NEW MODES OF GOVERNANCE PROJECT

Project no. CIT1-CT-2004-506392

NEWGOV
New Modes of Governance

Integrated Project
Priority 7 – Citizens and Governance in the Knowledge-based Society

Policy Memorandum on Evaluation of OMC in Research Policy

reference number: 02/D62 v.1

Due date of deliverable: January 2007
Actual submission date: 29 May 2007

Start date of project: 1 September 2004 Duration: 48 months

Organisation name of lead contractor for this deliverable:
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Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Summary

The OMC process, as applied to R&D policy making, has failed to deliver on many of its ambitious promises. These were (a) 3 percent of EU GDP invested in R&D and (b) the creation of a European Research Area. However, modest shifts in national policy making do indicate a convergence towards a less differentiated research space in the EU. We analyse the policy process and assess the ensuing objectives, asking whether they were credible or realistic. After presenting empirical evidence for stasis and change, we summarise arguments for and against policy coordination in the field of R&D.

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I. The OMC Policy Process

Most OMC processes operate in policy fields dominated by intergovernmental, rather than Community, decision-making. Above all, this means that a so-called 'policy' backed by an OMC has not necessarily received the political support of all members, nor do its objectives, although they might set Community targets, necessarily reflect their aggregate national preferences. Consequently, compliance is voluntary and often piecemeal. However, member states are loath to be entirely left out of a political process, especially if they are to be labelled a 'laggard' by subsequent benchmarking exercises that come in the wake of an OMC. This can lead to the generation of country reports that may pledge allegiance to the policy goals, present action plans guaranteeing implementation, and strict timetables for reaching targets. However, both the credibility of the policy objectives and the national commitments to their fulfilment require critical appraisal.

This basic configuration is, broadly speaking, the case with OMC R&D. Notwithstanding the existence of a Science policy going back to the early eighties, to date, member states have had fairly hermetically sealed national systems that have privileged domestic projects to the detriment of international collaboration. In the post-war period national projects were often conceived of as economic strategies to gain comparative advantage over potential competitors in a given field. Despite this, European intergovernmental structures were created in the fields of nuclear energy, civilian aviation, and space but did not boast any great commercial success.[1] The launch and then expansion of EU funded Framework Projects have created certain genuine collaborative institutions (most recently, the European Research Council), however 95 percent of R&D is funded on a national basis.[2] The real task of EU R&D policy is to coordinate these national programmes.

R&D policy gained its most significant political impulse following the launch of the Lisbon Strategy in 2000. Seeking the recipe of increased economic growth, policymakers and politicians identified research as an important motor for productivity and innovation. This acknowledgement was translated into several political commitments by the Barcelona European Council in 2003. It set two headline targets: one percent of GDP in government funding, 2 percent of GDP coming from business sources: in total, three percent of national wealth to be spent on R&D. The commitment made it clear that this target was to be understood as an EU-wide target with national differences acceptable so long as the global target was met.

Alongside measures to increase the level of R&D funding, EU policies, and especially those categorised as OMC processes, attempt to coordinate national research efforts in order to improve their efficiency. The creation of a European Research Area where the duplication and fragmentation of research programmes is mitigated is the other main goal of EU R&D policy.

As the EU does cannot legislate for a single research policy, national programmes remain the preserve of individual governments and their 'opening up' (i.e. the ability for foreign actors to influence and participate in the programmes) has been slow (Banchoff, 2002). Consequently, the two key policy objectives, 3 percent of EU GDP spent on R&D and the establishment of a European Research Area (ERA), require member state action but cannot legislate for it. Crucially, the 3 percent goal is a Community target and therefore does not engage individual

[1] These government subsidised programmes have more recently lost ground to incentivising business investment with favourable fiscal measures such as tax-deductible research expenditures. In this study, we concentrate on government funding as a measure of policy objectives.

[2] FP7 (2007-2013) will command a budget of around €10 billion per year while total EU27 annual spending is €200 billion (2005).

states. Theoretically, the 3 percent goal could be achieved by strongly performing countries doubling their investment and the poorer performing countries doing nothing. Naturally, the implicit message is for low-investment countries to catch up with the higher-investment ones and the Commission publishes country-rankings that identify best and worse practice.

Also, the 3 percent goal does not stipulate any overarching EU R&D strategy, i.e. a template of scientific areas where the EU should specialise and cooperate. National priorities differ greatly simply because they do not overlap (e.g. Ireland's commitment to research on nuclear energy is weak compared to France's) or because they compete (a member state possessing excellence in a field may not to overly keen to share the secrets of its success with potential competitors).

Similarly, the ERA project encourages member states to pool resources for their mutual benefit but does not set out individual targets either for countries or scientific domains. The ERA is, however, endowed with a considerable budget that itself constitutes around 5 percent of total R&D investment in Europe. The current framework programme (FP7) sets aside more that €32 billion (or more than 60 percent of the total budget) for the promotion of international cooperation.

Conditions for Policy Coordination

Whatever the potential gains from policy coordination, it remains an inherently costly business. So although contenders for international policy coordination are numerous, there remains a near-infinite amount of parallel or uncoordinated national policies that may be candidates for concerted action but remain stolidly uncoordinated. Whatever the long-term potential benefits, international coordination of policies is usually accompanied by short-term costs; coordination inevitably entails a loss of (amongst others) independence, entails the risk of policy distortions, and also the risk of non-cooperative behaviour by partners. The decision to coordinate is therefore entered into if certain conditions are met. Good contenders (Milner, 1997) would be:

(a) Interdependence
(b) Political support
(c) The need to defend policies from domestic pressure
(d) Structural similarities

Monetary policy is the shining example of the European Union (EU) coordination of policies across member states. All four conditions are met: (a) monetary policy displays high 'externalities' or spillover effects on neighbouring countries, (b) political backing was constitutionalised in the Maastricht Treaty, (c) the Stability and Growth Pact 'hardcoded' budgetary spending, thereby isolating it from the political cycle and (d) Euro-zone countries had to restructure anomalous or inconsistent policies and institutions before entering the pact. Accompanying this project was an extensive economic literature that dealt specifically with the costs and benefits of macro-economic policy coordination. The theory of the so-called 'optimum currency area' sought to define a geographical zone in which economic efficiency would be maximised if the entire region used a single currency (Ghosh and Wolf, 1994; Benigno, 2001).

II. Arguments for and against a coordinated policy

Taking research policy: (a) although research is understood to have strong and positive externalities within countries, the effects of one state's policies on the economic performance of its

neighbours in largely unknown, (b) there is strong rhetorical support for coordination even if the impact is not felt in either policy design or budgetary commitments, (c) research policy priorities rarely, if ever, receive the degree of domestic scrutiny that would warrant its supra-nationalisation[3] and (d) national research systems not only exhibit great dissimilarities, a body of research suggests that national innovation systems (NIS) are unique constellations of actors, institution and interests that cannot easily (Maurseth and Verspagen, 2002), or even should not (Grabher, 1993), be coordinated.

The literature on the regionalisation research policy is less well developed than the equivalent work carried out in the run up to monetary union. To summarise the arguments: the dangers of an uncoordinated regional policy are (a) duplication of research effort, (b) fragmentation of projects and (c) dispersion of resources. The dangers of a coordinated regional policy are (a) the creation of rigid institutional structures that can retard reaction and change and (b) inertia and resistance from local actors to centralised plans can dissipate energies and waste resources (Arndt and Sternberg, 2000).

III. Does EU R&D policymaking make 'real' policies?

Evaluating OMC processes is a task that can be dispatched fairly quickly; they are practiced more in their breach than their observance. Most have not had anything like the impact they promised (Idema and Kelemen, 2007; Zeitlin, 2005) and even the more successful OMCs, most expert opinion would seem to suggest, are not unambiguously so. Values of transparency, participation and democracy and effectiveness are frequently seen to be lacking or absent (see (De la Porte, 2004). One possible reason for this 'failure to impress' that is currently the theme of OMC evaluation is that the policies with which it is associated are not, in the strict sense, 'genuine' policies. If by 'public policy' we mean a set of decisions made by actors to meet certain goals *and* it is within the actors' power to achieve them,[4] then traditional methods of policy analysis will not readily capture any concrete 'OMC effect'.

This is the case of EU R&D policymaking. The disappointment expressed by Commission reports and academics can hardly come as a surprise: the headline objective was for member states to invest 3 percent of GDP in research by 2010. The supplementary objective was the creation of a coordinated European Research Area. Neither target will be met. If anything, member states are spending less on R&D than at the beginning of the decade. Is this policy failure? Perhaps Euro-sclerosis? A more modest proposition is that the current trend represents business-as-usual in the member states that either ignored or were unaware of the policy. After all, the target originated in a political declaration by heads of state in 2003 with the Commission given the role of monitoring progress based on national reporting. The means of achieving the target were 'mutual learning, joint actions and Community initiatives support national reform'. As with all OMCs, participation is voluntary, enforcement is self-imposed and opting-out is not sanctioned.

Given the toolbox of policy instruments at the disposal of advocates of OMC R&D, strict adherence to the policy objectives would have been more surprising than their actual observance. The strength of the policy was not to be in its instruments (as with competition policy) but in the idea that increased spending and coordination in R&D is good for economic

[3] Indeed, the opposite effect has been observed where national preferences in matters of genetically modified organisms and stem cell research threatened to politicise EU-level activities in the area

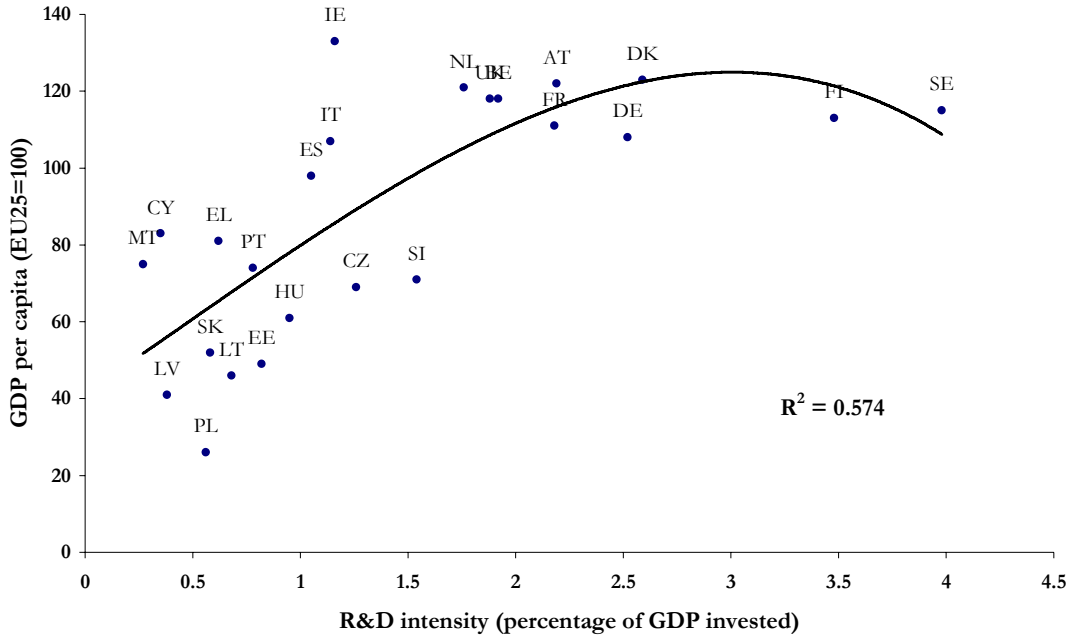
[4] The definition of public policy is from JENKINS, W., I. (1978) *Policy Analysis: Political and Organisational Perspectives*, London, Martin Robertson.

growth. Firstly, increased R&D investment is associated with higher GDP per capita (OECD 2004). Secondly, a single research system is seen to have a multiplier (or spillover) effect on investment returns.

IV. Credible targets: Why 3 percent?

Taking each policy rationale in turn, we shall analyse a snapshot of EU25 investment in R&D (Figure 1). The plotted line[5] describes the overall trend in GDP versus R&D investment as observed in the EU25. Putting causality aside for the moment, the shape of the curve suggests a correlation between the two elements: as one increases, so does the other until R&D intensity reaches 3 percent and GDP is 120 percent of the EU25 average. One possible interpretation of this correlation is that investing in research can boost GDP (that is the oft-repeated doctrine of the European Commission). A second, and reverse, interpretation is that richer countries tend to spend more on R&D, i.e. the causality runs from being wealthy to spending more on research, not the opposite. In either case, the observed tendency for richer countries to invest more in research is often quoted by the Commission as sufficient reason to set a Community target of 3 percent.

Figure 1 R&D vs GDP (Source: Eurostat. R&D expenditures are expressed as percentage of GDP)



The rationale for a quantifiable target was, according to Commissioner Busquin, because it 'can promote concrete action – the Maastricht criteria demonstrated that' (Busquin, 2003). This does not explain why 3 percent (and not 4.0 or 2.0 percent?) was chosen. Commissioner Potocnik provides some insight;

[5] The formula for the line is y = -1.9547x3 + 2.5073x2 + 37.919x + 41.397. The R-squared value of 0.57 is high enough to infer a non-trivial correlation between the two variables although multiple control variables are required to establish a meaningful correlation.

> Basically, if we look at those economies that are making the best use of technology for their development - Finland, Japan the USA - they are generally investing upwards of 3 percent of GDP in R&D. And around two-thirds of that investment is coming from private enterprise. So basically we can consider the 3 percent figure as an indicator of whether we are being successful in attracting and encouraging private investment in R&D in Europe (Potocnik, 2006).

Economic literature has not established an unambiguous link between R&D and economic growth nor can it establish a direction of causation. The investment in R&D rate may be affecting the economic growth rate, but also one member state may report higher investment due to the increased availability of economic resources (Bilbao-Osorio and Rodriguez-Pose, 2004). In summary, richer countries invest more because they can afford to.

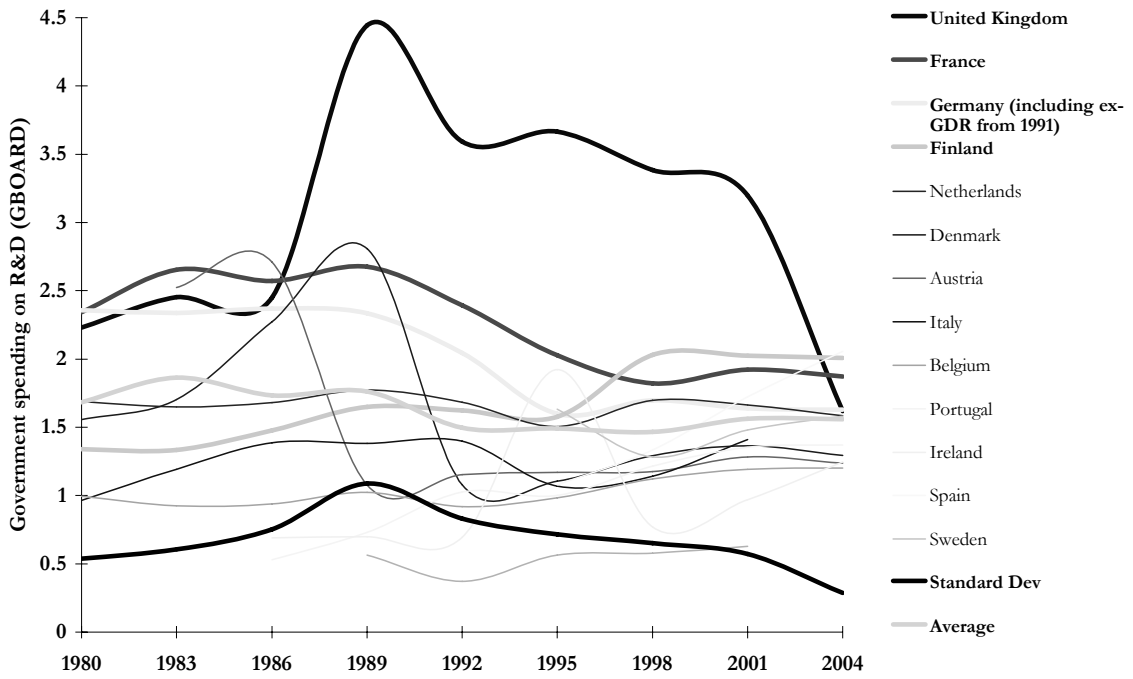
Whatever the rationale behind the target, it has been characterised in a report for the Commission as being both 'unrealistic and unachievable' (Arundel and Hollanders, 2005). Indeed, only ten EU25 member states[6] have committed to the target with the remainder promising less, often over a longer period of time.[7]

As stated, this snapshot does not take into account the many other elements that relate to economic growth and levels of R&D investment (for an overview of current research see (Gelauff and Lejour, 2006), not least time. Figure 2 isolates variation in levels of spending on R&D in 14 EU member states over a twenty five-year period. The individual lines plot government spending in each member state. The lower dark line describes the standard deviation of these levels, show how the late nineties were a period when member states varied more in their budgetary commitments to R&D while the difference attenuated over the past twenty years to reach a level of 0.28. In other words, although member states are spending less, they are spending alike, all tending towards a value of 1.5 percent.

[6] SE, FI (both pledge 4 percent), DK, DE, AT, FR, BE, LU, SL, NL.

[7] UK 2.5 percent by 2014, IE 2.5 percent by 2013, CZ, ES, LT 2 percent, the others less than 2 percent.

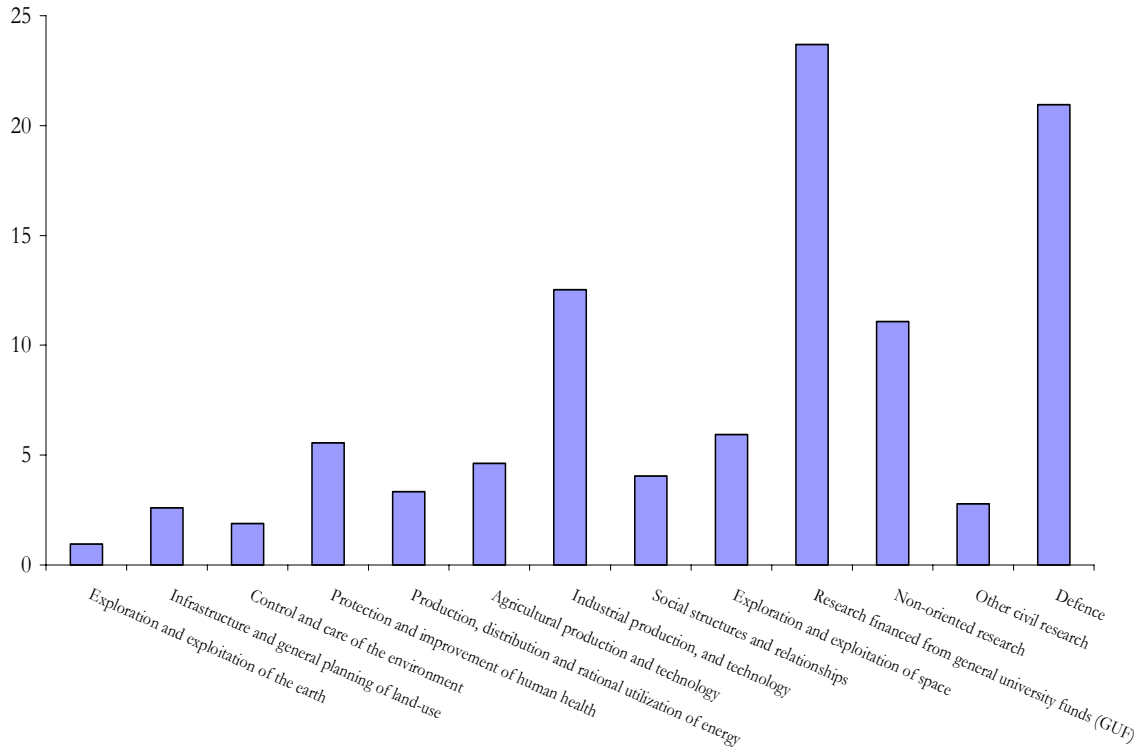
Figure 2 Trends in Government spending. Source Eurostat: Total GBAORD as a percent of total general government expenditure



V. Measuring trends in priorities

Figure 3 collates data on the same thirteen member states over the same time period, showing percentage variance according to research priorities. Over the past decade, states have differed most in defence spending, university-funded research and industrial production and technology.

Figure 3 Percentage variance in research priorities 1995-2005. Source Eurostat



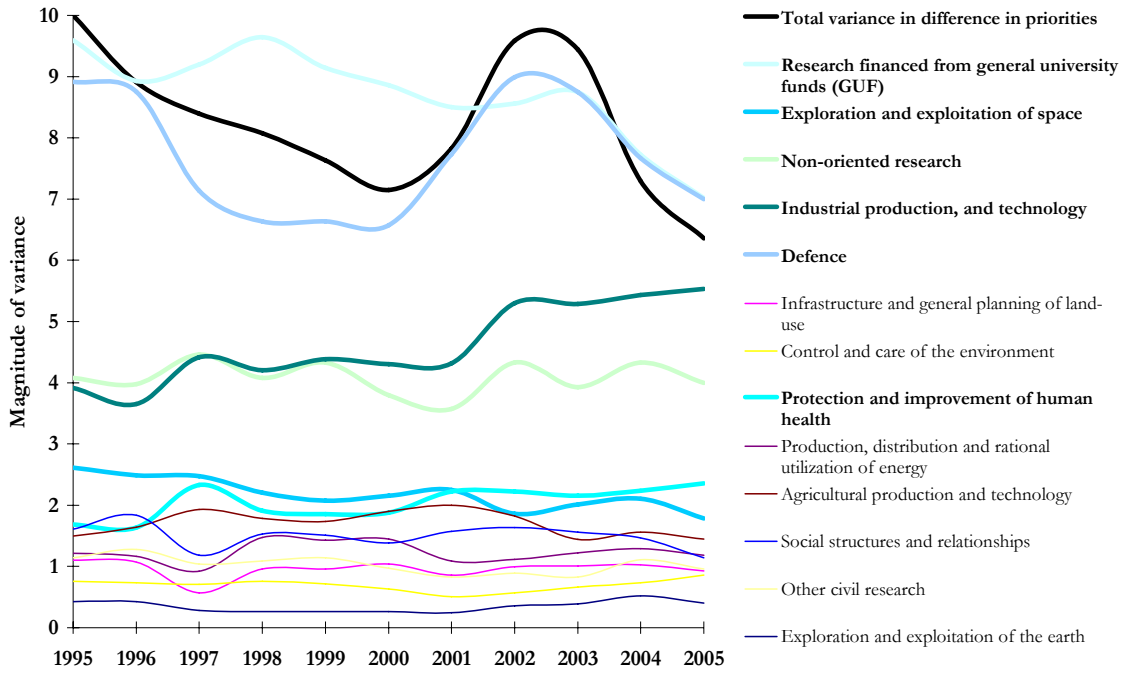
These differences are easily accounted for by country-specific commitment, with larger countries spending more that the average on defence and industry. It is of note that most of the variance in university-funded research is accounted for by a single country: France has traditional spent far more that neighbouring countries on third-level research institutes such as the Ecoles Normales.

Figure 4 presents variance in research priorities over an eleven-year period for thirteen EU countries. Based on government expenditure on research priorities as a percentage of GDP, these lines represent magnitudes of variation (and not levels of spending) between the countries across thirteen priorities coded by the 1-digit NABS format.[8] The upper dark line is a normalised (1995=10) measure of variance showing how priorities have converged after 2002 and are falling sharply. In other words, regardless of how much different countries are spending on research (and figure 1 would suggest that countries are tending to spend the same), they are increasing financing the same priorities with the exception of industrial production and technology where variance is increasing. The same overall trend was observed by (Siune, 2005) using similar data from the OECD.

These two findings would suggest that while the targets set by the European Council in 2003 is not being met; convergence in spending (albeit in the wrong direction) and priorities is a feature of European research.

[8] Eurostat employs the Nomenclature for the Analysis and comparison of Scientific programmes and Budgets (NABS) codes Government budget appropriations or outlays on R&D (GBAORD) by thirteen socio-economic objectives (http://europa.eu.int/estatref/info/sdds/en/gba/gba_nabs_classification.pdf).

Figure 4 Variance in Research priorities. Source: Eurostat NABS codification



VI. Conclusion

Although OMC R&D is seen as something of a failure (the targets set remain allusive to say the least) there is evidence of convergence in patterns and levels of spend across the European Union. Whether this is due to some 'OMC-effect', is open to analysis. Ninety five percent of R&D funding is still managed at national level, a proportion that would be set to fall if member states radically increased their domestic investments. The opening up of national research strategies to allow funds to be expatriated to successful foreign tenders would be a measure of how seriously governments take the European Research Area. This is unlikely to happen anytime soon.

Most national programmes espouse a mercantilist vision of research: the objective is the 'attract and secure' foreign researchers and investments against the siren calls of its competitors. These beggar-thy-neighbour practices are best observed when the decision to locate a European Union laboratory or research institute is being made. Also, participation in Framework Projects is often measured by states in 'draw-down' i.e. how much money is repatriated by successful tenders.[9] A less mercantilist view would be concerned not in budget but the number of projects and partners.

The eagerness of national research programmes to manage budgets and priorities locally is nevertheless understandable. If the Europeanisation of research signifies the sometimes sprawling and loosely managed international networks that are a feature of recent FPs, then perhaps it is no wonder that research policy makers observe that 'On n'est jamais mieux servi que par soi-même'.

[9] Both the Irish and UK FP7 initiatives set targets for draw-down that equal their per capita share of the total budget.

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