Innovation Dynamics as Coevolution Processes: A Longitudinal Study of the Computer Services Sector in the Region of Attica, Greece

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Extended Abstract of PhD

Innovation dynamics is a cross-discipline research area which involves a wide spread of sciences and brings together theories, methodologies and empirical results from areas such as innovation dynamics and organization studies, management science, regional development and systems theory. Although the exact link between economic development and innovation is unclear, most of the theories emphasize the complex aspect of innovation as an evolutionary and interactive process involving different types of learning (Dosi et al., 1998), interdependencies and feedback (Kline and Rosenberg 1986, Van den Bosch et al., 1999). The systemic and interactive practice of innovation also highlights the pervasive relationship between the firm and its environment. The numerous examples of regional clustering provide evidence that competitive advantage can be localized in spite of competition and economic activity becoming increasingly globalized (Asheim & Isaksen 2002, Maskell & Malmberg 1999, Porter 1998, Storper 1997).

The theory attempts to integrate the interplay between the adaptation of individual organizations, their competitive dynamics, and the dynamics of the institutional systems within which firms and industries are embedded. The theory of co-evolution (Lewin et al., 1999) assumes that organizations, industries and environments co-evolve, that their rate, pace, and patterns of change are distinct and interdependent, and that the direction of these changes is not unidirectional. This PhD research intents to elaborate on both the regional and sectoral perspectives of innovation and integrate them under one coherent approach. The regional and sectoral approach could be utilized, as a National Innovation System should be understood and analyzed as a complex of sub-systems that can be

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classified according to individual sector and region (Chung, 2002). A NIS is composed of both regional and sectoral systems of innovation. As the user-producer relationship of innovation is established in almost every region and industrial sector, the concept of innovation system will be very helpful for the enhancement of regional and industrial competitiveness by activating interaction and flow of qualitative information among major innovation actors in a region and sector. Following the classification of industrial sector, many sub-systems of a NIS can be formulated (Breschi & Malerba, 1997).

Coined by Pouder & St. John (1996), the notion of “Innovation Hot Spots - IHS” is employed by policy makers, regional and local authorities searching to promote growth and development in a region, as well as by business leaders searching to identify attractive locations for their businesses. In terms of innovation systems, the innovation hot spot is situated in the intersection between national, regional and industrial innovation systems (Carlsson et al, 2002; Chung, 2002; Moualert, 2003; Porter & Stern, 2001). Hence, it can combine the best of national support for basic research and venture funding (NIS), regional development incentives, transport and communication infrastructure, access to qualified workforce and access to a local market offered by the regional resources (RIS), and privately funded and driven R&D within established industry structures (SIS). Thus, we argue that the innovation hot spot framework can be considered and used as a synthesizing framework adopting a holistic approach when studying innovation systems dynamics.

The Research Objective of this PhD Research is to question the framework in which enterprises and greater organization forms, such as clusters, co-evolve in relation to other organizations, products or to their environment as living organisms. Coevolution is defined (Lewin et al., 1999) as “the joint outcome of managerial intentionality, environment, and institutional effects.” Lewin et al. (1999), make clear that co-evolution assumes that change may occur in all interacting populations of organizations. Moreover, the target is to describe the dynamics that rise from this coevolution as far as innovation is concerned, studied in both over time and in spatial scale. It comes to be of great importance to study not only to recognize the changes in which organizations have to go, in order to meet the environmental changes but also the way in which these changed organisms affect their environments which they change. The Central Research Question of this PhD research can be
defined as the following: “How national, regional and sectoral innovation systems coevolve over time and space? The target is to examine the existence and intensity of relationships appeared, through the use of a coevolutionary framework.”

Each one of these levels of analysis enriches the agenda of research questions and thus the answers that should be given. The research should question what are the mechanisms, determining factors and critical linkages, leading the coevolution process between different levels of analysis. Do we need national, regional or sectoral innovation policies? Which innovation policies and in which level of analysis, perform better and why? Is innovation a national, a regional or a sectoral phenomenon?

The basic *Methodological Research Framework* of this PhD proposal suggests the use of a qualitative research methodology, which will be empowered by descriptive quantitative data. The triangulation of quantitative and qualitative data can be achieved by using multiple qualitative sources and quantitative data (Jick, 1979), multiple theoretical lenses (Denzin, 1978), and multiple sense-making strategies (Langley, 1999). This research will also include characteristics of multilevel analysis, since coevolutionary research involves multiple levels of analysis (Lewin and Volberda, 1999; Candace, 2001). In our case, data at four different levels should capture processes and identify generative mechanisms at the firm, industry, regional and national level. The sample of the empirical part will be composed by companies from the *computer services sector*, forming the *sectoral innovation system*, operating within the Region of Attica and thus forming the *regional innovation system* (Region of Attica) within the *NIS* of Greece.

The longitudinal field research should be materialized through a retrospective way. The goal of the co-evolutionary enquiry in the retrospective field research scheme is to understand how the structure of direct interactions and feedback within organization-environment systems give rise to their dynamic behavior. This is operationalized with the use of selected case studies and other qualitative instruments.

The *Computer Services Sector in the Region of Attica* concentrates competence and innovation capability in both products and services, creating at the same time new business opportunities and contributing significantly to employment growth. Consulting, implementation,
operations management and support services will all enjoy similar growth since they are the
complementary industries forming the Attica computer services innovation hot spot. This gearing-up
of a wide range of players in the computer services cluster is a key characteristic of sustainable
growth. These firms often work together, form both vertical and horizontal alliances in the production
procedures while implement state of the art management practices. As a growing industry, it attracts
better and better human capital. Today, it is estimated that over 100,000 people are already employed
in more than the 400 ICT firms. Moreover, the Sectoral Innovation Scoreboard of the European Trend
Chart of Innovation identifies Greece as the leading country in “Computer Services and Related
Activities” for years 2004 and 2005, (no data for 2006 yet). Additionally, the sector itself was the most

As the Expected Results of this analysis are concerned, we anticipate that the factors affecting
the emergence of the Attica Innovation hot spot are in terms of resource conditions: the availability of
well educated human capital, the existence of infrastructures and the favorable macroeconomic
environment. The institutional processes encouraging the development of the hot spot were the funds
of the 3rd EU CSF and the Athens 2004 Olympic Games. Both, important driving forces for the
modernization of the local firms’ IT infrastructure. The third factor, concerning the management
mental models of the sector, were the clustering and networking activities fostered by the fact the
structure of the firms forming the hot spot provide supplementary services.
References


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