource to the networking partner without threatening own existence? What can be the ideal number of partners to ensure the security of the firm while benefiting from the reduction of cost transaction advantage of the co-operation? In

general, this study has shown that even willing to co-operate in view of supplying their limited resources, transnational SMEs are still committed to their autonomy.

REFERENCES

- Agmon T. and R. Drobnick, 1994, *Small Firms in Global Competition*, New York. Oxford University Press.
- Aoki M., 19886, "Horizontal vs. Vertical Information Structure of the Firm", *American Economic Review*, 76(5): 971-983.
- Balakrishnan S. and B. Wernerfelt, 1986, "Technical Change, Competition and Vertical Integration", *Strategic Management Journal*, 7(4): 347-359.
- Barlett C.A. and S. Ghoshal, 1987, "Managing across Borders: New Strategic Requirements", *Sloan Management Review*, 28(4): 7-17.
- Barney J.B. and A.H. Ringleb, 1992, "Organizational Responses to Legal Liability: Employee Exposure to Hazardous Materials, Vertical Integration, and Small Firm Production", *Academy of Management Journal*, 35(2): 328-349.
- Barringer B.R., 1997, "The Effects of Relational Channel Exchange on the Small Firm: A Conceptual Framework", *Journal of Small Business Management*, 35(2): 65-79.
- Baudry B., 1995, *L'économie des relations interentreprises*, Paris. Éditions La Découverte.
- Belley J.-G. and al., 1995, "Les PME et les risques de la sous-traitance industrielle à l'ère de l'assurance qualité", *Revue Internationale PME*, 8(2): 49-77.
- Blasius J., 1994, Correspondence Analysis in Social Science Research, in, Greenacre M. and J. Blasius (eds.), *Correspondence Analysis in the Social Sciences*, London. Academic Press: 23-52.
- Brush C.G., 1992, *Factors Motivating Small Companies to Internationalize: The Effect of Firm Age*, Ph.D. Thesis, Boston University.
- Bryant F.B. and P.R. Yarnold, 1995, Principal-Components Analysis and Exploratory and Confirmatory Factor Analysis, in, Grimm L.G. and P.R. Yarnold (eds.), *Reading and Understanding Multivariate Statistics*, Washington. American Psychological Association: 99-136.
- Bull A.C., M. Pitt and A.J. Szarka, 1991, "Small Firms and Industrial Districts, Structural Explanation of Small Firm Viability in Three Countries", *Entrepreneurship & Regional Development*, 3(1): 83-99.

- Butler R.J. and Carney, 1986, "Strategy and Strategic Choice: The Case of Telecommunications", *Strategic Management Journal*, 7(2): 161-177.
- Canals J., 1995, Country-, Industry- and Firm-Specific Factors in Global Competition, in, H. Thomas, D. O'Neal and James Kelly (eds.), *Strategic Renaissance and Business Transformation*, Chichester. John Wiley & Sons: 107-133.
- Celeux G. and J.-P. Nakache, 1994, *Analyse discriminante sur variables qualitatives*, Paris. Polytechnica.
- Cheung Y. -L., 1994, "Categorical Criteria Values: Correspondence Analysis", *Omega*, 22(4): 371-380.
- Christensen P.R., 1991, "The Small and Medium-sized Exporters' Squeeze: Empirical Evidence and Model Reflections", *Entrepreneurship & Regional Development*, 3(1): 49-65.
- Dalkey N.C., 1972, The Delphi Method: An Experimental Study of Group Opinion, in, N.C. Dalkey, D.L. Rourke, R. Lewis and D. Snyder (eds.), *Studies in the Quality of Life: Delphi and Decision-Making*, Lexington. Lexington Books: 13-54.
- Darréon J.-L. and S. Faïçal, 1993, "Les enjeux des partenariats stratégiques entre grandes entreprises et PME", *Revue Française de Gestion*, 95: 104-115.
- Dean J., S. Holmes and S. Smith, 1997, "Understanding Business Networks: Evidence from the Manufacturing and Service Sectors in Australia, ", *Journal of Small Business Management*, 35(1): 78-84.
- DeMott J.S., 1994, "Company Alliances for Market Muscle", *Nation's Business*, 82(2): 52-53.
- Dodgson M., 1993, "Learning, Trust, and Technological Collaboration", *Human Relations*, 46(1): 77-95.
- Dodgson M. and R. Rothwell, 1991, "Technology Strategies in Small Firms", *Journal of General Management*, 17(1): 45-55.
- Dubost N., 1996, "Un exemple de stratégie de renforcement des moyennes entreprises (ME): l'échange relationnel comme moyen de gérer la dépendance économique envers les clients", *Revue Internationale PME*, 9(2): 126-142.
- Easton G., G. Burrell, R. Rothschild and C. Sherman, 1993, *Managers and Competition*, Oxford. Blackwell Publishers.

- Entreprise*, 1995, "Les secrets des cent plus belles entreprises françaises", Magazine *Entreprise*, no 117: 30-60.
- Esposito E. and M. Raffa, 1992, "Qualité et sous-traitance dans l'industrie italienne: quelques résultats d'une étude empirique", *Revue Internationale PME*, 5(2): 57-82.
- Estades and Ramani, 1997, "Trajectoires technologiques et mobilisation de réseaux dans les PME de biotechnologie en France et en Grande-Bretagne", *Revue Internationale PME*, 10(3-4): 39-56.
- Farrell C. and J. Doutriaux, 1996, "Collaborative Strategies or Internal Development: When are they most Appropriate for Canadian Entrepreneurial High-tech Firms and Why"? *Journal of Small Business and Entrepreneurship*, 13(1): 25-44.
- Faucon E. and N. Levratto, 1994, "PMI en situation d'insularité et marchés internationaux: le cas de la Corse", *Revue Internationale PME*, 7(2): 31-58.
- Fauré R., M. Marshesnay and B. Mathié, 1979, "L'ombre des grands", *Revue Française de Gestion*, sept-oct.(22): 108-115.
- Fernandez G. and A. Noël, 1994, "PME, mondialisation et stratégies", *Revue Internationale PME*, 6(3-4): 145-163.
- Fombrun C.J. and S. Wally, 1992, Global Entanglements: The Structure of Corporate Transnationalism, in, V. Pucik, N.M. Tichy and C.K. Barnett (eds.), *Globalizing Management: Creating and Leading the Competitive Organization*, New York. John Willey & Sons.
- Forrest J.F., 1990, "Strategic Alliances and the Small Technology-based Firm", *Journal of Small Business Management*, 28(3): 37-45).
- Furukawa K., Teramoto Y. and Kanda M., 1990, "Network Organization for Interfirm R&D Activities: Experiences of Japanese Small Businesses", *International Journal of Technology Management*, 5(1): 27-40.
- Géniaux I., 1994, "Les entreprises de développement technologique", *Revue Internationale PME*, 6(3-4): 37-57.
- Gifi A., 1990, *Nonlinear Multivariate Analysis*, Chichester. John Wiley & Sons.

- Greenacre M., 1994, Correspondence Analysis and Its Interpretation, in, Greenacre M. and J. Blasius, *op. cit.*: 3-22.
- Greenacre M.J., 1993, *Correspondence Analysis in Practice*, London. Academic Press.
- Greenacre M.J., 1991, Interpreting Multiple Correspondence Analysis, *Applied Stochastic Models and Data Analysis*, 7: 195-210.
- Greenacre M. and J. Blasius (eds.), 1994, *Correspondence Analysis in the Social Sciences*, London. Academic Press.
- Guilhon B., 1993, " Les relations entre constructeurs et fournisseurs: l'exemple de l'industrie automobile", *Revue Internationale PME*, 6(1): 87-99.
- Gunasekaran A., P. Okko, T. Martikainen and P. Yli-Olii, 1996, "Improving Productivity and Quality in Small and Medium Enterprises: Cases and Analysis", *International Small Business Journal*, 15(1): 59-72.
- Hara G. and T. Kanai, 1994, "Entrepreneurial Networks Across Oceans to Promote International Strategic Alliances for Small Businesses", *Journal of Business Venturing*, 9(6): 489-507.
- Harry D., 1990, "Corporation of the Future: How Strategic Alliances and Networking Will Reshape the 90s", *Small Business Reports*, 15(5): 55-63.
- Harrigan K.R., 1988, "Joint Ventures and Competitive Strategy", *Strategic Management Journal*, 9(2): 141-158.
- Heisser W.J. and Meulman J.J., 1994, Homogeneity Analysis: Exploring the Distribution of Variables and their Nonlinear Relationships, in, Greenacre M. and J. Blasius, *op. cit.*: 181-209
- Héraud J.-A. and C. Nanopoulos, 1994, "Les réseaux de l'innovation dans les PMI: illustration sur le cas de l'Alsace", *Revue Internationale PME*, 7(3-4): 65-86.
- Hodgetts R.M., F. Luthans and S.M. Lee, 1994, "New Paradigm Organizations: From Total Quality to Learning to World-class", *Organizational Dynamics*, 22(3): 5-19.
- Hoffman D.L. and G.R. Franke, 1986, "Correspondence Analysis: Graphical Representation of Categorical Data in Marketing Research", *Journal of Marketing Research*, 23 (3): 213-227.
- Holmlund M. and S. Kock, 1996, "Buyer Dominated Relationships in a Supply Chain: A Case Study of Four Small Suppliers", *International Small Business Journal*, 15(1): 26-40.

- Ingham M., 1994, "L'apprentissage organisationnel dans les coopérations", *Revue Française de Gestion*, 97: 105-121.
- Jambu M., 1989, *Exploration informatique et statistique des données*, Paris, Dunod.
- Jarillo J.C., 1988, "On Strategic Networks", *Strategic Management Journal*, 9(1): 31-41.
- Jones R., 1996, "Small-firm Success and Supplier Relations in the Australian Boat-building Industry: A Contrast of Two Regions", *Journal of Small Business Management*, 34(2): 71-78.
- Julien P.-A., 1994, "L'entreprise partagée: contraintes et avantages", *Gestion*, 19(4): 48-58.
- Karagozoglu N. and M. Lindell, 1998, "Internationalization of Small and Medium-sized Technology-based Firms: An Exploratory Study", *Journal of Small Business Management*, 36(1): 44-59.
- Kataoka H.C., 1994, The Effectiveness of Interorganizational Relationships in a Network Organization, in B. Dyck (ed.), *Annual Conference of the ASAC*, Halifax, ASAC, 15: 31-40.
- Kogut B., 1988, "Joint Ventures: Theoretical and Empirical Perspectives", *Strategic Management Journal*, 9(4): 319-332.
- Larson A., 1992, "Network Dyads in Entrepreneurial Settings: A Study of the Governance of Exchange Relationships", *Administrative Science Quarterly*, 37(1): 76-104.
- Larue de Tournemine R., 1994, "La complémentarité stratégique entre grande entreprise et PME en matière d'innovation technologique", *Revue Internationale PME*, 7(3-4): 173-200.
- Lebart L., A. Morineau and K.M. Warwick, 1984, *Multivariate Descriptive Statistical Analysis: Correspondence Analysis and Related Techniques for Large Matrices*, New York. John Wiley & Sons.
- Lecoq B., 1995, "La relation technologie-territoire et les milieux innovateurs", *Revue Internationale PME*, 8(1): 81-106.
- Lipnack J. and J. Stamps, 1993, "One plus One Equals Three", *Small Business Reports*, 18(8): 49-58.

- Lorenzoni G. and O.A. Ornati, 1988, "Constellations of Firms and New Ventures", *Journal of Business Venturing*, 3(1): 41-57.
- McDougall P.P., S. Shane and B.M. Oviatt, 1994, "Explaining the Formation of International New Ventures: The Limits of Theories from International Business Research", *Journal of Business Venturing*, 6(6): 469-487.
- Miles G., S.B. Preece, and M.C. Baetz, 1999, "Dangers of Dependence: The Impact of Strategic Alliance Use by Small Technology-Based Firms", *Journal of Small Business Management*, 37(2): 20-29.
- Mohr J. and R. Spekman, 1994, "Characteristics of Partnership Success: Partnership Attributes, Communication Behavior, and Conflict Resolution Techniques", *Strategic Management Journal*, 15(2): 135-152.
- Murphy P., J. Daley and D. Dalemberg, 1991, "Smaller Shippers Play Important Global Role", *Transportation & Distribution*, 32(12): 41-42.
- Nadeau M.-A., 1982, *La technique delphi: une technique utile*, Québec. Département de Mesures et Évaluation, Université Laval.
- Oakey R.P., 1993, "Predatory Networking: the Role of Small Firms in the Development of the British Biotechnology Industry", *International Small Business Journal*, 11(4): 9-22.
- Oakey R.P. and S.Y. Cooper, 1991, "The Relationship between Product Technology and Innovation Performance in High Technology Small Firms", *Technovation*, 11(2): 79-92.
- Olleros F. -J. and R.J. Macdonald, 1988, "Strategic Alliances: Managing Complementarity to Capitalize on Emerging Technologies", *Technovation*, 7(2): 155-176.
- Oviatt B.M. and P.P. MacDougall, 1997, Toward a Theory of International New Ventures, in, H. Vernon-Wortzel and L.H. Wortzel (eds.), *Strategic Management in a Global Economy*, John Wiley and Sons. New York: 110-123.
- Parkhe A., 1993, "Strategic Alliance Structuring: a Game Theoretic and Transaction Cost Examination of Interfirm Cooperation", *Academy of Management journal*, 36(4): 794-829.
- Pitt M., J. Szarka and A. Bull, 1991, "Executive Characteristics, Strategic Choices and Small Firm Development: A Three-country Study of Small Textiles and Clothing Firms", *International Small Business Journal*, 9(3): 11-30.

- Porter M.E., 1986, "Changing Patterns of International Competition", *California Management Review*, 28(2): 9-40.
- Reynaud D., 1979, "Perspectives pour les PME: l'ambition internationale", *Revue Française de Gestion*, no 22: 92-101.
- Richards T.J. and L. Richards, 1998, Using Computers in Qualitative Research, in, N.K. Denzin and Y.S. Lincoln (eds.), *Collecting and Interpreting Qualitative Materials*, Thousand Oaks, Sage Publications: 211-245.
- Rothwell R., 1991, "External Networking and Innovation in Small and Medium-sized Manufacturing Firms in Europe", *Technovation*, 11(2): 93-112.
- Scully J.I. and S.E. Fawcett, 1994, "International Procurement Strategies: Challenges and Opportunities for the Small Firm", *Production and Inventory Management Journal*, 35(2): 39-46.
- Senker J., 1994, "L'accès de la PME à la recherche fondamentale", *Revue Internationale PME*, 7(3-4): 121-146.
- Shutt J. and R. Whittington, 1987, "Fragmentation Strategies and the Rise of Small Units: Cases from the North West", *Regional Studies*, 21(1): 13-23.
- Simons G.R. and C. Kerr, 1993, "Networking TQM for Small Manufacturing", *Journal for Quality & Participation*, 16(6): 6-11.
- Simon H., 1990, Hidden Champions: Spearheads of Germany's Export Success, *Working Paper* 02-90, Johannes Gutenberg-University.
- Stevens M., 1992, Strategic Partnership: Even Small Companies Can Form Alliances that Expand their Capabilities, *D & B Reports*, Nov.-Dec.: 50-51.
- Strutton D. and L.E. Pelton, 1994, "A Multiple Correspondence Analysis of Telephone Contact Rates", *The Mid-Atlantic Journal of Business*, 30(1): 27-40.
- Szarka J., 1990, "Networking and Small Firms", *International Small Business Journal*, 8(2): 10-22.
- Tallman S.B. and O. Shenkar, 1997, A Managerial Decision Model of International Cooperative Venture Formation, in, H. Vernon-Wortzel and L.H. Wortzel (eds.), *Strategic Management in a Global Economy*, New York. John Wiley and Sons: 246-262.

Thorelli H.B., 1986, "Networks: Between Markets and Hierarchies", *Strategic Management Journal*, 7(1): 37-51.

Unger H., 1988, "Small Firms Help Large Firms Nourish New Ideas", *Industrial Management*, 12(1): 12

Van de Geer J.P., 1993, *Multivariate Analysis of Categorical Data: Applications*, Newbury Park. Sage.

Williamson O., 1975, *Markets and Hierarchies: Analysis and Anti-trust Implications*, New York. Free Press.

Table 1: Associations between explanatory variables and suggested quantity of networking activities per type of co-operation

Variables	Categories	Percent of Ideal Subcontracting Activities						Percent of Ideal Collaborative Activities						Percent of Ideal Outsourcing Activities					
		None	Very low	Low	Mode-rate	High	Very high	None	Very low	Low	Mode-rate	High	Very high	None	Very low	Low	Mode-rate	High	Very high
Nature of the demand	Customized Standardized													*		*		*	
Scope of the product use	Specialized General																*		*
Target market	End-users Industrials	*	*			*		*						*		*	*		*
Technological intensity	Low High		*	*	*		*	*	*	*		*	*	*			*	*	*
Stage of development	Emerging Mature		*	*	*											*	*	*	*
Size of the firm	Small Medium													*	*			*	*
Organizational structure	Organic Mechanistic														*	*			
Required core competencies	Human res. technology																		
Age of the firm	Young Old													*	*	*		*	*
Manager's level of specialization	Less High																		
Manager's level of instruction	No university University																		
Manager's level of experience	Less High																		
Age of the manager	Young Mature		*	*	*		*												

* Consistent associations at the two levels of analysis.

Appendix 1: Networking activities suggested for the success of transnational SMEs

<i>Necessity of networking activities to the success of transnational SMEs in the global market</i>				
Categories		% of owner-managers by category according to the type of co-operation		
		Subcontracting	Collaborating	Outsourcing
Networking activities absolutely necessary to success		27	91	80
Networking activities not necessary to success		73	9	20
Total		100	100	100
<i>Proportions of networking activities suggested for each type of co-operation</i>				
Relative quantity of activities (%)	Categories	% of owner-managers by category according to the type of co-operation		
		Subcontracting	Collaborating	Outsourcing
0	No one	22.5	2.5	12.5
1-9	Very low	12.5	20.5	12.5
10-24	Low	25.5	27.5	42.5
25-49	Moderate	30.0	32.5	17.5
50-74	High	5.0	7.5	10.0
75-100	Very high	5.0	7.5	5.0
No answer		0.0	2.5	0
Total		100.0	100.0	100.0
<i>Number of partners suggested for each type of co-operation</i>				
Number of partners	Categories	% of owner-managers by category according to the type of co-operation		
		Subcontracting	Outsourcing	
0	No one	22.5	10.0	
1-5	Few	30.0	30.0	
6-10	Moderate	12.5	25.0	
11 and more	Many	12.5	17.5	
No answer		22.5	17.5	
Total		100.0	100.0	

Appendix 1 (continued)

<i>Location of co-operation activities on the industrial chain of value according to the type of co-operation</i>			
Co-operation area	% of owner-managers by category according to the type of co-operation		
	Subcontracting	Collaborating*	Outsourcing
Research	0.0	15.0	0.0
Conception	2.5	20.0	0.0
Purchasing and procurement	0.0	34.0	0.0
Manufacturing	15.0	51.0	68.0
Distribution	7.5	32.0	0.0
Marketing	0.0	0.0	2.5
Maintenance	0.0	0.0	2.5
Accounting	0.0	0.0	2.5
No answer		0.0	24.5
	75.0		
Total	100.0		100.0

*For the collaborative co-operation, some respondents have given more than one answer.