HOW CLUSTER MEMBERSHIP PLACES THE MEDIATOR EFFECT OF INTERNAL RESOURCES ON THE ASSOCIATION BETWEEN KIBS AND THE GROWTH OF NIFS.

ABSTRACT

Recently, network literature has considered the crucial importance of the resources which firm obtains through its network of external relationships. Specifically, this paper analyzes if the mediator effect of the internal resources on the association between Knowledge-Intensive Business Services (KIBS) and the growth of the New Innovative Firms (NIFs) is moderated by the belonging of the firm to an industrial cluster.

The paper presents several contributions. First, this research shows like firms with higher internal resources exploit better the external resources and enhancing firm's performance. In this way we integrate two approaches, network strategic perspective (external resources represented by the KIBS) and those authors from Resource-Based View, giving priority to internal resources. Moreover, we prove like the mediator role played by internal resources is not constant; on the contrary is changing when firm belong to an industrial cluster. Additionally, we consider as a contribution the application in this context of the particular and new analysis techniques to combine mediator and moderator effects as it is suggested in Preacher et al., (2007).

Keywords: Social capital, clusters, mediation effect, moderation effect, KIBS, internal resources

HOW CLUSTER MEMBERSHIP PLACES THE MEDIATOR EFFECT OF INTERNAL RESOURCES ON THE ASSOCIATION BETWEEN KIBS AND THE GROWTH OF NIFS.

As it has argued by authors from the Resource-Based View (e.g. Barney, 1991, Peteraf, 1993), the organizational capacities and internal resources are determinants of the performance of firm. In other words, under the premise of the firms' heterogeneity, firms vary in its resources endowment explaining performance differences. However, to put emphasis on internal resources may underestimate the significance of the external resources (Zaheer and Bell, 2005). Recently, network literature has considered the crucial importance of the resources which firm obtains through its network of external relationships (McEvily and Marcus, 2005; Gnyawali and Madhavan, 2001; Gulati, 1999). In fact, as the network strategic perspective suggests, to be member of a network of relationships with other organizations (e.g. firms and institutions) has significant implications for the firm's performance (Gulati et al., 2000).

This research addresses a central question in strategy: how do internal resources firms mediate the effect of the external resources on the firms' performance. While the literature has provided with arguments on network structure and internal resources independently it is relevant to consider whether firms with superior internal capabilities will gain a better access and exploitation to the external resources. Specifically, along this paper, we develop and extend these approaches combining both perspectives. External and internal resources must be analyzed together for a complete understanding of the firm's performance determinants (Zaheer and Bell, 2005). In fact, both categories of resources can interact in different ways. Internal resources have been considered as moderator in the use of alliances by firms Park et al., (2002) or they can moderate the effect of strategy on firms' performance (Hitt et al., 2001). In this vein, we suggest that superior internal resources can allow to a better exploitation of the external resources and consequently enhancing the performance of the firm. In other words, the internal resources mediate on the effect of the external resources on the firm's performance.

Although the role of the internal resources has already received a lot of attention, there is no research that attempts to determine whether their effects remain constant across

different contexts, as far as we know cannot be found in the literature. On the other hand our main contribution fills the gap specially pointed out by Wennberg and Lindqvist (2010), providing evidences about the mechanisms through which cluster effect operates and enhances new firm's performance.

The paper presents several contributions. First, this research shows like firms with higher internal resources exploit better the external resources and enhancing firm's performance. In this way we integrate both, network strategic perspective (external resources represented by the KIBS) and those authors from Resource-Based View, giving priority to internal resources. Moreover, we prove like the moderator role played internal resources is not constant: on the contrary is changing when firm belong to an industrial cluster. Additionally, we consider as a contribution the application in this context of the particular and new analysis techniques to combine mediator and moderator effects as it is suggested in Preacher et al., (2007).Specifically, this paper analyzes if the mediator effect of the internal resources on the association between Knowledge-Intensive Business Services (KIBS) and the growth of the New Innovative Firms (NIFs) is moderated by the belonging of the firm to an industrial cluster.

To address all these objectives the research was conducted in a sample of 173 Spanish NIFs located in the Valencia Region. Following the specific literature, the growth of the firm has been used as the main performance indicator (Almus and Nerlinger, 1999; Brush and Vanderwerf, 1992).

We have structured the paper as follows: first, we propose the theoretical bases of the research, justifying hypotheses and then we describe the empirical study. Finally, we explain findings and we discuss potential implications of them.

THEORETICAL BACKGROUND

Internal and external resources

Resource-Based View (e.g. Barney, 1991) explains how variations in firm's internal resources translate into variations in firms' competitive capabilities (Peteraf, 1993; Winter, 2003). Firms' competitive capabilities have attracted a fair amount of research

interest due to its identification as a major source for the generation and sustainability of competitive advantages (Wernerfelt, 1984). Competitive capabilities are critical means of achieving competitive advantage (Teece et al., 1997). Most explanations for the differences in capabilities concentrate on sources that are internal to the firm, based on relatively inimitable and immobile resources owing to causal ambiguities and incomplete factor markets (Helfat, 2000; Penrose, 1959), and to different evolutionary paths (Eisenhardt and Martin, 2000; Zollo and Winter, 2002).

However, relevancy of the internal resources and capabilities do not must to undervalue of the external resources, those which come from external or networking relationships (Zaheer and Bell, 2005). Network literature review reveals that interorganizational relationships directly affect to the firms' performance (Mowery et al., 1996). Relationships with other firms and institutions from alliances or agreements affect both behavior and results of the firms (Gulati et al., 2000). It is important from a strategy perspective to examine the effect of network structure on firm performance (Gulati *et al*., 2000). In fact, many of the strategic resources, which influence on firm performance, are acquired through networks of interfirm ties (Mowery et al., 1996). For instance access to diversity knowledge (Burt, 1992), second pooled resources and cooperation (Uzzi, 1996), and third-party endorsements (Stuart et al. 1999).

Industrial Clusters

Industrial clusters are a concept defining territorial agglomerations of firms (Porter, 1998). In the case of clusters, it is important that the firms involved are not considered to be the only actors. In fact, local institutions and supporting organizations play a relevant role in cluster development (McEvily and Zaheer, 1999). Clusters can be understood as a network of inter-organizational relationships between different actors, such as customers, competitors, suppliers, support organizations and local institutions and others (Piore, 1990). In this context geographical proximity and a strong feeling of belonging are primary elements facilitating such relationships, based on norms and values such as trust, reciprocity among others (Antonelli, 2000). Prior research has explained how industrial clusters represent local configurations that are high in social capital as they are characterized by mutual trust, co-operation, and entrepreneurial spirit

as well as a multitude of local small firms (as opposed to large firms) with complementary specialized competencies (Saxenian, 1994; Dakhli and De Clerq, 2004).

Traditionally, authors have focused on geographical proximity. Since Marshallian external economies, many different notions and conceptual developments have been proposed related to proximity. Probably the most relevant and popular are the industrial district (Becattini, 1990) and the industrial cluster (Porter, 1990a, 1998). Authors have, however, used a wide array of terms, such as physical, territorial, spatial or local proximity. Moreover, a review of the literature reveals a great diversity in definitions and measures (Boshma, 2005). For instance, some authors have established proximity depending on the distance between actors, or the perception of distance taken by the actors. Others authors, have focused on the presence of groups or agglomerations of firms in a specific place (for instance, in contexts of industrial clusters or districts). In fact, this is the approach we have used, defining geographical proximity for membership of an industrial district[1] (Becattini, 1990). Among other advantages proximity facilitates face-to-face interactions between actors. These interactions favor the exchange of high quality information and tacit knowledge (Boschma, 2005).

Knowledge Intensive Business Services (KIBS)

We have specifically focused on the so-called the Knowledge Intensive Business Services (KIBS). Following Bettencourt et al. (2002: 100-101), KIBS are *enterprises whose primary value-added activities consist of the accumulation, creation, or dissemination of knowledge for the purpose of developing a customized service or product solution to satisfy the client's needs*. The role of KIBS is to provide expertise to other sectors. They are sources of innovation for other companies, acting as co-producers of innovation (Den Hertog, 2000, Van Ark et al, 2003; Doloreux and Muller, 2009). The KIBS operate as an interface between the knowledge base available in the whole economy and knowledge available within the client company. So, these services have a central role in producing and disseminating knowledge (Aslesen and Isaksen, 2007), as they provide substantial opportunities for learning, acquiring valuable

[1] In the context of this research, we consider the notions of district and cluster to be equivalent, although we are aware of the conceptual and methodological differences.

information and enhancing firm capabilities in nowadays economy. The availability of KIBS in the close context of the firm facilitates the creation and commercialization of new products, processes and services (García-Quevedo and Mas-Verdú, 2010).

Hypotheses

As it is well known firms vary in capacity to understand, develop and use certain external resources. A key factor to improve the ability of the firm to benefit from external resources has been conceptualized as the absorptive capacity (Cohen and Levinthal, 1990). This capacity has been usually represented by firm capacity to innovate and its ability to develop new knowledge (Zahra and George, 2002). Internal communication networks and also cultural factors are additional factors influencing on the capacity of the firm to innovate and create value valor (Henderson and Clark, 1990).

In the specific case of KIBS, the propensity to use this services will depend on the own absorption capacity of the enterprises and their integration into networks (Tether and Takhar, 2008). The knowledge transfer of KIBS has been described by Strambach (2008), who not only underlines the key role of external knowledge resources but also the skills that are required by the client companies. Thus the provision of knowledge to business customers requires complex and intensive interaction with the client companies where both parties participate in interactive learning (Den Hertog, 2000; Sundbo, 2001). The literature has emphasized the complementarity between external knowledge provided by KIBS and the resources and capabilities of the client company (Muller and Zenker, 2001; Tether and Takhar, 2008). In fact, as Zaheer and Bell (2005) suggest both categories of resources (external and internal ones) have to be analyzed together in order to offer a complete explanation of the sources of the firm's performance. External and internal resources can interact affecting each other. For instance, Park et al. (2002) showed how internal resources moderate the use of external alliances by firms. Also, Hitt et al. (2001) argued that internal resources can moderate the effect of strategy on firms' performance.

We suggest that internal resources will improve the exploitation of the external resources enhancing the performance of the firm. However, considering that firms vary in terms of internal resources and absorptive capacity of these external resources, we

also expect that the endowment of internal resources mediates on the effect of the external resources on the performance. We can express that in a formal way.

Hypothesis 1 Internal resources mediates the effect of the Knowledge-Intensive Business Services on the performance of firms.

The cluster has been implicitly identified as a network in a context spatially defined within local geographical borders where actors share a common cultural and entrepreneurial background. Actors are part of a complex structure of interrelationships which can produce a multiplicity of networks among firms within the cluster (Parrilli and Sacchetti, 2008). Cluster literature has pointed out the existence and importance of the externalities which are generated inside of the agglomeration. These externalities are external with respect the individual firm but intern with respect to the whole cluster. These external – internal *economies* are crucial to explain firms' performance.

In clusters, KIBS are the public or private-public agencies that provide services to cluster firms in such fields as technological transfer, product and process innovation, quality certification, and other knowledge-intensive services are worthy of note (Muller and Zenker 2001, Strambach 2001). In this sense KIBS act as catalysts for innovation systems (Castellacci, 2008, Castaldi, 2009). More precisely, KIBS operate as knowledge hybridizers and gatekeepers between the district context and the wider competitive environment (Patrucco 2003).

Inside cluster interactions among firms and institutions are channels through which information and resources flow and enable an actor to gain access to other actors' resources. Moreover, interactions dissolve the boundaries between organizations and stimulate the formation of a common interest. Among the advantages are access to information, knowledge and specific resources. Through interactions, firms may increase the depth, breadth and efficiency of the mutual exchange of knowledge. The positive effect to belong a cluster and knowledge acquisition is consistent with the assumptions that learning, particularly that involving difficult-to-transfer information, is aided by intensive, repeated interactions. Thus, cluster membership exerts an influence on the future capabilities of firms and, hence, constitutes a factor that helps us to better

understand performance. If a firm belong to a cluster, it will have more opportunities to exchange and combine resources in the network and, as a result, this will have a positive effect on performance.

In addition, the combination of individual and cluster level resources and capacities can produce additional benefits. Firms may enjoy extra advantages when combining external resources with some of their internal resources because of *asset stock inter-connectedness*. On the other hand, *s*ome firms may have some similar resources already, hence enjoying economies of scale *asset mass efficiency* (Dierickx and Cool, 1989). Consequently, we can expect that the effect of external resources (from KIBS) will be modify when a firm is connected to the cluster. In other words, the scope and magnitude of the potential benefits from external resources are likely to be dependent to the belonging to the cluster.

As a consequence of above theoretical development, we consider that firms in cluster find those externalities or resources to explain its performance. Foss (1996) suggested the existence of the systemic capabilities. In the same line, Giuliani (2004) defined the absorptive capacity at cluster level. Finally, Molina-Morales and Martínez-Fernández, (2008) used the notion of shared resources to refer to those resources to which firm inside of the cluster have access.

Clustered firms are affected for the shared resources or cluster effect in such a manner that the role of the internal resources is modified. Externalities moderate the effect of the internal resources. We can express more formally as follows:

Hypothesis 2: The mediator effect of the internal resources on the relation between the Knowledge-Intensive Business Services and the firm performance is moderated by the firm belonging to the cluster.

THE TERRITORIAL CLUSTERS AND THE VALENCIAN AUTONOMOUS COMMUNITY

Building on the vast literature on territorial clusters and industrial districts (Becattini, 1990; Brusco, 1982, Samarra and Biggero, 2001, among many others), we may conceptualize them as geographically delimited areas where business structure is comprised of locally owned SME's that usually kept decisions within its boundaries. Innovation and entrepreneurship are frequent phenomena in these unique socio-economic territorial systems characterized by high levels of identity, shared values, cooperation and trustworthiness favoured by pervasive local interactions (Paniccia, 1998 and 2002).

The Valencian Autonomous Community (VAC) is a Spanish region located on the eastern coast of the Iberian Peninsula, and subdivided into the provinces of Castellon, Valencia and Alicante. Its economic profile is notable for the predominance of specialized small and medium enterprises (SME's), exhibiting high levels of spatial agglomeration. Using different methodologies, previous empirical research has precisely identified multiple industrial clusters mainly focused in traditional manufacturing industries like footwear, textiles, clothing, foodstuff, furniture, tiles and toys (Ybarra, 1991; Giner and Santa María, 2002; Boix and Galletto, 2006 among others).

Geographically speaking, our industrial clusters are spread across the region. Ceramic activities are located in the province of Castellon; while the furniture cluster is placed in the province of Valencia. The remaining four clusters are in the province of Alicante: Vinalopó cluster (footwear), Toy Valley cluster (toys), Marble cluster and Foodstuff cluster. Although all clusters exhibit considerable agglomeration indexes (e.g. Ybarra, 1991), they largely differ in some structural characteristics. Three agglomerations account for more than 1000 companies (furniture, footwear and textile), while the others comprise less than 300 (ceramic, toys and textile). Firms with less than 25 employees clearly predominate in all clusters, with the tile one being an exception as 30% of the firms present more than 100 employees. Export orientation is limited in both toy and textile clusters; conversely to the medium-high internationalization rates reported by the footwear, natural stone or tile industrial systems.

After these preliminary considerations, let us discuss in detail why is worth using data on the Valencian clusters to scrutinize the mechanisms through which internal and external resources affect firm's performance, particularly KIBS. First, according to Pavitt's (1984) taxonomy of innovation patterns, incremental developments to solve specific problems or satisfy certain needs predominate. Although knowledge bases and nature of innovation processes varies by industry. Second, economic activity is visibly embedded in a much broader social context thanks to solid values reinforced by associations and sectorial events. [2] Third, educational and research centres work together with cluster actors on the goal of competiveness. Universities are tightly linked to their respective local environments, and increasingly develop research projects and specialized programs.[3] From another perspective, education centres and business schools also offer specific professional and management courses. Finally, the role of technological institutes, sectorial public-private entities integrated into a network of Institutes of Technology (REDIT) and depending on the regional innovation agency IMPIVA (Institute for Small and Medium Industrial Enterprises)), should be highlighted. In an initial stage, most of these institutions were devoted to provide specialized technical services and spread good practices among clustered units. Nowadays, the need for innovation in the industry has also transformed them in meta-organizers of knowledge and partially shifted their efforts towards supporting manufacturing business activities (e.g. Molina-Morales, 2005).

THE EMPIRICAL RESEARCH

Data and Sample issues

During 2009, the IMPIVA, a public entity of the Valencian Regional Government created to promote innovation in the field of SMEs, embarked on the construction of a detailed directory containing all NIFs located in the region. Our cooperation in this project provided an opportunity to gain enhanced access to a wide range of innovators,

[2] The key business associations are ASCER (ceramics), ATEVAL, (textile), AEFJ (toys), FICE and AEC (footwear), FEVAMA (furniture), TDC (foodstuffs), Marble of Alicante (natural stone). Among the sectorial events, the following trade fairs should be highlighted: Cevisama, Textil-Hogar, Modacalzado, FEJU, Intermolde, Futurmoda.

[3] For example, see the cases of local universities: Universitat Jaume I (Castellon) and the ceramic industry, The Universitat d'Alacant and the toy industry, The Universidad Miguel Hernández and the footwear industry or The Universitat Politècnica de València and the textile sector.

and collect firm-level data needed to test the hypotheses previously proposed. To such end, although we were conscious of the complexity of the innovation phenomenon, a brief survey was designed in order to maximise the response rate and avoid jeopardizing the main purpose of the project. Once we pretested and modified some questions based on the feedback from experts and some randomly selected firms, the questionnaire was submitted to our sample frame.

A crucial phase of the data collection process consisted in delimitating the appropriate population and sample. Identifying the population was a complex task as in VAC there is no official list of NIFs; in fact that was the intention of our main project partner. After evaluating different approaches with academic and IMPIVA experts, we all commonly agreed to resort to several sources for the construction of our target population. These included lists of academic spin-offs and high-tech start-ups communicated by universities, public research organizations, business incubators centres, national industry associations, new innovative firms applying for public support, lists of participants and prior studies that the authors had realized or were aware of. Altogether, 210 innovative firms created during the period 2005-2008 were identified. It is worth noting that this combination of different sources of information minimized the risk of potential bias in our directory and is unlikely to distort our results in any case.

As soon as this initial process was finished, we contacted the entrepreneurs, corroborated the profile of the company, presented them the aim of our research and invited them to participate by completing a questionnaire. Of the total 210 NIFs contacted, a total of 173 answered our survey. The high response rate (82.3%) was product of the IMPIVA monitoring process and the entrepreneur's interest in contributing to improve the innovative environment of the VAC. Generally speaking, we could check ex-post that the sample obtained was representative of the industrial structure of the VAC.

In spite of its idiosyncrasy, our dataset exhibits clear strengths with respect to the ones used in prior studies. First, while most extant similar studies involving innovative start-ups have analysed mostly high-tech industries and focused on the USA, we consider here a large and heterogeneous sample of NIFs, which spans over several mature

industries and includes cluster and non-clustered units. By focusing in mature industries, we also attempted to reduce the problem of unobserved heterogeneity; as the agglomerations and the supplier-driven innovation models predominate. Furthermore, the Valencian traditional industries have attracted increased attention from researchers, such an interest stems from the fact that their clusters show a specific weight at both Spanish and European level, a considerable degree of knowledge cumulativeness and a solid social network structure that is responsible for knowledge transmission and encourages entrepreneurship

Second, this study tackles an issue relegated in the academic literature, such as the influence KIBS and the location of NIF (Audretsch et al., 2004; Karlsson and Nyström, 2006, Baptista and Mendoça, 2009 are exceptions). Considering that innovative is frequently used as a broader label, our sampling procedure ensures the adequacy of the NIF's selected and provides a unique opportunity for the evaluation of both issues. Third, many pre-published works rely on information gathered from large public databases that may provide limited information. So, we can take advantage of an ad hoc database including specific information and displaying sufficient variety in terms on the phenomena under scrutiny. The last reason for our choice is that internal resources (for example absorptive capacity) may exhibit a different role on NIFs due to their particularities and unique goals. The successful transformation and exploitation of knowledge is predicted to enhance performance (Zahra and George, 2002). This is important for new firms that are pressured to growth and obtain benefits immediately in order to survive; but lack the solid knowledge base of the existing companies.

The contacted firms were requested to provide information about different external sources of knowledge, internal resources and growth rates. Furthermore, with regard to the external sources of knowledge, they were asked if formal cooperation agreements with well-known KIBS providers existed. Even, there is no standard approach and accepted definition of KIBS (Wood, 2002), services typically included in this category are software and new media industry, marketing communications, financial services, technical services, management consultancy, personnel services and training services. More concisely, along this paper, services were considered as knowledge intensive according to the Statistical classification of economic activities in the European

Community-NACE Rev. 1.1.[4]

Immediately after the data collection, we were able to identify some core characteristics of the total sample. At the year of the initial of the surveying process, the average age of the new companies in our sample was 2.24 years, ranging between a minimum of 0 and a maximum of 4 years, and 33.5% of our NIFs were located in the Valencian clusters mentioned in our literature review. The distribution according to firm size showed that 61.8% were very small firms with less than 10 employees. By contrast, only 12.7% of the replies came from new firms having more than 50 employees. At the same time, the mean internal investment during the gestation process was 272,128 euros; while surveyed companies evidenced 2.81 active promoters on average, with a minimum of 1 and a maximum of 10. Finally, the average NIF had about 1.25 KIBS providers, ranging from 0 to 4.

The economic activities and the spatial distribution of the sample showed the expected structure. Valencia, the largest province of the region, comprised the majority of the surveyed companies, 56.1%. The remaining provinces Castellon and Alicante accounted for 26.6% and 17.3% respectively. Although firms were widespread in the VAC territory, a remarkably 33.5% of our NIFs were located in the clusters previously presented. The most common sectors were Manufacturing (21.4%), Engineering, Water and Energy (16.8%), ICT (15.0%), Consultancy and advisory Services (14.5%), Bio-Life (13.3%). Firms devoted to product design and R&D activities were 12.7%, while other industries contributed 6.4%.

Variables definition

In order to verify the mediating effect of KIBS (as external sources of knowledge) on new firm's performance (size/growth) through internal resources, we decided to make operative our dependent and independent variables as follows:

Dependent variable

[4] Two-digit level of NACE Rev. 1.1. included were 61, 62, 64, 65, 66, 67, 70, 71, 72, 73, 74, 80, 85 and 92.

Traditionally, in empirical studies, firm's performance is usually measured by accounting ratios, strategic indicators or market value (De Carolis et al., 1999). However, among business creation researchers, growth is particularly signaled as a crucial indicator of success for entrepreneurs (Brush and Vanderwerf, 1992). Due to obvious limitations, previous literature on early firm size or growth has traditionally focused on actual size during initial period of operation, one to five years after the birth of the venture (see Birley and Westhead, 1994; Cooper et al., 1994; Hansen, 1995).

Consistently with above considerations, two different dimensions of size/growth were used in the present study: sales and employment. Both sales and employment data were obtained from the administered survey. Respondents were asked for size in terms of employees and annual sales since company was launched. In order to minimize the risk of rejection, due to well-known reluctance to answer direct questions about benefits or sales, we opted for an ordinal 7 points scale. An overall index of new firm performance labeled as (NFG) was created by mixing data from all this items. Initially, reliability analysis was conducted, producing a Cronbach's alpha of .714 for the mentioned set of items. Principal component analysis (PCA) condensed information into one principal factor encompassing 78% of the total variance (KMO>.500 and p-value<.01).

Independent variables

Internal Resources (IR)

RBV suggests that a firm's initial resources are critical antecedents of survival and growth (Barney, 1991). Although many entrepreneurship researches rely on just one proxy such as age or size, a slightly different perspective was adopted to achieve a more nuance picture of this concept. Previous studies argued that business survival and success is related to organizational human resources and financial factors at the initial start-up stage (Carter, et. al., 1994; Nucci, 1999, Eisenhardt and Schoonhoven, 1990, among others). Several previous studies have applied the initial investment efforts arguing that greater initial resource availability may allow more flexibility to develop firm strategies, enhance knowledge base and, in this way, favours faster growth (Peña, 2004; Marmet, 2004). In similar a vein, Cooper et al. (1994) found that financial capital is positively related to firm's performance, total amount invested during the gestation process was selected as an indicator of NIF's stock of internal resources.

On the other hand, as innovation is more likely to be the outcome of a group of persons, organizational and entrepreneurship research has shifted towards increasingly analyze the whole entrepreneurial team (e.g. Higashide and Birley, 2002). Larger and heterogeneous management teams have been found yield better firm performance and faster firm growth (Eisenhardt and Schoonhoven, 1990; Sethi et al, 2002), as they present more social capital and cognitive resources to deal with complex situations. So, we would expect NIFs with larger promoting teams to be better able to build competitive advantages and achieve solid market positions. In terms of operationalization of the variable, in line with Wennberg (2009), the total number of active firm promoters was therefore considered a suitable measure of firm's stock of resources.[5]

Considering the contribution of both variables, PCA was conducted to amalgamate the information of both average amount invested during the gestation process and number of firm promoters in one factor encompassing 60% of the total variance explained (KMO>.500 and p-value<.01).

Knowledge Intensive Business Services

Access to outside resources and acquiring adequate resources are also important for new firms with lack of resources and capabilities. For example Lee et al. (2001) showed that supports from venture capital companies have a beneficial influence on performance as they not only provide financial resources but also management know-how or legitimacy. More recently, Lee and Lee (2004) observed that failed firms had less supporting services from external companies.

[5] To determine our conceptualization of active members of the promoting team, we combine delineations by Ensley et al. (1998) and Ucbasaran et al. (2003) stating that an individual was active member of the promoting team when the following criteria were fulfilled: financial interest, implication on the strategic management and contribution to set up the firm.

Taking into account our earlier conceptualization of KIBS, to capture the contribution of external resources to firm growth, we focus on the relationships between NIFs and its KIBS providers. Building on previous research, our independent variable, namely KIBS providers, was assessed by the private knowledge service providers (consultancy, advisory, education, advanced financial services, among others) with formal contracts and cooperation agreements with the firm during the gestation period. The rationale underlying this operationalization is that the more private knowledge providers the more access to external knowledge and abilities exist.

We used three questionnaire items to collect the data to accurately develop the variable described above. The first question asked to specify the private providers of valuable technological and managerial information the NIF had during the gestation process. The second question asked to specify NIF's private partners in innovation programs developed during the gestation process. The third question, as investors and financial institutions may become sources of knowledge, asked to indicate the private ones with which NIF had contracts and endowed valuable information during the gestation period. Finally, the summation of private partners identified by each entrepreneur in the three questions allowed us to generate just one independent variable reflecting the total number of private sources of external resources. Similar variables have been already used to reflect the contribution of external partners to firms' performance (see Wagner, 2009 or Laursen and Salter, 2006).

Cluster membership

Similarly to several previous studies, a dummy variable was applied to distinguish between cluster member and non-member firms (Hundley and Jacobson 1998; Molina-Morales, 2002, among many others). Using answers from our questionnaire, the variable took value one if the new firm was located in one of the industrial clusters identified by previous research (Boix and Galletto, 2006; Giner and Santa María, 2002); and takes value zero if the new firm was not located in any industrial cluster. In order to reinforce the quality of our instrument, we verified the information submitted by the respondents (business name, telephone number and address) using web search or well-known databases (for example, Dun&Bradstreet or SABI).

Control variable

Age measured by the months from the inception was the control variable included in our analysis because it is expected to influence the firm's size or growth. Older firms are more likely to have higher sales than younger firms (Deeds and Hill, 1996). Furthermore, younger firms are considered to have higher failure risks due to their lack of environmental legitimacy and organizational constraints (Zheng et al., 2009).

To test the robustness of our dependent and independent variables, confirmatory analysis was conducted using qualitative techniques. Both peer debriefing (confirming analysis with a small group of academic experts and policy makers) and member checks (confirming analysis with the study's participants) also corroborated the validity of our variables.

Methods

Analysis techniques and results

Since the publication of the well-known paper by Baron and Kenny (1986), models that control for mediating effects have become popular among academic researchers (Parra-Requena et al., 2010; Walker et al., 2010; among others). This models propose that explanations for an association between a proposed causal variable *X* and some presumed effect *Y* almost always invoke at least one *mediator* variable *M* to account for the cause-effect relation between *X* and *Y*.

Insert table 1 about here

Table 1 presents the means, standard deviations, and correlations for the independent variables. The findings of the correlation matrix indicate that IR, AGE and KIBS were positively related to NFG ($r = 0.423$, $p < 0.01$; $r = 0.187$, $p < 0.01$; $r = 0.255$, $p < 0.01$ respectively). In addition, the results indicate that unit's resources were associated with KIBS ($r = 0.132$, $p < 0.1$).

Insert table 2 about here

In our hypothesis, we suggested an indirect effect of external sources of knowledge on new firm's growth through internal resources. Following Baron and Kenny (1986) four conditions should be met to verify this conjecture: a) KIBS is significantly related to NFG; b) KIBS is significantly related to IR; c) after external resources is controlled for, IR remains significantly related to NFG; and d) after IR is controlled for, the relationship between KIBS is zero.

For our mediator effect, the first condition is satisfied; since the independent variable (KIBS) has a positive and significant influence on the dependent variable (NFG), see Model 1 in table 2. The second condition, which establishes a positive relationship between the independent variable (KIBS) and the mediator variable (IR), was also satisfied as per Model 2 in the same table. The third condition requires a relationship between the mediator variable (IR) and the dependent variable (NFG). This condition is corroborated as model 3 reflects. Finally, the fourth condition establishes that the relationship between the independent variable (KIBS) and the dependent variable (NFG) should be eliminated—or at least reduced—when the mediator variable (IR) is included in the model. Our results indicate that the absolute size of the direct effect between the independent variable (KIBS) and the dependent variable (NFG) decrease after controlling for the mediator variable (IR), and the direct effect is still significantly different from zero. Finally, once bootstrap data indicated the lack of significance at 95% CI, a 19.5% partial mediation effect can be confirmed, see figure 1.

Insert figure 1 about here

To further analyze the role of proximity, a conditional indirect effect analysis was conducted. The mediation question focuses on the mechanism that generates the treatment effect, while moderating effect occurs when the strength of the relationship between two variables depends on a third named moderator. Both mediation and moderation questions may be combined to verify if moderation is mediated or mediation is moderated. Specifically, our analysis exploited the bootstrapping technique of Preacher et al. (2007). This moderated mediation model does not contradict traditional approaches to test mediation (Baron and Kenny, 1986). In fact, the approach of Preacher et al. (2007) tests the significance of the mediating effect at different values

of the moderator, affording the opportunity to determine the exact point at which this effect becomes significant, each of those test is identical to more traditional mediation analyses.

Insert table 3 about here

Insert figure 2 about here

In Table 3 there are two multiple regression models: The first displays the path coefficients for the model with IR as the dependent variable; the second displays the path coefficients for the model with NFG as the dependent variable. - According to the first model, the interaction term (KIBSxCluster) was significantly associated with the mediator (IR) at *p-value* < .05. As can be seen from the second model, the mediator (IR) was significantly associated with NFG (*p-value* <.01). Table 2 also displays the *conditional indirect effect* of the spatial dimension. Concretely, the effect refers to the indirect relationship (mediated by IR) between KIBS and NFG at conditional values of cluster (the moderator). As shown, when firms are located outside the cluster (cluster=0) there is no indirect relationship between KIBS and NFG, however, this indirect relationship between social support and NFG is significant at p-value< .01 for clustered firms (cluster=1). Therefore the moderated mediation model supports for our expectations.

Discussion and implications

Using data from a survey of NIFs located in the VAC region, we addressed the question of how the spatial dimension moderates the mediating role of internal resources on the relationship of KIBS on new firm growth. In line with previous research, our results prove the positive impact of the internal resources on the future growth of new firms, NIFS with more initial investments and higher level of human capital grow faster (Hariman and Clarysse, 2005; Cooper et al, 1994). Although several stylized models discarded the possession of resources and capabilities at birth, consistently with previous literature (Helfat and Peteraf, 2003; Helfat and Lieberman, 2002), we have confirmed the existence of a set of initial endowment that represent at the same time sources of heterogeneity and pre-determine the development of new resources and

capabilities.

Furthermore, this study represents a new step toward closing the analytical gap in the existing literature on the potential interactions between external resources and new firm's internal attributes, and their combined effects on performance. The results confirmed that KIBS providers, as a form of external resources, exercise a positive influence on NIF's performance through the mediating effect of firms' internal assets. However, without certain level of internal resources and capabilities to convert external resources into advantages, KIBS contribution does not completely translate into performance. Consequently, this paper provides a more precise comprehension of the role of the embryonic resources and capabilities.

An important conclusion, consistent with the acknowledged importance of the external resources (particularly knowledge) for NIF's growth, is that intra-firm investments are more likely to collect benefits when these initial efforts are complemented with the appropriate external resources. In line with previous research (e.g. Wu, 2007), core resources such as human and financial capital and complementary resources, in this case supplied by private KIBS providers, determine entrepreneurial success. Internal and external resources should not be conceived as strictly independent spheres, conversely they are strongly interrelated. In-house resources should be configured to maximize the benefits from KIBS providers. It is not a question of quantity over quality. Obviously, the quantity matters, but overall it is a question of adequacy and adequateness of both types of resources.

Synergies will arise when harmony between human and financial capital, and inputs from KIBS providers exist. So, decisions about resources endowments should not be taken without a prior evaluation of the supplementary of the available external resources, and vice versa. Therefore, a clear message for new firms in early: cooperation with valuable service providers should be considered under the light of fostering core business areas so as to benefit from the potential synergies between both sources of competitiveness. From KIBS perspective, suppliers' offer needs to be designed according with the specific internal characteristics of new firms that should be targeted.

From a managerial perspective former is important because internal resources and capabilities should be improved, changed and adapted consistently with the external resources available by the NIFs. Thus, entrepreneurs must be willing to build internal assets to maximize growth by optimizing the match with the external resources provided by KIBS. On the other hand governments should encourage entrepreneurs to employ public KIBS, but also private ones through their myriad programs. Such policy orientation requires complementary knowledge service supply, rather than overlapping both types of KIBS. The corollary is obvious, public knowledge services should be carefully tailored to avoid crowding-out effects, and optimize public spending in entrepreneurship and innovation programs.

As recently synthesised by Wennberg and Lindqvist (2010), micro-level research about the impact of agglomeration on new firm's performance seems inconclusive or even contradictory. Although with limitations, this paper confirms conceptual approaches that highlight how cluster benefits for incumbent firms could also apply to new firms (Rocha and Sternberg, 2005; Audretsch and Lehman, 2005). Furthermore, the moderating influence of cluster location obtained, is consistent with empirical findings by Pe'er and Vertinsky (2005), Rosenthal and Strange (2005) or Wennberg and Lindqvist (2010). Following to Romanelli and Schoohnoven (2001), cluster dynamics emerge also as particularly influential in a young firm context.

Due to the model specification, this finding also connects with previous research that revealed how agglomeration economies and knowledge spill over effects are important in developing internal resources and capabilities (DeCarolis and Deeds, 1999; Owen-Smith and Powell, 2004). Essentially, it confirms that despite competition over local resources, clusters are beneficial entrepreneurial atmospheres, as their effect counterbalances some disadvantages linked to the gestation process. Co-location provides opportunities for building social relationships through which NIFs access knowledge to successfully perform (Sorenson and Autio, 2000), mitigates the difficulties of new entrants in securing resources from others (Stuart and Sorenson, 2003), enhances access to effective production methods and management practices that can be easily imitated (Helsley and Strange 2002) and reduces consumers' search costs (Kalnins and Chung, 2004).

The combination of both results seems extremely attractive as it shows a refined understanding of how clusters affect NIF's growth. Overcoming previous research limitations that relegate the deeper scrutiny of the mechanisms that produce cluster benefits (e.g. Wennberg and Lindqvist, 2010), our findings reveal not only the superior performance of clustered units, but also how cluster effect operates. Share resources in clusters help to ensure that external resources received from KIBS are more efficiently applied, enhancing NIF's performance. Such results emphasize the relevance of being co-located as a way of absorbing the maximum value from external knowledge sources. Meso-level resources and capabilities of clusters have a positive effect on NIF's capacity to benefit from KIBS contribution to growth, as they complement the initial assets, generating valuable synergies.

Entrepreneurs assess their potential success of their new firms by comparing the initial bundle of resources and capabilities with the average resources required in the industry. The evaluation determines the vulnerability and the need to expand or complement the resources and capabilities in order to prosper and survive. Location in clusters becomes a crucial way to meet detected resource deficiencies as allows NIFs to fill the gap by completing or facilitating the development of resources and capabilities during the gestation process. As Pe'er and Vertinsky (2005) suggested, entrepreneurs should choose cluster location on the basis of the resource needs of the enterprise during the gestation process.

However, NIFs must have the appropriate internal resources and capabilities to benefit from the agglomeration effect. In line with previous research, our findings indicate that not only weak internal assets may constrain access to the additional resources in clusters as few enterprises will choose to partner with an entrant who has no resources or capabilities to contribute (Baum et al., 2000), but also the mismatch between both internal and external resources. The contribution of agglomeration economies to a NIF growth will depend on its own capacity to develop, search and exploit the opportunities generated by co-location. Such capacity will emerge when the necessary resources are devoted to local networking and the set of initial resources approximates enough to the frontier of knowledge allowing the proper absorption by the new firm.

Conclusion and directions for future research

Recognizing the relevance of the evaluating strategic resources and the spatial dimension, this paper has sought to advance research by considering a model not only relating external resources, internal resources and new firm's performance; but also the moderating effect of being located among a cluster boundaries. From a practical point of view, this study shows that the partial mediating effect exercised by internal resources and capabilities on growth, becomes more intense when new firms benefit from cluster location. In other words, shared resources are showcased as complementary assets that can function as a crucial moderators of the mediating effect mentioned. This finding complements past research by deepening the knowledge about the underlying mechanisms through which agglomeration synergies operate, and suggesting firms pay greater attention to such benefits that can play a key role in their potential growth. Accordingly, new firms must not exclusively develop their internal resources and capabilities, but they must consequently leverage them to benefit from the externalities derived from cluster.

At that point, the limitations of the study are provided with the purpose to discuss opportunities for further research. First, this study is cautious and uses only two well-known internal resources and capabilities indicators. Thus, in the future, our research should be extended to other dimensions of the strategic internal assets. In addition to investments and human capital, upcoming analysis should also include entrepreneur's characteristics or more variables related to firm's knowledge base in order to achieve a more complete picture of the importance of the mediating role of firm's internal resources and capabilities. Additionally, next research should also identify differences between private and public KIBS providers (e.g. technological institutes, research centres, universities) using the purposed methodological tool. Such analysis may lead to detect the existence of displacement effects when both public and private offer some overlapping.

Second, this paper applied a strict and simple measure to the growth of new innovative firms. Future research should apply more sophisticated measures of the agglomeration effect to allow a precise evaluation of the limits of cluster effects for new firms, as local

embeddedness may become a barrier to innovation or growth (Love et al., 2010; Molina-Morales and Martínez-Fernandez, 2009). Forthcoming studies should also try to link the conditional indirect effect to different performance indicators because when innovation and financial dimensions are employed differences may arise.

Third, another limitation of this research relates to the sample and population of companies. Although the final sample covered several industries in terms of NACE codes, the population was drawn only from the previously discussed sources and only included new innovative firms. Future research should increase the scope by replicating this study using a mixed population of respondents (e.g. incorporating incumbent firms), controlling for sector divergences or expanding the population through uncontrolled new ventures. Finally, the static nature of this study opens avenues for coming research as it reduces our insights into the dynamics of resource building and development in the cluster. In spite of these limitations, our paper represents a compelling case for considering the importance of embryonic resources and capabilities in leveraging KIBS contribution and cluster effect for enhancing the growth trajectory of new firms.

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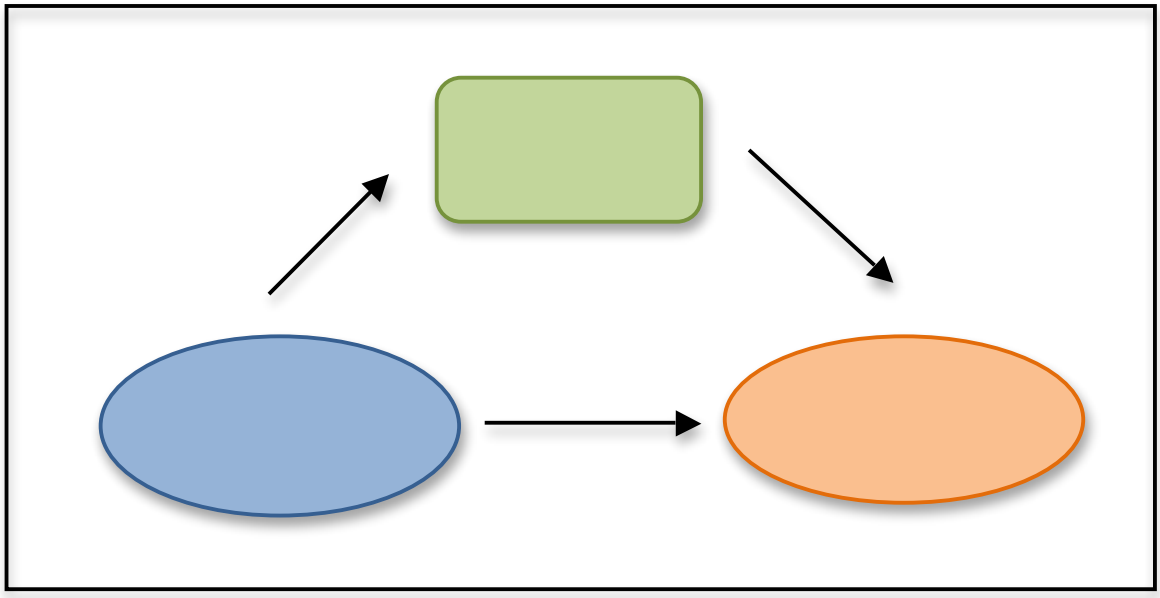
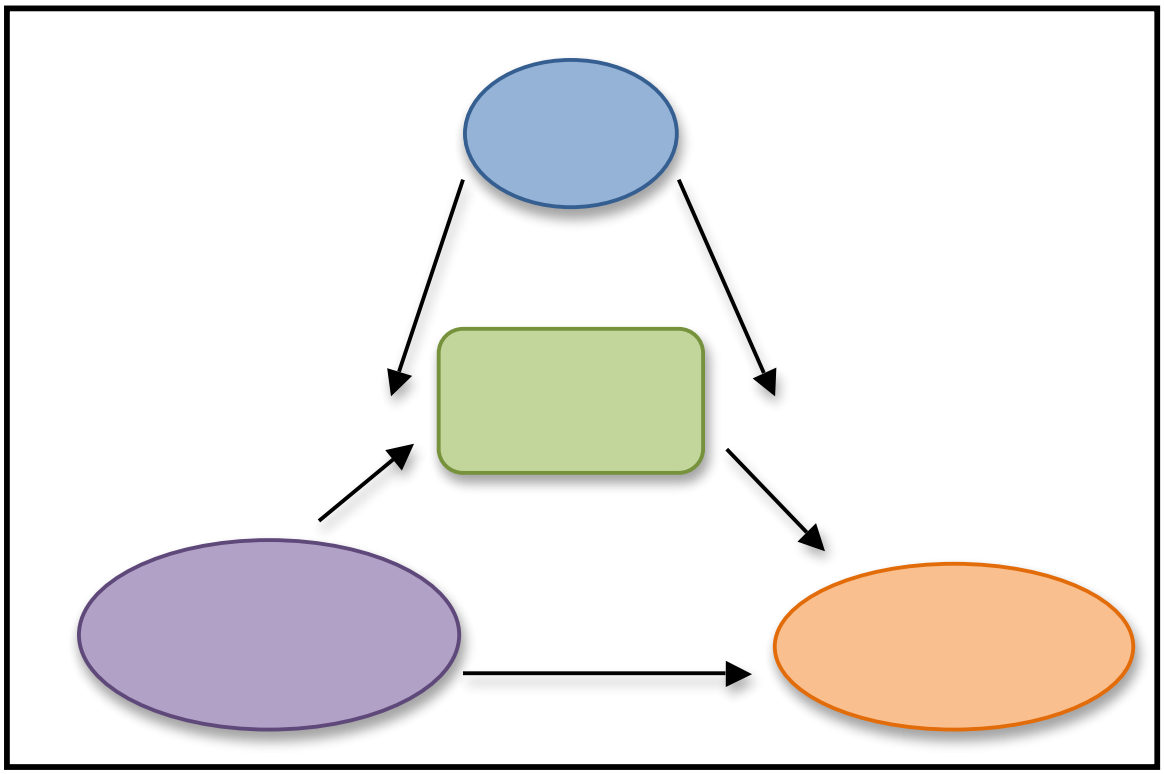
Figure 1: Simple mediation model results



Significance level ***.01; **.05; *.1

Figure 2: Compacted presentation of the conditional indirect model results



Significance level ***.01; **.05; *.1

Table 1. Correlation matrix and main descriptive statistics

NFG	1.000			
IR	***.423	1.000	.078	.132
AGE	***.187	.078	1.000	-.080
KIBS	***.255	*.132	-.080	1.000
Mean	.0068623	-.025987	33.0405	1.2543
S.D.	1.019203	.784835	16.3566	1.0477
N	173	173	173	173

Significance level ***.01; **.05; *.1

Table 2: Mediation model results[+]

Model 1: Total effect of KIBS on NFG			
	β *(sig)*		
External Sources of Knowledge (KIBS)	***.2639		
Model 2: Direct effects of KIBS on IR			
	β *(sig)*		
Internal resources (IR)	*.01858		
Model 3: Direct effect of IR on NFG			
	β *(sig)*		
Internal Resources (IR)	***.4935		
Model 4: Direct effect of KIBS on NFG			
	β *(sig)*		
External Sources of Knowledge (KIBS)	***.2125		
Partial effect of Age on NFG			
	β *(sig)*		
Age	***.0109		
Model summary for the NFG model			
Adjusted R^2	.2356		
F Statistic (sig)	***18.675		
N	173		
Bootstrap results for indirect effects (5000 bootstrap samples)			
	Point estimate	BC*95% CI	
		Lower	Upper
	.0515	.0043	.1588

[+]Results obtained using macro developed by Preacher and Hayes (2004)
Significance level ***.01; **.05; *.1

Table 3: Conditional Indirect Effect of KIBS in relation to NFG through IR

MODEL 1		**MODEL 2**	
Direct effects of KIBS on IR		**Direct effect of IR on NFG**	
	β (sig)		*β (sig)*
Constant	-.1742	Constant	***-.6757
Age	.0045	Age	***.0113
KIBS	.0241	KIBS	***.2409
Cluster	*-.3489	IR	***.3273
KIBSxCluster	**.2486	Cluster	.3034
		KIBSxCluster	-.1854
		IRxCluster	***.6046

Conditional indirect effect at specific value of the moderator (cluster)	
Value	Indirect Effect *(sig)*
.0000	.0079
1.000	***.2541

Significance level ***.01; **.05; *.1