
Technology and Innovation Policies in Europe - Lessons for Cyprus?

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The Cyprus Government has recently engaged in a policy of promoting the creation of "high-tech" businesses on the island. A first step in that direction will be the creation of a "business incubator" and a "research and development centre"; other measures could include the setting-up of a "science park" and the attraction to Cyprus of "strategic investors" like Israeli "high-tech" companies. These efforts are certainly commendable, but it may be useful to consider the European experience, to obtain some relevant insights on the matter, even though the situation in Cyprus may not be directly comparable to the industrial core of Europe (the reduced size of its economy and its peripheral location in Europe probably explain the almost total atrophy of its research and development (R&D) infrastructure).

Throughout the Western economies, innovation policies have become increasingly important in recent years because they represent the only way in which firms and regions can face the challenges of the global economy through the stimulation of their own endogenous potential. Increasingly, technology and innovation policies are seen within the context of regional territories, involving actions by local institutions and focussing on small - and medium sized enterprises (SMEs).

Thirty years ago and up to the end of the eighties, technology policies in Europe were mainly focused on larger projects involving big companies, large research centres and universities. Within this "linear model" model of technological innovation, it was assumed that large sums invested into R&D projects (including basic science) would automatically "trickle down" into industry, where they would be translated into new commercial products and innovative production processes. This first generation of technology policies was based on large infrastructures and the attraction of R&D intensive companies (often multinationals) through a whole range of incentives such as subsidies and tax concessions.

During the late eighties and early nineties, the policy focus changed towards supporting the "software" of the development process. This second generation of technology policy aimed at stimulating the innovation capacity of firms (with special emphasis on SMEs) through technology transfer schemes and networking programmes encouraging the diffusion of new technologies from R&D institutions and larger firms. Typically, measures included business incubators, innovation centres, technological institutes and training centres.

In the last five years, a third generation of innovation policy has been developing at a rapid pace. This time, the engine of growth derives from the dynamics of networks of firms and institutions from the region as well as from strategically complementary territories. Entrepreneurial and territorial competitiveness is promoted through new patterns of collaboration amongst competing firms and between firms and technology providers. The accent of the new innovation policy lies in the "organisation-ware" which offers individual SMEs a credible alternative to isolated efforts in the field R&D. Unlike the "linear model" in which the central administration played a crucial role, the latest type of innovation policy recognises the role of the local community through its institutions and business organisations that now participate in the process of decision-making concerning public and private investments. Public managers are in charge of the organisation of growth, they play a key role in developing and strengthening networks and co-operation agreements between firms. The recent development of the Welsh region is a case in point (Cooke and Morgan, 1998).

The evolution of technology and innovation policies during the last three decades reflects the evolution of the economic structure from the "Fordist-type" mass production system to newer forms of "post-Fordist" articulated structures of industrial production. In other words, changes in policy have followed the shift from standardised large-scale production towards customised quality production in smaller batches, which often take place within networks of independent SMEs, which may be spatially clustered. From a theoretical point of view, the new policies derive from the understanding of a clear shift from a linear model of innovation supported by formal, scientific-based knowledge to a "botton-up" interactive innovation model based on networks of actors, mainly SMEs.

This recent shift of policy -from technology to innovation- may have far-reaching implications for countries, like Cyprus, where smaller firms dominate the economic landscape. Indeed, within the linear model, the outcome of large research and technology projects could not benefit smaller firms whose R&D efforts are primarily incremental. The interactive model of innovation changes the rule of the game: research and technology, as such, are not - any longer - the only source of innovation. Increasingly, collaborative synergies and collective learning processes involving a variety of actors such as employees, suppliers, customers, competitors, technical institutes and training bodies, reinforce the innovative capacities of small firms. This offers new possibilities for "non-technological" SMEs, which lack the resources to invest in R&D, and which may now gain the opportunity to innovate in other ways.

The above discussion bears a particular relevance for the case of Cyprus. Indeed, the small "island economy" has gone through a rapid development process

during the last thirty years, by-passing some essential milestones such as the creation of a mature and competitive manufacturing base and the establishment of a meaningful research and technology infrastructure. For this reason, the country never developed high technology-based industrial activities. However, this in itself should not be a worrying fact since what matters most in today's competitive world is productivity and not inputs or scale. A most relevant and interesting contribution in this field has recently been made by Maskell *et al* (1998) who explain how high-cost small nations (like Cyprus to a certain extent) can sustain prosperity in open, low-tech economies.

The argument can be taken a step further, discussing the relevance of, so called, "high tech" industries:

The term *high-tech*, normally used to refer to fields such as information technology and biotechnology, has distorted thinking about competition, creating the misconception that only a handful of businesses compete in sophisticated ways. In fact, there is no such thing as a low-tech industry. There are only low-tech companies- that is, companies that fail to use world-class technology and practices to enhance productivity and innovation (Porter, 1998, pp. 85-86).

The "choice of industry" or forceful government intervention to promote the development of certain "desirable" industries should not be a prime concern for policy makers. Instead, what matters is to help existing and future companies to reach high levels of productivity so as to create localised competitive advantages to raise living standards at home.

Coming back to the case of Cyprus, it appears that careful planning would be needed to assess the needs for targeted innovation policies in selected manufacturing or service industries. The island's economy suffers from a serious handicap in terms of R&D infrastructure and policy. While this needs to be addressed urgently, it may also be true that wanting to attract *per se* foreign "high tech" companies is not a *panacea*. The promotion of local technologically driven industrial activities calls for a well-balanced, sophisticated and long-term policy involving a wide range of actors. In short, a sharp burst of government inspired technological investment is unlikely to sustain significant new growth in the short run and may not bring about the expected long term positive impact on the local economy

The technology gap (i.e. the difference in R&D capacity) between Cyprus and other major European countries is huge and the likelihood that Cyprus may ever "catch up" with its European partners is quite remote. However, this does not mean that Cyprus cannot remain competitive. As the recent Second European Report on Science and Technology indicators (1997) notes:

But what is the real importance of the technology gap? Is there a close relationship between economic differences and technology differences? One could for instance argue that not all regions need to be technology "leaders" in order to be economically profitable. Some might profit from technology adoption, others might focus on innovation in a non-technological sense" (p. 346).

The European experience offers much food for thought for policy makers in Cyprus to implement a balanced mixture of measures that will be instrumental in generating spin-offs in terms of employment and sustainable long term growth.

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