Regional, national and international networks: the suitability of different competitive strategies for different geographic profiles

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Abstract: The aim of this paper is to conduct an exploratory investigation on the type of competitive strategies that are likely to be associated with different networking profiles. We focus our attention on response strategies related to investments and technological adjustments, and how they vary according to different spatial scales of firms' networks. We report the results of the application of a common questionnaire to a sample of 165 SMEs from labour-intensive sectors belonging to southern Europe. Using cluster analysis, the firms were grouped according to the use of regional, national and international geographic scales for supply, distribution and sales networks. For each group, response strategies were analysed. Our results allow us to observe that there is a relation between the capacity to improve the geographic scale of networking and the capacity to strategically react to changing market conditions.

Keywords: networking profiles; geographic scales; competitive strategies; manufacturing; small business.

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1 Introduction

The continuous capacity of firms to learn is seen by many scholars as the critical solution in order to avoid firms from becoming locked into obsolete technological and competitive trajectories. This is a very common tendency, particularly in peripheral areas and/or labour-intensive industries.

Networks are often seen as the channel to overcome the risk that firms may become rigid. By accessing other markets, assets and technologies, firms free themselves from their own limitations while following the technological trajectories of their competitors. Case-studies across Europe give empirical and theoretical perspectives on how firms benefit from external linkages with other firms along the value-chain (Alvarez et al., 2009; Arndt and Sternberg, 2000; Cantner et al., 2010; Mazzola et al., 2009).

Our main purpose in this paper is to empirically analyse the relation between the capacity of firms to strategically react to changing market conditions and their networking propensities.

We emphasise the interconnected nature of those aptitudes, arguing the dependence between each other. In addition to confirming the positive effects of the ability to network on company performance, we also confirm that there are certain 'enablers' necessary for successful cooperation (Hanna and Walsh, 2002, 2008). Firms that do not cooperate, and that do not formally or informally exchange knowledge, limit their long-term knowledge-base and, ultimately, reduce their ability to enter into exchange relationships (Pittaway et al., 2004).

More specifically, regarding product and process innovation, positive associations were found in cooperation with customers, suppliers, the public sector, and universities (Freel and Harrison, 2006); however, in some cases, the effects are not as direct because there are sectoral and regional influences in the efficiency with which such networking inputs are translated into innovative outputs (Love and Roper, 2001).

Our empirical analysis is based on the application of a common questionnaire to a sample of 165 SMEs from the textiles, clothes and leather (TCL) sectors belonging to a group of Southern European areas: North (Portugal), Valencia (Spain), Macedonia (Greece) and South Italy (Italy). We report data on the use of supplier-distribution-sales networks at the local/regional, national, European and international levels.

Using cluster methods, we aim to identify the different geographic networking profiles within the sample. For each profile, competitive strategies related with investments and new technologies are analysed so statistical dependences between these strategies and group membership can be tested. We state that an interdependent relationship occurs between the networking and strategic capacities of firms.

2 Small firm networking

2.1 Network scaling-up

Networks may be distinguished from one another by reference to who qualifies for entry and who is excluded from membership. With scares resources and limited opportunities for trade, the sharing of a common identity is an efficient mechanism for excluding others from access to those resources (Clark, 2004).

The simplest definitions of networks suggest the involvement of economic agents who engage in repeated transactions. This repetition is a means of sharing values and expectations about proper behaviour. Morgan (1996) defends the business networks as the most effective and credible way for knowledge acquisition. Similarly, Gulati et al. (2000) state that a firm's network can create inimitable and non-substitutable value just as any inimitable resource by itself. Besides the access to resources and skills, networks of interaction also improve firms' response capacities to changing competitive circumstances, allowing the reduction of risks, information and transaction costs and allowing the development of trust and social cohesion, hence facilitating problem-solving (Hotz-Hart, 2000).

Further to the more formal nature of transactions involved in a firm network, the definition of networking often embraces more informal collaborative linkages. The term 'untraded interdependencies' was used by Storper (1995) to define those relationships that extend beyond traditional customer/supplier links and embrace interdependencies that are untraded and include conventions, common languages and rules.

One way or another, networks have different geographical nodes. Although much of the literature on networks refers to issues such as embeddedness (Granovetter, 1985) and path dependence (Nelson and Winter, 1982; Dosi et al., 1988; Arthur, 1994; Dosi, 1997) that implicitly mean the efficiency of local linkages, our focus is upon the different spatial scale of firms' supply and distribution linkages, arguing that network configuration may be associated with different adjustment strategies.

Literature recognises that networking is vital for firm performance, but in particular for TCL; we proved elsewhere (Cesário and de Noronha Vaz, 2012) that the contacts with international suppliers, for instance, are one of the most important sources of technological knowledge. As the drivers of globalisation are removing barriers which traditionally segmented the competitive environments of small and large firms, firms of all sizes are joining international networks (Dana, 2001). While some sectors often need to internationalise their activities, especially sales, at a very early stage of their development because of limited domestic markets (Cantwell, 1995; Keeble et al., 1998), others do it in search of technical advances. Nachum and Keeble (2003) argue that firms need to identify a successful balance between localised sources of interaction and those in wider geographic areas, and to establish linkages at those different geographic scales in order for them to compete successfully.

Even when industrial districts are strongly and successfully embedded, international sourcing is hardly prevented as traditional manufacturing industries become more heavily involved in the global arena. The Spanish home-textiles (Pla-Barber and Puig, 2009) and the Italian footwear and apparel industries (Camuffo et al., 2007) are good examples.

In manufacturing sectors, as already stated, networking activities are primarily based on vertical relationships such as customer, manufacturer supplier and producer service provider networks, rather than on horizontal linkages such as producer networks and industry-university linkages (Fischer and Varga, 2002), and firms tend to rely on sources of technology from national and, especially, international sources.

In this paper we are particularly interested in the scaling-up of those forward and backward linkages and how different geographic profiles are associated with different strategic responses.

2.2 The importance of networking in TCL sectors

We argue that networking strategies are mandatory in two ways in TCL industries because:

a These sectors belong to the so-called supplier-dominated industries, where innovative opportunities are primarily a process of diffusion of best-practice along the value-chain (Cesário and de Noronha Vaz, 2012).

b Both horizontal and vertical links allow firms to create critical mass and exploit standardisation opportunities that should lead to reductions in costs, enhancement of quality and reduction of technological and commercial risks (Cesário and de Noronha Vaz, 2011).

Empirical studies across Europe corroborate these arguments. For example, the importance of sourcing and subcontracting was observed by Smith et al. (2008) when assessing the capacity of these strategies to sustain European clothing production networks, despite the 'spectre of China'. In fact, the global garment industry is currently being reshaped in dramatic ways through processes of trade liberalisation, delocalisation and inter-firm and interregional competition. Although the higher labour costs of European firms can induce further rounds of de-localisation of garment production towards low-cost production locations, such as China and India, the authors argue that that does not necessarily mean the end to garment production in higher European factor-cost locations if the right supply, distribution and sales networks are developed.

This is truer when considering the fashion industry, where the consistent use of outsourcing means that material production is constantly on the move to low-cost locations (Hauge et al., 2009). For firms in European high-cost countries, the creation of value and profitability commonly rests not only on the ability to produce innovative design and brand value, but also on efficient marketing channels, logistics and distribution.

Although we recognise the importance of the social facet of networking (one that is harder to measure), our arguments emphasise the market relations in supply, distribution and sales networks. In this paper we consider that a market transaction constitutes a network activity, based on the idea that, ultimately, all market transactions appear as the outcome of previous social connections along the value-chain (horizontally and vertically). According to Staber (2011), 'marketless' conceptions of social networks in clusters are overstated and need to be balanced with a stronger concern for the role of competition in the social embeddedness of small firms. Whatever the contents and motivating factors for networking, firms always seek the benefits for their client and resource base, while they only prudently collaborate with competitors (Shaw, 2006).

3 Research design

3.1 Questions addressed

The aim of this paper is to conduct an exploratory investigation on the type of competitive strategies that are likely to be associated with different networking profiles.

We focus our attention on response strategies related to investments made and technologies adopted, and how they vary according to different spatial scales of firms' networks.

3.2 Sampling

Empirically, the analysis is based on the application of a common questionnaire to a sample of 165 SMEs from the TCL sectors (Table 1) belonging to the following Southern European areas: North (Portugal), Valencia (Spain), Macedonia (Greece), and South Italy (Italy). Appendix 1 gives the sampling procedures.

Table 1 Sample distribution by focus area and sector

	Footwear and leather products	*Textiles and clothes*	*Total*
North, Portugal (PT)	14	52	66
Macedonia, Greece (GR)	14	34	48
South Italy (IT)	-	24	24
Valencia, Spain (SP)	15	12	27
Total	43	122	165

These areas are composed of one or more NUTS II regions and were selected because of their economic vulnerability established in three common features:

a these areas are lagging behind the EU-27 average in terms of gross domestic product (GDP) per capita

b their heavy industrial tissues are mainly composed of labour-intensive activities, the ones most affected by low-wage competition

c their peripheral geographic location constitutes an economic restraint (Cesário and de Noronha Vaz, 2012).

3.3 Data and methodology

Agglomerative hierarchical clustering was used to find similar groups of firms according to the use of different geographical scales (regional, national and international) for supply, distribution and sales networks. The distances between firms were calculated using the square Euclidean distance. The distance between two groups was defined as the distance between their average values (the *centroids*).

In order to draw the different networking profiles, the authors used the information provided by firms about the geographical and functional origin and destination of inputs to production and outputs of production. Database variables are presented in Appendix 2.

In order to detect if the adjustment strategies of firms vary across the different networking profiles, the response variables (in Appendix 3) were cross tabulated with the group membership of each firm.

Adjustment strategies were separated in investment strategies, specifically regarding the nature of investment made, and technological strategies, in what concerns the type of technologies adopted.

The chi-square statistic was used to test the hypothesis that the competitive strategies of firms are independent from group membership. A low significance value ($p < 0.05$) indicates that strategies are significantly different across the different networking profiles. The analysis of the Cramer's V statistic is used to give additional information on the strength of that variation.

4 Results

This section will present the results of the clustering exercise as well as the results of the chi-square statistics.

4.1 Networking profiles

The cluster analysis allows the identification of different networking profiles. This section will look to the results of that statistical procedure, combining that information with the main descriptive statistics for each group, in order to provide a better characterisation of each cluster.

The 165 regions were grouped as described in Table 2 (from the initial group of 165 firms, 15 were excluded because of missing values). The networking profile of each group is easily depicted from Figures 1 to 3.

Group 1 is composed of 73 firms with a regional/national network profile. This is the less internationalised group, which mostly develops links with local/regional or national suppliers and customers. Firms in this group are generally smaller than firms in the other groups, in terms of number of employees and value of sales. This group will be labelled as the one with a *regionally-based* networking profile.

Group 2 is composed of 27 firms with a strong international orientation. This group develops strong linkages with European suppliers, distributors and customers, but weaker linkages inside country borders. Firms in this group mostly present higher value of sales due to exports. This group will be labelled as the one with an *internationally-based* networking profile.

Group 3 is composed of 50 firms with a wider market position, both national and in Europe. Firms in this group are generally older and higher-scaled in terms of employees, but not in terms of the value of sales, because a substantial part of sales is absorbed by the national market, at lower prices than exports. This group will be labelled as the one with a *nationally and internationally-based* networking profile.

Table 2 Descriptive statistics

		Group 1 N = 73	*Group 2 N = 27*	*Group 3 N = 50*	*Total N = 150*
Employment	<=14	60%	19%	18%	38%
	15–49	28%	44%	40%	35%
	50+	13%	37%	42%	27%
Total		100%	100%	100%	100%
Sales (euros)	< =1,600,000	49%	21%	29%	37%
	1,600,001–12,500,000	19%	25%	42%	28%
	12,500,001+	32%	54%	29%	35%
Total		100%	100%	100%	100%
Year of establishment	< =1979	26%	33%	39%	32%
	1980–1989	36%	37%	29%	34%
	1990+	38%	30%	33%	35%
Total		100%	100%	100%	100%

Figure 1 The use of supply networks by group

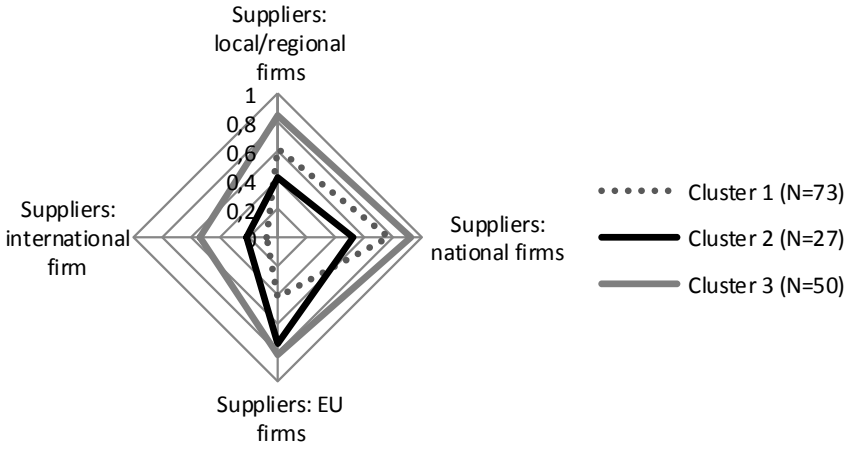


Figure 2 The use of distribution networks by group

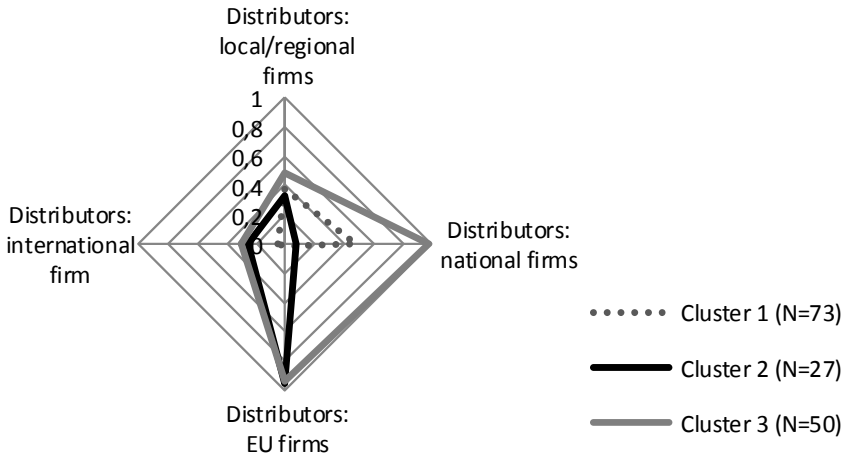
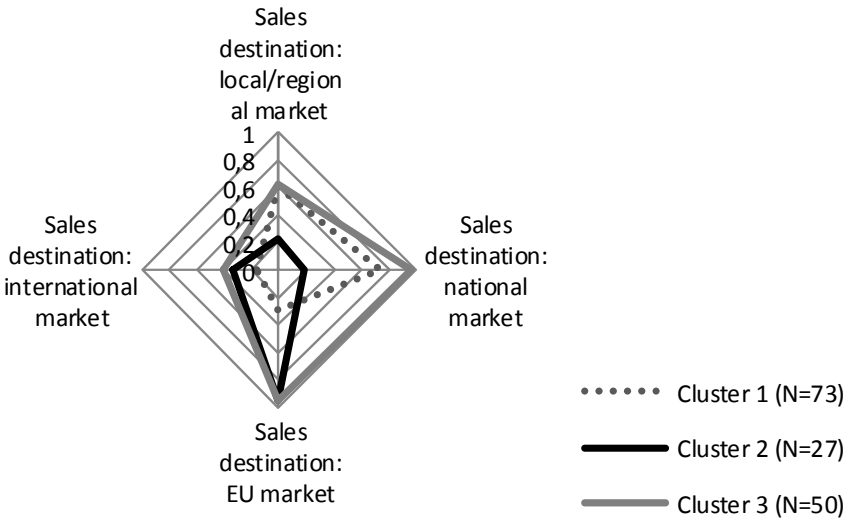


Figure 3 The use of sales networks by group



4.2 Investment and technology strategies

This section gives the results of the chi-square statistics used to examine if the response strategies considered in this study are related with the different networking profiles.

Tables 3 and 4 list the chi-square, the Cramer's V and their significances. The chi-square results allow identifying the response variables that are not independent from the group membership. The observation of Cramer's V allows determining the strengths of the association, when present.

The rule of thumb that 80% of cells should have an expected count of five or more, and no cells should have a zero expected count, was used as reference.

When interpreting the following results, attention should be paid to the fact that significant variables are identified when they are determinant to distinguish between the groups. When a variable is not indicated as significant, that does not mean that that variable is not important for the firms themselves. It means that it is not important to distinguish between the profiles.

4.2.1 Investment strategies

From the list of variables related with investment strategies, there are three with significantly different results across the three groups of firms (Table 3). A $\alpha = 0.1$ was exceptionally considered in this case given the importance of analysing the two variables with a significance level slightly above five percent. In testing the hypothesis that investment strategies vary within different networking profiles, the null hypotheses were rejected for the investment in information technology ($p = 0.001$), the investment in the purchase of patents and licensing ($p = 0.084$) and the investment in the development of existing products ($p = 0.064$). The most distinguishing variable across the three groups was the investment in information technology ($V = 0.303$).

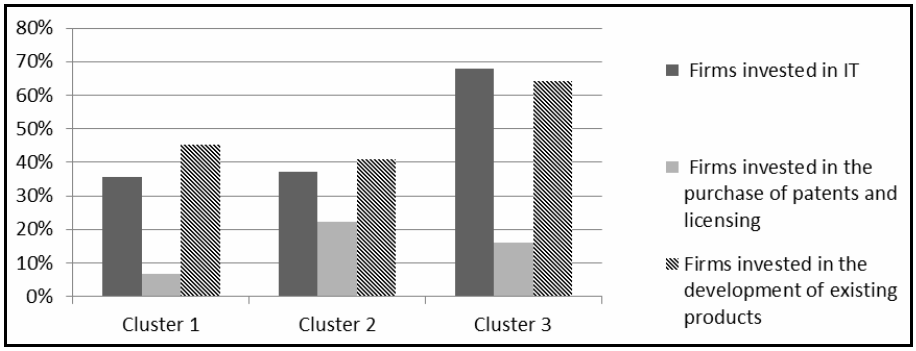
Table 3 Chi square results for investment strategies

Variable	χ^2	*V*	*Sig.*
H0: Investment strategies are independent from group membership			
Firm invested in: new plant and equipment?	3.454	0.152	0.178
Firm invested in: information technology?	13.730	0.303	0.001
Firm invested in: the purchase of patents and licensing?	4.964	0.182	0.084
Firm invested in: the development of existing products?	5.491	0.191	0.064
Firm invested in: the development of new products?	1.874	0.112	0.391

From Figure 4 we observe the following:

- The third group presents higher incidences in terms of investments in IT and in the development of existing products. This group is composed of older and bigger firms, with a higher network implantation, both national and international.
- The internationally-based networkers present the higher incidence of investments in the purchase of patents and licensing. This is a distinguishing feature of this export-oriented group. These types of investments are generally associated with breakthrough innovations, which can explain the higher valued sales that characterise this group.
- Although not very expressive, the regionally-based networkers distinguish from the international ones as they present a higher incidence of investments in the development of existing products. These are, essentially, smaller and regionalised firms.

Figure 4 Investment strategies by networking profile



4.2.2 Technological strategies

In what concerns the variables related with technological strategies, there are three with significantly different results ($\alpha = 0.05$) across the three groups of firms (Table 4).

In testing the research hypothesis that technological strategies vary within different networking profiles, the null hypotheses were rejected for the adoption of new technologies related with: production processes ($p = 0.006$), product design ($p = 0.011$) and marketing tools ($p = 0.000$). The most distinguishing variable across the three groups was the adoption of new technologies related to marketing technology (V = 0.350).

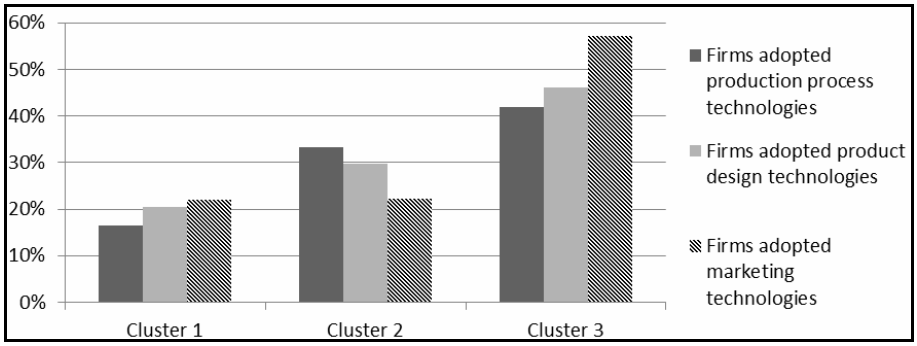
Table 4 Chi square results for technological strategies

Variable	χ^2	*V*	*Sig.*
H0: Technological strategies are independent from group membership			
Technologies adopted: inventory control	2.226	0.122	0.329
Technologies adopted: production process technology	10.082	0.259	0.006
Technologies adopted: product design technology	9.059	0.246	0.011
Technologies adopted: marketing technology	18.217	0.350	0.000
Technologies adopted: B to B electronic networks	3.177	0.146	0.204

From Figure 5 we conclude that:

- A main distinguishing feature between regional and international networkers regards the adoption of production process and product design technologies (such as CAD and CAM). The use of such instruments is marginal in the small domestic firms from the first group.
- Regarding the technological variables related with marketing tools, the incidence of investments in such technologies is much higher in cluster 3, which has a higher network implantation, with a national and international nature. This group shows high occurrences on the three types of technologies adopted but, differently from the export-oriented group, cluster 3 favours marketing instruments.

Figure 5 Technological strategies by networking profile



4.3 Discussion of results

The following table summarises the several findings in order to facilitate the discussion.

Cluster	*1 Regionally-based networking profile*	*2 Internationally-based networking profile.*	*3 Nationally and internationally-based networking profile*
Main feature	Smaller firms	Higher value of sales	Older and bigger firms
Main distinguishing response strategies	Higher incidence of investments in the development of existing products than cluster 2; marginal occurrence of adoption of production process and product design technologies	Higher incidence of investments in the purchase of patents and licensing than the others; favouring the adoption of production process and product design technologies	Higher occurrences of investments in IT and in the development of existing products than the others; higher occurrences of adoption of new technologies, but favouring marketing instruments

As expected, we observe differences among the three groups regarding not only the type of firms (age and size) but also the nature of investments made and type of new technologies adopted recently.

The results allow the identification of a major group of regionally-based networkers, essentially smaller firms, that are distinguished from the others by their weaker aptitude to technological adjustments.

It is also possible to observe that the third group, which is characterised by older and bigger firms, with a national and international network implantation, differs from the export-oriented group, as firms in cluster 3 invest more in the acquisition of new IT technologies and in the development of existing products, but invest less in the acquisition of patents and licenses.

Given these two different investment orientations, we can discuss the motivations and the implications of the internationalisation processes that both groups accomplish.

The internationalisation processes, especially regarding sales, are often developed because of limited domestic markets. The aim, in those cases, is to up-hold market share and to explore scale economies (quantity production). However, in the specific case of the export-oriented group identified in this study, this strategy seems to be associated with an innovative behaviour. In this case, the network scaling-up, more than simply being associated with market enlargement, reveals a preoccupation with added valued and quality production.

5 Conclusions

The aim of this paper was to conduct an exploratory investigation on the type of competitive strategies that are likely to be associated with different networking geographic scales.

Our focus is upon the different geographic levels of sales, supply and distribution linkages and how they are related with different investment and technological adjustments.

We base our evidence upon a comprehensive, cross-country database of surveyed firms, developed using a common analytical framework. This is a main contribution of the present paper, as the study of competitive strategies is normally based on case studies.

From the observation of our sample of TCL firms from Southern Europe, it was possible to identify three different groups with distinguished geographic networking profiles. For each one of them, investment and technological adjustment strategies were analysed.

One of the profiles identified was the *nationally and internationally-based* networkers, a group that, besides a high level of internationalisation, is also embedded in local/national networks (a result also achieved by Keeble et al., 1998). Another profile identified was the *internationally-based* networkers, a group with a strong export orientation, with higher concerns with quality and innovation, reflected in the type of investments made (patents and licensing) and in the higher valued sales. This group presents good capability for international connections, while paying less attention to national contacts. Similar to Freel (2003), we found that export propensity is positively associated with innovative behaviours at a higher spatial level.

Finally, it was possible to identify a major group of *regionally-based* networkers, essentially smaller firms, with few concerns with innovation and new technologies.

Our results allow us to observe that investment and technological adjustment strategies vary across the three groups, indicating that there is a relation between the capacity to improve the geographic scale of networking and the capacity to strategically react to market-changing conditions. Similar to Clark (2004), it is shown that some types of competitive responses are associated with a process of scaling-up networks rather than remaining loyal to local linkages.

While the related literature confirms the advantages of networking for the competitiveness of firms, we conclude that not all firms have the ability to develop international contacts.

The exploitation of marketing networks depends heavily on the openness towards new opportunities which, in turn, depends on the knowledge stock of firms (Cohen and Levinthal, 1990) and on the empowerment of employees to pursue it (Lechner and Dowling, 2003). At the end, the resource base of firms is both an input for and an output of networking activity, and that can be either a vicious or a virtuous cycle.

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Appendix 1

Sampling procedures

The questionnaire used in the present research was designed, tested and applied in the scope of the EU FP5 Project RASTEI – Regional Adjustment Strategies to Technological Change in the Context of European Integration – HPSE-1999-00035.

This project aimed to study how local adjustment strategies designed to enhance productivity utilising technological change in labour-intensive industries has affected, and will affect in the future, European non-metropolitan regions in terms of their employment potential.

The results for the Greek, Italian and Spanish firms were generously provided by the project coordinator for the present research. The same questionnaire was applied to the Portuguese sample firms during 2005.

Using common questions and an agreed coding system, the dataset allows for the pooling of data by question across a group of European southern regions.

It should be recognised that the results of the present research are dependent, certainly, upon the integrity of the survey instrument, the sampling procedures and the collection of the data in each country, as in every multi-team cross-country research. In the present research, the author assumes the responsibility for the Portuguese questionnaire application. Similar sampling procedures were applied by the other teams.

Sampling exercise for the Portuguese region

The total number of 5,916 small and medium sized firms (<250 employees) from CAE 17, 18 and 19 from Portugal North Region were considered as the target population. The data source is the *Ficheiro das Unidades Estatísticas* (FUE) from INE – *Instituto Nacional de Estatística*.

The sample was randomly selected from the firms in the target population. The distribution among different regions and sectors was done proportionally.

A total number of 722 questionnaires were distributed by RSF post during a five-month period, followed by 217 phone contacts in order to supply complementary information and increase the final rate of answers. Finally, it was possible to come up with a final sample of 66 respondent firms, corresponding to a final answer rate of 18.3% from the initial, planned sample (n = 361). As mentioned by Vicente et al. (1996), the representativity of a sample is not a matter of its dimension; rather, it is a matter of whether or not the non-respondents' answers differ from the respondents' ones. Since it is expected that the non-answers are mainly due to the entrepreneurs' lack of availability and awareness regarding the cooperation in these sorts of research initiatives, it is assumed that the non-respondents' opinions do not bias the representativity of the final sample.

Appendix 2

Description of database variables for networking profile

Description	*Codification*
Supply, distribution and customers networks	
Suppliers: associated local firms	1 = yes; 0 = no
Suppliers: other local/regional firms	1 = yes; 0 = no
Suppliers: national firms	1 = yes; 0 = no
Suppliers: EU firms	1 = yes; 0 = no
Suppliers: international firms	1 = yes; 0 = no
Distributors: associated local firms	1 = yes; 0 = no
Distributors: other local/regional firms	1 = yes; 0 = no
Distributors: national firms	1 = yes; 0 = no
Distributors: EU firms	1 = yes; 0 = no
Distributors: international	1 = yes; 0 = no
Customers: local/regional market	1 = yes; 0 = no
Customers: national market	1 = yes; 0 = no
Customers: EU market	1 = yes; 0 = no
Customers: international market	1 = yes; 0 = no

Appendix 3

Description of database variables for competitive strategies

Description	*Codification*
Investment strategies	
Firm invested in: new plant and equipment?	1 = yes; 0 = no
Firm invested in: information technology?	1 = yes; 0 = no
Firm invested in: the purchase of patents and licensing?	1 = yes; 0 = no
Firm invested in: the development of existing products?	1 = yes; 0 = no
Firm invested in: the development of new products?	1 = yes; 0 = no
Technological strategies	
Production process is customised/standardised	1 = yes; 0 = no
Technologies adopted: inventory control	1 = yes; 0 = no
Technologies adopted: production process technology	1 = yes; 0 = no
Technologies adopted: product design technology	1 = yes; 0 = no
Technologies adopted: marketing technology	1 = yes; 0 = no
Technologies adopted: website/internet	1 = yes; 0 = no
Technologies adopted: business to business electronic networks	1 = yes; 0 = no