

Business Relationships and Subcontractors' Capabilities: a Portfolio Approach

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Abstract

We aim to understand how the customer relationship portfolio of a subcontractor changes as the subcontractor evolves its capabilities. While this line of research is under-investigated in the literature on business relationships, we believe that it is a crucial aspect to gaining new insights about how competitive advantages are developed in industrial markets. To address this research question we studied the customer relationship portfolio of 62 subcontractors located in the mechanical industrial district of Pordenone (North East Italy). We used univariate analysis of variance (ANOVA) as the appropriate statistical technique to test the potential associations between the measures involved in the study. From the results we derived three propositions that reveal the dynamics between subcontractors' capabilities and their business relationship portfolios. Academic and original managerial contributions have been proposed and discussed.

1. Introduction

A large body of research on buyer-supplier relationships has developed over the last years (e.g. Dwyer, Schurr & Ho, 1987; Dyer, 1997; Zhao & Cavusgil, 2006). Much has been learned about the benefits of developing collaborative relationships (e.g. Helper & Sako, 1995; Dyer & Singh, 1998; Kotabe, Martin & Domoto, 2003) or about the dynamics of interfirm relationships embedded in business networks (Ford, Håckansson & Johanson, 1986; Håckansson & Snehota, 1995). However, in the literature there is a tendency to focus on the understanding of an individual relationship without considering how the firm manages the whole array of its vertical relationships (Wagner & Johnson, 2004).

Consistent with such considerations, the aim of this paper is to understand how small and medium subcontractors (SMSs) change the configuration of their portfolios of downstream relationships as they develop new capabilities over time.

This research question is particularly relevant within geographical industrial clusters, a specific form of production organization which has developed and become particularly widespread in Italy but also in many other countries. Mutual commitment and mutual orientation are typical features of vertical inter-firm relationships developed by SMSs and their main customers within industrial clusters. Challenged by globalization and new technologies, in recent years clusters have undergone major structural and strategic changes, partly losing their historical peculiarities (Berger & Locke, 2001; Corò & Grandinetti, 2001). Firstly, increasing competition from producers located in low-cost countries and ever new, more powerful information and communication technologies have reduced the importance of geographical proximity with main customers as a competitive advantage factor. Secondly, globalization and the related risks require financial structures and managerial capabilities that are not easily accessible and adoptable by SMSs, which are mostly undercapitalized, family owned and run businesses. In this scenario, where innovation and internationalization are the key success factors, competencies other than manufacturing efficiency and flexibility have become critical. In the attempt to address at least some of these structural weaknesses,

many firms located in the clusters are changing (Camuffo, 2003). On the one hand, the largest firms, usually assemblers/buyers located in the downstream sections of supply chains, have changed sourcing policies, reducing their dependence on their local suppliers' bases, actively seeking low-cost sources in emerging areas such as East Europe and East Asia and establishing direct access to global markets even with autonomous distribution networks. On the other hand, some of the SMSs have also tried to carve out a new role within global supply chains, diversifying their business and customer portfolio, reducing their level of symbiosis with few, local main customers and sometimes moving from subcontracting to direct business.

This evolutionary process is very selective since it calls for the development of appropriate capabilities that traditional SMSs do not usually have. As a matter of fact, SMSs need to develop appropriate design and marketing capabilities in order to diversify and internationalize their customer portfolio and, ultimately, maintain a competitive advantage (Esposito & Raffa, 1994). A recent study on a large and representative sample of Italian subcontractors (Furlan, Grandinetti & Camuffo, 2007) identifies four clusters of Italian subcontractors on the basis of their design and marketing capabilities: "developed subcontractors" (24.2% of the sample), "developing subcontractors" (12.2%), "question mark subcontractors" (32.0%) and "traditional subcontractors" (23.7%). In comparison with traditional subcontractors, developed subcontractors have undergone an evolutionary process that has led them to diversify their customer portfolio, to increase the proportion of exports on total sales (an average of 23.7%) and to develop valuable design and marketing capabilities.

Since a relationship model based on geographical proximity and embeddedness does not appear reproducible on an international basis, it therefore becomes interesting to understand how the whole array of relationships between a subcontractor and its customers changes as the former internationalizes its customer portfolio and ultimately evolves its capabilities. To address this research question we study the customer relationship portfolio of 62 subcontractors located in the mechanical industrial cluster of Pordenone (North East Italy).

The paper is organized as follows. The second section reviews the relevant literature on buyer-supplier relations. The third section describes the data, research design and method. Section four presents the results of the research while section five discusses the theoretical and managerial implications of the findings. Section six concludes the paper.

2. Theoretical background

To address our research question we draw from the section of buyer-supplier relationship literature that studies the dynamics of buyer-supplier relationships. This literature is vast and is located at the crossroads of a variety of managerial disciplines such as industrial marketing, supply chain management and organizational design.

We identify three different streams of literature that take different perspectives and leverage on different theories to study the same phenomena, i.e. the evolution of business to business relationships.

The first and most common stream of literature takes the perspective of the buyer and studies the transition of vertical relationships from arm's length to partnership characterized by a high degree of interaction and collaboration between buyer and supplier.

During the 1990s, several studies recognized that supplier relations based on cooperation, trust and risk sharing were successfully emerging in a number of

industries. For example, the studies on “lean suppliers” by the International Motor Vehicle Program at MIT (Cusumano & Takeishi, 1991; Helper & Sako, 1995 and 1998; Helper & MacDuffie, 1997; Fine, 1998) showed that North American and European assemblers and suppliers were converging to Japanese-style supplier relation management, moving from competitive, adversarial relationships, to more cooperative ones, characterized by risk-sharing practices. More recently, Helper, MacDuffie and Sabel (2000) suggest that “voice” practices like benchmarking, co-design, and “root cause” error detection and correction are the pragmatist mechanisms that constitute “learning by monitoring” a relationship in which buyers and suppliers a) continuously improve their joint products and processes; and b) control opportunism and share risk.

Along this vein several studies have tried to model the dynamics of supplier relations and link this evolution with the evolution of the firms involved in these relationships. Lamming’s (1993) groundbreaking work on suppliers’ evolution identifies nine factors (e.g. competitive pressure, adoption of information sharing and negotiation practices, supplier integration in new product development and logistics) that need to be considered in the analysis of buyer-supplier relationships. On the basis of these factors he proposes an evolutionary pattern that marks the transition from traditional subcontracting to partnership relationships. Several benefits are related to closer customer relationships for the SMSs such as higher sales volumes, shorter product-development lead times, lower logistics and transportation costs (Bradley, Meyer & Gao, 2006). Moreover, through the exchange of knowledge between buyer and supplier the parties increase their own stock of knowledge and capabilities that can be spent on the market and improve their operational performance (Kotabe, Martin & Domoto, 2003). In this regard, supplier development programs are examples of how the buyer can help the supplier develop the capabilities it lacks the most in order to become a valuable partner within the partnership (Wagner & Johnson, 2004; Handfield et al., 2000).

The second stream of literature involves a much more restricted number of studies than the first stream. While this second stream of literature also focuses on the buyer-supplier relationship, it employs, differently from the previous stream, the supplier capabilities perspective. Some of these scholars model the evolution of suppliers by analysing the characteristics of their relations with the main contractors. For example, Zandoni (1992) identifies an evolutionary pattern (from traditional subcontracting into partnership) contingent on the evolution of some characteristics of the supply relationship (i.e. information sharing, technological integration, early supply involvement in new product development). Some others emphasize knowledge transfer as the main determinant of subcontractors’ evolution. For example, Esposito and Lo Storto (1992) first identify four components in the technological knowledge of a subcontractor: machines (e.g. computerized numerical control tools), individual skills (e.g. design, engineering, testing), formal documentation (e.g. drawings, specifications) and organizational routines (quality manuals and procedures); then they argue that changes in one or more of these components trigger the evolution of the subcontractor. Esposito and Raffa (1994) subsequently developed this point suggesting that several knowledge transfer mechanisms (technical help, on-site support, resident engineers, training, exchange of documents, equipment and machines) can induce changes in equilibrium among the four components of technological knowledge, thus triggering subcontractors’ evolution. Their findings provide evidence that in the early nineties Italian supply systems were moving towards supplier relations characterized by more

intense technological knowledge transfer, stronger inter-firm collaboration and increasing subcontractors' involvement and responsibilities in design. Moreover, they found that, although subcontractors still focused on few customers (on average the first two customers accounted for 70% of the subcontractors' total sales), they tended to diversify their customer portfolios by leveraging on their growing technological knowledge.

A third stream of literature tries to link the resources and the capabilities of both parties involved in the relationship with the dynamic of the relationship itself. One of the prominent schools of thought concerning this stream of literature evolved from the IMP Group (Håkansson, 1982; Håkansson & Snehota, 1995). Håkansson and Snehota (1995) propose the activities-actors-resources model describing how a business relationship can be analysed through its individual substance layers (activity links, resource ties and actor bonds). Activity links are the links between the activities performed by each actor involved in the relationship. Resource ties are the links used by the actors to exchange existing resources, access complementary resources and create new ones. Actor bonds describe the bonds between the actors through their perceptions, their trust and their understanding of each other. It is the interplay of bonds, ties and links that is "at the origin of change and development in relationships" (Håkansson & Snehota, 1995, p. 171).

On the whole these three streams of literature provide us with a fundamental insight: subcontractor capability development affects and is affected by the nature of the supply relationships in which the subcontractor itself is engaged. This makes the dynamic relationships between subcontractor's capabilities and the nature of its customer relationships a research topic worth studying.

This paper investigates the relationship between SMS capabilities and the nature of the relationships within their customer portfolios. We aim to overcome two major limitations that flaw the literature. Firstly, most of the studies have focused on the evolution of business relationships towards the collaborative model (Ford, Håkansson & Johanson, 1986) without considering how the subcontractor's whole relationship portfolio evolves. Thus, a deterministic approach emerged indicating the path towards the collaborative model as the unique evolutionary path for all business relationships. Our study rejects this deterministic approach and assumes a higher autonomy of the subcontractor in choosing the composition of its business relationship portfolio.

3. Methodology

3.1. Research design and context

The Italian industrial system represents an ideal research setting for a study on subcontractors' capabilities and their customer relationships. It is known worldwide for the high level of firm size fragmentation, its organization around geographically coupled production systems (i.e. industrial districts) and the presence within them of a large number of small and medium subcontractors specialized in one or few phases of a supply chain (Sabel & Piore, 1984; Porter, 1990; Sforzi, 2003). Traditionally, Italian subcontractors have prospered in such "protected", semi-closed environments, embedded in well-defined geographical clusters. They have relied on a few main co-located customers, and such "quasi-captive" demand has usually saturated their production capacity and shaped their capabilities. However, challenged by globalization and new technologies, these production systems have undergone major structural and strategic changes in recent years (Becattini & Rullani, 1996; Berger & Locke 2001;

Corò & Grandinetti, 2001). While manufacturing, built on a heritage of craftsmanship and skilled labour, has historically been district firms' core competence, marketing and design capabilities have been neglected and underdeveloped. Now that innovation and internationalization are the key success factors, capabilities other than manufacturing efficiency and flexibility have become critical. At the same time it has become critical to change the relationships with customers accordingly.

Our study is based on a sample of 62 subcontracting firms, drawn from a population of firms operating in the mechanic industrial district (MID) of Pordenone. This cluster, located in the North East of Italy, perfectly fits the typical situation of an Italian district (Bortoluzzi, Furlan & Grandinetti, 2006). It currently counts 487 limited companies which mostly arose as the consequence of spin-offs from a few large firms, that acted as incubators. Indeed, about 74% of the company founders of our sample before starting their own business were employees of firms located in the MID. Typically, at inception, these firms had only one client (the originating firm) and were merely executors of the specifications provided by this customer. Two firms were especially important as incubators: "Zanussi-Elettrolux" (household appliance industry) and "Officine Savio" (textile machinery industry). More recently the MID has evolved in two ways: on the one hand, with the rise of an important segment of industrial machinery manufacturers with a remarkable internationalization attitude towards final markets, and on the other hand, many subcontracting firms originated from spin-offs have successfully diversified both their customers and their product portfolios.

The 62 subcontractors included in the sample were randomly sampled from a data base of the 487 limited companies located in the MID (the data base was provided by the Pordenone Chamber of Commerce). To select the subcontractors to include in the research sample we have adopted the following definition of subcontracting: "a situation where the firm offering the subcontract requests another independent enterprise to undertake the production or carry out the processing of a material, component, part or subassembly for it according to specifications or plans provided by the firm offering the subcontract" (Holmes, 1986, p. 84).

Table 1 gives information about the size of the firms in the sample showing that most of the subcontractors are small firms while only 16.1% of them can be considered medium sized firms, those having more than 50 employees.

Table 1
Distribution of the subcontractors by size

Employees range	N	%
1-9	15	24.2
10-19	14	22.6
20-49	23	37.1
50-99	7	11.3
100-249	2	3.2
250 or more	1	1.6
Total	62	100.0

We interviewed all the firms with a structured questionnaire of 53 multiple choice questions concerning our research topic. Interviews have been personally conducted with the founder or the C.E.O. of the firms. Each interview took approximately 1.5 hours.

3.2. Constructs and their measures

The questionnaire encompasses a variety of variables and is part of a broader research project on the evolution of Italian subcontractors. However, in accordance with the aim of this study and in line with the literature reviewed in the previous section, in this paper we used only two sets of variables.

The first set of variables is related to subcontractor capabilities. In particular the focus is on two subcontractor capabilities: design and marketing capabilities. We chose to focus on these two capabilities because a recent study (Furlan, Grandinetti & Camuffo, 2007) carried out on a large sample of Italian subcontractors shows that these are the ones mostly involved in the evolution process of subcontractors. Marketing capabilities can indeed alleviate subcontractors' dependence on local demand and facilitate customer portfolio diversification and internationalization while design capabilities are the prerequisite to establishing more valuable and balanced relationships with a wider array of customers.

The second set of variables is related to the types of customer relationships of the subcontractor. We relied on the vast literature on strategic supplier portfolio (Wagner & Johnson, 2004; Dyer & Singh, 1998) and on customer-supplier integration (Furlan, Romano & Camuffo, 2006; Sobrero & Roberts, 2002; Asanuma, 1989) to distinguish three types of customer-supplier relationships on the basis of their nature: arm's length relations, traditional subcontracting relations and partnership relations. For each type of relationships, we asked the informant to provide both the number of relationships and their weight on SMS's total sales.

In the following paragraphs we discuss in detail the construct definitions and the set of measures we employed in the empirical research.

3.2.1. Subcontractors' marketing and design capabilities

Marketing capabilities. We can define marketing capabilities as the ability of the subcontractor to monitor the market, to seek and identify new opportunities and market niches, and to establish mutually satisfying exchange relationships with the customers (Baker, 1995). This definition of marketing capabilities is in line with the concept of market orientation that marketing scholars define as the organization-wide generation of market intelligence, the dissemination of that intelligence across organizational units, and the organization-wide responsiveness to it (Tuominen, Rajala & Moller, 2004; Jaworski & Kohli, 1993).

According to Tuominen, Rajala and Moller (2004) we expect that companies operating only in the domestic market do not require as high a level of market orientation as companies with a global focus. Especially for the SMSs embedded in geographical clusters, the establishment of foreign relationships informs us of an evolutionary discontinuity that requires adequate capabilities in order to cope with a more complex marketplace. Thus, we chose sales internationalization (i.e. export over total sales) as the measure of the subcontractor's marketing capabilities. Overall our research supports this choice. Firstly, there is a positive correlation ($\rho=0.3$, $p=0.03$) between export over total sales and the marketing workforce. Moreover, firms adopting a marketing information system have, on average, twice the size of the ratio of export to total sales than those that do not adopt a marketing information system (41.4% vs. 21.2%).

Design capabilities. Design capabilities are the ability to autonomously develop products/services that meet client requirements. We measured the design capabilities of the subcontractors with the adoption and the use of computer aided design (CAD)

systems. Again we chose this proxy for reasons strictly connected to the peculiarities of SMSs. More complex measures are indeed suggested by the literature, such as the presence of appropriate product development systems or the registration of patents (Liu & White, 1997; Liu, Ding, & Lall, 2000; Wynstra, Weele & Axelsson, 1999; Petroni & Panciroli, 2002). However, these measures seem more appropriate for larger firms in that they rely on well-structured organizations based on formal processes. Moreover, the codification of at least part of the technical knowledge of the firm (e.g. drawings and blueprints) is an essential prerequisite for the implementation of a CAD system. This leads the SMSs to stray from the traditional situation grounded on an overall informality of all internal processes (Furlan, Grandinetti & Camuffo, 2007). Thus, the implementation of CAD systems seems to be a clear and unequivocal signal of the presence, in the subcontractor's organization, of specific design capabilities. Again our findings corroborate the measure of subcontractor design capabilities we have chosen. The firms that use CAD to design their products have indeed on average 3 people dedicated to design and R&D activities while those that do not use a CAD have on average 0.4 people dedicated to the same activities.

3.2.2. Types of customer-supplier relationships

Arm's length or market relationships. In this type of relationship the buyer purchases the component which has been fully designed and manufactured by the supplier. Through these low interactive relationships the supplier sells a standardized good without any type of customization to customers' needs. In this relationship the key feature is the price that is the only parameter used by the buyer to choose and evaluate the supplier.

Traditional subcontracting relationships. In these relationships the buyer completely designs the component, the supplier just manufactures it. Supplier does not perform any development activity and merely executes the instructions provided by the customers. For these relationships the level of interaction is medium given the higher buyer-supplier interdependency than that of market relationships.

Partnerships. The buyer defines the product concept domain and the functional parameter domain, while the supplier develops the design details and manufactures the component. Early supplier involvement is a common practice for this type of relationship (Wagner & Johnson, 2004). The supplier is indeed involved from the concept stage of the new product development. Typically, partnerships are characterized by a high interaction between the actors in managing different processes such as new product development, logistics-manufacturing integration and quality management.

4. Results

This section presents the results of our research. We give an outline of subcontractors' design and marketing capabilities and subcontractors' relationships on the basis of the measures employed in our study. Then we combine the two sets of information using the univariate analysis of variance (ANOVA) as the appropriate statistical technique to test the potential associations between the measures involved.

4.1. Subcontractors' marketing and design capabilities

First of all general features of the sample demonstrate that, on average, the subcontractors have achieved a good level of capability evolution (table 2).

Table 2
Characteristics of the sample (n=62)

Characteristic	Value
Export on total sales*	27.4%
Number of foreign markets*	8
CAD**	69.3%
More than 50 customers**	61.3%
Weight of the first customer*	23.9%
Weight of the first 3 customers*	43.1%
ISO 9001**	43.5%
Patenting 2001-2005**	27.4%

*Averages, **Frequencies (firms with CAD, etc.).

As for the marketing capabilities (measured by the degree of internationalization), the sample shows a good attitude towards internationalization. On average the firms export 27.4% of their total sales and operate in 8 different foreign markets. However, a closer look to the data reveals that the propensity to export is unevenly distributed across firms. For example, while none of the 62 firms has only local customers (i.e. located within the mechanical industrial district), 19 firms (30.6% of the sample) have relationships only with domestic (Italian) customers. It is also interesting to note that 54 firms of our sample have at least one local customer proving that most of the subcontractors are rooted in the district even if they have developed relationships with customers located outside the district itself.

As for the design capabilities, 47 firms (75.8% of the sample) have adopted a CAD system while 43 (69.3%) use CAD to design their own products. The latter percentage is remarkably higher than that of a recent research on a sample of more than 400 Italian subcontractors showing that 42.2% of the subcontractors use a CAD system (Furlan, Grandinetti, & Camuffo, 2007).

Finally, other indicators confirm the average-good level of capability evolution achieved by the subcontractors. Firstly, they have a rather diversified customer portfolio with about 61% of them operating with more than 50 customers and 22.6% of them falling within the 20-49 customers range. Having a diversified customer portfolio allows the subcontractors to reduce their dependence on the main customers as proved by the average weight of the first customer (23.9%) and of the first three customers (43.1%). Secondly, 43.5% of the firms possess the ISO 9001 certification and 27.4% of the firms have registered one or more patents during 2001-2005 period.

4.2. Subcontractors' business relationship portfolios

On the whole firms have developed relationships with 15,977 customers and on average each firm has a portfolio of 258 customers. The firm with the highest number of customers has 3,000 customers while the firm with the lowest number of customers has 4.

Figure 1 shows that the number of market relationships is clearly predominant (62.6%) over the other types of relationships. Traditional subcontracting relationships account for 24.3% of the total number of relationships while collaborative relationships are those with the lowest number, accounting for 13.1% of the total number of relationships. Despite the high number of arm's length relationships only 3 firms of the sample have developed only this kind of relations. On the other hand, 8 firms have developed only collaborative relationships and 10 firms only traditional relationships.

Most of the firms (41 firms, 66.1% of the sample) have a mixed relationship portfolio. Finally, 44 firms (71.0% of the sample) collaborate with at least one customer. Figure 2 provides the weight of each of the three types of relationships on the total sales of the subcontractors. Data shows an opposite trend when compared with figure 1. Market relationships, accounting for 62.6% of the number of relationships, have a modest weight of 18.7% on total sales of the firms. Vice versa, collaborative relationships (13.1% of the total number of relationships) have the highest weight on total sales of about 43%.

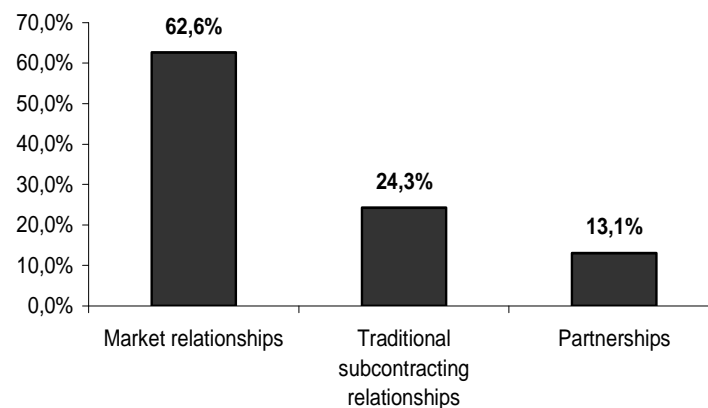


Figure 1. Number of relationships by type.

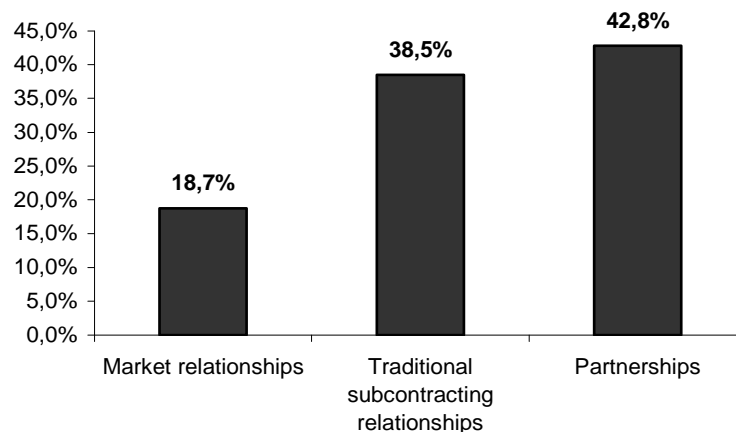


Figure 2. Incidence of different types of relationships on total subcontractors' sales.

4.3. Capabilities and business relationship portfolio

To investigate the relationship between subcontractors' capabilities (i.e. design and marketing capabilities) and the subcontractors' relationships we can divide our sample into four groups based on their design capabilities (CAD/no CAD) and marketing capabilities (degree of export on total sales). Subcontractors with export equal or less than 12% (the median of export) are treated as firms with low level marketing capabilities while those with an export greater than 12% as firms with high level marketing capabilities. We chose the median of export to discriminate between the

subcontractors since respondents indicate 12% as the threshold among the subcontractors for whom export is merely an occasional activity and those for whom export is more systematic requiring specific capabilities. This is confirmed by the descriptive statistics (table 3). In particular the average of export on total sales between the two groups is considerably and statistically different.

Table 3
Test for the difference between low and high export

	N	Mean	Std. Dev.
Exp > 12	30	52.80	24.83
Exp <= 12	32	3.56	4.70

T-test =10.68; p=0.00.

Table 4
ANOVA results

	N	INC_MKT	INC_TRAD	INC_PART
(group 1) Exp <= 12 – No CAD	14	8.7%	70.4%	20.9%
(group 2) Exp <= 12 – CAD	18	16.2%	35.1%	48.7%
(group 3) Exp > 12 – No CAD	5	44.2%	35.8%	20.0%
(group 4) Exp > 12 – CAD	25	30.0%	16.7%	53.3%
		F=2.002	F=7.419	F=2.669
		p=0.120	p=0.000	p=0.056

	N	IMP_MKT	IMP_TRAD	IMP_PART
(group 1) Exp <= 12 – No CAD	14	6.6%	70.2%	23.2%
(group 2) Exp <= 12 – CAD	18	14.3%	39.8%	45.9%
(group 3) Exp > 12 – No CAD	5	45.6%	34.4%	20.0%
(group 4) Exp > 12 – CAD	25	23.3%	20.6%	56.1%
		F=2.344	F=6.178	F=2.835
		p=0.082	p=0.001	p=0.046

Table 5
Tukey differences for the four groups

	F	p	Tukey* differences (0.90)
INC_MKT	2.002	0.120	Not significant
INC_TRAD	7.419	0.000	(1; 2, 4)
INC_PART	2.669	0.056	(1; 4)
IMP_MKT	2.344	0.082	(1; 3)
IMP_TRAD	6,178	0.001	(1; 2, 4)
IMP_PART	2.835	0.046	(1; 4)

* (1; 2, 4) means that the group 1 is significantly different (at 0.10 level) from groups 2 and 4.

Subcontractors that fall in group 4 (design capabilities and high marketing capabilities) present the highest evolutionary position in terms of technical and market resources. On the other hand, groups 1 (no design capabilities and low marketing capabilities) is the least developed while group 2 (design capabilities and low marketing capabilities) and group 3 (no design capabilities and high marketing capabilities) are in an intermediate position.

Table 4 shows clear differences between the four groups of subcontractors both with respect to the incidence (on total number of relationships) and with respect to the importance (weight on total sales) of each type of relationship.

In particular, the business relationship portfolios of group 1 are characterized by the majority of traditional subcontracting relationships (70.4%) that account for the largest part of the total sales (70.2%). Instead, the incidence and the importance of market relationships are very low (8.7% and 6.6%). This portfolio profile is coherent with the situation of a traditional subcontractor that merely executes the specifications provided by customers without any involvement in the new product development process. However, traditional subcontracting relationships are able to generate tight resource ties and actor bonds in other processes – i.e. logistics and negotiation – for the level of coordination between buyer and supplier that is typically involved in these relationships.

The subcontractors in group 2 are those that have developed only design capabilities. On average, a large portion of the relationship portfolios of these firms are partnerships (48.7%) accounting for 45.9% of their total sales. The incidence of traditional subcontracting relationships is remarkably lower for these subcontractors than for the subcontractors in group 1 (35.1% vs. 70.4%). Also the weight on total sales of traditional subcontracting relationships is substantially lower (39.8% vs. 70.2%). Finally the incidence and the importance of market relationships are substantially higher for these subcontractors than for those in group 1 (16.2% and 14.3%, vs. 8.7% and 6.6%).

In group 3 there are subcontractors that have developed only marketing capabilities. When compared with group 1, the incidence of market relationships is substantially higher (44.2% vs. 8.7%) and so is the weight of this type of relationships on total sales (45.6% vs. 6.6%). Traditional subcontracting relationships diminish their incidence (35.8% vs. 70.4%) and so does their importance (34.4% vs. 70.2%).

Subcontractors in group 4 have developed both their design and their marketing capabilities. Firstly, traditional subcontracting relationships have the lowest incidence and importance when compared with the other groups (respectively 16.7% and 20.6%). When compared with group 1, the incidence of partnerships shows a sharp increment (53.3% vs 20.9%) and so does the weight on total sales (56.1% vs 23.2%). Also market relationships have a substantially higher incidence and higher importance than traditional subcontracting relationships.

A key question is whether the distinction between the four groups of subcontractors has any statistical power to distinguish between the dimensions of SMS business relationship portfolios. Table 4 shows that all but one dimension (the number of market relationships) exhibit highly significant p-values and strongly discriminate the groups of subcontractors. Table 5 shows the Tukey differences between each couple of average values at 0.10 level.

In the following paragraph we use the results of the ANOVA analysis (and Tukey differences) to interpret the relationships between subcontractors' capabilities and the average profile of their business relationship portfolios. Specifically, we advance three propositions on the basis of only those variables that exhibit Tukey differences at the 0.10 level.

5. Discussion

Our study provides important insights on the relationship between the evolution of subcontractors' capabilities and the characteristics of their customer relationship portfolios.

Since our study is cross-section it does not provide longitudinal data on the evolution of each subcontractor relationship portfolio. However, we know that most of the subcontractors in our sample, at inception, were in a traditional situation characterized by low profile both in terms of design and marketing capabilities. Indeed, most of these subcontractors (74%) originated from spin-off processes, starting their businesses as traditional subcontractors merely executing the orders provided by the originating firms. As table 3 shows, the current situation reveals that only 14 suppliers are traditional subcontractors while the majority of sample firms have undergone an evolutionary process that has led them to enrich either their design capabilities or their marketing capabilities or both. Following this line of reasoning our data set allows us to investigate the dynamic relationships between subcontractors' capabilities and their customer relationship portfolio even if we cannot claim causality between the two but only dynamic association.

First of all, since there are significant differences in the relationship portfolio profiles of the four groups of subcontractors, we can conclude that, coherently with the literature reviewed in the second section (Håkansson & Snehota, 1995; Wagner & Johnson, 2004; Bradley, Meyer & Gao, 2006), a dynamic relationship exists between a subcontractor's capabilities and the nature of its business relationships.

As for the specific relation between capabilities and the nature of business relationships, we first observe that whenever the subcontractors develop their design capabilities the incidence and the importance of traditional subcontracting relationships decrease. This is a clear signal that the development of design capabilities supports the transition of the subcontractor out of its traditional position. The first proposition follows:

Proposition 1. *As a subcontractor develops only its design capabilities, the incidence and the importance of traditional relationships decrease.*

The fact that the development of design capabilities is associated with a decrement of traditional relationships tells us that subcontractors leverage on these capabilities to increase the relationships over which it has a higher design autonomy (i.e. market relationships and/or partnerships). This means that besides a process of exploration that generated new knowledge in the form of design capabilities, a process of exploitation occurs leading subcontractors to change their portfolio profile towards situations characterized by a lower degree of dependence on the customers (March, 1991).

Interestingly enough, the results do not show any statistical difference between group 1 (traditional subcontractors) and group 2 (those subcontractors that have developed only design capabilities) as regards partnerships or market relationships. This means that the development of only the design capabilities does not lead to a unique path of evolution in terms of business relationship portfolio. While all these subcontractors reduce their traditional relationships some of them increase only market relationships, others increase the number of partnerships and others devote their resources to both market relationships and partnerships. Thus the development of design capabilities leads to different evolutionary paths in terms of the relationship portfolio's profile. The factors

that drive the subcontractor to choose one path over another are related both to the characteristics of the products and to the strategy adopted by the subcontractors. Another evolutionary pattern that emerges from our study stems from the development of only marketing capabilities:

Proposition 2. *As a subcontractor develops only its marketing capabilities, the importance of market relationships increases.*

We first note that few firms (5 out of 62) undergo this evolutionary process. These are firms that have decided to increase their exposure to the market by means of their marketing capabilities only. In particular, these subcontractors have developed valuable searching and monitoring capabilities (Furlan, Grandinetti & Camuffo, 2007). The enhancement of monitoring and searching capabilities favors an enlargement of market horizons, overcoming the local market situation that typically characterized a traditional subcontractor. Leveraging on these capabilities, subcontractors broaden the part of business that relies on market relationships. The increasing weight of the market is not accompanied by a significant reduction of the weight of traditional relationships or partnerships. As in the previous case, the lack of statistical significance indicates that different evolutionary paths may take place as the subcontractor develops only its marketing capabilities. Some subcontractors decide to heavily reduce the weight of traditional relationships in favor of the two other types of relationships. Others set all the resources devoted to partnerships to zero, moving them to market relationships. Even though our data does not allow us to infer the performance of the different evolutionary paths, we believe that, coherently with the relational view approach (Dyer & Singh, 1998), this last evolutionary path is not able to provide the subcontractors with a sustainable source of competitive advantage since it erases all the rents coming from a collaborative approach to business relationships.

The last proposition regards those subcontractors that develop both design and marketing capabilities:

Proposition 3. *As a subcontractor develops both marketing and design capabilities, the incidence and the importance of traditional relationships decrease while the incidence and the importance of partnerships increase.*

The 25 subcontractors (about 40% of the sample) of the fourth group have substituted traditional relationships with partnerships. In fact, for these subcontractors collaborative relationships assume strategic relevance which accounts for most of both their relationship portfolio (53.3%) and total sales (56.1%). This is in line with the literature on buyer-supplier relationships claiming that collaboration can provide the firm with valuable sources of competitive advantage (Dyer & Singh, 1998). But, to develop collaborative relationships with its customers, a subcontractor needs to generate appropriate capabilities allowing it to increase the interaction between activities, actors and resources (Håkansson & Snehota, 1995). Indeed, the “core offering of a supplier is increasingly perceived as a mere entry ticket for a relationship” (Ploetner & Ehret, 2006; p. 6). The design capabilities allow the subcontractor to improve its absorptive capacity (Cohen & Levinthal, 1990) thus increasing learning potentials of the relationships. As for the marketing capabilities, the subcontractor needs to develop its ability to search and select customers that are suitable to cooperate and forge interactive

and effective relationships with these customers. Finally, as Furlan, Grandinetti & Camuffo (2007) highlight design and marketing capabilities mutually reinforce one another and tend to be aligned over time.

Even though market relationships do not show any statistically significant differences between group 1 (traditional subcontractors) and group 4 (developed subcontractors), the average incidence and importance of these relationships increase indicating that some subcontractors choose to balance partnerships with market relationships. This is probably due to what Håkansson and Snehota (1998) call the “burden of relationships”. The authors maintain that close relationships entail five different quandaries: loss of control, uncertainty, resource demanding, exclusiveness and stickiness. Thus a subcontractor who relies a large part of its business on partnerships may face an excessive risk as the result of such quandaries. By allocating part of its resources to market relationships the subcontractor can reduce this risk. Moreover, the subcontractor can increase business volume through standardized goods, also exploiting knowledge developed through its partnerships.

6. Conclusion and future research directions

The aim of the study was to understand how the whole business relationship portfolio of a subcontractor changes as it evolves its capabilities. To address this research question we studied the customer relationship portfolio of 62 subcontractors located in the mechanical industrial district of Pordenone (North East Italy). Given the peculiarity of the research setting and the general features of the Italian subcontracting system we focused our analysis on the subcontractors’ design and marketing capabilities. From the results we derived three propositions that reveal the dynamics between subcontractors’ capabilities and their business relationship portfolios.

From a theoretical standpoint, our study makes several original contributions. Firstly, while most of the studies focused on the evolution of business relationships towards the collaborative model, our study considers how the whole subcontractor’s relationship portfolio evolves. Secondly, while a large body of literature takes the customers’ perspective in studying buyer-supplier relationships, we adopt the perspective of the supplier thus highlighting its role in shaping customer-supplier relationships. Finally, we contribute to that part of the literature claiming the existence of a general relationship between firms’ capabilities and their business relationships (Håkansson & Snehota, 1995). Our propositions advance a set of dynamic relationships between specific subcontractors’ capabilities and the nature of relationships that form subcontractors’ business relationship portfolios.

This study has some managerial implications for subcontracting firms’ managers of business relationships. Managers have to be aware that in order to change its business relationships, the subcontractor needs to evolve its capabilities. The evolution of the subcontractor’s capabilities rests on a series of complex mechanisms that have their logical antecedent and organizational prerequisite in knowledge codification capabilities (Furlan, Camuffo & Grandinetti, 2007). Moreover our paper gives the managers a kind of template to dynamically manage their business portfolio coherently with the evolution of the capabilities of their firm. For example, if the subcontractor aims to improve the strategic importance of the partnerships with its customers, it needs to develop both design and marketing capabilities. Obviously this evolution occurs over time as the result of investments in tangible, intangible and organizational resources.

Similarly the evolution of these capabilities can be nurtured over time by knowledge absorption processes that the subcontractors activate with their partners.

As this is an exploratory study there are a number of limitations that should be addressed by future research. Firstly, while there is statistical support for the propositions we advanced, the results are based on a study of 62 Italian subcontractors operating in the mechanical industry. Future studies should adopt a deductive approach to test our hypotheses on larger data bases and a more general arena of industries and countries. Moreover more accurate measures of subcontractors' capabilities should be conceived and tested and new hypotheses should be advanced to dynamically link new capabilities with the relationship portfolios of the subcontractors. Finally our study does not explicitly consider the performance of the subcontractors. Future research should look for differences between the different evolutionary paths of subcontractors as regards their ability to provide sustainable competitive advantages.

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