

The Role of Skills in the Development of a Sector

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It is widely accepted that the role of education and skills in influencing the location and the type of economic activities needs both theoretical development and empirical evidence, particularly in order to understand emerging patterns of linkages among regions and sectors. Today, there are quite a number of studies examining the links between human capital, development and growth. Such studies include the work of Benhabib and Spiegel (1994), Bils and Klenow (2000), Eicher and Garcia-Penalosa (2001), Galor and Mountford (2002) and Mankiw et al. (1992). Some argue that the ability - and need - to change existing, or formulate new sectors or industrial architectures derives from the emergence of new scientific and technological knowledge which affects the competitive dynamics of the entire economy and the way business is done. New sectors have emerged on the basis of new disciplines as well as on the basis of the integration of old ones with emerging bodies of theoretical knowledge. Moreover, traditional sectors are affected by new disciplines in ways which challenge incumbents' positions and favor the entry of new actors (e.g., telecommunications). Within this context, the role of education and skill becomes of utmost importance as it is one of the main drivers allowing for such changes to take place.



The target of our research is to examine the interrelation and the co-evolution between the development of formal skills and the formation and evolution of a sector by studying the sectoral dynamics in the formation of the computer services industry in Greece, between years 1940 and 2008. In the context of this study, computer services refer to business activities taking place in the form of IT consulting, implementation, operations management and support services. Such activities are considered to be complementary industries forming the Computer Services Sector. Computer services are characterized by a high knowledge creation and knowledge diffusion intensity meaning that the firms exploiting such services position high on an innovation intensity scale.

According to secondary sectoral data (HellasStat and ICAP) the domestic ICT sector in Greece consists of approximately 1.870 companies. Almost 40% are in activities in the NACE 72 (Computer and related activities), while 36,4% engaged in the wholesale trade (NACE codes 514 & 518). The sector itself is quite new, since the 82,8% of the firms were established during the last fifteen (1990-2005), while three out of 10 IT firms were established during the period 1996-2000. In terms of size, four out of five firms employ up to 49 employees. On average, every ICT firm employs 51 persons, while the 67,4% of the micro firms (<10 people) were established since 1996 employ an average of 24 people, when companies set up during the 80s' employ 77 people.

In terms of location, the majority of the firms (77,2%) are based in the region of Attica, a 10,7% in the second largest city of Greece, Thessaloniki, and another 12,1% in the rest of the country. The average size of companies in other Regions, however, is considerably smaller, since the majority of them are very small (<10 people). Despite the geographical area over Attica, the rate of new businesses in the region is faster than in Athens, but this does not mean that it can alter the structural picture of the domestic ICT quickly and significantly.

The Evolution of Tertiary Education in Computer Services Skills in Greece

The planning of educational system in Greece is centralized. The state is responsible for providing tertiary education from Universities, Technical Universities and Technological Institutes. Private structures in tertiary education do exist, but the degrees they offer are not recognized by the Hellenic State. The decisions for the establishment of a new academic department, of a new discipline or for a new educational institution are taken by the Ministry of Education and Religious Affairs which is the supervising body responsible for the tertiary education in the country. Existing departments can ask for the permission and the funds to establish new areas/departments but the permission to do so remains to the hands of the ministry.

The European Commission urges the introduction of policy initiatives that centre on enhancing ICT training at all educational levels, updating ICT education to meet market needs and promoting life-long learning schemes (Commission of the European Communities, 2000). While less developed countries in Europe currently suffer less from skill shortages than more developed countries, the assumption is that if they are to enter the information society, they will need to make a greater effort to increase the supply of an ICT skilled labour force than more advanced countries. Otherwise the gap between North and South is likely to widen further (ETO, 2001). The Greek Ministry of Education has responded to existing concerns regarding ICT skill shortages by increasing the number of courses offered in ICT-related subjects in tertiary level educational institutions. Particular emphasis has been placed on increasing the number of students who acquire technological training in ICTs. During the past five years there has been systematic effort to increase official training provided in ICT-related subjects. Since 1998, 16 new departments have been created in Greek universities and three-year technical colleges, providing ICT-related training and bringing the total number of departments to 35. Ten of the new departments created were in technical colleges. Moreover, the total number of students enrolled in ICT related courses almost doubled during the same period (Zambarloukos & Constantellou, 2002).

While these measures are likely to benefit the ICT sector, this article argues that alone they are not sufficient in helping the majority of Greek firms in other sectors to utilise existing human resources and ICT technologies more effectively. Our research suggests that reforming vocational training and education related to ICTs might be more urgently needed rather than a simple expansion of ICT education and training. As many firms in less advanced regions are unable to provide the kind of learning environment needed for their employees to develop their skills, the education system and training policies should try to fill this gap. This could be achieved by combining formal education in ICTs with more hands-on experience, which is currently lacking among those that are being employed for the first time.

The following figure exhibits the evolution of the establishment of new academic departments in the Greek tertiary education. All the fields beside computer engineering, economics and business are quite new and all of them have met important developed during mainly the last 20 years. This growth has led to the establishment of a total number of 91 departments in all the categories examined in this article.

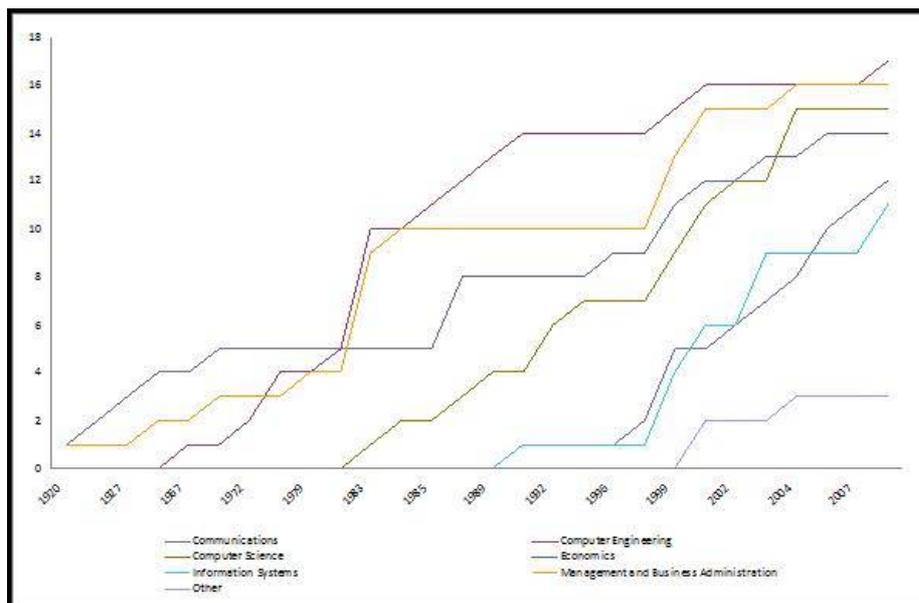


Figure: The Evolution of Computer and Management Studies in Tertiary Education

Today, academic departments relevant to computer services can be categorized into four main scientific fields: Information Technology/Computer Science, Computer Engineering, Telecommunications and Information Systems. In all the above categories we can find departments belonging to Universities, Technical Universities and Technological Institutes. Most of the departments focus their studies on one main scientific field but there are also departments that are focused in two, three or even four fields. Independently, of their focus, most of the departments offer additional courses on a wide range of disciplines in order for the students to have a better view of their science. We have, though, to underline that the actual name of the Dept. is not always representative of the studies offered, while in some cases it might be misleading. For example, studies in the Engineering Depts. of Technical Universities do not necessarily mean studies on Computer Engineering.

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