Towards a taxonomy of innovation systems

Manuel Mira Godinho
ISEG/UTLisbon and CISEP, mgodinho@iseg.utl.pt

Sandro F. Mendonça
ISCTE and SPRU, sfm@iscte.pt

Tiago Santos Pereira
CES and CISEP, tsp@ces.uc.pt

Summary of the paper (preliminary version)

The concept of ‘national innovation systems’ (NIS) was initially put forward in the context of research focusing on more advanced economies. Freeman (1987) used the concept in his discussion of the Japanese system of innovation, while Lundvall (1992) applied it to the Scandinavian economies. The collective work by Nelson (1993) and colleagues represented a first attempt of extending the concept to a more diverse group of economies. Further deepening of the approach however developed around the cases of technologically advanced economies. More recently the concept has been applied more widely to the developing and intermediate economies with several studies emerging focusing on different countries in Asia (China, e.g. Gu, 1997; India, e.g. Krishnan, 2003; Thailand, e.g. Intarakumnerd, 2004; or Vietnam, e.g. Sinh, 2004) and Latin America (Brazil, e.g. Cassiolato et al., 2003; Mexico, e.g. Cimoli, 2003).

In a sense this new trend may be interpreted as a return to the origins. In the light of pioneering material by Chris Freeman (2004) originally written in the early eighties but only recently made available, the concept of national innovation system arose from the analysis of the historical factors behind the stunning economic development of countries like Germany and Japan that were well behind the technological frontier in the late 19th and early 20th centuries. As Lundvall (2004) notes in his introduction to Freeman’s paper, the Listian emphasis on governmental initiatives to build a technological infrastructure as well as the importance attributed to the coupling between knowledge institutions and firms represents the hallmark of modern research on innovation systems.

This recent recovery of the NIS concept in the context of the analysis of economic development raises however the methodological problem of knowing whether what was learnt in the study of more advanced NISs is relevant for all sorts of economies regardless the maturity of their actual innovation systems. Such question is particularly relevant for countries in lower and intermediate levels of development seeking to progress to more advanced stages of economic development through the promotion of endogenous innovation.

With this question in mind Godinho et al. (2003) developed an exploratory exercise aiming at mapping different NISs. The technique that was put forward, although simple in the steps required to produce graphical representations and quantitative indicators of the contours and dimensions of each NIS, showed analytical potential. The cartography produced in that exercise allowed the direct comparison of different (mostly advanced) countries, by visualizing in bi-dimensional space the graphic pattern of the relevant dimensions of their respective NIS. The eight dimensions that were highlighted included resources supply; actors’ behaviours; interactivity and linkages; institutional diversity and development; external communication; economic structure; innovation; and diffusion. This technique allows for a comparative analysis of weaker and stronger dimensions of each NIS. It also introduces a dynamic perspective in the framework of analysis by allowing assessments of the evolution between different moments in time. Furthermore, this analysis can fruitfully be applied to both more and less advanced economies.

In the present paper that approach is extended to a larger number of countries, with the objective of producing a taxonomy of innovation systems. This would contribute to moving from an exploratory stage to a more robust work in terms of data collection, processing and analysis. A set of 40 indicators is used to
examine the degree of development of different innovation systems along the major dimensions highlighted above. The purpose of the empirical analysis is to identify what are the common and differentiating factors of the more and less developed NISs through the definition of a taxonomy of innovation systems. This analytical quest has practical importance for drawing normative implications, namely by illuminating the cognitive and institutional factors that are more relevant for the economies aiming at catching up.

References


