

The innovativeness of Thessalian wood and furniture SMEs: towards an understanding of internal and external drivers

Glykeria Karagouni¹

Department of Wood & Furniture Design and Technology
Technological & Educational Institute of Larissa
karagg@teilar.gr

Ioannis Papadopoulos²

Department of Wood & Furniture Design and Technology
Technological & Educational Institute of Larissa
papad@teilar.gr

Marios Trigkas³

Department of Wood & Furniture Design and Technology
Technological & Educational Institute of Larissa
mtrigkas@cereteth.gr

Abstract

The international literature has dealt extensively with innovativeness, both in theory, as well as in a plethora of empirical studies. Radical innovations encompass high quality action that contributes to the creation of new sectors, products or markets. Cooper (1998) adds that as long as innovations become more radical, they lead to evident and risky removal from existing practices. It is obvious that this kind of innovation does not appear at the level of the wood and furniture industry which is characterized as a low - tech industry (OECD, 2002).

For this particular reason the present study turns to the search of characteristics and capabilities that contribute to the growth of innovation in the Thessalian wood and furniture enterprises using the Schumpeterian concept of innovation. In this paper Innovation is related to a firm's ability to trace and absorb external information, knowledge and technologies. A recent trend in the innovative performance of a firm is to be related with the information gathered by customers and suppliers, competitors, universities, and public research organizations or the one stemming from internal sources such as production and sales.

Empirical data was acquired via a recent study of 45 Thessalian small and micro wood and furniture companies. Descriptive statistics expose their mediocrity, regarding the use and exploitation of the above mentioned internal or external drivers. Regression analyses examine the differentiation of enterprises regarding their innovativeness, based on the Technological Innovation Capabilities. Parameters of exterior environment that contribute or deter the innovativeness of Thessalian wood and furniture enterprises were statistically compared.

The results show that Thessalian wood and furniture enterprises are not particularly innovative. Where mechanisms for innovation exist, they are lactated within the firms' production activities and their

¹ Application Professor - Laboratory of Applied Marketing, Management and Economics - Department of Wood and Furniture Design and Technology - TEI Larissa, Tel. 694-2642497, E - mail: karagg@teilar.gr

² Assistant Professor - Laboratory of Applied Marketing, Management and Economics - Department of Wood and Furniture Design and Technology - TEI Larissa, Tel. 693-7384777, E - mail: papad@teilar.gr

³ Wood and Furniture Business Economics M.sc. - Center For Research and Technology Thessaly - Institute of Technology and Management of Agricultural Ecosystems - CE.RE.TE.TH./I.TE.M.A, Tel. 6974287874, E - mail: mtrigkas@cereteth.gr

own supply chain. Furthermore, the local enterprise support environment does not contribute positively to the growth of innovative action: the enterprises do not approach or show trust for the institutions that support innovation and often appear not to know of their existence.

Keywords: innovativeness, business environment, technological innovation capabilities, wood and furniture industry

JEL classification codes: O31 - Innovation and Invention: Processes and Incentives

Introduction

Due to increasing global competitive pressure, shortened product life cycles and ease of imitation, firms must continue to innovate to maintain competitiveness (McGahan, 2004, Jenkins, 2005). Innovation has become the primary basis of productivity improvements, sales volume growth, and a firm's competitiveness. Increased global competition pressures are also forcing firms to continuously adopt, develop and innovate to enhance product competitiveness such as product design and quality, technological service and reliability. For these reasons, a firm must upgrade its innovation capability for developing and commercializing new technologies more rapidly than other firms, and must facilitate creation and dissemination of technological innovations within its organization to strengthen its competitive advantage.

Based on literature findings, activities, processes and characteristics associated with innovation success and failure are adopted as TIC (Technological Innovation Capabilities) dimensions (Guan and Ma, 2003, Yam et al., 2004). A lot of studies have analyzed their impact on a company's competitive output. On the other hand, conclusions of such researches seldom reach the industry and specially the micro and small enterprises. This results to ignorance for the new world data, as well as the cultivation of a culture that mature industries have no need of innovative actions.

Innovation can be defined as the application of new ideas to the products and processes of a firm's activities. According to Joseph Schumpeter all creative activities which contribute to diversity and thus generate profits count as innovations (Schumpeter, 1934). This concept establishes no compelling connection between innovation and scientific or technological originality. Jon Sundbo (who is following Schumpeter) defines innovation in a very general approach as the "introduction of new elements or new combinations of old elements in industrial organizations" for commercial use (Sundbo 1998: 1). Freeman et al., (1988) sees this as a process that includes the technical, design, manufacturing, management, and commercial activities involved in the marketing of a new or improved product or the first use of a new or improved manufacturing process or equipment.

Innovation can be transformational, radical or incremental depending on the effect and nature of the change. Afuah (1998) suggests that innovations do not have to be breakthroughs or paradigm shifting. Bessant and Francis (1998) suggest that effective innovation must involve all areas of an SME with the potential to affect every discipline and process.

Becoming more precise, the Schumpeterian innovation concept includes a wide variety of types of innovation that a firm can introduce, describing at least four types of change according to the following terms:

- The introduction of new goods or services—ones with which consumers are not yet familiar— or of a new quality of goods.
- The introduction of a new production process that does not need, by any means, to be founded upon a new scientific discovery and can also consist, for example, in a new way of handling a commodity commercially.
- The opening of a new market, that is, a market into which the particular branch of manufacturing of the country in question has not previously entered, whether or not this market has existed before.
- The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespectively of whether this source already existed or whether it has first to be created.

According to Ahmed (1998), innovation is the motive force of change - a change which is rather imperative, especially today, in a global competitive environment, where every resistance to change is very dangerous. Researchers evaluate the success of an innovation according its degree of correspondence to the market needs. Success is translated into improvement of company's competitiveness, increased profits, efficiency and turnover, higher productivity and share of market, improved quality and wider environment (Vracking et al., 2000).

Product Innovation Management constitutes a model, that takes into account a lot and different types of new product development (NPD) projects, that can range from minor to radical changes (e.g. a new basic product for the company). Wheelwright and Clark (1992) classify the projects in the following categories:

- derivative **projects**: incorporation of small scale, progressive changes in existing products
- platform **projects**: important progressive changes, which are connected to the same product base
- revolutionary **projects**: radical changes and growth of innovation
- **R&D projects**: projects with a special vision that curve the company's future and destiny.

The first two categories focus on market activities and are connected with progressive innovation, while next groups refer to technological activities and are reported as radical innovation.

Micro and small enterprises can seldom innovate alone - particularly if we refer to radical innovation. The whole process of developing radical innovations is rather precise, time-consuming, exigent (as for the total of resources) and laborious. The alternative solution is the import of innovation and the process of technology transfer.

Boer et al (1999) describe product innovation as a continuous and crossed process, which includes and integrates a number of different capabilities inside and outside the firm. These capabilities represent the ability of the firm to combine efficiently a number of resources to engage in productive activity and attain a certain objective (Amit and Schoemaker, 1993). A firms' capabilities are important in providing and sustaining its competitive and innovative

advantage (Penrose, 1959; Foss, 1997; Barney, 2001; Bender and Laestadius, 2005).

Innovation capability is a special asset of a firm. It is tacit and non-modifiable, and it is correlated closely with interior experiences and experimental acquirement (Guan & Ma, 2003). Accordingly, Technological Capabilities (TCs) are dynamic resources which encompass the skills, knowledge and routines involved in generating and managing technological change, whether they concern production activities, investment activities, or relation with other firms (Albu 1997). Peteraf (1993), claims that a firm's heterogeneous resource portfolios (e.g. technology, capital and human resources) play a vital role in observed variability in its financial returns.

Technological Innovation Capabilities (TICs) are defined by Burgelman *et al.* (2004) as a comprehensive set of characteristics of an organization that facilitates and supports its technological innovation strategies, when acting in a suitable business environment. They define the roots of a firm's long-term competitive advantage, which in turn, depends on the degree of acceptance of the firm's innovation as better than the idea or the practices that it replaces (McGahan, 2004) It is expressed as economic profit, company's prestige (fame, promotion of corporate image), or as means that leads to other advantages (e.g satisfaction, low risk). The nature of innovation and the characteristics of the firm determine which dimension of the comparative advantage is the most important at each occasion.

"Business environment" influences the innovative behavior of the enterprises that "live" and act within it. Its definition includes sources of information, research centres and institutions as well as the parameter of proximity (technical, technical and local) to them (Frambach *et al.*, 2002), suppliers and competitors (Koberg *et al.*, 2003), adding the easy access to the suitable resources (financial ones, human potential etc). Governmental institutions of policy mapping out have long recognized the need for an innovative business environment for their economies to prosper (Valery *et al.*, 2007). At the level of European Union, for example, countries overwhelm efforts in order to encourage the innovativeness and strengthen the relevant activities of micro and small to medium-sized enterprises (SME) via technology transfer, direct support (such as national or Community subsidies and aids - Community support frameworks) while at the same time a bigger attention is given to indirect measures too, such as tax motives. In regions and national economies of small size, the exterior sources of innovation are the most important source of technological knowledge pumping. The growth of enterprises relations, either among them, or with technology institutions, is quite essential for the configuration of multiform beams of feedback and interaction (Haanila *et al.*, 2007).

The wood and furniture industry and the Region of Thessaly

Mature and saturated at a world - wide level, the furniture industry constitutes the 2% of production value of total E. U. constructional sector. Europe bears the palm in the world furniture production (around 45%), while the overwhelming majority of the sector enterprises are SMEs. (Cismaru, 2003)

A characteristic element of Greek furniture production is the individual enterprise that serves the local demand, uses traditional techniques and becomes acquaintant particularly via the publicity

from mouth to mouth. A small number of furniture enterprises has attempted to cover the total of Greek market, and/or is advertized through mass media, while the number of companies that is activated abroad (exports, representations, production and sale) is rather negligible (Papadopoulos, 2005). It should be mentioned that these companies belong mainly to the office furniture segment. The sector is threatened by the invasion of cheaper imported products (Turkish, Chinese), cannot still escape from imported design (mainly Italian), while at the same time, it faces the raid of multinationals (e.g. IKEA).

The Region of Thessaly is characterized by an intense activity of wood and furniture enterprises, presenting however enough problems, such as the big territorial dissemination of enterprises in the Region (Trigkas, 2005). According to up to 2006 data, published by the National Greek Statistic Service, in the Region, there are in total 1271 activate enterprises. Respectively, the mainer problems of these enterprises are:

- **Production:** Low productivity, not certified quality, lack of industrial design, remedied technologies of mechanical equipment, no application of innovation.
- **Marketing:** Difficulties in accessing the markets of abroad (exporting), no application of modern Marketing methods, lack of organised distribution networks and lack of manufacturing and commercial sector cooperation.
- **Financial Management:** Unsatisfactory access to financing sources, lack of modern financing tools.
- **Human Resources Management:** Insufficient specialisation and training of workforce specialy in new technologies.

Thessalian business environment

The number of small to medium-sized and micro enterprises in the Region of Thessaly is estimated around 52,628 (6.0% of the enterprises of Greece). The predominance of micro firms constitutes a main characteristic of the region, since the 92.8% (90,3% in national level) occupies 0-5 workers (EOMMEX, National Observatory for SMEs, 2006). A basic problem for these companies is the lack of general and specialised information. The lack of suitable information is the main cause that firms still fail to understand and adapt themselves to the new business environment as the later is henceforth shaped at a global level and is crusially marked by the explosion of new economy and the knowledge and information society. Moreover, a big part of the industry (the one dominated by micro family and craft-based firms) remains not competitive, is unable to face the radical global changes and / or correspond to the specifications and terms of investment motives exploitation. Additionally, the cost of production is overloaded particularly by external factors (infrastructure quality, comparatively low production effectiveness, distribution and use of energy), which further decrease the firms competitiveness.

Wood and furniture industry constitutes one from most important manufacturing sectors in Thessaly (Papadopoulos et al., 2005). The enterprises of the 4 Thessalian prefectures are mainly micro and small ones and usually the entrepreneur herself deals with all company operations (manufacturing, marketing, accountance, finance).

Research Objectives

This paper aims to explore:

- 1 the internal factors that influence the rate of innovation in Thessalian wood and furniture SMEs
- 2 the extent to which factors in their environment influence the rate of innovation in Thessalian wood and furniture SMEs
- 3 the effect of Technological Innovation Capabilities on the innovativeness of Thessalian wood and furniture companies

Research Methods

The aim of the present research is to provide a comprehensive and holistic understanding of the internal and external drivers which drive the innovativeness of Thessalian wood and furniture SMEs. The mapping of the existing situation, the problems and obstacles that face regarding the information flow and the management of innovative processes could substantially contribute to new policymaking, action axes mapping, as well as the mobilisation of all required reformation mechanisms of the existing business environment of the particular sector, aiming at its survival and progress.

The process applied is the determination and association of concrete, decisive and representative technological innovation capabilities to the successful innovative activity of the firms under discussion and their correlation with parameters entered by the external business environment of Thessaly. Incorporating the conclusions of relative literature, activities, processes or characteristics that are reported to be connected to the success and failure of any kind of innovation are used to develop the questionnaire. The elements referring to the innovativeness are grouped using seven dimensions of technological capabilities according to Guan and Ma (2003) and Yam *et al.* (2005) and constitute the first part of the questionnaire. The second part consists of questions concerning technology institutions, sources of information, collaboration possibilities and other similar parameters that compose the business environment. It also contains items that are translated into obstacles to innovative efforts. The questionnaire is completed with further explanatory questions.

Both quantitative and qualitative data were collected via personal interviews in micro and small enterprises of Thessaly: The questionnaire was e-mailed to selected companies, after a telephone agreement, so that the directors (often the businessmen themselves) would have enough time to reflect upon their actions that reveal the real Technological Innovation Capabilities of their enterprise, as well as their views on the business environment and its contribution to the culture of innovativeness of each enterprise.

When a company did not have an e-mail, a member of our inquiring team would fax it or even bring it himself at the place of the enterprise. The interviewer would then arrange a personal interview in order to discuss the questions, clarify difficult points and finally complete the questionnaire. Quite often there would be a big discussion explaining some meanings and words of the questionnaire, since many interviewees did not have a clear view about them.

The questionnaire was pre-tested in seven firms. Interviewees were first asked to provide their views on various aspects of innovation

and competitiveness, including the easiness of new product development, making new moves and planning new strategies. This discussion was largely unstructured although a series of standard probes were used to guide the discussion. At the end of the interview session, respondents were then requested to fill in the structured questionnaire, in the presence of the researcher. The average length of the interviews was one hour. Respondents, one per firm, were senior executives such as general managers, directors, production managers or the entrepreneurs themselves. The companies were selected by random sampling using the ICAP list (2007) and were supplemented finally 45 questionnaires, i.e. the 3.5% the total population. The data were selected between January 2007 and March 2008. The data analysis techniques employed are descriptive statistics, reliability analysis, correlation analysis and regression analysis. All computations were done using the SPSS package (Norusis, 1997). The qualitative responses are used to provide context for the statistical results obtained.

Results

Profile of respondent firms

Most enterprises (44.4%) are activated in furniture manufacturing and/or woodworking work, including usually all kinds of furniture apart from sofas and armchairs. An important percentage of 22, 2% manufacture exclusively frames and kitchen cabinets, a 20, 2% scales, roofs and more general woodworking works, while some very small percentages manufacture exclusively upholstered furniture, office furniture and baby swings (4.4%, 4.4%, 2.2% respectively). The 51% of companies that participate in the research employ less than 9 people, and the rest 49% between 10 and 49. From a sample of forty five companies in the research, the twenty - six (57.8%) reported that they have made at least one innovative movement the last 3 years.

Regarding the legal form, the majority of the firms (44.4%) are individual enterprises, followed by G.P. (General Partnership) with a 22.2%, S.A.s (15.6%), PLC (ABEE) (4.4%) and LTD (2.2%). A non negligible percentage of 11.1% declared "other form". Cases of enterprises belonging to multinationals or not Greek organizations were excluded.

The innovativeness of Thessalian enterprises

There is only an 18% of innovative firms in the sample, considering the fact that - according to the European Innovation Trend Chart, - a firm is innovative when its innovation rate is greater than 20%. The companies that presented one at least innovative movement during the last three years were characterized as Innovators, while the rest were characterized as Not Innovative.

There is always of course the question about the way of understanding the term of innovation. The starting point was the original Schumpeterian concept that involves identifying a broad innovation concept including all forms of diversity creation (*creative combinations*) which may contribute to profitability and thus to value added. Free discussion excluded the possibility of radical innovation and led mainly to the development of equipment (passage from conventional to CNC), the import of design systems (CAD), the application of CIM and MRP in certain cases, as well as the first use of new or improved raw material of semifinished products. Actions such as replication of new furniture design mainly from European

countries (Italian, Spanish and Swedish design) were not considered as innovations and were excluded.

Among the technological capabilities that constitute the innovative capability, the R&D and the manufacturing capability have been proved in one of our previous research work (Karagouni et al., 2007), to play absolutely no role in the support of the possibility of companies to innovate. They don't even participate in the discrimination of the two categories (innovators-not innovative) (Table 1).

On the contrary, there exists an important difference as long as it concerns the Resources Allocation Capability, the marketing, organisation and strategic planning capabilities (Table 1). In one sense, the results are consistent with the literature. According to Berry (1996), if SMEs need to be successful and even survive in the long term, they must be more market-driven rather than technology-driven. The literature also suggests that, innovation cannot be viewed as the sole brief of a research and development or technical department (Tidd et al. 2001) and that in implementing and developing the process of innovation, there is no definitive path that can be embarked upon (Bessant and Caffyn, 1997).

Furthermore, there is only a small percentage of companies (16.2%) that develops innovation with other collaborators on a regular base. On the contrary, a 40.5% have never had any collaboration in any innovation plan and action. Both questionnaire results and interviews suggest that firms still resist co-operation with their local competitors. Our conclusions reaffirm previous studies results, for instance Meyer-Stamer (1998) and Morrison (2003) for Santa Catarina's and Sao Bento furniture industry in Brazil, respectively.

Table 1: Technological Innovation Capabilities and their effect on the innovativeness of Thessalian wood and furniture companies

TICs and innovativeness							
VARIABLES	INNOVATORS		NOT INNOVATIVE		REGRESSION ANALYSIS		
	Mean	S.D.	Mean	S.D.	INNOVAT	NOT INNOV	ALL
Learning Capability	5.38	1.061	5.09	0.980	0,931	NO	NO
R&D Capability	4.25	1.035	4.27	1.039	NO	NO	NO
Resources Allocation Capability	5.25	0.707	4.30	1.159	NO	NO	NO
Manufacturing Capability	4.88	1.246	4.88	1.083	NO	NO	NO
Marketing Capability	6.38	0.744	5.55	1.148	NO	NO	NO
Organizing Capability	6.25	0.463	5.15	0.834	NO	NO	NO
Strategic Planning Capability	5.50	0.535	4.94	0.864	NO	1.942	0.462
<i>F</i>					56.240	39.751	10.290
<i>R</i>					0.931	0.927	0.462
<i>R</i> ²					0.867	0.859	0.213
Adjusted <i>R</i> ²					0.861	0.838	0.192
Std Error					1.497	1.239	1.512
NOTES: NO = not important, *<i>P</i><0.05, Using 7 as absolutely satisfactory							

For Innovators, the Learning Capability is the only one affecting the innovation rate (standard regression coefficient = 0.931 at significant level *P*<0.05). That means that Knowledge Identification, Assimilation and Exploitation plays a vital role in helping small and micro firms successfully start an innovative activity. That is quite

normal if we assume that this category has not the resources and potential for intramural R&D (see i.e. Robertson and Smith, 2008; Hirsch-Kreinsen et al. 2005).

The descriptive statistics of all enterprises (Table 2) expose the mediocrity down to the negative status of Thessalian wood and furniture enterprises regarding the possession and exploitation of technical innovation capabilities in their total. R&D Capability presents the worst mean value, followed by the Resources Allocation Capability (4.24 and 4.60 respectively), with almost same standard deviations (around 0.96). These capabilities are commented by the enterprises themselves as non-existent, since they seem not to be ever used by them neither as tools, nor even as useful concepts. Free discussion proves that the best case is reported to be the search for drawings and tendencies in trade fairs and exhibitions and the search of instruments of up-to-date technology, or the distribution of the financial resources, concerning mainly the investment on new equipment. Special attention is however given to the development of the Marketing Capability (mean 5.80), followed by organisational capability.

Table 2: Technological Innovation Capabilities for all firms

	Learning Capabil.	R&D Capabil	Resources Allocation Capabil.	Manufacturing Capabil.	Marketing Capabil.	Organizing Capabil.	Strategic Planning Capabil.
N	45	45	44	45	44	45	45
Mean	5.22*	4.24	4.60	4.80	5.77	5.27	5.04
Std. Deviation	.93	.96	.96	1.04	.68	.80	.80
Minimum	3.44	1.93	2.43	1.00	4.44	3.17	3.33
Maximum	7.00	6.36	6.43	6.43	6.78	6.67	6.67

* Where 7 = absolutely satisfactory

Human Resources is regarded as a basic factor of corporate innovativeness culture. Taking their educational level as a parameter, a significant percentage (56%) was declared as "not having completed the primary education", while a hardly 5% were graduates of higher education (Higher Education Institutions, Polytechnic Colleges). This is rather a critical deficiency, particularly in the case of innovation, as well as the successful transfer of technology: there are practically no keen employees to inspire and cultivate the required culture or create the required environment of creativity and flexibility.

The business environment

A basic prerequisite of a business environment that would encourage innovation is the existence of suitable information and knowledge institutions, which would further, facilitate the access to technology and know-how and could inspire confidence to enterprises interesting in their services. Figure 1, underlines the lack of vote of confidence in any institution: actually, no institution was judged capable to support the process of innovation and technology transfer by the majority of enterprises. A 28% entrusts the institutions of financing innovation, relating directly the possibility to innovate with the purchase of equipment, which is a rather discouraging view of the firms' innovativeness. A 24% would refer to technological centres and institutes, but as the free discussion reveals, these companies do not know where to find these organizations or what precisely is their mission. When asked about the reason they selected

this type of institution, the most usual answer is because of their name, which connects technology to equipment.

Private consultant companies enjoy the same level of confidence, probably because they are closer to wood and furniture enterprises, when entering investment programs or installing MRP, ISO 9000 etc. The very last place belongs to Chambers and Development Agencies, followed by Educational Institutes (Higher Education) proving that they have not yet managed to reach entrepreneurial needs and actions.

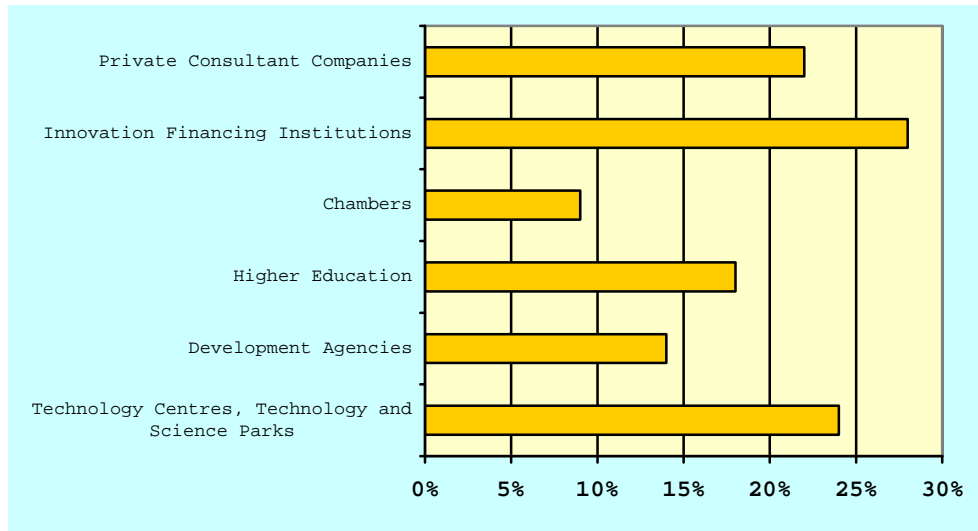


Figure 1: Innovation Support Institutions

The research proved the perseverance of wood and furniture enterprises in the "traditional" ways of information regarding the progress in technology and new innovations and that is by visiting trade shows of the sector. This way of information precedes considerably against the rest, with a percentage that exceeds 40%. Information through industry magazines and other relative forms of bulletins holds the second place with a considerable difference (around 25%). Very close and with quite the same percentages to this type of information, we find company customers (22%) and Internet. The last one is still in infantile stage, with its main use being the search of representatives, machinery and raw material companies, as well as furniture drawings and design tendencies. Nevertheless younger company executives start timidly to take advantage of the enormous potential, offered by the direct updating on new technologies, innovative ideas and good practices in Internet. All However, all interviewees in free discussion encouraged the conduct of seminars about internet search methods and a further stress on innovation and good practices. When asked whether they would be interested in the engagement of technological gatekeepers -after the proper analysis of technological gatekeeping -most of them agreed that such a possibility would be important on certain conditions (with the parameters of cost and necessary time, spent by themselves, the mainer ones). Machinery, material and software suppliers respectively, are considered to be quite important sources of information and innovation spillovers, through their collaborations with other countries.

It should be noted that the Administrative Structure of the Region comes last in the above classification. It does not appear to be recognized by the sector companies either for its contribution (neither direct, nor indirect) to any kind of information and

support, or even to any effort of sectoral development. This negative image of a governmental structure and its representatives owes to puzzle and lead to fertile dialogue. The data reveal therefore, that the enterprises of wood and furniture sector have not developed relations of confidence or even ignore several technology transfer, know - how and innovation management institutions, both government owned and private ones.

Of particular interest are the subjects of information that are considered as more important by the businessmen of the sector. First and with a big difference (34% against 18% of the second one) appears the market and product research. This need reveals various aspects of the intense problem of competition that the enterprises of the Region of Thessaly experience. Ignorance, as well as the inability of micro and small enterprises to be acquaintant of the wider business environment hinder them of having a holistic picture of the variety and the change speed of competitive products. Furthermore, one can detect the non-existence of mechanisms and processes of new product development or even of creative copying. The businessmen feel -and really are - helpless in their attempts to create, mainly because they have access neither to channels and mechanisms of direct market search and follow-up, nor to methods to transform the tendencies and consuming needs into new, original products.

The next place in the information priorities is occupied by the briefing on financing opportunities, betraying the weakness to access sources of relative investment programs and signifying the complexity of the whole system, that makes it substantially impassable for businessmen without the help of experts. Combining this gap with the lack of confidence to consultants, government owned and sector-based institutions, one can easily explain the small rates of enterprises participation in research programs, particularly when there are no direct economic profit. In particular, a 40% answers that it has taken part in a program related mainly with training, while the 60% has never participated in a relative activity.

The third choice underlines (with a hardly 1% difference from the previous one) a somewhat positive aspect: the interest for scientific and technological developments. The free discussion proved that even if initially the businessmen or the superior executives were referring to a very narrow frame of technological development (e.g. new machinery) they are open on other issues, too, such as new materials, waste exploitation, environment protection, hygiene and safety etc. On the other hand, concepts like kaizen, "production cell", lean production etc, which have been developed by similar companies in Europe and USA, are considered by Greek businessmen of wood and furniture sector as complicated and incompatible with the Greek mentality due to the very small firm sizes.

Obstacles of innovation development in wood and furniture sector

The very small rate of innovativeness (hardly 18%) underpins the fact that the business environment is not particularly favourable, since the sector enterprises do not appear to present a particular appeal to innovation absorption and exploitation. Consequently, the more important obstacles that lead to this weakness were seeked, in order to be locked to policies.

Enterprises rate as quite important the high cost of innovation that is included in the innovation process and much more the economic dangers that companies alone are called to undertake for innovative

products and processes development. Actually, they will not undertake such an initiative, but only through a process of some subsidy. In the same category and line stands the combination of lack of financing and lack of information and specialised personnel. The lack of information about the technology that has been developed within and about the sector and the solutions it provides to the enterprises, at all stages (from production process to the disposal of products or the company management), constitutes a powerful suspensive factor.

As "important enough" are also presented the lack of specialised personnel, the lack of information on the sector markets at both national and international level as well as the insufficient potential of innovativeness, beyond human resources, such as special technological equipment for example. Other factors reported were the competition of basic suppliers of the enterprises and the lack of satisfactory suppliers of equipment or materials, through which the enterprises can acquire incorporated or not incorporated technology and innovation. It was also reported the imperfect organizational culture of the enterprises that took part in this research. Only a few companies in the free discussion talked about lack of their own infrastructure and a comprehension inability or at least difficulty, when trying to "translate" and exploit the knowledge that acquire with any type of information.

The factors that prevent the successful absorption and exploitation of innovation become more concrete, when the questionnaire becomes more "personal". Thus, in the question what prevented them to extend to new innovative activities during the three last years, the enterprises that did not present something new named the problem of lack of marketing and sales capabilities as the most important ones, referring to their internal environment.

Respectively, when searching their external environment, companies underline the voluntary avoidance of competition with basic suppliers and the lack of customers response to their new ideas. The above seem to be far enough from the disability of knowledge and innovation transfer from the existing institutions. However, if we accept Porter's theory of the value chain, we will discriminate the non-existence or a rather weak existence of supporting operations, which exert their insufficiencies at the main company operations, with the businessmen pointing out the top of the iceberg.

On the contrary, the enterprises of our sample that had presented something new the last three years, marked as major contributors to their achievement the successful access to new technology (mainly the acquisition of CAD, MRP or relevant programs), which was rated as "big contribution" and the company's capability in managing new ideas. There was no factor to be characterized as "main" or "absolute contribution". Besides, the success was attributed to personal and corporate efforts and not to the contribution of any institution.

Evaluating the attendance of exterior environment, the contribution was mainly attributed to salesmen of equipment and customers ("big contribution"), followed by suppliers (as companies) and competitors. The contribution of educational institutions was characterized "rather small", while the firms do not trust the collaborations on promoting their innovative or - more generally - new ideas.

The Innovative Enterprises and the Business Environment

Innovative Companies usually use a large variety of knowledge and innovation sources. According to Hirsch-Kreinsen (2008) "firms that are characterized by specific process and organization structures, competencies and strategic goals and which moreover to a greater or lesser degree exchange information with further actors such as customers, suppliers and advisors and with organizations such as financial service providers, science and political institutions and sometimes form networks, are considered as the central actors of an innovation system".

In the effort to detect the parameters of the business environment that encouraged the innovativeness of the Thessalian wood and furniture enterprises, a regression analysis was carried out using the Kreinsen's "further actors" that is information sources and institutions as independent variables. No significant differences were found, regarding both sources and information institutions. Actually, the information derived by the company's production constitutes the only variable with a significantly unique contribution to the forecast of the dependent variable (i.e. innovativeness), with a Std Coeff. of 0.396 and a Sig. of 0.048 (Table 3). It should be pointed out that it is an internal source of the enterprise, while, on the contrary, no information institution presents a similar behavior. It should be noted that the above figure shows only some faint tendency, since $R^2 = 0.246$.

Table 3: Information Sources for Innovative Action

SOURCES OF INFORMATION	Means				Regression Analysis	
	INNOVATORS N=12	NON INNOV. N=32	T	Sig. (2-tailed)	Std Coef Beta	Sig.
Production	.34	.08	1.684	.036	.396	.048
Administration	.13	.00	1.704	.044	.020	.930
Marketing - sales	.49	.50	.363	.719	.075	.710
Customers	.47	.50	.181	.858	-.037	.877
Competitors	.28	.25	-.203	.840	.022	.918
Suppliers	.31	.33	.129	.898	.016	.933
Bulletings - Magazines	.59	.42	1.040	.063	.264	.161
Trade Shows	.99	1.00	1.089	.304	.071	.696
Higher Education	.42	.33	.769	.446	.021	.929
Commercial -sector Contacts	.25	.09	1.342	.187	-.233	.284
Region Administration	.06	.00	-.874	.387	.177	.369
Internet	.50	.42	-1.438	.161	.200	.296
Business Consultants	.18	.17	.483	.632	.011	.954
F					0.751	
R					0.495	
R2					0.246	
Adjusted R2					0.081	
Std Error					0.468	

Where: 1= YES and 0= NO

Comparing the means (Table 3, t-test with independent samples), it is also evident - beyond, of course, the supremacy of production - the company administration's contribution to the pumping of information. We should also mention bulletins and magazines, as well as the exploitation of the commercial and sector-based contacts, referring to the external environment.

Generally, however, the means prove the dependency of trade shows (means=0.99 and 1.00) for both categories, as it was also reported before. On the contrary, looking into the means of information institutions (Table 4) there is a significant difference, as long as it concerns their exploitation by innovators and non innovators. The first category collaborates with Higher Education and the Development Agencies with a statistically significant difference from the second one (means 0.58 and 0.50 against 0.35 and 0.26 respectively).

Table 4: Information Institutions for Innovative Action

Information Institutions	Means			
	INNOV.	NON INNOV.	t	Sig. (2-tailed)
Technological Centres Technological and Scientific Parks	.67	.52	.879	.385
Development Agencies	.50	.26	1.524	.045
Higher Education	.58	.35	1.360	.041
Chambers	.25	.19	.399	.692
Innov. Financing Institutions	.67	.68	-.066	.948
Private Consultant Companies	.50	.52	-.093	.927
Where 1=YES and 0= NO				

The figures on Table 4 result to the fact that both categories pay a great attention at financing institutions (means 0.67 and 0.68, respectively), without however to be able to use them properly (particularly the non innovators), since they do not combine the financing with some kind of collaboration with the technological institutions. On the contrary, both categories do not appear to entrust chambers (means 0.25 and 0.19).

Table 5: Obstacles of Innovation Development

Obstacles of Innovation Development	Means			
	INNOVATORS	NOT INNOVATIVE	t	Sig. (2-tailed)
Lack of information	.55	.67	-.673	.510
Lack of subsidies	.64	.63	.017	.986
Lack of specialised personnel	.45	.50	-.615	.547
Weakness of financing	.73	.33	1.376	0.029
Where 1= YES and 0= NO				

In direct relation with the above, the weakness of financing seems to be the only statistically significant variable that differentiates the firm innovativeness, with a particular emphasis on the results of the innovative enterprises that have already been involved in the adventure of progressive innovation (means 0.73 and 0.33 respectively). The lack of information constitutes a brake for both categories (means 0.55 and 0.67), but it does not constitute a parameter that would statistically influence the development of the innovative capability (Table 5).

All regression analyses were done, but they did not present statistically important results, since the model does not explain in a satisfactory way the fluctuation of the dependent variable (R^2 is very small).

Conclusions - Proposals

The research underlined that the wood and furniture enterprises in the Thessaly Region are not particularly innovative and that the existing local business environment does not contribute positively to the birth and growth of innovative actions. In particular, the innovativeness of the mentioned enterprises is found to be still in its infancy, bearing a partial cultivation of technological innovation capabilities to some extent, while ignoring or shrugging off the majority of them.

Referring to the exterior drivers, enterprises do not approach the innovation institutions, they do not trust them and they often appear not even to know them. The actions of innovativeness spring mainly from customers and equipment and raw material suppliers. The enterprises develop mechanisms of innovation that emerge from their production and other places of their own supply chain. Thus, the need to bridge the gap appears rather imperative in order to achieve superb collaborations. The only institution that appears to be accepted by Thessalian firms of the specific sector is the Department of Design and Technology of Wood and Furniture of the Technological and Educational Institute of Larissa. There is an increasing number of wood and furniture companies which seek to collaborate on a great variety of subjects, while the enormous potential of these collaborations has not yet been exploited or has even achieved the leverage of both sides capabilities.

It would be an omission not to report that this research alone contributed to the comprehension of the *bona fides* of the business environment by a respectable number of businessmen. The heads of wood and furniture companies understood the important role of an innovative environment in the growth and viability of enterprises and got involved in finding ways to help themselves and get advantages of the existing institutions of innovation and innovation financing. A consequence of this conscious turn to the extraversion is the movements for a wood and furniture cluster creation in the Region of Thessaly.

A remarkable question that emerged from the results was how and in what ways the enterprises eventually conceive the business environment. What is -or should be- their role against the challenges and the opportunities? The argument that business environments do play a most important and vital role in the growth of every enterprise either on innovation or other issues is unquestionable, but how much more powerful is the internal environment and the existence of a company's innovative culture that encourages or prevents the management of innovation? What is the value of the interaction between internal and external environment and which are the dependences? What can an Innovation Cluster offer both at firm level and the configuration of a regional business innovative environment?

References

- Afuah, A., 1998. "Innovation Management: Strategies, Implementation and Profits". Oxford University Press, New York, NY.
- Ahmed, P. K., 1998. "Culture and climate for innovation", European Journal of Innovation Management, Vol. 1, No.1, pp.30-43.

- Albu, M., 1997. "Technological Learning and Innovation in Industrial Clusters in the South", SPRU Electronic Working Paper No. 7, University of Sussex, Brighton.
- Amit, R, Schoemaker, P.J., 1993. "Strategic assets and organizational rent", *Strategic Management Journal*, 14(1), 33-46.
- Baron, D., 1993. *Business and Its Environment*. Prentice Hall, Englewood Cliffs, NJ.
- Barney, J.B. (2001) "Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view", *Journal of Management*, Vol. 27, 643-650
- Bender, G.; Laestadius, S. 2005: Non-science based innovativeness: on capabilities relevant to generate profitable novelty. In: Bender, G.; Jacobson, D.; Robertson, P. (eds.), Non-Research-Intensive Industries in the Knowledge Economy. Special Issue of Perspectives on Economic, Political and Social Integration, Catholic University, Lublin/PL
- Berry, M., 1996. "Technical entrepreneurship, strategic awareness, and corporate transformation in small high-tech firms", *Technovation*, 16(9),187-198.
- Bessant, J., Caffyn, S., 1997. "High - involvement innovation through continuous improvement", *International Journal of Technology Management*,14(1) 14-22.
- Bessant, J., Francis, D., 1998. "Implementing the new product development process", *Technovation*, 17(4),187-197.
- Boer M., Van den Bosch F., Volberda H., 1999. Coevolution of Firm Absorptive Capacity and Knowledge Environment: Organizational Forms and Combinative Capabilities, *Organization Science*, 10 (5), pp. 551-568
- Burgelman, R., M.A. Maidique, S.C. Wheelwright, 2004. "Strategic Management of Technology and Innovation". McGraw-Hill, New York.
- Cismaru I., 2003. "Wood Industry in Romania - Present and Perspectives", 8th International IUFRO Wood Drying Conference.
- Cooper, R.G., 1998. "Overhauling the new product process.", *Industrial Marketing Management* 25, 465-482.
- EOMMEX - National Observatory of SMEs, 2006. "The situation and the prospects of Greek SMEs. Annual report on 2006 ".
- Foss, N. 1997: *Resources, Firms and Strategies - A Reader in the Resource-Based Perspective*, Oxford
- Frambach, R., Schillewaert, N., 2002. "Organizational Innovation Adoption: A Multilevel Framework of Determinants and Opportunities for Future Research". *Journal of Business Research*, 55, 163-176
- Freeman, C. and P. Carloza, 1988. "The Structural Crisis of Adjustment", in G. Dosi, C. Freeman, R. Nelson, G. Silverberg and L. Soete, (eds.), '*Technical Change and Economic Theory*', Pinter Publishers, London.
- Guan, J., N. Ma, 2003. "Innovative capability and export performance of Chinese firms", *Technovation*, 23(9), 737-747.
- Haanila, Tiina Meristö, Tarja, Leppimäki, Sami, Laitinen, Jukka ja Kettunen, Jyrki, 2007. "South America as a Future Business Environment. Innorisk project's research report", CoFi Åbo Akademi. (unpublished)
- Hirsch-Kreinsen H., 2008, ''Low-Tech'' Innovations", *Industry and Innovation*, Vol. 15, No. 1, 19-43
- Hirsch-Kreinsen H., Jacobson D. and Robertson P., 2005, "Low-Tech" Industries:
 Innovativeness and Development Perspectives A Summary of a European Research Project", PILOT Project Consortium, Dortmund
- Jenkins, W. (2005) "Competing in times of evolution and revolution: An essay on long-term firm survival", *Management Decision*, Vol. 43 No. 1, 26-37

- Karagouni G. and Papadopoulos I., 2007, "The Impact of Technological Innovation Capabilities on the Competitiveness of a Mature Industry" , MIBES Transactions On-Line International Journal ISSN 1790-9899, Vol.1, Issue 1, pp. 17-35
- Koberg, C.S., Detienne, D.R., Heepard, K.A., 2003. "An Empirical Test of Environmental, Organizational, and Process Factors Affecting Incremental and Radical Innovation," *The Journal of High Technology Management Research* (14), pp 21-45.
- McGahan, A.M. (2004), "How industries change", *Harvard Business Review*, October,
- Meyer-Stamer, J., 1998. "Path dependence in regional development: persistence and change in three industrial clusters in Santa Catarina, Brazil", *World Development*, 26(8), 1495-1511.
- Morrison A., 2003. "Local Systems of Innovation in Developing Countries: Evidence from a Brazilian Furniture Cluster", Università del Piemonte Orientale , Novara
- Norusis, M., 1997. "SPSS Professional Statistics 7.5", Chicago, SPSS Inc.
- OECD 2002: Frascati Manual. Proposed Standard for Surveys on Research and Experimental Development. Sixth revision, Paris
- Papadopoulos I., 2005. "Research on innovation of the enterprises of timber and furniture of W. Macedonia Region". Scientific Yearbook Department of Forestry and Natural Environment, Honorary volume MD / 2001, dedicated to peer professor Mr N. Athanasiadis (under publication).
- Papadopoulos I., G. Ntalos and K. Soutsas, 2005, "A Research Study On The Competitiveness And Response To The Changes Of The External Environment Of Thessalian Furniture Firms, As Elements Of Dynamic Marketing", *Geotechnical Scientific Issues*, 18
- Penrose, E. 1959: *The Theory of the Growth of the Firm*. 3rd ed., Oxford
- Peteraf, M., 1993, "The cornerstones of competitive advantage: a resource-based view", *Strategic Management Journal* 14 (3),179-191.
- Robertson P. and Smith K., 2008, "Distributed Knowledge Bases in Low and Medium Technology Industries", AIRC Working Paper Series WP/0208, Australian Innovation Research Centre University of Tasmania
- Schumpeter, J.A. 1934. *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Sundbo, J. 1998: *The Theory of Innovation*. Entrepreneurs, Technology and Strategy. Cheltenham: Edward Elgar
- Tidd,J., Bessant,J., Pavitt,K., 2001. "Managing Innovation: Integrating Technological, Market and Organizational Change", Wiley, Bognor Regis.
- Trigkas, M., 2005. "The Spatial Economics of Enterprises of Timber and Furniture using Geographic Information Systems. The Case of Western Thessaly". Postgraduate Thesis. Laboratory of Forestal Economy, Thessaloniki
- Valery, N., Kekic, L., 2007, "Innovation: Transforming the way business creates *includes a global ranking of countries*" Economist Intelligence Unit
- Vracking, W. J., & IJzerloo, M., Cozijnsen, A. J., 2000. "Success and failure of 50 innovation projects in Dutch companies". *European Journal of Innovation Management*, 3(3), 150 - 159.
- Wheelright, S., Clark, K., 1992. "Revolutionizing Product Development, Quantum Leaps In Speed, Efficiency, And Quality". New York: The Free Press.
- Yam R.C.M., J.C. Guan, K.F. Pun, E.P.Y. Tang, 2004. "An audit of technological innovation capabilities in Chinese firms: some empirical findings in Beijing, China", *Research Policy*, 33 1123-1140.