The Diversity of Social Systems of Innovation and Production during the 1990[s]

Bruno Amable (Université de Lille II, CEPREMAP, MODEM)
Pascal Petit (CNRS-CEPREMAP)

May 2001

Introduction

The concept of an "innovation system" (IS) is a reference to the various attempts that have been made to incorporate institutional elements into the economic analysis of technical change, and to study the impact of these elements on long-term economic performance.[1] Many research projects have started out with the same premise, i.e., that it is necessary to get away from a conception in which innovation is viewed as a simple process of individual decision-making that is enacted independently from the institutional environment.[2] Innovation necessarily implies interactions between actors (firms, researchers, universities, laboratories, etc.) and their environment. Moreover, it is wrong to think that such environments are comprised of nothing more than market price(s), albeit contingent. In reality, they consist of a whole set of rules, forms of organisation, and institutions. The differences in "technological styles" that can be observed at the territorial level (usually a national territory, although this can sometimes cover a region or any wider grouping of countries), or even at the sectorial level, stem from the differences in the institutional configurations that are specific to each of these territories. The expression "technological style" is intentionally vague, given the diversity of the characteristic features of the technical change that is being associated with these institutional particularities: rate of technical change; type of innovation (i.e., radical or incremental); a sectorial specialisation that varies as a function of the level of technological intensity or even the long-term growth rate.

This being the case, which types of institutions should be integrated into innovation systems studies ? IS research derives from the economics of technical change, and a large proportion of the work that has been carried out in this field has therefore concentrated on institutions that are directly involved in scientific or in technical activities.[3] This includes scientific systems, research laboratories, scientific institutions of technology, and possibly universities and institutes of higher education – as well as the relationships that such institutions entertain with the corporate sector. However, this minimalist conception of IS is not the only possibility. Other approaches will include a wider range of institutions in their framework, encompassing a few institutions that get involved on a more or less ad hoc basis. After all, if innovation is an accumulation of knowledge, the training system as a whole should be seen as an important constituent of an IS. Moreover, the financial system necessarily plays a role in IS if firms are financially constrained in terms of the investments that they are able to make in innovation. As such, an Innovation System's borders, in the widest sense of the term, are moveable.

---

[s] The drafting of this paper was facilitated by discussions with Yann Cadiou, Ekkehard Ernst, Donatella Gatti, Stefano Palombarini, Xavier Ragot, Bruno Théret and Jean-Philippe Touffut. The authors would like to thank them without associating them with any deficiencies the paper may have.

[1] On the role of institutions in economic development, see North [1990]. For an analysis of the importance of institutions in innovation systems, see Amable [2000].

[2] See Freeman [1995], Smith [1998].

[3] See inter alia Freeman [1987]

This extended conception of IS fits in with a literature that does not specifically take the economics of technical change as its starting point, but which focuses instead on the varying institutional structures that can be found in the developed economies. The numerous studies that have been made of "varieties of capitalism"[4] have all followed a comparative approach when dealing with contemporary developed economies. These studies have focused on the way in which those societies that feature a wide range of institutional arrangements have been able to nurture and reproduce this diversity - despite the growing integration of the world's economies. Another aspect of this diversity is that national institutional structures cause variations in the different economies' ability to compete in a given type of production or sector of activity. In a certain sense, institutional diversity leads to comparative institutional advantages.[5] Conversely, the economic (and technological or even scientific) specialisation of the developed economies has caused people to take a closer look at the structures that characterise the institutions which are specific to a given society.

It could even be said that these other studies are dealing with the same topic as IS-related research projects are – without emphasising the technological determinism that is hallmark of this latter corpus. The relationship between the two bodies of literature can be seen from two perspectives:

- IS's, in their restrictive (minimalist) denotation, constitute a subgroup of the total economy, and IS-related literature is therefore a sectorial application of research into the different varieties of capitalism.
- IS's, in their extended denotation, constitute another way of apprehending the differences between the various types of capitalism, insofar as they attribute a specific role to innovation and to the factors that drive competitiveness and long-term growth.

A "social systems of innovation and production" (SSIP) [6] approach is an attempt to transcend these two points of view. Like studies that delve into varieties of capitalism, it constitutes an all-encompassing economic approach. As such, the institutions that are deemed relevant, and which are therefore integrated into SSIP analysis, transcend the scientific and technological fields alone. Nor does SSIP postulate that scientific and technological phenomena constitute the core of the appropriate theoretical framework – a view that one finds in the extended IS approaches (which define relevant institutional spheres by moving progressively outwards from a centre comprised of an IS in the minimalist sense of the term). However, an SSIP approach does attribute a specific role to innovation and to technique, not because it has fallen prey to the idea that all of an economy's institutions are subject to technological determinism, but because technological competitiveness (and at a more general level, one's insertion in the international division of labour) is a good indicator of all of the mutual influences between institutional structures and macroeconomic trends. For the contemporary period at least, innovation is a useful gateway, inasmuch as it can provide access to an entire economic system. Moreover, by including institutions above and beyond those that are solely involved in scientific and technological endeavours, the SSIP analysis shows that it is trying to account for, and study, sources of innovation that may lie outside of this minimalist inner circle.

The SSIP approach, like the varieties of capitalism and the IS approaches, must cope with issues such as the potential superiority of a given economic model, and the possibility that economies will become more or less diverse over time. At the same time, evolutionist arguments hold that competition between economies will lead to the birth of economies in which the least efficient institutional structures will be

---

4 See inter alia Kitschelt et al. [1999], Whitley [2000] etc. for recent contributions on this subject.
5 Soskice [1999]
6 Amable, Barré & Boyer [1997]