

Global-Local Dialectics in the Process of European Scientific Integration

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Abstract

The author deals with the role of the national factor in the processes of scientific and technological globalisation. The main focus is on the internationalisation processes of national R&D systems of small EU accession countries in the context of the new European Research Area. The author's thesis is that concepts such as 'national scientific community' or 'national system of innovation' are being challenged by globalisation processes, but are not being abolished. The national factor is also retaining its importance in the context of the common EU R&D policy as to which supranational levels of intervention and steering have been growing in recent times. The discourse on EU endeavours to agree on a common EU patent is presented as a case of the expansion of supranational R&D policy. The issues surrounding a common EU patent demonstrate that the efficient policy regulation of intellectual property rights at the EU level must find a suitable balance between global and local (national) factors.

Introduction

National R&D systems form part of the increasingly globalised environment that is constantly changing and which has some big winners but also many losers. At the European level, the processes of globalisation and internationalisation of national R&D systems are currently most tangibly influenced by the growing importance of the European Research Area (ERA). The concept of the ERA is being increasingly used in recent R&D policy discussions to describe Europe's transformation into the new knowledge society. The creation of a Europe of knowledge has been a prime objective of the European Union since the Lisbon European Council of March 2000. The main strategic goals of the ERA defined in various EC documents are to establish a genuine transnational co-ordination of national R&D policies (for more details, see: Communication from the Commission 2000a; Communication from the Commission 2002a; Communication from the Commission 2002b).

Following the rationales of co-ordination and harmonisation in scientific, technological and innovation activities, the key factor for Europe is to compete with other major global 'players', e.g. the United States and Japan. Against this background, the objective of the ERA initiative combines three related and complementary concepts: (1) creation of an 'internal market' in R&D, an area for the free movement of knowledge, researchers and technology with the aim of boosting R&D co-operation in Europe; (2) improvement of the co-ordination of national R&D policies which account for most of the science carried out and financed in Europe; (3) the development of a common EU R&D policy which not only addresses the funding of R&D activities but also takes account of all relevant aspects of other EU and national policies.

To answer the basic question of what should be the relationship between national and transnational factors in the framework of the new European R&D policy, my interest is also to confront some theoretical conceptualisations of globalised science and technology. My intention is not to present a comprehensive conceptualisation of the issue of the governance of R&D in this new globalised world. Instead, I will try to pose a slightly different question, namely whether in the modern globalised world the so-called national (local) factor plays any role at all in the social regulation of R&D.

The global-local dialectic in R&D

If we begin with the meaning of the word 'globalisation', then it could be said that it is a word that nobody likes but everybody uses. Recent theoretical approaches to the phenomenon of globalisation differ in many ways. There are some social scientists, such as James Rosenou, who state that globalisation is the latest buzzword to which observers resort when things seem different and they cannot otherwise readily account for them (Higgot & Payne 2000). However, there are also some opposite views: Anthony Giddens says that although globalisation may not be a particularly attractive or elegant word, absolutely no one who wants to understand recent occurrences in the world can ignore it (Giddens 2002).

The globalisation concept has been readily applied to virtually all aspects of social life in the last three decades. Several decades ago very few studies concentrated on the globalisation of scientific research and communication. Richard Worthington presented data on the number of books published in English with the word 'global' in their titles (Worthington 1993). Worthington's data relates to the period 1910 to 1980. The stark contrast between counts for the first and the second half of the century suggests there was a crucial shift in the 1970s and 1980s (7 books in 1900, 1 book in 1910, 2 books in 1920, 1 book in 1930, 0 book in 1940 compared 82 books in 1950, 303 books in 1960, 1,766 books in 1970, 4,496 books in 1980).

Many definitions of globalisation have emerged in the social scientific literature. We encounter strong calls to arrive at a precise definition of 'globalisation'. According to views of those 'conceptual purists', most definitions of globalisation in the social science disciplines should not be sufficiently precise to determine the core meanings of the real processes of globalisation in the modern world. There is the question of whether it is at all possible to come to any precise definition of globalisation. Globalisation is a complex set of processes, which often operate in a contradictory way. For example, the various social subsystems, which previously could have been considered functionally differentiated (science, technology, education, the economy) are tending to become integrated at various levels of structure.

According to Ulrich Beck, defining the term globalisation is like an attempt at nailing a pudding to the wall (Beck 2002). Globalisation is not necessarily a good thing; nor is it available to everybody. Or it is like this situation illustrated by Daniele Archibugi and Calestous Juma: 'While teenagers in parts of the world use mobile phones to exchange messages from one end of their classroom to the other end, two billion people have never made a telephone call' (Archibugi & Juma 2004, 3).

The paradox of globalisation is that we cannot even think about globalisation without referring to specific locations and places. It is this global-local dialectic Robert Robertson has in mind when he talks about 'glocalisation' (Robertson 1992). Modern occurrences in R&D are the '*locus classicus*' of this global-local dialectic. On the one hand, science and technology

seem to be an area of human endeavour in which the international dimension has always been involved. Indeed, historical investigations show that since its origin modern science has been internationalised and deterritorialised. For example, the first promoters of the idea of transnational scientific integration in Europe were the medieval universities. They were able to create true European science at a time when our continent was broken up into hundreds of political units. One of the main features of the beginning of modern science in the middle of the seventeenth century was the rapid diffusion of new scientific discoveries and theories across Europe. In those times, the first scientific journals such as the *Philosophical Transactions* of the Royal Society in London and the *Comptes Rendues* of the Academie des Science in Paris were published nationally, but they circulated freely and were cited indiscriminately throughout the European scientific world.

Nevertheless, the historical record of 'universal medieval science' is far away from the recent phenomena of scientific and technological globalisation. Recent changes in the processes of globalisation, as we are experiencing them, are totally new and revolutionary. In particular, modern information and communication technologies play an important role in allowing R&D to occur in the new global dimension. It seems we are in an era when the globalisation of R&D is proceeding at an unprecedented speed. It appears that we are just at the beginning of a far-reaching transition. And, as has already been said, the key forces driving the revolutionary transformation often date back only a few decades.

In the recent globalisation processes, which have primarily been influenced by the development of modern information and communication technologies in the past few decades, there have been ever growing links between science, technology and the economy. Even if we agreed with the thesis that 'economy (market) cannot be the only force of world integration' (Delanty 2001, 116), it cannot be denied that the new forms of co-operation between R&D and the economy have been one of the dominant trends in recent globalisation processes.

The emergence of the new knowledge-based economy calls the exclusive patronage of nation-states into question. In the past parochialism was the prevailing attitude, even among economic actors involved in international trade. The accelerated process of globalisation is coinciding with governments'

loss of the power to control the flow of many resources. States have retreated from many economic areas they traditionally controlled (for more details, see: Etzkowitz & Leydesdorff 2001; Suarez-Villa 2000).

Unlike nation-states, multinational corporations are becoming the key players in the world economy. They also have pushed R&D in the directions of commercialisation and commodification. Or, as Luis Suarez-Villa says: 'Perhaps the most salient feature of the emerging globalisation is its utilitarian perspective, joining R&D to invention more closely than ever before. Utilitarianism in technocapitalist and global society influence most funding decisions on R&D. In many respects, scientific utilitarianism may become a fundamental value in the technocapitalist economy, much the same as the quest for efficiency in factory work did during Frederick Taylor's and Henry Ford's time' (Suarez-Villa 2000, 42).

The emerging globalism involving a new role for multinational companies is being accompanied by the globalisation of intellectual property rights. In global capitalism, trade in intangibles such as inventions, patenting, and licensing, promises to become more important than ever before.

Europe and the challenges of globalising intellectual property rights

The enormous economic pressures to assimilate the fruits of scientific, technological and intellectual activities into a strong property form also pose new challenges to the EU. That is the main reason why in the past few years Brussels has begun to promote the idea of a common EU patent more aggressively. Different official documents of the European Commission have recently promoted the need to develop effective tools to protect intellectual property (for more details, see: Communication from the Commission 2002c; Communication from the Commission 2004). These official EU documents state that the protection of intellectual property is not only important for promoting innovation and creativity, but also for developing employment and improving economic competitiveness. This suggests that the actors of EU R&D policy are starting to shift towards the new innovation paradigm.

To arrive at an efficient policy regulation of intellectual property rights (IPR) at the EU level, it is still very important to find a suitable balance between national and supranational factors. At the EU level discussions about a common patent system have never been limited to the matter of who will own the biggest share of profit. The same importance has been given to the question of who will control the direction of the new inventions and what kinds of social values will guide the patent norms in the new generic technologies. It is also interesting that EU authorities have so far had success in establishing some sorts of intellectual property regimes, but not all. For example, in a relatively short period of time, the EU has come to regulate common European trademarks, copyrights and industrial designs. Yet many more difficulties are connected to the creation of the common EU patent.

Let us review in brief the efforts that have been made to achieve a common EU patent. The European Commission, referring to Article 100a of the EEC treaty, redefined the intellectual property issue as a single market issue only in the 1990s. Despite the fact that the single market, agreed by the Single European Act of 1986, basically deepened '(...) the original European Community customs union by establishing the free flow of goods, capital, services, and people throughout the member states' (Barnard 2001, 159), the EU's full competences for regulating the patent regime have not yet been realised. Looking at the historical reasons for this, it could be said that the process of harmonising patent systems in Europe has been hindered by the following factors:

- (1) One fundamental reason is the fact that patent systems have traditionally followed the territoriality principle of all national legal systems. Namely, the historical development of intellectual property right regulations has followed the organisation of other types of property rights, which have been related to national constitutional frameworks since the first liberal constitutions of the 19th century (for more details, see: Hesse 2002).
- (2) Europe has been a territory in which divergences between national patent systems have always been very strong, even among EU member states. In the 1960s and the early 1970s there was a big variety of substantive

scientific and legal rules for patent eligibility: criteria for novelty, formal procedures required to obtain a patent, a system for classifying patents (subject-matter categories and sub-categories), conditions and procedures for the enforcement of patent rights etc.

- (3) As already remarked, before the 1990s none of the European Union's treaties directly provided for the regulation of intellectual property rights as such. Hence, the EU's R&D and innovation policies in this period hardly corresponded to the optimistic expectations of some theorists and politicians that European integration would proceed exponentially because the success of common policies in highly technical, non-controversial sectors (science, technology etc.) would create pressure on related sectors to formulate common policies (a functional spillover). The newly integrated policies would, in turn, lead to the gradual transfer of responsibilities from the national to the supranational level.

Yet one cannot say that there was simply no sort of activity to put a common EU patent in place before the 1990s. Analysts dealing with the history of EU policies usually point out the following milestones in the early attempts to create common IRP regimes: (1) the signing of an international treaty in 1947 by France, Belgium, Luxemburg, and the Netherlands which established an International Patent Institute in The Hague to achieve co-operation in patent searching and archiving; (2) a plan for an international convention establishing a European Patent Office in 1949 at the Council of Europe in 1949; (3) preparation of a Draft Convention for a European patent law in 1962, soon after the establishment of the European Economic Community (Common Market) in 1958.

Since several political obstacles emerged along the way, none of these actions led to a successful end. Yet, these failures in the 1960s and 1970s did not stop efforts to achieve harmonisation. A stronger political and legal initiative to make some progress re-emerged in the mid-1990s. In 1995 the European Commission adopted 'The Green Paper on Innovation' (Communication from Commission 1995). In fact, the primary goal of this document was to launch a public debate on the promotion of innovative activities in the EU. However, the document also described several types of activities to promote IPR at both national and international levels:

ratification of the Community Patent Convention, encouragement of the use of utility models and, last but not least, the harmonisation of IPR within the EU.

The European Commission's next proposal entitled the 'Green Paper on the Community Patent' dealt very explicitly with issues relating to the establishment of a common EU patent system (Communication from Commission 1997). In the forefront was the issue of how to reduce the high costs of patenting. These high costs of patenting were then caused by several factors: high processing fees at the European Patent Office (EPO), the costs associated with translations, the distribution key between national patent offices and the EPO.

The Green Paper on the Community Patent launched long-term discussions which, after the creation of the ERA, resulted in the European Commission's Proposal for Regulation of the Community Patent (Communication from Commission 2000b). This proposal envisages some interesting solutions concerning: (1) the translation of languages; (2) judicial organisation; and (3) the relationship between the Community patent and European Patent System.

In relation to (1): The ongoing ambition of the EU is to reduce the costs of patenting. The European Commission has suggested the translation of all patent documents into one of the three working languages of the EPO and the translation of the technical descriptive part of patents into two others. The argument is that restricting the number of translations should dramatically reduce the costs of patenting.

In relation to (2): The European Commission's proposal suggests a more centralised judicial structure. A new court—the so-called Community Patent Court—should be established with chambers of both first instance and appeal. The European Commission supports the need for such an independent court on the basis of the fact that the current Court of First Instance of the European Court of Justice does not have the necessary expert qualifications to deal with the infringement of patents. This new court should have jurisdiction over certain categories of proceedings, most notably patent infringement and validity. Other matters such as the transfer of patents or contractual licences should automatically fall within the jurisdiction of national courts.

In relation to (3): The European Commission's proposal suggests that the expertise offered by the EPO should be used in the granting of a Community patent. The EPO should play the central role in the administration of Community patents. It should be responsible for the examination of applications and the granting of Community patents. It should take over a number of other tasks relating to a Community patent, for example, limitation of the patent on application by the holder or recording the surrender or lapse of the patent. Although the EPO grew directly out of Brussels' initiatives at the beginning of the 1970s, it is based on an international treaty that remained entirely outside the legal structures of the EU, and in particular out of the reach of both the European Commission and the European Court of Justice. The European Union's accession to the Munich Convention will enable it to be included in the international patent system as a territory for which a unitary patent can be granted.

At the end of this part of the discussion, I would like to point out that success in the planned creation of a common EU patent will strongly depend on the further transformation of the structure and functioning of EU R&D and innovation policies, e.g. the possibility of EU institutions to introduce transnational and national factors.

The ERA as a new cross-national R&D and innovation strategy

The issue of a new IRP regime is one topic with regard to which the question often emerges of whether the new ERA discourse will ultimately lead to full unification and centralisation in European R&D and innovation policy. In my view, these fears are unjustified. Taking the situation in Europe into account, it can be expected that EU member states will never follow the model of full imitation. They place far greater importance, for example, to the rationale of competitive imitation based on the 'benchmarking' method. The use of benchmarking methods enables nation-states to evaluate and improve their policies through exchanges of good practice. The benchmarking method was particularly important in the context of the last EU enlargement.

As I have already said, globalisation is a dialectic process in which the global and local do not exist as polarities but as combined and mutually implicit principles. This means that global and national research practices do not exclude each other. Concepts such as the 'national scientific community' (Stichweh 1996, 332) or the 'national system of innovation' (Nelson 1993, 3) are being challenged by globalisation processes, but are not being abolished. The national factor continues to be important in the era of global R&D. On the basis of the 'benchmarking method' we can also see that in the EU context, where supranational and sub-national (e.g. regional) levels of intervention and steering have been increasing in recent times, there has been nothing to suggest the abolition of the national context in the field of R&D. Because Brussels intends to take over activities which can be carried out better at the EU level than at the level of EU member states, we can say that EU R&D and innovation policy is based first of all on the rationale of subsidiarity.

For the EU the key challenge is still to find new forms of governance, which can move us beyond the simple bureaucratic and centralistic type of R&D and innovation regulation. The bureaucratic and centralistic perspective suggests that decisions should only be made on the basis of an administrative decision. The alternative approach, the democratic perspective, argues that the different stakeholders involved in R&D matters at national and European levels should be able to have a word in the decision-making structure.

In the recent past, some analysts have expressed strong criticism of the bureaucratic character of the EU's R&D policy (for more details, see: Biegelbauer 1998; Haller 1999). They have pointed out different cases of nepotism and favouritism, even fraud in the Brussels administration responsible for R&D funding. We can only hope that the people who are standing behind the ERA's whole strategy will be successful in their endeavours to avoid such deficiencies and deviations as seen in the second half of the 1990s (for example, the Edith Cressons affair). The new strategy of the ERA could be a motivating factor for the different R&D stakeholders if there is real trust in the central EU R&D policy institutions.

The ERA has established a new political context in which to develop a new strategy of international R&D co-operation. Even in the recent past, different forms of research networks at EU level have been developing into an important element of the transnationalisation of European R&D

activities. If we use the words of John Ziman, by introducing Framework Research Programmes (FP) '(...) the traditional cosmopolitan individualism of science is rapidly being transformed in what might be described as transnational collectivism' (Ziman 1994, 218).

It might be said that scientists today no longer appear only as individual members of the European scientific community who are competing for international recognition of their contributions to a worldwide knowledge base. On the grounds of Brussels' requirements for the effective running of R&D they are becoming members of strong R&D networks. To implement the ERA strategy, the European Commission has embarked upon a series of actions to strengthen the co-operation between academic science and industry. Here, we should only mention the discussions according to which the closer market orientation of the new Framework Programmes would lead to a contradiction with the original principle, namely that the EU should not promote the interests of particular companies but should promote the competitiveness of European industries in general. The research results achieved in the context of the 'pre-competitive' character of Framework Programmes would be a limited 'public good', to be shared by all participants. This would sometimes lead to a conflicting situation at the policy level (for more details, see: Luukkonen 2000; Luukkonen 2001). The tensions mentioned above were certainly one of the reasons that great attention is given to issues of intellectual property rights in the new ERA discourse.

Why is the role of the common EU R&D and innovation policy important for small EU accession countries?

It is clear that in this era of an increasingly globalised environment that is constantly changing and which has some big winners but also many losers, the factor of a scientific community's small size can present some sort of deficiency. Some authors say that small scientific communities are, by their nature, placed in the position of an 'intellectual province' in the global world (see, for example: Schott 1991; Stichweh 1996). The main reason for this

de-privileged position should be that scientists in small countries work in much less favourable conditions than those in large countries. Small countries tend to have less money, proportionally speaking, to spend on R&D. There should be a considerable tendency of researchers in small countries to emigrate. Moreover, small countries should have problems in concentrating their R&D efforts. Namely, funding across the full spectrum of R&D research needs to be as open as possible to new developments, but in so doing they often fail to define the technological niche areas.

Concerning the functioning of the common EU R&D policy, it would be difficult to say that a country's small size is, in itself, a deficiency. The success stories of small EU member states in the recent past point to quite the opposite. Various authors have drawn attention to the fact that since the beginning of the 1990s Brussels has played an important role in the development and diffusion of new R&D policies in small EU member states (for more details, see: Alestalo 1999; Miettinen 2002). Countries like Finland, the Netherlands and Denmark have redesigned their R&D policy instruments and administrative structures under the influence of EU documents. These countries belong to the so-called 'first movers' in the introduction of the new 'innovation paradigm' (for more details, see: Biegelbauer & Borrás 2003). Although the interplay between stakeholders and policy-makers in this group of countries has worked very differently, their common characteristic is that they succeeded in establishing strong communication channels between themselves. Dutch government initiatives such as the 'centres of excellence', 'technology top institutes' or 'research schools' did not have any major start-up problems as the stakeholders were positively interested in them, not just for the new organisations but also because they were economically viable through public funding. Denmark reinforced and expanded the number of 'contact points' between stakeholders and the administration in the 1990s. Besides the traditionally active 'technology councils', 29 different working groups were activated. In Finland, key social actors also took part in formulating the new policy. Here, a more tripartite model ensued.

It seems that the new ERA strategy is also a source of opportunity for new small EU accession countries. On the one hand, the whole group of states that most recently joined the EU are committed to taking part in policy

actions aiming to contribute to the Lisbon goals. They have expressed the ambition of becoming dynamic, knowledge-based economies alongside the older EU member states. They must overcome several obstacles, however, in order to achieve this goal. As I have pointed out in some other contributions, R&D systems in transitional countries from Central and Eastern Europe are still operating with a substantial number of handicaps, mainly those inherited from their past (see, for example: Mali 1998; Mali 2000).

On the other hand, the promoters of the ERA strategy have expressed on different occasions their readiness to help the new EU accession countries become fully integrated into the highly structured European R&D arena. In the context of the ERA a lot of new R&D and innovation policy instruments have been developed which are important for the flexibility of national policies in line with the new EU discourse (benchmarking and open methods of co-ordination etc.) These new instruments have a significant long-term integration effect which should bring many positive effects for small transitional countries. As noted by Thorsteindottir, the extremely small size of a country in itself (this could well be applicable to many of the new EU accession countries) does not necessarily lead to more highly co-ordinated R&D and innovation policies, nor does it allow more flexibility in the scientific sector (Thorsteinsdottir 2000, 434). The ERA establishes a lot of other instruments to ensure greater co-operation between national and EU levels in matters of R&D and innovation activity.

From the point of view of the new global-local dialectic, the new ERA strategy is not only important for new EU accession countries because it stimulates scientists in this part of the world, which was intellectually isolated in communist times, to co-operate in international research networks, but also because it makes scientists from universities and other academic institutions focus on interdisciplinary, practical and application-oriented problems. If we compare the situation with older EU member states, there is still quite a deep divide between the university and business sectors. The new ERA discourse promotes the new role of the university in the knowledge-based society. It is assumed that the changes in the position of universities in the knowledge-based Europe will call the traditional

'ivory tower' model of the university into the question (see, for example: Communication from the Commission 2003).

It would appear that this change is of great importance for the small countries in the group of new EU accession countries. It is to be expected in these cases that the university sector serves a variety of functions, in spite of the fact that the question often appears of how universities can perform their distinctive combination of functions (basic research, teaching, applied research, advising industry, establishing spin-offs etc.). Although there appear to be some conceptual and ethical dilemmas with regard to the increased processes of commercialisation and commodification of scientific knowledge at universities, there is no doubt that it is necessary for the new EU accession countries to follow the above presented basic rationales of the new ERA strategy. In this way there is hope that the success stories of small older EU countries (Finland, Denmark, the Netherlands) of the recent past will be repeated in the near future by some of the EU newcomers.

To conclude, it is important to restate that fears concerning the inferior R&D position of small countries in the ERA are unjustified. Although there are also conflicts of interest between large and small countries in the EU, and although the rapid transfer of powers and resources to Brussels on R&D and innovation matters is coming, the position of small countries in the context of the ERA is not threatened. On the contrary, it could be said that the new ERA strategy is a source of opportunity for new small EU accession countries. Not only due to the success stories of the recent past, but also because of the many new policy instruments in the hands of EU institutions. The European Commission has several mechanisms by means of which it can transfer the new R&D paradigm. This influence is not necessarily always direct and explicit, but often rather more subtle and less explicit. This, however, tends to lead to more effective changes in the national R&D policies of EU member states.

Conclusion

Instead of simply summarising the contents of my contribution, I would like to say at the end that in recent globalisation processes even the so-called soft sciences, where cultural diversity might play a much more important

role, are rarely limited by national frontiers. In this sense, the arguments that the cognitive structures of different scientific fields make some of them more globally-oriented than others have today become less important. Different types of independent empirical investigations have shown that scientists in the field of soft sciences are motivated in the same way as scientists from the hard sciences to exchange their results in the global research market (see, for example: Kyvik & Larsen 1997). Here, the ERA clearly provides many opportunities for social and human sciences as well, although the new ERA instruments are often perceived among the social sciences and humanities as not being designed for these research fields, but for the needs of the 'big sciences'. The biggest challenge for the social sciences and humanities in the context of the ERA is thus to engage top quality researchers from across the various national research communities who have acquired skills and experience in research innovation (and management) at both national and European levels.

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