**Institution: University of Reading**

**Unit of Assessment: 19 Business and Management**

**Title of case study: Impact on European Union Horizon 2020 research co-operation policy and enhancing support for international collaboration in research and innovation.**

## 1. Summary of the impact

University of Reading Professors have developed innovative theory of how Multinational Enterprises (MNEs) interact with different policy environments that has informed funding policy for research and innovation in the European Union and beyond. This work has led to the growing recognition of two policy dilemmas facing many countries' attempts to subsidise R&D activities, and their attempts to counter what was originally seen as the threat of the 'hollowing out' of R&D activities to low-wage nations. Initially, Professor Rajneesh Narula identified how MNEs were reluctant to invest in R&D without a stable industrial policy. But a stable policy environment inevitably contained the potential for incumbents to gain privileged access to government support, which could disadvantage smaller firms in emerging, high technology sectors. This could result in such high-growth firms relocating from their home countries to more supportive environments overseas, with consequent negative impact on the economic well-being of the home country. Narula also recognised that as R&D activity in individual countries became more mature and more specialised, so firms would relocate some R&D activities to be closer to their ideal collaborators, many of which might be overseas. This relocation of R&D activities was, once again, not 'hollowing out', but a response to increasing specialisation of R&D.

In the first instance, the appropriate policy response to the apparent threat of 'hollowing out' of MNEs was for governments to invest more in subsidising R&D activities overall. In the second, it was to encourage a wider co-operation policy encompassing all forms of international research collaboration.

These ideas were incorporated into the EUs new Framework Programme for Research and Innovation – Horizon 2020 – where the focus on international collaboration beyond the EU represents a very significant departure from past EU practice. This is directly attributable to Narula's research.

## 2. Underpinning research

In the 1990s and early 2000s there were grave concerns among policy makers in advanced economies that high value-added R&D activities were increasingly being lost to low-wage economies, and that the knowledge-base in advanced economies was being 'hollowed out'. This growing mobility of R&D posed a potential threat to the future economic well-being of R&D intensive economies. Furthermore the then prevailing theory of international business did not account for this behaviour. Research on this topic by several scholars at the University of Reading in the field of international business has contributed to an improved understanding of the relationship of MNEs to national (and supra-national) industrial and R&D policies. Professor Bob Pearce (appointed at Reading in 1968 now Emeritus), Professor John Cantwell (appointment in Reading 1985 to 2009, now at Rutgers) and Professor John Dunning (appointed to Reading in 1964, deceased 2009) began to explain the relationship between the internationalisation of MNEs' R&D and innovation. This research was then consolidated by Narula at Reading (at Reading since 2004) with a growing emphasis on policy choices, which forms the focus of this case study.

Narula and Pearce were able to demonstrate that MNE's R&D subsidiaries were actually deeply dependent on the specialised research infrastructure present in those advanced economies in which they were located. They discovered that MNEs were basing their decisions about where to locate R&D subsidiaries increasingly on the availability of opportunities to collaborate with other specialised researchers in those locations, and hence on the wider institutions supporting research (such as other firms, as well as public laboratories and universities). It followed that if there was evidence of 'hollowing out' of R&D in advanced economies, it was not because MNEs were relocating R&D activities to cheaper locations, but rather because governments were not supporting the research bases sufficiently for MNEs to invest in these economies.

Moreover, Narula showed that a government's increased spending on research infrastructure

alone was insufficient to attract MNE investment in R&D facilities. This was because establishing a R&D subsidiary in a host economy represents a big investment that has to be amortised over a long time, the predictability of the national government's industrial policy towards R&D became an increasingly important consideration to MNE's investment decisions. Stability was disproportionately rewarded.

This led to two important conclusions relevant for this case study.

*First,* the unintended cost of stability in industrial policy was that incumbents were better placed to capture the benefits, and so new and emerging firms and sectors might be disproportionately penalised. Because incumbents are typically larger and (by definition) better established and so more influential than new and emerging firms, the new, high-tech firms may conclude that, without any influence on policy, their concerns are unlikely to be treated with the same weight as incumbents' and so choose to disinvest and relocate overseas. Evidence of the 'hollowing out' of R&D in advanced economies here was in fact a result of not offering appropriate policy support to fast growing, high-tech emerging sectors.

*Second*, given that no national or supranational government could ensure its location be ideal for all R&D, and given that firms increasingly recognised the importance of collaborating with the best partner for their R&D activities regardless of where that partner might be, so evidence of the relocation of R&D activities was not 'hollowing out', but the result of firms pursuing increasingly specialised R&D strategies through collaborations with their ideal partners across the world. This was not activity to be discouraged by policy makers, but rather was activity that increased the productivity of investments in R&D in the home economies.

## 3. References to the research


- Dunning, JH and Narula, R. (1998) 'Explaining international R&D alliances and the role of governments,' *International Business Review* vol 7, no 4, pp. 377-397.
- Pearce, R. (1999) 'Decentralised R&D and strategic competitiveness: globalised approaches to generation and use of technology in multinational enterprises (MNEs),' *Research Policy* 28 (2): 157-178. (ABS 4*).
- Narula, R. (2002), 'Innovation systems and 'inertia' in R&D location: Norwegian firms and the role of systemic lock-in'. *Research Policy* 31 795–816. (ABS 4*)
- Narula, R. (2003), *Globalization and technology. Interdependence, innovation systems and industrial policy*. Polity Press, Cambridge. (298 Google citations October 2013).
- Narula, R., A. Zanfei (2005) 'Globalization of innovation: The role of multinational enterprises'. J. Fagerberg, D. Mowery, R. Nelson, eds. *Oxford Handbook of Innovation.* Oxford University Press, Oxford. (250 Google citations March 2013).
- Narula, R., G.D. Santangelo (2009), 'Location, collocation and R&D alliances in the European ICT industry'. *Research Policy,* 38(2) 393-403 (ABS 4*)


## 4. Details of the impact

Since the early 1990s the United Nations and European Commission have increasingly relied on the data and analyses of a succession of Reading-based researchers, notably John Dunning and Rajneesh Narula, to improve their understanding of the economic impact of MNEs and to improve the quality of their advice to policy makers.

In particular from the late 1990s to the present Narula was commissioned by the European Commission and several EU and EEA national governments to advise on national and supra-national industrial policy. This research led to a two-year project for the Norwegian Research Council (NRC, the industrial policy arm of the Ministry of Science and Technology), where officials were increasingly concerned by the growing evidence of Norwegian firms reducing or even closing their domestic R&D activities and relocating these overseas. Narula discovered that an increasing number of smaller but fast growing firms in new, high-technology sectors believed that Norwegian industrial policy and support for R&D had been captured by the dominant incumbents. They were therefore increasingly disinvesting and relocating R&D activities to countries (like the United States

and Ireland) where the research infrastructure offered better returns. Narula's report to the NRC therefore identified the problem not as one of a 'hollowing out' to low wage countries, but one of policy failure arising from incumbents capturing the policy making process.

This led to Narula being invited to collaborate with a succession of EC Directorate for Research and Innovation researchers from 2003 and 2008, focusing on understanding the relationship between a firm's dependence on access to the local R&D infrastructure and its increasing need to locate some complementary R&D activities closer to other firms or research institutions with which it could collaborate. As R&D activities were becoming increasingly specialised, so the importance to a firm of locating close to its ideal partner (in order to ensure the optimal returns from the collaboration) meant that R&D mobility increased yet further. These findings were increasingly welcomed at the highest policy levels. This began with Narula's keynote address on policy dimensions of globalization and R&D to the United Nations Commission on Trade and Development annual intergovernmental meeting of 2004, and a similar keynote to the OECD in 2005. These were followed by several high level contributions, such as to the EU Presidency special investigation on innovation policy in Prague in 2009.

Then in November 2011, Narula was invited to join the Expert Group commissioned by the EU Directorate General for Research and Innovation to investigate the potential costs and benefits of increasing international co-operation in research and innovation as a part of its Horizon 2020 programme, the EU's 7-year industrial and technological policy framework, with specific reference to the technological and scientific priorities for spending €35 billion in R&D subsidies.

The Expert group published its report, *International Cooperation in Science, Technology and Innovation: Strategies for a Changing World* in 2012 [1], which contained nine recommendations, five of which directly draw from Narula's research. These five are: 1. The strategy should focus on promoting European attractiveness as an international research and innovation hub and partner in order to strengthen European competitiveness and prosperity. 2. Theme- and problem-oriented prioritization is needed rather than geographic; Grand Challenges as a clear prioritization tool should be mainstreamed also in the international dimension. Prioritization of international collaboration should follow closely the priorities of the EU's core research and innovation programmes, while the geographical approach should be the core of an implementation strategy. 3. Make the Horizon 2020 truly open and attractive to the best and brightest in the world allowing European actors to work with the best brains wherever they are. 4. The international perspective needs to be more fully integrated into 'regular' programmes at EU level. 5. A strong focus on firms and innovation is needed. This has not been properly addressed before and it requires a new/different approach; there are fundamental differences in drivers of international cooperation between academia and industry and between research and innovation.

All these recommendations have been accepted by the Commission, and are now included in the Horizon 2020 policy [2].

Narula's research has assisted in a fundamental departure in EU policy. Horizon 2020 now explicitly encourages and supports R&D co-operation with non-EU partners, and further treats non-EU partners on an equal basis. This represents a fundamental departure from previous EU policy, where the former emphasis was on geographic priorities within the EU. Furthermore, Horizon 2020 also includes an enhanced focus on subsidising R&D infrastructure explicitly to encourage additional private investment in R&D facilities.

The Chair of the Expert group confirms that Narula's research has led to 'a more effective innovation policy strategy' within the EU [4], and the Expert group's Rapporteur further underlines how Narula's research made an 'outstanding contribution' to policy with respect to collaboration between academia and industry, Narula's research led to 'a significant improvement in EU policy' [5].

This University of Reading research has therefore directly impacted one of the most important items of EU policy – research and innovation - and the many thousands of firms around the world participating in Horizon 2020 research and innovation programmes.

**5. Sources to corroborate the impact**

1. *International Cooperation in Science, Technology and Innovation: Strategies for a Changing World* Report of the Expert Group established to support the further development of an EU international STI cooperation strategy 2012 EUROPEAN COMMISSION, Directorate-General for Research and Innovation, Brussels. *http://ec.europa.eu/research/iscp/pdf/report-inco-web-5.pdf*

2. *Horizon 2020: The EU Framework Programme for Research and Innovation* http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020

3. *EU International Strategy for Research and Innovation* http://ec.europa.eu/research/iscp/index.cfm?pg=strategy

4. Letter from Chairperson of the International STI Cooperation Expert Group (Executive Director International Strategy and Networks, VINNOVA, Stockholm, Sweden, Senior Research Fellow, Research Policy Institute, University of Lund) [Available upon request]

5. Chief Rapporteur of the International STI Cooperation Expert Group (and Special Adviser, International R&D Policy, Research Council of Norway) [Available upon request]