COOPERATION'S CHARACTERISTICS FOR POTENTIAL INNOVATIVE SMES IN CRISIS: THE GREEK PARADIGM

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Abstract

This study focuses on the role of business cooperation and firms' exporting activity as the determinants of Greek manufacturing SMEs' innovative extend use, contributing to the existing empirical literature. The empirical analysis based on unique both quantitative and qualitative data, derived from a survey covering more than 158 small and medium-sized Greek manufacturing firms, and examines factors affecting innovation activity, emphasizing on clustering activities. We find that inter-firm cooperation enhances innovation activity, which in turn empowers firms' growth by improving domestic and overseas sales performance. This study opens the floor for a greater perspective in managerial and financial firms' characteristics; Firms should take initiatives to promote collaborative networks for innovation and create trade associations that represent SMEs, in order to facilitate social interaction. Also, government should offer incentives to SMEs with high innovation potential (e.g. tax allowances) and invigorate linkages between universities, research centers and the private sector by creating effective institutional arrangements. Finally, we seek to provide policy implications to business owners, policy makers and academics, to optimize performance, in the shadow of economic turbulence that the country experiences.

Keywords: Innovation, Cooperation, Clustering, Z-Score, Risk, Greek Manufacturing, SMEs, Financial Crisis

1. INTRODUCTION

Small and Medium Enterprises (SMEs) are considered as the engine of a country's economic growth (Lee et al., 2012; Sawers et al., 2008; Zeng et al., 2010) and attract the interest of policy makers, since they represent the majority of the economic structures and they are the main employers of a country (Tödtling & Trippl, 2005; Villa & Antonelli, 2009; Zeng et al., 2010;Lee et al., 2012; Muscio & Nardone, 2012; Solleiro & Gaona, 2012). SMEs have the ability to react faster to the changing needs and environment, and argue that the successful development of these enterprises enhances the competitiveness of a country (Sawers et al., 2008). However, even though flexibility of SMEs is seen as an advantage for accelerating their innovation, only few of them achieve to manage the whole innovation process on their own in order to turn their inventions into products or services. They often lack resources and capabilities at the stages of manufacturing, distribution, promotion and research funding, and this leads them to cooperate with other firms, in order to reduce risk, cost and time required for innovation, as well as to gain access to sales and marketing networks during the last stages of innovation process (Lee et al., 2010).

SMEs face higher cost of capitals compared to larger and thus turn to solutions such as venture capitals and partnerships (Hall and Lerner, 2009). The ability of smaller firms to compete larger is limited due to internal (lack of knowledge, skills, capital, human resources) and external (presence of big players in the market) issues. Therefore, innovation partnerships is a way for smaller enterprises to overcome these obstacles. Clustering enables small firms to supplement their existing resources and overcome funding barriers that are faced due to their small size and their limited access to new knowledge.

Today's Greece is struggling to overcome economic crisis and return to growth. In the meantime, many experts agree that economic growth is inextricably linked to innovation and cooperation. SMEs represent 99.9% of Greece's total enterprises (OECD, 2014) and given that manufacturing firms are considered to be the main innovators within an economy, this study attempts to examine the relationship between clustering and Greek manufacturing SMEs' innovation. The performance of SMEs and their financial soundness are paramount (Voulgaris et al, 2000), thus the impact of innovation on firm probability of default is examined also.

The study is structured as follows: the next section presents a literature review in SMEs' innovation and the relationship with clustering, while section 3 highlight the methodology as well as the model approach of the study. In section 4, the empirical results of the study are presented and

discussed. Section 5 summarizes the empirical findings and draws the policy implications of the study.

2. LITERATURE REVIEW

Firms form alliances because they are not self-sufficient and they cooperate in order to reduce uncertainty and gain access to other resources (Ozman, 2009). Zeng et al. (2010) observed that SMEs have limited financial resources implying less R&D investments and generally more uncertainty and barriers to innovation, and need some additional resources, such as marketing knowledge and managerial skills. They concluded that collaborative networks are crucial to overcome those barriers and to reduce uncertainty in innovation. Therefore, they argue that it is necessary for SMEs to link different enterprises, research facilities, vendors and clients to an innovation network which will enable them to share knowledge and benefit from the skills available in the network. Those external skills and resources that are available for exploitation can provide the impetus and the potential for SMEs to innovate, as more and more companies focus on the external environment, looking for ideas, knowledge and resources necessary for the development of successful innovations (Garefalakis et al., 2016).

Nevertheless, although firm cooperation is generally beneficial to both small enterprises, as it provides access to new knowledge, new markets, specialized and experienced partners and additional sources of financing, and large, which may not have much to lose, problems related to the additional knowledge transferred accidentally from one firm to another, are frequently identified (Sawers et al., 2008). This unintentional knowledge diffusion is considered as a major threat for a small firm choosing to cooperate with a larger, and thus businesses should develop safety mechanisms against this type of information flows.

Since SMEs lack research personnel and do not have the resources needed for the development of their own R&D department, they collaborate with universities and research centers. Kirkels & Duysters (2010) arguing that SMEs have neither the time nor the financial resources to devote to education in order to acquire knowledge. To address this lack of competitiveness, they should give priority to enhancement of their innovation through rise of private R&D investments and strengthening the linkages between businesses, research organizations, universities and government (Muscio & Nardone, 2012; Solleiro & Gaona, 2012). Cooperation with other firms and development of links with knowledge centers are key factors for enhancing SME innovation (Revilla & Fernández, 2012). Moreover, Lee et al. (2012) suggest that government subsidies and regulations support and encourage R&D, in order to address the financing problem of SMEs.

Lack of innovative collaborations has a negative impact on innovation (Zeng et al., 2010). The involvement of businesses in efficient cooperative networks is considered to be one of the most important factors of achieving innovation (Klerkx & Leeuwis, 2008). Lee et al. (2010) argued that firms engaged in more than one link are more innovative than those linked with only one partner. The importance of multiple links is also supported by

Zeng et al. (2010) arguing that a wide range of external partners and other sources has a positive impact on firm innovation. In the same context, Lee et al. (2012) argue that cooperation with suppliers, customers and other partners should be taken more seriously in order to SMEs can achieve innovation and define the ability of an SME to innovate as its ability to choose "ever-changing environment-responsive strategies and actions to achieve corporate goals".

Aziz & Norhashim (2008) argue that there is no single definition for clusters. Porter (1998) defined clusters as "geographic concentrations of interconnected companies, suppliers of specialized inputs, service providers, firms in related industries, and associated institutions (universities, standards agencies, trade associations and so on) in particular fields that compete but also cooperate" and as "a form of network that occurs within a geographic location, in which the proximity of firms and institutions ensures certain forms of commonality and increases the frequency and impact of interactions". According to Casanueva et al. (2013), clusters are "knowledge production centers that are characterized by the transference of knowledge and information between its members. Maine et al. (2008) argue that the definition of the minimum requirement for a cluster is "a group of firms from the same or related industry located geographically near to each other". According to Felzensztein et al. (2014), the proximity between cooperating enterprises is of particular importance, in cases of obtaining access to information, technology and innovation. However, they highlight that clusters share a geographical area that can vary from one city or area to one country or a group of neighboring countries. Cooperation networks can range from a narrow region (municipality or county) to an entire state or, more rarely, an entire continent (Villa & Antonelli, 2009). Similarly, Erkuş-Öztürk (2009) indicated that the term "cluster" refers to a local network of specialized organizations, where close links between businesses exist; local networks are not the only to contribute significantly to the competitiveness of the cluster. International networks are of major importance in terms of competitiveness, as well. Finally, Moosavi & Noorizadegan (2009) defined clusters as "interrelated industries and institutions that mutually reinforce and enhance competitive advantage by acting as each other's consumers, competitors, partners, suppliers and sources of research and development, relying on collaboration and cooperation between public and private sectors, breaking down barriers and promoting the intangible assets of synergy, trust and social capital". Moreover, according to Enright & Roberts (2001), "firms and organizations involved in clusters are able to achieve synergies and leverage economic advantage from shared access to information and knowledge networks, supplier and distribution chains, markets and marketing intelligence, competencies, and resources in a specific locality" and they also argue that "the modern concept of clusters involves integrated and often dissimilar firms and public agencies/ institutions specializing and collaborating of R&D, innovation, commercialization and marketing to produce a range of new or re-engineered products and services".

Thus, the actors that form a cluster can be suppliers, specialized infrastructure providers,

customers, research and technology oriented enterprises, as well as governmental or other institutions like universities, think tanks, standard agencies and trade associations. All these elements, linked together with continuous cooperating and competitive linkages, promote growth, innovation and competitiveness (Motoyama, 2008). Connell et al. (2014) highlighted the continuous linkages among actors enabling enterprises to gain added value and improve their competitive advantage by exploiting the strengths of the cluster and the agglomeration economies.

The majority of authors argue that companies involved in a cluster enjoy more benefits and, generally, have higher levels of innovation activity (Cai & Fan, 2011; Szanyi, 2012; Connell et al., 2014; Lai et al., 2014; Bourletidis, 2014). The main reasons why innovation is associated with clusters related with the benefits associated with the creation of new knowledge, which arises through interpersonal contacts (Connell et al., 2014). Joining a cooperation network gives companies the opportunity to develop inter-firm relations and social capital, through social interactions (Felzensztein al., 2014). Therefore, mutual trust, cooperation and information exchange is encouraged and thus firms' willingness and ability to innovate is enhanced (Kumral et al., 2006). Another factor affecting innovation performance is the total number of strategic alliances. In strategic alliances, the strong bonds of trust facilitate the flow of tacit knowledge (Casanueva et al., 2013; Sarvan et al., 2011), which is the basis of innovation process (López-Nicolás & Meroño-Cerdán, 2011). Trust is an important prerequisite for the development of inter-firm relations and the facilitation of knowledge exchange among them, as it is considered an essential feature of business networks which can affect cooperation and information and knowledge quality that flows among firms' human capital (Connell et al., 2014).

According to Felzensztein et al. (2014), companies participate in a cluster in order to access specialized suppliers achieving: joint sales to foreign markets, joint distribution policies, joint marketing agencies for foreign markets, collaboration and share market information. Moreover, the participation of enterprises in a cluster often leads to reduction of investment costs, facilitation of qualified employee, knowledge and information acquisition, access to common suppliers and the enhancing of their competitiveness (Lai et al., 2014). Bourletidis (2014) indicated that in order to efficiently solve the legal and regulatory issues raised, the actors of a cluster can promote their common positions to the public authorities through clustering. Therefore, the most important benefit firms enjoy when joining a cluster, is their ability to increase their external resources, knowledge and capabilities and, through them, to improve their competitive advantage.

Clustering reduces transaction costs, especially the cost of searching and information reduces the possibility of wiretapping and facilitates the acquisition of resources and capabilities (Maine et al., 2008). Moreover, firms in a cluster can benefit from lower prices of large scale orders, the training of their human resources, use of facilities, testing and other benefits that result from economies of scale (Moosavi & Noorizadegan, 2009). Generally, clusters correlate companies from different levels of the industrial chain and through joint technologies, infrastructure and distribution channels, enable them to achieve competitive advantages (Erkuş-Öztürk, 2009).

It seems that frequent interactions in terms of sharing knowledge and ideas enhancing the development of social capital, is a very important competitive advantage for companies (Ben Letaifa & Rabeau, 2013). Even though companies aim to strengthen their competitive advantage by entering a cluster, their placement near businesses of similar object doesn't seem to be enough to benefit them. Agglomeration in a regional setting may have negative effects as well, since it does not autonomously lead to knowledge exchange, which is the terminus (Connell et al., 2014). Beugelsdijk & Cornet (2002) argued that geographic proximity is not leading companies to collaborate, but the attractiveness of the transaction. Thus, physical proximity of a potential partner can be considered an advantageous, but it is not a necessary condition for cooperation.

Tödtling & Trippl (2005) distinguished the problems that may arise through clustering in two categories. The first is the lack of communication and cooperation, which result inadequate flows of knowledge and technology and, thus, low levels of innovation, and the second is the existence of extremely strong bows between the actors, which can cause serious deadlocks. One more issue, highlighted by Ben Letaifa & Rabeau (2013), is the "knowledge base proximity" between the cooperating parties, which can also lead to dead ends, because when every actor has a homogenous knowledge base, no new ideas flow and the creation of new knowledge becomes impossible.

Cooperation is a basic characteristic of clusters and firm size is an important indicator for the determination of the level of linkages with other businesses and organizations (Garefalakis et al., 2015a,b). Given the increased need for resources, small businesses are usually linked more closely compared to the largest, which need collaborations less, due to their size (Erkuş-Öztürk, 2009). Soriano & Huarng (2013) argue that external partnerships may enhance as well as limit a firm's capability to turn its R&D activities into successful innovation, depending on the type and extent of their partnership. They also highlight that universities, suppliers and customers are important examples of external sources of innovation, with which firms can cooperate during their innovative activities.

However, De Faria et al. (2010) argue that collaborations are more likely to be found in high tech industry, as almost 80% of all inter-firm research partnerships are concluded in this industry. This is primarily due to the high complexity of the processes and faster creation and use of knowledge.

With university – industry collaborations being an important part of regional and national innovation systems, further enhancement of their cooperation is particularly important for the competitiveness of a country. Universities play a vital role, not only as the main creators of new knowledge and technology, but also as "suppliers" of qualified personnel in the labour market (Guan & Zhao, 2013). According to Muscio & Nardone (2012), in order for technological progress and economic growth to exist, an institutional link between industry and universities is necessary. Belderbos et al. (2004) highlighted that

universities significantly affect firms' productivity performance, as they are the only sources of knowledge that effectively disseminate knowledge to the public (through publications) and improve the productivity of innovative sales of firms (via their formal R&D collaboration). This is because firms' collaborations with universities focus more on developing new products, rather than improving the existing ones. Tödtling et al. (2009) also argue that complex or radical innovations are based on new scientific knowledge, which is mainly created in universities and research centers. Moreover, according to Belderbos et al. (2004), university and research center collaborations focus more on innovations that may open up new markets or market segments, while there is a positive relation between university collaboration and new to the market innovative products corporate sales share. Similarly, De Faria et al. (2010) argue that university, research center and competitor cooperation positively affects the increase of new to the market products and services sales, and highlight that collaborations with universities is one way for sharing costs, as they complement the existing innovation processes, like internal R&D. Moreover, they argue that cooperation with universities has a significant impact on achieving process innovation. In the same context, Guan & Zhao (2013) argue that university – industry collaboration facilitates the reduction of R&D costs and the diversification of risks. According to Tödtling et al. (2009), firm cooperation with universities and research centers has an important impact on patenting, while, according to Belderbos et al. (2004), this kind of collaboration is more likely to be chosen by firms operating in rapid technological growth industries. Generally, cooperating with universities seems to bring sales increases, high levels of research productivity and patenting to companies (Fontana et al., 2006).

Cooperation with suppliers is related to the improvement of process innovation (De Faria et al., 2010) and focuses on incremental innovations, improving products or processes (Belderbos et al., 2004). Moreover, De Faria et al. (2010) argue that supplier, as well as competitor cooperation has a significant impact on labor productivity growth. One more important source of knowledge for firms aiming at radical innovations is customers. Customer cooperation reduces the risk that relates to the introduction of innovations to the market and it is connected to product innovation (Belderbos et al., 2004). Participating in the products' design process, customers have an active role during the innovation process and often it's them that bring new solutions and products in the spotlight (Tödtling et al., 2009).

However, opposite to universities and competitors, customer cooperation seems to negatively affect innovation production levels (Belderbos et al., 2004).Businesses within a cluster usually cooperate and compete at the same time (Felzensztein et al., 2014). Competition within a cluster often enhances innovation (Tödtling et al., 2009). A "coopetition" relationship offers the advantage of a combination of the need for innovation, as a result of competition, and the access to new resources, as a result of cooperation. In particular, this relationship provides benefits such as reduced costs, tolerance to risk-taking, foresight in product development and expectations for healthier

competition (Osarenkhoe, 2010). As argued by Maine et al. (2008), the co-location of competing firms can generate demand-side benefits, by reducing consumer search costs. They also highlight that such a co-location is by definition necessary, in order for a cluster to exist, and argue that small businesses that develop new products are those that benefit the most through competitor cooperation, as they usually lack R&D resources. According to Belderbos et al. (2004), cooperation between competitors is the only type of cooperation that has multiple purposes and effects, as it increases labor productivity through the cost-sharing of R&D, and sales productivity, by allowing the starting of innovative programs (through risk allocation) and by improving sales (through technological standards establishment). Besides, as argued by Sedziuviene & Vveinhardt (2010), "the success of the most strategic decisions depends on competitive efforts, which involve deep knowledge on consumers' behavior, viewpoints as well as the adequate analysis of stronger competitors".

During the activity of large companies idle is often observed, due to increased bureaucracy, which makes them less flexible, compared to SMEs. Information flows slow down as they become larger and that limits their innovative capability. However, their surplus resources intended for R&D financing, and the sophisticated marketing systems, which facilitate the promotion of their innovations (Revilla & Fernández, 2012), make large firms especially attractive for partnerships. SMEs often enter into supplier-customer relations with large firms in order to create value (Lee et al., 2010), while, at other occasions, their cooperation relates to joint innovative activities. However, due to the high cost of capital faced by smaller businesses, as opposed to larger, which usually prefer to use their own resources to finance R&D activities (Hall & Lerner, 2009), there are cases where smaller companies become dependent on the largest, and that leads to tense relations and power imbalances (Osarenkhoe, 2010).

International cooperation linkages, according to Erkuş-Öztürk (2009), seem to increase with the firm size. As argued by Zeng et al. (2010), cooperation with foreign firms facilitates the introduction of new products to the domestic market, through new ideas, while, according to Kang & Park (2012), SMEs that cooperate with foreign firms performed better in their innovation results, than those that did not cooperate.

3. METHODOLOGY AND DATA

3.1. Data

The data sample of this study consisted of 158 Greek manufacturing SMEs in a balanced panel data set covering the time period of 2009-2013. The qualitative data of this study are based on survey-questionnaire research, while firm-level financial data derived from Infobank Hellastat S.A. The questionnaire completed from firm executives (owners, general managers or CEOs) who were asked to rate the importance of each factor for their firm on a five-point Likert scale (1- Very low, 5- Very high) during the examining period (Madrid-Guijarro et al., 2009). Obtaining information on qualitative variables associated with SMEs internal operation and their

relation to the market (e.g. management, organization etc.) is more difficult than obtaining these from large firms (Voulgaris et al., 2000).

About 800 Greek SMEs from manufacturing sector were contacted and 158 valid responses obtained, giving a respond rate of 19.8%.

According to European Commission (EU recommendation 2003/361:http://ec.europa.eu/ enterprise/policies/sme/facts-figures-analysis/sme-definition/index_en.htm), the main factors determining whether a company is an SME are: number of employees and turnover or balance sheet total. In this research, the number of employees is selected for the separation of firms that constitute the data sample. Hence, from the total data sample, 14.6% are too small-micro, 61.4% small and 24% are medium.

3.2. Empirical model

Data panel approach is used in order to analyze changes on an individual level. The general form of a panel data model is:

$$y_{it} = a + \beta x_{it} + \varepsilon_{it}, \qquad (1)$$

where, β_{it} measures the partial effects of x_{it} in period t for unit i.

Generalized least squares (GLS) method is used for the estimation of the unknown parameters in a linear regression model. The resulting estimator is given by the form:

$$\hat{\beta} = (X^{*'}X^*)^{-1}X^{*'}y^* = (X'\Psi^{-1}X)^{-1}X'\Psi^{-1}y \qquad (2)$$

3.3. Variables

In this study, the a proxy of innovation (INN) is used as dependent variable, taking value one whether firm innovates in whichever type of innovation (Lemonakis et al., 2013). Six explanatory variables that present a five-point Likert scale (0=low-5=very high) are used in order to define the relationship between innovation clustering. In addition, proxy of firm risk (Z-score ratio) is used in order to investigate the relationship between innovative activity and firm survival (Table 1).

Table 1. Variables of the model

Variable	Symbol	Definition
Innovation	INN	Dummy variable, taking value one whether firm innovates in whichever type of innovation.
Cooperation in Knowledge of Production	CWEPKP	Cooperation of firm with external partners enhancing knowledge of production.
Cooperation in distribution networks	CWEPD	Cooperation with external partners in distribution networks.
Cooperation in R&D activities	CTRD	Cooperation with external firms in R&D activities.
Cooperation in exports	CFE	Company cooperation with other companies in exports.
Cooperation with universities/ research centers	CWIU	Firm cooperation with universities and/or research centers.
Foreign Ownership	PROP	Property right relations (subsidiary or parent) with foreign companies with which it cooperates. It takes value one whether it has or zero otherwise
Z- Score	RISK	Firm's financial solidarity related with two-year default probability. Z-score bankruptcy model for private firms

CWEPKP variable defines cooperation of firm with external partners enhancing knowledge of production, CWEPD presents the firm cooperation with external partners in distribution networks, CTRD defines the cooperation with external firms in R&D activities, CFE presents the company cooperation with other companies in exports and CWIU represents firm clustering with universities and/or research centers. PROP variable defines whether firm has property right relations (subsidiary or parent) with

foreign companies with which it cooperates. It takes value one whether it has or zero otherwise. RISK variable is Z-score used as a measure evaluating firm risk and examining the relationship between innovation activity and firm survival (Murro, 2013). Z-score introduced by Altman (1968) measures firm's financial solidarity related with two-year default probability. Z-score bankruptcy model for private firms is given by the formula:

$$Z' = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5, \qquad (3)$$

where, X_1 = (Current Assets-Current Liabilities)/ Total Assets, X_2=Retained Earnings/Total Assets, X_3=Earnings before Interest and Taxes/Total Assets, X_4=Book Value of Equity/Total Liabilities and X_5=Sales/Total Assets. The higher the value of Z-score is, the smaller the probability of firm's default becomes.

4. RESULTS AND DISCUSSIONS

The first regression model used examining the relationship between innovation activity, cooperation and export orientation as well as other determinants of innovation activity of Greek manufacturing SMEs is:

$$INN_{i,t} = \beta_{0\,i,t} + \beta_{1\,i,t}CFE_{i,t} + \beta_{2\,i,t}CWIU_{i,t} + \beta_{3\,i,t}CWEPKP_{i,t} + \beta_{4\,i,t}PROP_{i,t} + \beta_{5\,i,t}CWEPD_{i,t} + \beta_{6i,t}CTRD_{i,t} + \beta_{7i,t}RISK_{i,t} + \varepsilon_{i,t}, \qquad (4)$$

where, subscripts i: represent firm observation, t: represents time (year) and ε_{it} denotes the error term of the equations.

In order to analyze the data, E-views 7 software package is used with panel data. The results indicate that the null hypothesis can be rejected so that the panel regression analysis can be used in this paper.

We also used Hausman test to verify whether we should choose the fixed or random effects method. The null hypothesis is associated with selection of random effects method and alternative hypothesis is associated with accepting the fixed effects method. Since the null hypothesis is not accepted the fixed effects method is accepted.

Table 2. Results of regression

Variable	Coefficient	t-Statistic
C	-0.1118 (0.0003)	-3.60962
CFE	0.102894 (0.000)**	10.08233
CWIU	0.104608 (0.000)**	11.02495
CWEPKP	-0.01289 (0.238)	-1.18088
PROP	0.33357 (0.000)**	9.52381
CWEPD	0.006801 (0.6069)	0.514767
CTRD	-0.02005 (0.0622)	-1.86735
RISK	0.003914 (0.0092)**	2.610729

*(Probability in parentheses, **: statistically significant at 1% level of significance)*

EGLS (Cross-section weights), Adj. R-squared=0.61029, F-statistic=177.51, Prob (F-statistic) = 0.000

In Table 2 it is observed that variables related to clustering with firms for exports, clustering with universities or/and research centers are highly significant and positively correlated with innovation activity of Greek SMEs. This is a very interesting result we've expected due to imbalances experiences Greek firms' in innovation matters.

In addition, firms that have property rights (parent or subsidiary) with foreign companies have better innovation performance indicating that foreign firms can increase diffusion of knowledge providing their know-how in innovation process. Cooperation with large and international firms increase innovation performance through new ideas and introduction of new products to the domestic market (Zeng et al., 2010) and SMEs that cooperate with foreign firms performed better in their innovation results than those that do not (Kang & Park, 2012).The results of this study also suggest that SMEs with innovation activity have smaller probability of default. Similarly, according to Murro (2013), innovative companies present less probability to default indicating that they are in competitive position.

5. CONCLUDING OBSERVATIONS/ POLICY IMPLICATIONS

Because of the economic turbulence that experiences Greece, innovation has received great interest in economic literature, since is correlated with firm survival, growth and competitiveness. This study using a data sample of Greek manufacturing firms, examines the impact of clustering on innovation and the impact of innovation on firm survival.

The results of the study indicating that clustering with universities/research centers and firms is significant factor enhancing innovation performance of Greek manufacturing SMEs. Hence, Greek SMEs should focus on clustering opportunities

in order to increase their innovation capacity and be more competitive in a globalized market. Especially, in a period of economic turbulence, Greek firms should find ways in order to increase their market value and their market position in the international market, while domestic market is shrunken.

Another significant output of this study is the contribution of innovation in survival of Greek manufacturing firms. Innovative SMEs present lower probability of default, suggesting that innovation plays a significant role in their survival.

The successful results of the cooperation between firms and universities or research centers are in most cases granted. Therefore, policies that promote and enhance such relationships are of particular importance (Tödtling et al., 2009). As government policies strongly affect the efficiency of universities and research institutions, regarding innovation processes (Zeng et al., 2010), policy makers should establish policies that will strengthen the ties between universities and the private sector (Solleiro & Gaona, 2012), so as to create a solid basis for cooperation, through which mutual exchange of information among firms and universities will exist. Such an example is science parks. Thus, initiatives for upgrading the liaison offices of universities and research centers should be taken, in order for them to be gradually linked with science parks. In addition, science parks should be supervised by the same governmental organization, so as for strong bonds between them and the state to be developed (Villa & Antonelli, 2009).

Governmental support directly and indirectly affects innovation of a firm, as it enhances the internal R&D and promotes partnerships. Therefore, government policies that support firms with high innovation potential, by offering technical support and other incentives such as tax reliefs (Tödtling et al., 2009), tax deductions for R&D expenditures, subsidies for R&D costs (Kang & Park, 2012), regulation improvements especially for innovative firms, simplification of the existing legislation, grants for startup businesses and venture capitals (Herrmann & Kritikos, 2013) are necessary. Policies that promote private R&D are of major importance, as they not only favor firm's own R&D activities, but its ability to benefit from research network spillovers as well (Autant-Bernard et al., 2013).

In addition, the state should ensure the development of existing universities and research centers and the establishment of new research institutions of high quality. Especially for Greece, there should be initiatives for researchers not to leave the country, and reforms that aim at the strengthening of the education system (Herrmann & Kritikos, 2013). Moreover, in order for Greece to have a restructured national innovation system, new structures that allow private and public organizations to participate in voluntary communities of knowledge exchange should be established (Papadopoulos et al., 2013). Inter alia, governments should promote innovation targeting at policies that facilitate international connections, in order for partnerships to be established inside and outside a nation's borders and enhance SME clusters' innovation capabilities, by promoting open innovation in universities and research centers (Cai & Fan, 2011).

In the end, policymakers face a serious dilemma. On the one hand, they should facilitate innovation

development, which will lead to economy growth, but, on the other hand, they should introduce policies that don't cost much to the country (Papadopoulos et al., 2013).

Firms should promote their innovation cooperation with each other, and persuade government institutions of the importance of a greater commitment to innovation and competitiveness (Solleiro & Gaona, 2012). Moreover, business managers should be more extroverted and develop their social capital participating in international strategic alliances that aim at creating competitive advantages, exploiting the new technologies of informal communication on social networks, when distance is great. An additional proposal for business managers is the organization of their businesses in associations, through which interactions between them will be facilitated and their chances for cooperation will be enhanced (Felzensztein et al., 2014). Moreover, since capacity building is considered an important factor of success, staff training on innovation management and its related policies is necessary (Solleiro & Gaona, 2012).

Especially for small companies, characterized by heterogeneity, followed policies should be diversified, in relation to the weaknesses and risks each one faces, as well as ranked. This means that a small company that is unable to determine its strategic vision should –before anything else– implement strategic planning capacity-building policies, instead of taking measures to support its export activity (Hagen et al., 2012).

In reality, however, companies are reluctant to engage in partnerships that may not provide guaranteed significant benefits, or may endanger the future viability or disappoint their shareholders (Papadopoulos et al., 2013).

Nevertheless, "successful clusters are those connected on a voluntary basis driven by knowledge spillover and innovation" (Ben Letaifa & Rabeau, 2013). Governmental interventions and amenities form "artificial" clusters that rely on exogenous proximities (geographic, organizational, cognitive and institutional) rather than the endogenous social one, which "spontaneous" networks require from the beginning. Firms should learn to connect, in order to achieve innovation (Connell et al., 2014).

Generally, it seems that there are no ideal policies for clusters, since each network has its own needs. Though, in order for real economic growth to exist in collaborative networks, there is a need for frameworks that do more than indicating the requirements for the formation of a cluster. In other words, there is a need for policies that can lead clusters in a stable and sustainable growth (Aziz & Norhashim, 2008).

Global economic crisis has highlighted the need for innovation, in order for economies to diversify and for jobs to be created; clusters are seen as particularly attractive, from a political perspective, as they serve a dual purpose. They enhance the competitiveness of SMEs, through cooperation and business agglomeration and they build or revitalize targeted areas (Connell et al., 2014).

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