Unravelling the effects of interorganizational networks on innovation in the textile industry. The case of the Valencian cluster in Spain

DOI: 10.35530/IT.070.03.1575

JOSÉ-VICENTE TOMÁS-MIQUEL
MANUEL EXPÓSITO-LANGA
GABRIEL BRĂTUCU
OANA BĂRBULESCU

REZUMAT – ABSTRACT

Studiu privind efectele rețelelor interorganizaționale asupra inovării din industria textilă. Cazul unui cluster din Valencia, Spania

Cercetătorii au susținut ideea că rețelele interorganizaționale prin care se transmit fluxurile de cunoștințe în cadrul unui cluster reprezintă un factor-cheie al inovării pentru firmele din cluster. Cu toate acestea, dovezile empirice existente sugerează că, în timp ce aceste rețele pot spori performanța inovatoare a firmelor, nu toate legăturile create în cadrul rețelei influențează în aceeași măsură. Plecând de la acestă premisă, lucrarea urmărește să exploreze modul în care implicarea firmelor în rețelele de afaceri și în cele de cunoștințe tehnice influențează inovarea în cadrul unui cluster textil spaniol. Rezultatele relevă o influență pozitivă asupra rezultatelor inovative exercitate doar de legăturile create între firmele care fac shimburi de cunoștințe tehnice în cadrul clusterului. Aceste constatări oferă informații relevante în scopul realizării unui management eficient al rețelelor teritoriale la nivelul firmelor și pentru o mai bună definire a politicilor industriale adoptate în cadrul clusterelor textile.

Cuvinte-cheie: rețea de cunoștințe în afaceri, clustere, inovare, relații interorganizaționale, rețea de cunoștințe tehnice, industria textilă

Unravelling the effects of interorganizational networks on innovation in the textile industry. The case of the Valencian cluster in Spain

Scholars have supported the idea that interorganizational knowledge networks are a key factor for firms' innovation in clusters. Yet, existing empirical evidence suggests that, while networks can enhance firms' innovative performance, not all network linkages influence to the same extent. On this basis, this paper aims to explore in a Spanish textile cluster how the involvement in business and technical knowledge networks influences textile firms' innovation. The results reveal the influence of the firms' connectedness to the cluster knowledge network on their innovative results, although only in the case of the technical knowledge network. These findings provide relevant insights for an efficient management of territorial networks at the firm level and for a better definition of textile clusters' industrial policies.

Keywords: business knowledge network, clusters, innovation, interorganizational relationships, technical knowledge network, textile industry

INTRODUCTION

Over the last decades, the textile industry has developed a broad process of globalization that has led its firms to develop a robust network of international relations and extend their processes around the world [1]. Despite this scenario, the importance of local relations in localised textile clusters has not lost value, allowing their companies to improve their knowledge bases and innovation capabilities [2]. The effective management of this knowledge intensive "global context" [3] can help textile firms to improve their competitiveness and adapt to future challenges.
The importance of collaborative knowledge networks in regional clusters has been highlighted by numerous research contributions [4–5]. These studies emphasized the importance of the territory, which through its collaborative and localized networks, influenced firms' innovative behaviour and performance. For example, Signorini [6] in the Italian textile industrial clusters of Prato and Biella revealed the existence of productivity and profit differentials in favour of firms belonging to these clusters compared to non-cluster firms. However, in recent years, literature has questioned this view, carrying out a "relational turn" [7] and focusing more on established linkages and networks than on geography per se [8]. This change implies a focus on the firm itself and its set of relationships rather than on the territory, highlighting that it is these actors and elements that make it possible to generate their regional environments [9].
This relational turn has generated an important debate in economic geography, helping to overcome the limitations of previous research work. Among the most relevant questions addressed and still being unravelled, we may find those related to the way in which the nature of networks impacts on the economic development of regional clusters [8]. In general, scholars have supported the idea that interorganizational networks are a key factor for firms' innovation in clusters [10–12]. However, existing empirical

evidence suggests that although networks can enhance innovation processes, not all network ties or structures do so equally [13–14]. In this sense, the involvement of firms in the cluster business and technical knowledge networks may have a different influence on their performance. In addition, the specific characteristics of certain industrial sectors may determine the presence of such networks and their influence on the firms' innovation performance.

The textile industry has undergone a remarkable process of modernization in recent years through the acquisition of new knowledge to face the new challenges of the global competitive scenario. Thus, textile firms, especially those in the more advanced economies, have increased the development of innovative products in new market niches thanks in part to the development of an appropriate portfolio of knowledge relationships.

Challenged by the above theoretical premises and the absence in the literature of unambiguous evidence on the impact of networks on innovation, this paper aims to explore in textile industrial clusters how the involvement in business and technical knowledge networks influences the innovation performance of textile firms. To address this research question, the empirical study draws on a sample of 92 firms belonging to the textile industrial cluster of Valencia, located in one of the most important industrial areas in the eastern Spain.

This paper is structured as follows: first, theoretical foundations upon which the research is based are discussed. Research hypotheses are defined within this section. Next, the research design and the results of the empirical study are described. Lastly, main conclusions are presented along with the limitations of the work.

THEORETHICAL FRAMEWORK AND RESEARCH HYPOTHESES

In the new globalised environment, textile companies are under enormous pressure from the competitive context and fashion retailers and distributors, questioning their capacity to survive and carry out their activities efficiently [15]. While some textile companies in cluster have relied on strategies focusing on relocating activities to low-cost countries and reducing prices, more resilient companies have promoted functional and inter-sectoral improvement strategies [16]. In this sense, these textile companies have taken on new, higher value-added functions in their activities, such as R&D, design or marketing. In addition, they have also sought synergies with other sectors by expanding their product range, for example through the development of new technical textiles for the car, construction or health industries, among others.

Textile firms' worldwide competitiveness increasingly tends to be grounded on a unique collection of assets and capabilities developed by each company over time through internal resources and also external sources, especially those closely related to the cluster. Thus, thanks to their frequent grouping in clusters, textile firms can access new external sources of knowledge and upgrade their knowledge base and competitive advantage through multiple collaborative networks [17].

Numerous contributions have pointed out the presence in clusters of a multiple set of overlapping networks [8, 18]. In particular, the literature emphasizes the existence mainly of a business knowledge network (BKN) and a technical knowledge network (TKN).

According to Giuliani, the BKN can be defined as the set of relationships established by cluster firms when they interact on issues related to their business [8]. Business knowledge networks appear in cluster contexts thanks to the frequent occurrence of market, social and institutional relationships [11]. The trade in raw or semi-processed materials, membership of the same local associations or the attendance at social events in the local context are examples of these types of relationships.

On the other hand, the TKN deals more with technical knowledge as well as the resolution of problems within the firm. More concretely, the TKN is defined as the informal and unplanned network that links firms through the knowledge transfer, aimed at the solution of complex technical problems promoted by the local community of technicians and entrepreneurs [8].

The BKN structurally differs from the TKN [11]. While the BKN is extensive, allowing a large number of cluster firms to be linked together, the TKN is selective because it sties are unevenly distributed [8]. Therefore, the BKN is expected to be denser than TKN.

The literature agrees with the positive influence of cluster networks on innovation [19–20]. Yet, as suggested by different authors, not all network linkages have the same influence [13–14]. The type of network determines the kind of knowledge acquired. Thus, the knowledge acquired in the BKN differs from that obtained in the TKN.

On the other hand, knowledge of the cluster is not obtained in a homogeneous way among its companies, thus contributing to the divergent innovative results of cluster firms. Among the main characteristics of cluster networks and firms that determine their capability to innovate is the level of network connectedness. This is defined as the number of ties that a company maintains in the cluster, allowing it to represent the opportunities it has to obtain new knowledge. The literature shows a positive effect of cluster network connectedness on firm innovation [21].

Therefore, from a multi-network approach in clusters, we expect that the connectedness of cluster firms to both their BKN and TKN will provide their companies with new knowledge and skills in different areas that will lead them to improve their innovative performance. In this way, a high level of connectedness to the BKN is expected to provide firms with new general information on the business or industry, better access to international markets, institutional information or new commercial exchanges that may have an impact on the improvement of their strategies. On the other hand, we expect that those companies that are better connected to the TKN will have a better chance of solving technical problems and generating new ideas to improve processes and products both in the current market and in new market niches. In consequence and based on the previous theoretical framework, we can formulate the following two hypotheses:

H1: The level of connectedness of a textile firm in the cluster BKN positively influences its innovative performance.

H2: The level of connectedness of a textile firm in the cluster TKN positively influences its innovative performance.

EMPIRICAL SETTING

The Valencian textile cluster

The textile industry in Spain has traditionally played a central role in its pattern of industrial specialization. Among the most important textile areas in this country, we find the Valencian textile cluster, where a wide range of SMEs carry out a wide variety of activities, from spinning to dyeing, printing or weaving. This cluster, which is located in eastern Spain, comprises numerous textile SMEs, employing 22,695 workers with a production value about 1,975 million Euros in 2016 according to the Spanish Inter-Textile Council (CITYC). In addition, it accounts for the 19 percent of the total Spanish sector.

Traditionally, the Valencian textile cluster has distinguished itself in recent decades by the production and commercialization of home-textiles in the form of a wide range of traditional products among which we can highlight blankets, duvets, upholstery and curtains. However, the economic crisis at the end of the last decade has forced these companies to look for new sectors and reposition their products in high added value segments. Among these actions, we highlight the development of new yarns and non-woven and woven fabrics of a more technical profile for new sectors and industries. This fact has enabled many Valencian firms, either to devote part of their production or, in other more extreme cases, their totality, to high added value technical textiles mainly intended for the technical clothing and footwear, automotive and transport and healthcare industries. This evolution of the companies has allowed the cluster to grow again and partly regain the momentum that it had decades ago. This fact is corroborated by the data provided by CITYC. According to this institution, the Valencian textile cluster has experienced an increase of about 13% in turnover and of about 20% in exports over the period 2012–2016.

Sample collection and data sources

The data collection process started with the definition of the study population. To proceed, firstly, we drew up a roster of companies from the SABI[1] database including general information about firms in the textile cluster, such as their location, main activities, turnover, financial performance and number of employees. As we commented earlier, the textile cluster in Valencia is made up of a wide range of manufacturing processes involving a large number of primary and auxiliary activities. Thus, the number of companies in the cluster is large, around 300, mainly including micro enterprises and SMEs. Such a large number of companies cannot, however, be managed in the roster-recall technique used to obtain reticular data. So, in order to refine the population, from the initial list we selected the companies that are more representative, based on the opinion of a panel of experts from several cluster institutions (such as the Universitat Politècnica de València and the main trade associations) and following criteria such as turnover, number of employees or commercialization of innovative products. After applying this filter, a final sample of 110 companies was established, thereby allowing us to proceed with a representative set of enterprises from the total population addressed by this research.

Data collection took place between July and September 2016. To collect network data, we applied the roster-recall method [22], since it has been frequently used in previous research in this particular field [18, 23]. This technique consists in sending a questionnaire to a sample of firms, attaching the complete list of these firms. They are then invited to select from an open list of local companies those from which business and/or technical knowledge was received. Additionally, participants are also invited to include the firms not on the list from which business and/or technical advice was obtained.

Complementarily, firms were also asked to provide information about their market strategies, innovation activities and product portfolio. The process concluded satisfactorily with a total of 92 completed questionnaires obtained. Network data were recorded in two 92 by 92 data matrices in which cell *ij* was coded '1' when any of the respondents of firm *i* reported technical or business tie with firm *j*.

In order to improve the understanding of the sample studied, table 1 shows a classification of the analysed companies according to their activity, size and age.

Finally, in order to statistically validate that the sample is representative from the entire Valencian textile cluster, we performed a Student's t-test. To proceed, we carried out three different tests referring to the variables number of employees, turnover and age. We used SABI database as the source of this information. The results confirmed the representativeness of the sample used for the research as we cannot reject the null hypothesis about mean differences,

[1] SABI is a directory of Spanish and Portuguese companies that collects general information and financial data. In the case of Spain, it covers more than 95 percent of the companies of the 17 Spanish regions with total yearly revenues over 360,000–420,000 €.

Table 1

Characteristics of firms	Number	Percentage
Number of employees		
small (1–20)	43	46.74%
medium (21–100)	42	45.65%
large (> 100)	7	7.61%
Year of foundation		
before 1966	10	10.87%
1966–1975	11	11.96%
1976–1985	26	28.26%
1986–1995	29	31.52%
1996–2005	13	14.13%
2006 to today	3	3.26%
Activity		
Yarn manufacturing	15	16.30%
Fabric manufacturing	41	44.57%
Non-woven manufacturing	9	9.78%
Textile finishing, dyeing and printing	27	29.35%

number of employees (t = –.204; sig = .839), turnover (t = –.609; sig = .544) and age (t = 1.637; sig = .105). We can consequently conclude that there is no bias between sample and population.

Variables

Innovation

This variable attempts to capture the capacity of the company to improve processes in the existing products and services. We have measured this variable by adapting the scale of Jansen et al. of the variable incremental innovation to the particular characteristics of our study [24]. We have used incremental innovation variable as a general innovation measure of cluster firms because this type of innovation, as opposed to radical innovation, is the most representative in cluster contexts of medium-low tech industries such as textiles and also where there is a prevalence of SMEs [25]. We used a seven-point Likert scale with seven different items. The items were defined as follows: 1) your company frequently improves the existing range of products and services; 2) your firm regularly applies small adaptations to the existing products and services; 3) improvements in existing products and services are introduced in the local market by your company; 4) your firm improves the efficiency of your supplies of products and services; 5) your company increases economies of scale in existing markets; 6) your firm provides services to the existing customers; and finally 7) reducing costs of internal business processes is a major goal in your company. A factor analysis was run to identify the multi-item scale of the innovation construct. The resulting Cronbach's alpha value was 0.905 and the results of the factor analysis reported by the Barlett's test of sphericity were significant (χ^2 = 324.834; p < .001). On the other hand, the value of the Kaiser-Meyer-Olkin (KMO) measure of adequacy was greater than 0.6 (KMO = .892).Therefore, the data collected in this measure were adequate for factor analysis. Finally, the analysis revealed a one-factor solution representing 62% of the overall variance.

Firm connectedness

This variable seeks to capture the level of connectedness of the cluster firms within the cluster boundaries for both, BKN and TKN. In line with Boschma and TerWal [26], we followed an ego-network approach, estimating the firm connectedness to each network by means of the size of the egonet of each node in both networks. An egonet or ego-network is a part of the whole cluster's network that consists of a firm (ego), all its relations to other firms (alters) and the relationships among them. The larger the size of a firm's egonet, the larger its connectedness to the network. From the knowledge relationship data matrices previously obtained from the roster-recall method, we calculated each firm's egonet in both networks through social network analysis techniques using the UCINET v.6 software application [27]. These techniques provide a tool to explore the structural properties of a network, and encompass theories, models and applications that are expressed in terms of relational concepts or processes [22]. They have been used in cluster studies by several authors [11,18, 26].

Statistical methods

As commented earlier, network data gathered in the roster-recall method were processed using UCINET v6 software [27]. Complementarily, ANOVA Independent simple t-test was performed to analyse the influence of cluster interorganizational knowledge networks on innovation by means of inter-group comparisons. To proceed, we previously confirmed two basic assumptions. First, it was verified that data were normally distributed (Shapiro-Wilk test at p > .05). In addition, it was also confirmed that there was homogeneity of variances between the groups analysed (Levene test at p>.05). For all these analyses, we used the SPSS v16 statistics software.

RESULTS

Before addressing research hypotheses, the basic descriptive statistics of the cluster BKN and TKN (table 2) calculated through Social Network analysis are presented.

Based on the figures from the table above, we can see that both networks show notable levels of interaction,

Table 2

Indicators	BKN	TKN
Number of nodes in the network	92	92
Density	4.1%	2.3%
Number of ties in the network	346	190
Average connectedness (average number of ties per node)	3.761	2.065
Isolated nodes	17	24
Gini Coefficient	0.601	0.752

thus confirming that the textile firms significantly develop both business and technical knowledge relationships. On the other hand, they also confirm that density, that is, the proportion of linkages in the network compared to the total possible linkages, is significantly higher in the BKN (4.1%) than in the TKN (2.3%). This leads us to deduce that the textile firms in the sample have more business than technical knowledge relationships. In addition, the higher presence of business knowledge relationships is also confirmed by the number of links in the networks and the average number of ties per node, which are considerably higher in the BKN. Thus, we can conclude that the textile cluster TKN is more restrictive than the BKN, as already suggested by previous empirical studies. On the other hand, the Gini concentration index measures the degree of inequality in the distribution of links between the textile firms. As this index approaches one, the number of linkages established by the actors of a network is much more unequal. Conversely, a value close to zero indicates a more homogeneous distribution of the links between the different actors of the network. In the Valencian textile cluster, both networks analysed show high levels of heterogeneity in the number of relationships per firm, although significantly higher for the TKN. In this way, the access of the textile firms to the TKN is done more unevenly than the access they perform to the BKN. This fact is also corroborated by the number of isolated companies, which is notably higher in the TKN than in the BKN.

Complementarily, the graphical representation of both networks (figures 1 and 2) allow verifying the results obtained from the descriptive statistics. In the figures, one node represents one textile firm, and a line between two nodes indicates the presence of a relation between them. The direction of the line indicates how knowledge flows between the two companies. As can be visually verified, the BKN has a higher density.

Once the main differences between the textile cluster BKN and TKN were identified, we analysed to what extent the involvement of textile firms in these networks influence firm's innovation (hypotheses 1 and 2). To this end, we studied the relation between the firms' connectedness to these networks and their innovative performance.

To proceed, we initially divided the firms in each network according to their level of connectedness. More precisely, we calculated each firm's connectedness values for the BKN and TKN and then, classified them into three groups in both networks according to this value. Thus, the first group (G1) is made up of the nodes with a low connectedness value (lower tercile), that is, the firms less connected to the network. A second group (G2) made up of the nodes with intermediate connectedness values (central tercile), was composed of the firms located in a medium relational position, and finally, the third group (G3) which brings together the firms with a high connectedness value (higher tercile). As a result, three groups were obtained for each network (BKN and TKN) of similar size. Specifically, Group 1 and Group 2 comprised 31 firms each one and Group 3 30. Once the firms were classified into three groups for both networks according to their relational level, we proceeded to analyse the differences between the innovative performance of the firms in each of the three groups separately for both BKN and TKN.

As we indicated above, since assumptions of normality and homoscedasticity were met for all cases, we considered the application of ANOVA Independent simple t-test. In this case, the design of the experiment for both networks would have two independents factors (high, medium or low connectedness in the BKN and high, medium or low connectedness in the TKN), while firm's innovation performance would be taken as the dependent variable. The results of the ANOVA tests are shown in table 3.

Based on previous results, we only found significant differences in the mean innovative performance among the different groups in the case of the TKN. Therefore, hypothesis 2 cannot be supported by the empirical evidence.

In order to assess where the differences among the three groups in the TKN are, we performed a post-hoc analysis through pair-wise comparisons. In this case, we used the Tukey method, an analysis commonly accepted in research. The results are shown in table 4.

The results point out that the mean of the innovative performance of the group of firms with higher connectedness (G3) in the TKN is higher than and significantly different to the others (G1 and G2). Thus, this third group would comprise a homogeneous

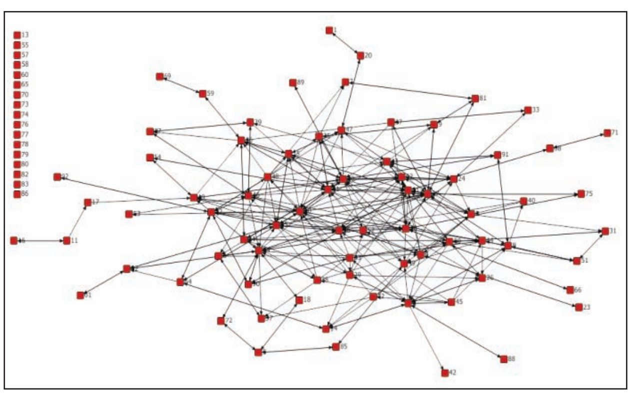

Fig. 1. Graphical representation of the BKN

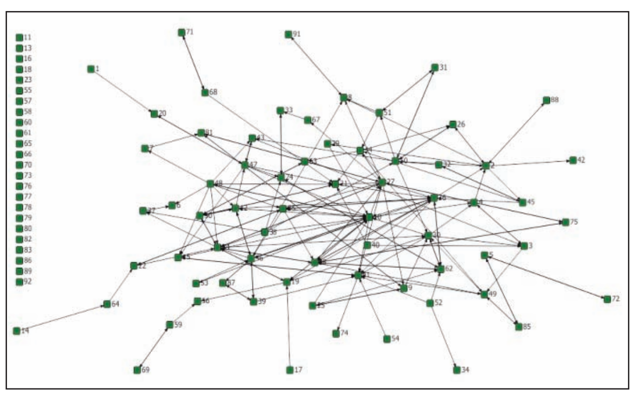

Fig. 2. Graphical representation of the TKN

Table 3

Network	G1 Mean	G1 Sd.	G2 Mean	G2 Sd.	G3 Mean	G3 Sd.	df	F	Sig
BKN	.083	.988	.135	1.026	.163	.771	2	.057	.945
TKN	–.410	.966	.102	.814	.705	.628	2	14.251	.000**

Note: * p < .05; ** p < .01

Table 3

G1-G2			G1-G3			G2-G3		
Dif.	Std. error	Sig.	Dif.	Std. error	Sig.	Dif.	Std. error	Sig.
–.512	.207	.040*	–1.115	.209	.000**	–.603	.209	.013*

Note: * p < .05; ** p < .01

group. In turn, the mean of the innovative performance of the firms of the second group is also higher and significantly different than those of the first group. Therefore, G1 and G2 would also comprise two others homogeneous groups. Based on these results, we can assume hypothesis 1. With the goal of clarifying this finding, we included the bar diagrams per group (figure 3) in the TKN.

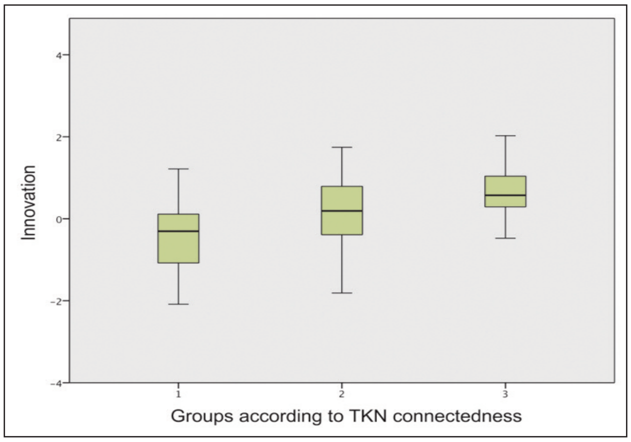

Fig. 3. Box-plot of the results

CONCLUSIONS

The aim of this work has been to study the structure of collaborative networks in a textile cluster and their influence on firms' innovative performance. The results obtained confirm the notable presence of both business and technical knowledge relationships in the textile cluster studied. They also confirm, as it was stated in the theoretical development, the unequal distribution of relations in these networks, both at a general level between the two networks and specifically between the companies in each of them. Furthermore, the results reveal the influence of the firms' connectedness to the cluster network on their innovative results, although only in the case of the TKN.

These results show the relevance of technical knowledge links in the innovation processes of textile companies, as is the case in other industrial sectors such as the wine industry [11, 18] or toy industry [28]. Conversely, the business knowledge linkages in the textile cluster do not have a significant influence on the innovative performance of their firms, which demonstrates that in these linkages, the type of knowledge acquired is not relevant to the innovation processes of textile companies, especially those more closely linked to product innovation, which is the type of innovation addressed in this research. This may be due, as suggested by Malmberg [29], to the fact that local business relations 'are relatively broad and diffuse, sometimes unwanted and often seemingly of little immediate use'. On the contrary, relationships within the TKN are more profound and directed towards solving specific problems, many of which usually deal with technical aspects of textile products and processes. These findings not only enhance the academic corpus of the cluster and textile literature, but also provide insights for an efficient management of territorial networks at the firm level and for a better definition of clusters' industrial policies. In this sense, managers, local institutions and policymakers must be aware of the advantages provided by the exchange of technical knowledge between cluster firms to improve their innovative performance. On the other hand, they should promote the development of joint actions and research projects within the cluster that facilitate the exchange of know-how and experience between companies.

Finally, this research suffers from some limitations. In this way, the stage of the cluster life cycle, the current post-crisis situation or the types of textile products produced by the companies studied may affect the potential generalization of the results in other textile clusters. Therefore, we must be cautious about the universality of these results and a broader analysis is in consequence needed to study how other cases vary. On the other hand, the conceptual division between BKN and TKN can be somehow considered as partially blurred, which makes it difficult to compare and draw conclusions. However, the operationalization of concepts that are to some extent complex and abstract into measurable variables, necessarily requires for simplification. Finally, while BKN connectedness does not influence product innovation, we can expect that it may influence other types of innovation such as market innovation. However, we leave this analysis for future work.

BIBLIOGRAPHY

[1] Guerrieri, P., Pietrobelli, C. *Industrial districts' evolution and technological regimes: Italy and Taiwan*. In: Technovation, 2004, vol. 24, no. 11, pp. 899–914.
[2] Expósito-Langa, M., Molina-Morales, F.X., Tomás-Miquel, J.V. *How shared vision moderates the effects of absorptive capacity and networking on clustered firms' innovation.* In: Scandinavian Journal of Management, 2015, vol. 31, no. 3, pp. 293–302.
[3] Onsager, K., Isaksen, A., Fraas, M., Johnstad, T. *Technology cities in Norway: Innovating in glocal networks*. In: European Planning Studies, 2007, vol. 15, no. 4, pp. 549–566.
[4] Piore, M.J., Sabel, C.F. *The second industrial divide: possibility for prosperity*, New York, Basic Books, 1984.
[5] Camagni, R. *Innovation networks: spatial perspectives*, London, New York, Belhaven Press, 1991.
[6] Signorini, L.F. *The price of Prato, or measuring the industrial district effect.* In: Papers in Regional Science, 1994, vol. 73, no. 4, pp. 369–392.
[7] Boggs, J.S., Rantisi, N.M. *The 'relational turn' in economic geography*. In: Journal of economic geography, 2003, vol. 3, no. 2, pp. 109–116.
[8] Giuliani, E. *Clusters, networks and economic development: an evolutionary economics perspective. The Handbook of Evolutionary Economic Geography*, 2010, pp. 261–279.
[9] Bathelt, H., Glückler, J. *Toward a relational economic geography*. In: Journal of economic geography, 2003, vol. 3, no. 2, pp. 117–144.
[10] Bathelt, H., Malmberg, A., Maskell, P. *Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation.* In: Progress in Human Geography, 2004, vol. 28, no. 1, pp. 31–56.
[11] Giuliani, E. *The selective nature of knowledge networks in clusters: Evidence from the Wine Industry*, In: Journal of Economic Geography, 2007, vol. 7, pp. 139–68.
[12] Expósito-Langa, M., Tomás-Miquel, J.V., Molina-Morales, F.X. *Innovation in clusters: exploration capacity, networking intensity and external resources*. In: Journal of Org. Change Management, 2015, vol. 28, no. 1, pp. 26–42.
[13] Peng, M. W., Luo., Y. *Managerial ties and firm performance in a transition economy: The nature of a micro-macro link*. In: Academy of Management Journal, 2000, vol. 43, no. 3, pp. 486–501.
[14] Stam, W., Elfring. T. *Entrepreneurial orientation and new venture performance: The Moderating role of intra- and extra-industry social capital*, In: Academy of Management Journal, 2008, vol. 51, no. 1, pp. 97–111.
[15] Abernathy, F.H., Volpe, A., Weil, D. *The future of the apparel and textile industries: prospects and choices for public and private actors*. In: Environment & Planning A, 2006, vol. 38, no. 12, pp. 2207–32.
[16] Humphrey, J., Schmitz, H. *How does insertion in global value chains affect upgrading in industrial clusters?*. In: Regional studies, 2002, vol. 36, no. 9, pp. 1017–1027.
[17] Dahl, M.S., Pedersen, C.Ø.R. *Knowledge flows through informal contacts in industrial clusters: myth or reality?.* In: Research Policy, 2004, vol. 33, pp. 1673–1686.
[18] Morrison, A., Rabellotti, R. *Knowledge and information networks in an Italian wine cluster,* In: European Planning Studies, 2009, vol. 17, pp. 983–1006.
[19] Coombs, J., Deeds, D., Ireland., R. *Placing the choice between exploration and exploitation in context: A study of geography and new product development*. In: Strategic Entrepreneurship Journal, 2009, vol. 3, no. 3, pp. 261–279.
[20] Schilling, M.A., Phelps, C.C. *Interfirm collaboration networks: The impact of large-scale network structure on firm innovation*. In: Management Science, 2007, vol. 53, no. 7, pp. 1113–1126.
[21] Bell, G.G. *Clusters, networks, and firm innovativeness*. In: Strategic Management Journal, 2005, vol. 26, no. 3, pp. 287–95.
[22] Wasserman, S., Faust, K. *Social network analysis. Methods and applications*, Cambridge, Cambridge University Press, 1994.
[23] Giuliani, E., Bell, M. *The Micro-determinants of meso-level learning and innovation: Evidence from a Chilean wine cluster*, In: Research Policy, 2005, vol. 34, no. 1, pp. 47–68.
[24] Jansen, J.J., Van Den Bosch, F.A., Volberda, H.W. *Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators*, In: Management Science, 2006, vol. 52, no. 11, pp. 1661–1674.
[25] Forsman, H., Annala, U. *Small enterprises as innovators: Shift from a low performer to a high performer*, In: International Journal of Technology Management, 2011, vol. 56, no. 2/3/4, pp. 154–171.
[26] Boschma, R.A., TerWal, A.L.J. *Knowledge networks and innovative performance in an industrial district: the case of a footwear district in the South of Italy*, In: Industry & Innovation, 2007, vol. 14, no. 2, pp. 77–199.
[27] Borgatti, S.P., Everett, M.G., Freeman, L.C. *Ucinet for Windows: Software for Social Network Analysis*, Analytic Technologies, Natick, MA, 2002.
[28] Morrison, A. *The Dynamics of Technical and Business Networks in Industrial Clusters: Embeddedness, status or proximity?* 35th DRUID Conference, 2013, Barcelona, Spain, June 17–19.
[29] Malmberg, A. *Beyond the cluster – local milieus and global economic connections*. In: Remaking the Global Economy, 2003, pp. 145–59.

Authors:

JOSÉ-VICENTE TOMÁS-MIQUEL[1], MANUEL EXPÓSITO-LANGA[1],
GABRIEL BRĂTUCU[2], OANA BĂRBULESCU[2]

[1]Universitat Politècnica de València, Business Administration Department, 03801, Alcoy, Spain
[2]Transilvania University of Brașov, Faculty of Economic Sciences and Business Administration, 500036, Brașov, Romania

e-mail: jotomi@doe.upv.es, maexlan@doe.upv.es, gabriel.bratucu@unitbv.ro, oana.barbulescu@unitbv.ro

Corresponding author:

OANA BĂRBULESCU
e-mail: oana.barbulescu@unitbv.ro