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Managing diversity in a system of multi-level governance: the open method of co-ordination in innovation policy

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ABSTRACT This article explains why open policy co-ordination has not yet gone very far in innovation policy. We claim that the multi-level character of innovation policies and the diversity of national innovation systems are major stumbling blocks to applying the OMC in this policy area. So far, these two peculiarities of innovation policies prevented 'vertical policy co-ordination' and 'horizontal policy learning', which have both been heralded as the main goals of applying the OMC. Acknowledging these features of innovation policies, this article argues that the OMC is only likely to constitute a valuable mode of governance if national and regional specificities are carefully taken into account, if actors at each territorial level are considered during the entire policy process, and if qualitative benchmark indicators are developed which consider the diversities of national innovation systems and regional idiosyncrasies. We explore our argument with respect to Austria, Germany, the Netherlands and Sweden.

KEY WORDS Austria; European Union; Germany; innovation policy; multi-level governance; national systems of innovation; the Netherlands; OMC; policy learning; Sweden.

I. POLICY CO-ORDINATION AND INNOVATION POLICY IN EUROPE

New modes of governance have been introduced in European research and innovation policies. The Lisbon European Council of 2000 decided to apply the open method of co-ordination (OMC), first introduced in the Employment Strategy of the Amsterdam Treaty, to research and innovation policies. Since the mid-1980s, this policy field has gradually developed typical multi-level characteristics because the European Union (EU) not only increased its efforts to support research and development but also broadened its approach towards

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a more comprehensive innovation policy which finances related activities even at the regional level (cf. Grande 1999; Peterson and Sharp 1998).

The prominent role of policy co-ordination needs to be seen in the context of the EU's effort to develop the European polity in a more effective, efficient and democratic way (e.g. European Commission 2001a; Héritier 2001; Jachtenfuchs 2001; Jørgensen 1997; Kohler-Koch and Eising 1999; Metcalfe 2001). The European Convention debated whether to codify the OMC within the future European Constitution. However, as for research and innovation policies, the Convention finally decided against a constitutionalization of the OMC in order to preserve its 'informal character' (European Convention 2003: 6). Furthermore, the Convention acknowledged the special 'logic' of research and innovation policies by drafting a separate sub-article for this policy area in the Draft Treaty for a Constitution (Part I, Art. 13.2). Nevertheless, the final text contains a passage that sums up the OMC in essence without referring to it (Art. III-148). Even the Competitiveness Council of 13 May 2003 acknowledged the specificity of national innovation systems and variations in specific regional or local strengths (Council of the European Union 2003).

In the field of research and innovation policies, the OMC establishes a number of 'soft-governance' instruments that go beyond the initial Treaty provisions. Although participation in the co-ordination process takes place on a voluntary basis, those soft-governance instruments are clearly designed to achieve greater convergence of innovation policies at different territorial levels 'to the main EU goals' (European Commission 2000c: 16). In this regard we have argued elsewhere that there are certain boundaries and conditions for the application of the OMC in the area of research and innovation policies (Kaiser and Prange 2002). One of those boundaries is the likely resistance, especially from regional actors who might consider the OMC as an instrument of centralization in areas in which the Community lacks legislative powers.

In this article we try to explain why the application of the OMC has not yet gone very far in innovation policy. We claim that there are two important stumbling blocks for applying the OMC to research and innovation policies, both resulting from distinct specificities in this policy area. Each stumbling block alone might prevent achieving the goals envisaged by applying the OMC, i.e. vertical co-ordination of policies and 'horizontal' policy learning.

Firstly, the *multi-level character of innovation policies*: this means, first of all, that there are significant variations among EU member states and regions according to legislative and budgetary powers leading to different policies, institutions and national co-ordination mechanisms. Vertical co-ordination problems (e.g. increasing transaction costs) in one policy area rise with the number of administrative levels and the degree of subnational autonomy. The problem of vertical co-ordination differentiates innovation policy from other policies, such as social or employment policy. It is also different from these areas because private organizations, not the state, are the main performing actors, while public organizations at different territorial levels enjoy a high

degree of autonomy. In this context member states, regions or even local clusters are in fierce competition for critical resources, such as knowledge, foreign research and development (R&D) investments, or human resources, not only with other EU member states but also with innovation lead markets around the world. Therefore, given the close interrelation between innovative performance and economic competitiveness, innovation policies are faced with the problem that there is a tension between market co-ordination and political co-ordination.

Secondly, Europe is characterized by a high *diversity of national innovation systems*. These variations include the structures of the member states' research and innovation systems as well as the performance of these systems. This assessment is highly relevant for estimating the impact of the OMC since the diversity of policies and institutions constitutes special conditions for mutual policy learning (cf. Chalmers and Lodge 2003; Lundvall and Tomlinson 2002; Scharpf 2002). On the one hand, these variations are an important precondition for policy learning since only institutional diversity allows for the comparison of different solutions for innovation problems. On the other hand, since innovation processes are always context-specific, policy learning is extraordinarily demanding as it requires knowledge of the local conditions responsible for the success of a policy programme.

Bearing these peculiarities in mind, we argue that the OMC is only likely to constitute a valuable mode of governance if national and regional specificities are carefully taken into account, if actors at each territorial level are considered during the entire policy process, and if qualitative benchmark indicators are developed that consider the diversities of national innovation systems and regional idiosyncrasies. Only when it meets these preconditions is the OMC more likely to become – as envisaged by the European Commission – a promising tool in research and innovation policies, either as an informal organizational framework for mutual policy learning (see also de Búrca and Zeitlin 2003) and policy transfer (cf. Dolowitz and Marsh 2000; Radaelli 2000) or as a mechanism leading to the formulation of 'strategic European goals' which do not interfere with competition between member states' innovation systems. However, in any case it remains an ambitious task as we will show below.

We explore our argument with respect to Germany, Austria, Sweden and the Netherlands, which show varying degrees of multi-level governance in research and innovation policies as well as a significant diversity among their innovation systems. With regard to multi-level character, the four countries differ in view of the vertical dimension of innovation policies. Whereas in Austria and Germany federal political systems exist in which regional authorities have legislative competencies, the Netherlands and Sweden – although they are more unitary states – have undergone in recent years a process of decentralization of political authority which has also led to a regionalization of innovation policies. Secondly, our sample comprises a high degree of diversity regarding the structure and performance of their innovation systems.

Although all four countries are commonly characterized as 'co-ordinated market economies' in which similar institutional arrangements exist, for example, in the financial system as well as in industrial or labour relations (Hall and Soskice 2001), they show significant differences which can be assessed in view of their R&D infrastructure, different patterns of technological specialization and the 'openness' of their innovation systems. In view of the last-mentioned point, it can be assumed that Austria, the Netherlands and Sweden have developed much more open innovation systems, given the fact that the small size of their domestic markets does not allow for refinancing of technical innovations at the home base (cf. Christensen 2000). According to innovation output, we will briefly show that the four countries demonstrate strengths and weaknesses in different areas. Here we will attempt to qualify our quantitative data, thus suggesting that there may be different solutions for similar innovation performance problems. In this case, a more co-ordinated European innovation policy would meet the requirement to go considerably beyond existing benchmarking activities that are still mainly based on the application of quantitative indicators (see also Lundvall and Tomlinson 2002).

In the following section we first recapitulate on the extent to which the OMC has been applied to innovation policy since the Lisbon Council announced it as the central governance tool in this policy area. We will then develop our argument along the distinct specificities of innovation policy in Europe. Hence, we first examine innovation policy as a matter of multi-level governance in order to clarify the problem of vertical policy co-ordination. Second, we point to the diversity of national research and innovation systems which, we argue, renders policy learning and, even more, policy transfer a highly unlikely goal. Finally, the article assesses the possible role of open policy co-ordination in managing diversity throughout Europe, its preconditions and potential benefits.

II. THE OMC IN INNOVATION POLICY: WHAT HAS HAPPENED SO FAR?

Open co-ordination in innovation policies can be characterized as a two-dimensional process, primarily based on a continuous benchmarking of national R&D policies against best performing countries (i.e. major competitors) in the world. Subsequently, the benchmarking serves first to identify specific needs that exist for individual member states or industrial sectors (horizontal dimension). In order to overcome the existing deficits of member states' innovation systems, benchmarking also refers to best practices which have been successfully implemented elsewhere. The dissemination of these best practices is supposed to take place through a process of mutual policy learning organized at the European level. Secondly, on the basis of the benchmarking results, EU member states may also agree on common European guidelines which have to be translated into specific short-, medium- or long-term targets for national and regional R&D policies (vertical dimension). These guidelines

consequentially concern measures which are designed to strengthen the coherence of innovation policies at different territorial levels and to improve Europe's innovative performance in general. The whole process is accompanied by periodic monitoring, evaluation and peer review pursued under the auspices of the European Commission (European Commission 2000c: 16).

In this context, the EU Commission and the member states have different functions. Whereas the Commission is primarily engaged in the establishment of a framework for dialogue, co-ordination and benchmarking,[1] the member states are responsible for the creation of 'internal' co-ordination mechanisms, both horizontally between the respective government departments and vertically between the national and regional levels. Local and regional actors are thus not directly involved in the co-ordination process. As a consequence, the success of the OMC in European innovation policy – at least in view of the vertical dimension – largely depends on the existence of co-ordination mechanisms within the member states and the willingness of local and regional actors to subscribe to targets which have been defined at the European level.

Up to now, open co-ordination in innovation policies has been clearly focused on benchmarking of member state R&D policies. At the European level, the benchmarking process has been institutionalized through the establishment of a High Level Group (HLG) composed of representatives from the member states nominated by the Minister in charge of research. The Commission, assisted by the HLG, co-ordinates the work of four expert groups on benchmarking in specific thematic fields. In a first cycle of benchmarking exercises, which lasted from September 2000 until January 2003, activities were concentrated on five thematic issues: human resources, public and private R&D investments, the impact of R&D on competitiveness and employment, productivity in science and technology, and the promotion of an R&D culture. These issues have been discussed with experts in a number of workshops in order to identify the implications for national R&D policy planning. However, the benchmarking activities especially showed that specific problems have a highly differentiated nature in various member states which can hardly be assessed by quantitative data. Consequently, benchmarking of national R&D policies still suffers from the lack of qualitative indicators which are suitable for illustrating the complexity of the institutional environment in which innovation processes and performers are embedded (cf. European Commission 2001e).

The solution to this problem has been called 'intelligent' or 'practice' benchmarking (cf. European Commission 2001e; Lundvall and Tomlinson 2002). This means that benchmarking is about to adopt a systemic perspective and will therefore be extended in two directions. First, it will look at all mechanisms which have an impact on research policies (e.g. public programmes, the education and research system, or financial structures). Second, it will incorporate the wider policy framework, taking into account issues such as employment or taxation. This may result in a situation in which benchmarking will include not only the international comparison of quantitative perfor-

mance indicators, but also the 'use of simple statistical techniques to map causalities and the qualitative comparison of systems' (Lundvall and Tomlinson 2002: 225). Such a benchmarking model seems more appropriate to reflect the context-specific characteristics of successful practices in innovation policy. However, it will also disclose that best practices are often based on specific local conditions and on specific modes of interaction between innovative organizations. This would constitute a strong argument in favour of a bottom-up benchmarking process in which organizations, local clusters or industrial sectors compare themselves with other respective units.

Apart from the benchmarking of national R&D policies, the application of the OMC in European innovation policies has so far led to the formulation of one strategic goal to be achieved by the member states. The Barcelona European Council agreed in March 2002 to invest at least 3 per cent of the member states' GDP in R&D by 2010, of which two-thirds should be provided by private sector industry. Looking at the current situation in the EU – and especially at the preconditions which exist in individual member states – this 3 per cent target is a highly ambitious goal. In recent years, the average was a mere 1.9 per cent while only a small number of member states came close to the 3 per cent target. Those countries, especially Sweden and Finland, have in common that they are relatively small economies which accommodate research-intensive multinational companies. In contrast, larger economies, as well as small economies in which multinational companies play no significant role, had considerably lower business R&D investments. Thus, there is a strong correlation between business R&D expenditure and the existence of large firms engaged in research-intensive industries, such as telecommunications or pharmaceutics. In Sweden, for example, almost 60 per cent of the country's business R&D expenditure in 1999 was invested by Ericsson, whereas in Germany 80 per cent of private sector R&D expenditure originated from a relatively small number of firms with more than 500 employees (Sheehan and Wyckoff 2003: 17). Given the fact that the amount of private R&D investment primarily depends on the industrial structure of a country, it seems obvious that some EU member states will hardly be able to reach the Barcelona target.

III. VERTICAL POLICY CO-ORDINATION IN MULTI-LEVEL GOVERNANCE SYSTEMS

In this section, we explore the multi-level character of innovation policies as a stumbling block for vertical policy co-ordination. European research and innovation policies have been primarily confronted with the problem of vertical (and horizontal) co-ordination since the beginning of the 1970s (Grande 2000; Peterson and Sharp 1998). The co-ordination of national policies was seen as essential to overcoming the growing technology gap between Europe, on the one hand, and Japan and the United States, on the other (Lawton 1999). However, the co-ordination approach of the Commission was abolished at the beginning of the 1980s, when European research and innovation policies took

a strategic turn. The introduction of framework programmes for research, development and demonstration abandoned efforts to co-ordinate national policies by the Commission. Only by proposing a European Research Area (ERA), in which the OMC should be the central mode of governance, did the Commission again follow the idea of policy co-ordination across territorial levels (European Commission 2000a). The rationale behind the application of the OMC is that public policy actors at the European, national, regional and even local level should become more involved to ensure that measures taken at the different levels will be mutually consistent. Under this premise, innovation policies implemented at various levels in Europe are expected to become considerably more integrated in a multi-level governance structure.

However, the specific multi-level character of innovation policy renders vertical policy co-ordination quite ambitious since, first, decision-making competences are shared by actors at different territorial levels, i.e. innovation policy faces a 'dynamic' dispersion of authority (cf. Grande 2000, 2001; Hooghe and Marks 2001, 2003; Marks *et al.* 1996; Peters and Pierre 2002). As a consequence, there are a variety of policies, instruments, actors and arenas at national as well as at European, regional or even local levels of government. Thus, in the context of co-ordination, in systems of multi-level governance the problem of transaction costs arises. Transaction costs increase with the number of actors that participate in negotiations. Additionally, even if actors are in fact willing to co-operate, but only seek to maximize their self-interest, a negotiation dilemma is likely to occur (Scharpf 1993).

To develop the argument of this section, i.e. that the multi-level character of innovation policy poses an obstacle to vertical policy co-ordination, we will briefly explore how innovation is organized in the four member states selected for this study.

In Germany, the federal states (*Länder*) have initiated their own innovation policy programmes since the mid-1970s in reaction to economic recession and structural change (cf. Scherzinger 1998). Apart from that, the *Länder* are considerably involved in various joint policy co-ordination processes at the federal level. Co-ordination exists especially in research and education policies where several permanent commissions were established. Furthermore, innovation policy co-ordination is supplemented by various co-financing arrangements that concern all major German research organizations as well as the university infrastructure. Within this structure, the *Länder* have not only increased their expenditure for innovation in recent years, they have also concentrated on areas in which they are least encumbered by the constraints of joint policy-making. As a result, regional innovation policies gained importance as an instrument of competition and differentiation among the states, while the federal level has focused its activities either on cross-cutting infrastructural programmes or specialized priority programmes funding technologies at a pre-competitive stage (Wilson and Souitaris 2002: 1132).

As the example of Austria shows, a federal state structure does not necessarily indicate the existence of autonomous regional innovation policies. Here the

key player is the federal government, which has only recently initiated regionalized innovation programmes, i.e. programmes that emphasize the role of the regional economic structure (European Commission 2001b). While the states have not yet been able to establish specific regional approaches to innovation, some local authorities have done so by introducing a series of cluster initiatives such as the automotive clusters in Styria and Upper Austria (OECD 2002: 74). Intergovernmental co-ordination and co-operation procedures exist – as compared to the German example – to a much lesser extent. Accordingly, the Austrian states are considerably less engaged in public R&D funding than their German counterparts. In 2000, only 5.7 per cent of the total Austrian R&D expenditure was provided by the states, while the German *Länder* contribution was 16 per cent (Kaiser and Prange 2001: 322). However, since the mid-1990s the Austrian federal government and the states agreed to stronger co-ordination of research programmes in the fields of environment and energy (cf. Österreichisches Institut für Wirtschaftsforschung *et al.* 1996: 66–7). In 2001, co-ordination procedures were extended to seven thematic priorities, which largely overlap with the priority areas of the Sixth European Framework Programme (Austrian Council 2002: 26).

Even in considerably more centralized EU member states, such as the Netherlands and Sweden, regional innovation and technology policies emerged in the 1990s, partly motivated by the EU's regional innovation measures. In the Netherlands, the provinces started regional innovation policies in the mid-1990s by designing so-called regional technology plans. The object of all provincial activities is to build up dense networks between administration, industry, science and intermediaries in order to withstand the growing competition among regions. Additionally, the Dutch provinces also intensified horizontal policy co-ordination at the subnational level as they called on the central state government to provide for more regional competencies in innovation policies. In Sweden, the central government has applied a regional approach since 1998, when a law on regional growth was adopted. Since then, the twenty-one Swedish counties have established regional growth agreements, which aim at co-ordinating regional and local policies. Moreover, since 2002 the programme 'Regional Growth through Dynamic Innovation Systems (Vinvaxt)' has been targeted at establishing regional innovation systems in order to strengthen the Swedish regions for global competition. However, approaches which concede more competences to the counties can hardly be intensified owing to insufficient administrative capacity and a lack of experience in developing strategies and co-ordinating policies.

In all four countries, the 'internal' co-ordination of innovation policies across territorial levels has either increased in recent years or has traditionally been strong. While the Netherlands and Sweden represent the former, Germany is the main example of the latter. Austria, however, is in a way an exception to the general trend, since internal co-ordination was, despite the existence of a federal structure, relatively weak and has increased only moderately. Thus, the degree of autonomy of subnational authorities is highest in Germany,

where the *Länder* not only have legislative competencies in innovation-related policies but also significant financial resources to invest in the R&D infrastructure and to fund the innovation activities of private and public organizations. Furthermore, both Austria and Germany differ considerably from the more unitary countries in terms of the involvement of their subnational authorities at the European level. In both countries constitutional law provides for participation in EU affairs within the domestic sphere as well as in the Council of the European Union and the Commission. For Swedish and Dutch regions these channels of representation do not exist. They are, however, like the Austrian and German *Länder*, represented in the Committee of the Regions as they have established regional offices in Brussels.[2]

To sum up: in addition to the expansion of innovation policies at the European level at least since the beginning of the 1980s, subnational authorities in all four countries participate in various innovation policy arenas at national and European levels. This is a typical characteristic of a multi-level governance system in which actors and arenas are not ordered hierarchically – i.e. 'member states and their regions are not subordinated to the supranational powers' (Grande 2001: 7) – as in traditional intergovernmental relationships (Marks *et al.* 1996). Rather, 'political arenas are interconnected rather than nested' (Marks *et al.* 1996: 346–7) and actors at different territorial levels form 'integrated systems of joint decision-making' (Scharpf 1988). Hence, from a theoretical standpoint, the organization of innovation policies in Europe should be a most likely case for significant transaction costs in the course of vertical policy co-ordination (Scharpf 1993).

Indeed, open co-ordination, as it has occurred so far in European innovation policies, does not much involve regional or local actors and it has thus tried to minimize transaction costs. However, given the importance of the sub-national level, this strategy can only be successful if member states 'upgrade' their internal co-ordination mechanisms to a bi-directional and interactive learning process which provides regional actors with the opportunity either to give their input or to decide to follow autonomous strategies.

IV. THE DIVERSITY OF RESEARCH AND INNOVATION SYSTEMS AND ITS IMPACT ON MUTUAL POLICY LEARNING

With the establishment of the European Research Area, EU innovation policy has certainly become more ambitious as, besides its multi-level character, it is faced with the persistence of structural diversity of member states' research and innovation systems, which includes enormous variations in innovation performance not only between but also within EU member states. Here we argue that this diversity of research and innovation systems across EU member states and regions is also a serious obstacle for the application of the OMC (i.e. first of all for the benchmarking exercise) with regard to policy learning or even policy transfer (see also Scharpf 2002). To clarify this argument, the following two sub-sections briefly explore that diversity.

The structural diversity of innovation systems

As many empirical studies have shown, nation states differ significantly in terms of their institutional, infrastructural or cultural conditions for innovation (cf. Edquist 1997; Freeman 1988; Lundvall 1992; Nelson 1993). These conditions determine not only the relationships between industry, public administration, and the science and education system but also the modes and the intensity of their interactions. Rather, they tend to establish certain peculiarities of a national innovation system, which have developed over a long period of time and are thus extraordinarily stable. In Austria, Germany, the Netherlands and Sweden such peculiarities can be identified especially in view of the R&D infrastructure, existing patterns of technological specialization, and the degree of openness of the respective innovation systems.

In view of the publicly funded research systems, Germany has a highly differentiated and decentralized R&D infrastructure with various universities, technical universities and polytechnics, on the one hand, and specialized non-university research organizations, on the other. Within this system a large proportion of public R&D is carried on outside the universities, whereas in Sweden and Austria publicly funded research is concentrated within the universities, thus focusing primarily on basic research (European Commission 2001b). Only since the mid-1990s has the Swedish government, for example, started to build up larger extra-university research centres in co-operation with industry. In the Netherlands, as in Germany, a huge amount of money is spent on research in forty extra-university institutes, the so-called 'non-profit' institutions.

As for business R&D, the dominant actors in Germany and Sweden are firms with more than 500 employees, whereas in Austria and the Netherlands small and medium-sized companies conduct about a third of private sector R&D (OECD 2001: 27; European Commission 2003: 136). Accordingly, the share of small and medium-sized companies in publicly funded R&D programmes is comparatively low in countries like Sweden and Germany. In Austria and the Netherlands the share is up to three times higher than in Germany and almost twice the EU average (European Commission 2001c: 28; 2003: 137).

The national innovation systems of Austria, Germany, the Netherlands and Sweden clearly show varying patterns of technological specialization. One important indicator, pointing to research orientation in an innovation system, is the relative citation impact of scientific publications. Between 1993 and 1999, Austrian scientists were especially strong in physics and also, but to a lesser extent, in basic life sciences and material sciences. Their German colleagues shared the high citation impact in physics and material sciences, but not in life sciences. The Netherlands was especially strong in environmental and food sciences, while Swedish scientists performed well primarily in pharmacology and clinical medicine (European Commission 2003: 296–7). The patterns of specialization of the science system are to some extent also

Table 1 'Openness' of national innovation systems

	Share of foreign R&D investments as a percentage of total R&D expenditure in 1999	*Number of foreign R&D joint ventures as percentage of total collaborations (1985–99)*	*Patents granted from the US patent office per million population in 1999*
Austria	20	0.6	70
Germany	2.1	3.3	122
Netherlands	11	0.8	93
Sweden	3.5	1.1	171

Sources: European Commission 2001c: 37; European Commission 2003: 53.

visible in terms of R&D intensity in different manufacturing industries. In the 1990s, R&D intensity in Germany was high in electronic equipment, motor vehicles and transport equipment, whereas the Netherlands scored highest in pharmaceuticals and chemicals. In Sweden, R&D intensity was highest also in pharmaceuticals and in electronic equipment (OECD 2002: 304).

The 'openness' of a national innovation system can be measured, *inter alia*, by the share of foreign R&D investments, the number of foreign R&D joint ventures in which domestic firms participate, and by patents granted on foreign markets. Table 1 gives an overview of the indicators concerning the four sample countries.

The different performance in view of participation in US-based R&D joint ventures reflects the industrial structure of the four countries since predominantly multinational companies engage in international R&D joint ventures. For the same reason, they also perform differently in terms of patents granted from the US patent office. As Table 1 shows, in 1999, Sweden scored 171 patents per million population, Germany 122, while the Netherlands (93) and Austria (70) were behind but still above the EU average of 69 US patents.

Differential performance and country-specific problems and solutions

Given the structural diversity of EU member state innovation systems, it comes as no surprise that the countries also vary in their innovative performance. These variations can be assessed both at national and regional levels.

According to the European Commission's annual innovation scoreboard, Germany performs well in employment in medium- and high-technology manufacturing, high-tech European patents and private R&D investments. Austria's overall performance is relatively weak; however, the country is strong in terms of innovation generated by small and medium-sized companies. The Dutch innovation system shows strengths in high-tech US patents, public R&D investments, and the availability of venture capital. Sweden's advantages

lie especially in participation in long-life learning, in employment in high-technology service sectors, and in innovation expenditure (European Commission 2001d: 9).

In terms of innovation potential at the regional level, variations are even more significant. A composite indicator of science and technology reveals that especially the German regions, some Scandinavian regions and the metropolitan area of Paris have resources at their disposal which are far above the EU average. These data indicate that the existence of subnational innovation policies supports a well-balanced provision of R&D resources at the regional level. Moreover, given the fact that Europe's most innovative regions perform significantly above the EU average, it becomes evident that variations in national innovative performance can be traced back primarily to different innovation potentials at the regional level (European Commission 2000b). Regional disparities become even more evident in view of R&D intensity. According to the European Commission, ten of the fifteen regions with the highest investments in R&D are German regions. None of the regions from the other three countries was listed in this ranking (European Commission 2003: 49).[3]

These quantitative data, however, do not reveal that in recent years some EU member states have developed specific solutions to overcome certain weaknesses in their innovation systems, i.e. the data do not offer any insights into the quality of innovation policies. In Germany, for example, in the first half of the 1990s the federal BioRegio programme initiated the country's catch-up process in commercializing biotechnology by setting up a regional competition. Even though this programme has often been characterized as a 'best practice' solution, the fact that three of the four winning regions were already selected for the establishment of national gene centres in the early 1980s was ignored; there was thus already a critical mass of scientific excellence (cf. Kaiser 2003a, 2003b). Therefore, 'learning' from such an alleged 'best practice' solution seems to be highly questionable for national innovation systems which do not provide a corresponding long-term input.

A second example concerns Sweden and the Netherlands which, in contrast to Austria and Germany, provide tax incentives for the contracting of researchers. Those tax incentives, however, did not necessarily lead to the intended result. In view of the growth rate of researchers per 1,000 of the labour force between 1991 and 1999, at least Austria (78 per cent increase) performed better than Sweden (55 per cent) and the Netherlands (21 per cent). In Germany, the number of researchers remained more or less constant. The country has, however, still more researchers per 1,000 of the labour force (6.45) than Austria (5.24) and the Netherlands (5.15), but considerably less than Sweden (9.10) (European Commission 2003: 182). Consequently, it would be unreasonable to label certain tax incentive schemes as 'best practice'.

Finally, R&D intensity at the regional level depends very much on the industrial structure. Leading regions in Germany, the Netherlands and Sweden essentially profit from the existence of multinational companies, which still

conduct research mostly at the home base, while they have decentralized development activities in many locations around the world. According to this aspect, Austria is certainly in a disadvantageous situation because the country does not have a domestic multinational company. Therefore, Austria is, more than most of the other EU member states, forced to attract R&D investment from foreign multinational companies (cf. European Commission 2003: 138–40).

To sum up, the diversity of member state innovation systems creates certain problems, especially for benchmarking national R&D policies. First, benchmarking at the aggregate level of the member states is in danger of ignoring that specific strengths and weaknesses of a national innovation system are indeed due to specific levels of performance at the regional or local level. Consequently, benchmarking certainly has to go deeper into the subnational dimension. This requires local knowledge, however, which is not necessarily at hand if open co-ordination involves regional actors only within the national context. The persistence of the diversity of the member states' innovation systems also indicates that policy co-ordination at the European level can only take place within certain boundaries, because industrial structures, innovation cultures and technological specializations follow long-established paths and are thus resistant to change.

V. CONCLUSIONS: WHAT ROLE FOR THE OMC IN EUROPEAN INNOVATION POLICY?

So far, the OMC has only been applied to a very limited degree to innovation policy. We have claimed that this is the effect of two essential stumbling blocks, both resulting from distinct specificities in this policy area. The multi-level character of innovation policies and the diversity of innovation systems, together with the highly competitive character of this policy area, differentiate innovation policies from other policies to which the OMC has been applied. The culmination of these factors, we have argued, makes the application of the OMC to innovation policies a highly ambitious task, since under these conditions the achievement of the initial OMC goals, i.e. vertical policy co-ordination and policy learning and/or transfer, is a challenging exercise.

Therefore, we conclude that, within the framework of the European Research Area, the application of the OMC should be most promising if it is used either for the definition of targets which aim at enhancing the competitiveness of the member state innovation systems or as an institutional platform for policy learning and policy transfer which comprises all relevant actors on a voluntary basis. However, up to now such actors, who are, for example, representatives of regional parliaments or administrations or even entrepreneurs, have not been systematically involved in the OMC process. Rather, OMC benchmarking workshops are basically comprised of EU and national senior officials as well as national experts, which turns the OMC into more of a 'top-

down' policy tool rather than a 'bottom-up' approach, as was originally suggested.

Additionally, in both cases, i.e. the definition of targets and policy learning, again certain boundaries appear. With regard to the first case, the definition of targets should be used in a limited way, especially in a way which does not hinder intra-EU competition. The definition of a '3 per cent of GDP target' for R&D investment in Europe is – notwithstanding the probability of achieving this goal – compatible with such a restrictive use, because it, first, allows for the fact that competition exists not only between Europe and other world regions but also among EU member states; and, second, it acknowledges the market as the more appropriate co-ordination mechanism.

The case of policy learning and policy transfer is considerably more difficult, especially in cases where a high degree of system diversity determines the playing field, such as in innovation and research policies. Even if countries are willing to learn from each other[4] and consensus has been reached upon 'best practice', there are at least three potential risks in the process of policy transfer: the uninformed transfer, the incomplete transfer and the inappropriate transfer (Dolowitz and Marsh 2000: 19–21; James and Lodge 2003). An uninformed transfer would ignore the fact that a specific policy measure might not only result in positive outcomes but also in negative impacts in other areas. An incomplete transfer might occur if countries which copy a successful policy programme overlook the role of a specific institutional set-up (i.e. actors and arenas) which exists in another country. The problem of inappropriate transfer occurs if the success of a policy measure is based on a country's specific norms and values. All three problems are certainly highly relevant for policy co-ordination in the European Research Area. Given the fact that innovation performance depends on a variety of factors and policies, the problem of uninformed transfer is likely to occur as long as benchmarking activities are mainly based on quantitative data. Therefore, policy learning and transfer is in need of qualitative data which consider member states' national and regional characteristics and patterns of economic specialization. The problem of incomplete transfer is also relevant. As we have shown, the EU member states differ in actors and arenas concerned with innovation policy. Therefore, the OMC has to involve all relevant actors either within the national context or at the European level in order to guarantee coherent approaches to certain measures. Finally, given the variations in member state innovation systems, it seems likely that innovation performance is also related to normative and cultural peculiarities which have developed in a specific country or region over a long time. Thus, the application of a policy in a certain country might be inappropriate even if the institutional preconditions are met. All in all, a certain 'practice' might only be labelled 'best practice' if the solution is 'generic', i.e. independent of the institutional, sectoral and geographical context, 'transferable', i.e. it works well in many different contexts, and 'robust', i.e. it remains a 'best practice' even if modes of production and innovation change (STRATA-ETAN Expert Group 2001: 90).

Whereas this article focused on the obstacles in applying the OMC to innovation policies to date, this new mode of governance raises additional questions regarding the democratic legitimacy of the policy process. However, while we were unable to address these issues at length, it is obvious that parliamentary involvement as well as the envisaged participation of civil society are still not intended. Thus, it is at least questionable if the OMC in general renders the European polity more democratic.

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NOTES

1 The European Commission conducts benchmarking of national R&D policies on a regular basis. The major results are published in the 'European Innovation Scoreboard' which summarizes mostly quantitative performance data and the 'European Trend Chart on Innovation' which is more focused on qualitative issue-oriented assessments.
2 According to a database of the Brussels–Europe Liaison Office, there are about 170 regional offices in Brussels. Whereas all German and Austrian states are represented there, Dutch and Swedish regional authorities established eight and seven offices respectively (cf. the Brussels–Europe Liaison Office's Website at http://www.blbe.irisnet.be/blbecgi/multicriteresen.pl).
3 This survey does not include data from Austria. It can be assumed that the municipal region of Vienna would have made it under the top fifteen R&D intensive regions.
4 Which is not self-evident since even at the national level non-learning seems to be common (cf. Chalmers and Lodge 2003: 18).

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