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**Polycentric Puzzles: Emerging Mega-City Regions Seen through the Lens of Advanced Producer Services**

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3 **Polycentric Puzzles: Emerging Mega-City Regions Seen**  
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6 **through the Lens of Advanced Producer Services**  
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9 **Michael Hoyler, Robert Kloosterman and Martin Sokol**  
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## 53 INTRODUCTION

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57 More than half of the world's population lives in cities at the beginning of the  
58 twenty-first century (UNFPA, 2007). At the same time, a new type of urban  
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3 form, first anticipated by GOTTMANN (1961), seems to be emerging across  
4 the globe (SIMMONDS and HACK, 2000). This urban form is spread out over  
5 a large area, contains a number of cities more or less within commuting  
6 distance, and one or more international airports that link the region with other  
7 parts of the world. Instead of one dominant central business district, there  
8 appear to be multiple centres, many with a strong presence of producer  
9 services housed in their telltale concentrations of high-rise buildings. Due to  
10 their polycentric structure, these regions tend to display criss-cross  
11 commuting patterns, which often result in severe traffic congestion. The  
12 emergence of such urban regions in the closing decades of the twentieth  
13 century, with an intricate spatial division of labour that clearly comprises more  
14 than one central city and its direct hinterland, has, inevitably, caught the  
15 attention of both academics and policy-makers. Within Europe, the  
16 development of large polycentric urban regions has serious implications for  
17 the key EU policy issues of competitiveness, social cohesion, and  
18 sustainability.

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44 Different attempts have been made to analytically handle these extended  
45 urban regions, and a number of labels have been used to denote the  
46 identified new metropolitan forms (see also TAYLOR and LANG, 2004); for  
47 instance, *multi-core metropolis* (HALL, 1999), *polycentric urban regions*  
48 (KLOOSTERMAN and MUSTERD, 2001), *global city-regions* (SCOTT,  
49 2001a), *Zwischenstadt* (SIEVERTS, 2003), *megapolitan areas* (LANG and  
50 DHAVALA, 2005), *megaregions* (REGIONAL PLAN ASSOCIATION, 2006),  
51 and, as in this issue, *mega-city regions* (HALL and PAIN, 2006). These

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3 different conceptualizations share the above-mentioned core characteristic of  
4 *polycentricity* at the level of an urban region (a term that itself requires further  
5 definition), but tend to diverge in their specific meaning and regional scope.  
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10 We will briefly touch upon some of these approaches in the next section.  
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15 In this special issue of *Regional Studies*, we bring together key results of  
16 *POLYNET – Sustainable Management of European Polycentric Mega-City*  
17 *Regions*, a €2.4 million research project funded by the European Regional  
18 Development Fund under the INTERREG IIIB North West Europe  
19 programme.<sup>1</sup> Over a period of three years, this study investigated the  
20 anatomy and dynamics of eight North West European ‘mega-city regions’<sup>2</sup>:  
21 South East England, the Paris Region, Central Belgium, the Randstad, Rhine-  
22 Main, RhineRuhr, Northern Switzerland and Greater Dublin. The principal  
23 project outcomes, including a full description of research methods and  
24 analyses of population, employment and commuting patterns in all study  
25 regions, are reported in HALL and PAIN (2006), while the contributions in  
26 HALBERT *et al.* (2006) discuss the policy implications of the research findings  
27 in greater depth.<sup>3</sup> This special issue focuses in detail on the thematic core of  
28 the project: the analysis of economic connections and information flows  
29 generated by *advanced producer services* in eight major urban regions in  
30 North West Europe. The study started from the premise that business service  
31 firms offer a strategic lens to examine inter-city relations *within* larger urban  
32 regions and *beyond* defined city-regional boundaries, nationally and  
33 transnationally, building theoretically on SASSEN’s (1991) identification of  
34 advanced producer services as crucial actors and outcomes of globalization  
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3 and localization processes, CASTELLS' (1996) notion of a 'space of flows',  
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5 and TAYLOR's (2004) concept of a 'world city network'. However, the focus  
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7 here is on the geographies of concentration and dispersion of advanced  
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9 producer services beyond the core cities that are at the centre of much of the  
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11 world and global cities literature.  
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17 Specifically, POLYNET aimed to test the hypothesis that 'APS [advanced  
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19 producer services] knowledge flows extend beyond the global city network to  
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21 create interlinkages between other cities and towns in North West Europe at a  
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23 city regional scale, leading to a new phenomenon: the global "mega-city  
24  
25 region"' (HALL and PAIN, 2006, p. 14). To study the advanced producer  
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27 services / inter-city relations nexus, a multi-layered methodology was used.  
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29 This involved a range of quantitative analyses, including the study of intra-firm  
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31 office networks, to map the geographies of connectivity and flow that bind  
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33 cities together. These were complemented with qualitative methods; in  
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35 particular interviews with decision makers in advanced producer service firms,  
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37 who through their locational strategies exert considerable influence on the  
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39 spatial structure of urban regions and their integration into wider economic  
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41 networks. As a study into the relational and scalar geographies of polycentric  
42  
43 city-regions, the POLYNET project was a first attempt to make the often  
44  
45 invisible contours of mega-city regions in North West Europe visible (see also  
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47 THIERSTEIN and FÖRSTER, 2008). The research reported here therefore  
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49 aims to contribute to what SCOTT (2001a, p. xiv) called 'a deeply contentious  
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51 and urgent debate' about emerging 'global city-regions' (see also SCOTT,  
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60 2001b) and the challenges they pose for policy-makers around the world, a

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3 debate that is now in full swing (e.g. OECD, 2006; SEGBERS, 2007; DEWAR  
4 and EPSTEIN, 2007; GOLDFELD, 2007; MEIJERS, 2007; LANG and KNOX,  
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6 2008).  
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12 In this introduction, we first briefly discuss key elements of the debates that  
13 informed the research project and point out some unresolved gaps in our  
14 understanding of polycentric city-regions. We then summarize the main  
15 findings of the contributions of this issue and conclude by presenting a  
16 possible agenda for future research on emerging mega-city regions.  
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### 29 **GLOBALIZATION, CITY-REGIONS AND POLYCENTRICITY**

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34 In recent years, major developments have taken place in both theory and  
35 policy debates on globalization, city-regions and polycentricity. Above all,  
36 there has been a spectacular surge of interest in cities and regions and their  
37 role in the global knowledge economy. This has been accompanied by  
38 suggestions that the simultaneous processes of globalization and knowledge-  
39 intensification of economies have produced a 'new spatial logic' (CASTELLS,  
40 1989). However, key theorists have argued that within this 'new spatial logic'  
41 the significance of agglomeration has *not* melted away. Quite the opposite –  
42 cities and city-regions have gained new prominence.  
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58 Thus, for CASTELLS (1989) the 'informational city' represents the emerging  
59 'new spatial logic' born out of a tension between the 'space of flows' and the  
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3 'space of places' in the 'informational economy' or 'network society'  
4 (CASTELLS, 1996). SASSEN (1991, p. 4) argues that 'a new type of city has  
5 appeared' in the form of the 'global city'. Amid complex changes of the global  
6 economy, major cities have acquired, in her view, a 'new strategic role' in  
7 particular with regard to knowledge-intensive, advanced business services. In  
8 turn, TAYLOR (2004) proposes that the interconnectedness of these  
9 advanced producer services has created a 'world city network' in which cities  
10 operate as global service centres. Both SASSEN (1991) and TAYLOR (2004)  
11 initially focused their attention on the functional centrality of cities rather than  
12 their wider city-regional context.  
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29 Elsewhere, however, the broader context of the region was taken into  
30 account. CASTELLS (1989, p. 167), for instance, argues that the new spatial  
31 logic is marked by the creation of 'multifunctional, multinuclear spatial  
32 structures'. SCOTT (2001a, p. 1) develops a broader regional view and sees  
33 'global city-regions' as new 'regional social formations'. These city-regions are  
34 undergoing a major transformation due to the impact of globalization; they  
35 perform a 'deepening role as points at which globalization processes  
36 crystallize out on the geographical landscape' (SCOTT, 2001a, p. 7).  
37 Furthermore, city-regions are 'active agents in shaping globalization itself'  
38 (SCOTT, 2001a, p. 7) and can be labelled as 'basic motors' (SCOTT, 2001a,  
39 p. 4) or 'essential spatial nodes of the global economy' (SCOTT *et al.*, 2001,  
40 p. 11). Scott and his colleagues state that:  
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3 'most metropolitan regions in the past were focused mainly on one or  
4 perhaps two clearly defined central cities, the city-regions of today are  
5 becoming *increasingly polycentric* or multiclustered agglomerations'  
6 (SCOTT *et al.*, 2001, p. 18; emphasis added).  
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15 In a similar vein, Peter Hall points to the emergence of a 'multi-core  
16 metropolis' (HALL, 1999, p. 19). Elsewhere, he argues that contemporary  
17 global city-regions are characterized by an extremely complex and  
18 sophisticated internal geography that is 'quintessentially polycentric' (HALL,  
19 2001, p. 73).  
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29 SASSEN (2001, p. 85) contends that city centres can extend into a  
30 metropolitan area in the form of a 'grid of nodes' of intense business activity.  
31 For her, the regional grid of nodes represents a 'reconstitution of the concept  
32 of region' amid emerging 'new geographies of centrality (and marginality)',  
33 although this 'grid of nodes' is clearly smaller than the wider mega-city region  
34 (DERUDDER, 2006). More recently, SASSEN (2007, p. 60) has argued that  
35 'the specific advantages of the megaregional scale consist of and arise from  
36 the coexistence within one regional space of multiple types of agglomeration  
37 economies'. According to this argument, the underlying spatial logic is not just  
38 based on urbanization economies (advantages of scale and spatial  
39 concentration) but also on localization economies.  
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58 These mega-city regions then encompass two different logics of economic  
59 organization and of global linkages (KLOOSTERMAN and LAMBREGTS,  
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2007). On the one hand, we find the globally linked advanced producer services highly concentrated in one city, as analysed by SASSEN and TAYLOR. The specific requirements for these 'commanding heights of capitalism' generate strong *urbanization economies* (JACOBS, 1969) and benefit, in particular, large cities. These cities constitute the higher echelons of a global network of cities, based on headquarters and other offices of transnational firms and producer services, on (international) accessibility (both physical and virtual), and on perceived quality of life. On the other hand, we find a different type of economic organization that is also very much part of the global economy. Many highly specialized, high-skilled economic activities are spatially clustered, too, but not necessarily in the primate city that houses the advanced producer services. These clusters are first and foremost dependent on more specific or *localization economies* and can, in principle, be located anywhere within a mega-city region. We find, for instance, high-quality knitwear in the Italian province of Modena, advanced automotive engineering (Porsche and Mercedes-Benz) in the German city-region of Stuttgart (COOKE and MORGAN, 1998), or world-class architectural design in Rotterdam (KLOOSTERMAN, 2008). The firms in these clusters thrive on the combination of local embeddedness (STORPER, 1997) and global pipelines (BATHELT *et al.*, 2004; CUMBERS and MACKINNON, 2004). As these clusters are to some extent dependent on the same infrastructure as advanced producer services (e.g. proximity to an international airport, ICT infrastructure) and the presence of a highly skilled labour force, and as they are, moreover, directly dependent on advanced producer services to link up with the global economy, these clusters are more likely to be found within

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3 mega-city regions than outside. They may thus contribute to a specific  
4 polycentric pattern, whereby different highly specialized clusters are scattered  
5 within one mega-city region, with one primate city specializing in advanced  
6 producer services and serving as a global gateway and node. The POLYNET  
7 project, however, did not investigate these different sets of agglomeration  
8 forces, nor did it focus on potential synergies in polycentric urban regions  
9 (MEIJERS, 2007). We will come back to these issues below when we propose  
10 a renewed research agenda.  
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24 The view that mega-city regions are taking on a specific spatial form is gaining  
25 ground. Many urbanists now seem to agree that these regions are becoming  
26 increasingly multinuclear or polycentric. However, the key question is what  
27 implications this may have for competitiveness and balanced spatial  
28 development. Two contrasting positions can be identified. On the one hand, it  
29 is hypothesized that polycentric urban regions have *potential* competitive  
30 advantages over monocentric regions and that they derive considerable  
31 economic strength from their polycentric structure (HALL, 1997; LAMBOOY,  
32 1998; BAILEY and TUROK, 2001). On the other hand, it has been argued that  
33 the 'culturally heterogeneous, polycentric, socially and spatially segmented  
34 global city-region is ... a highly fragmented chess-board of uneven  
35 development sprawling ever outward' (SCOTT *et al.*, 2001, p. 20), thus  
36 representing a major challenge in terms of social and spatial cohesion and,  
37 increasingly, also in terms of sustainability (WHEELER, 2008).  
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3 These are precisely the issues that policy-makers are facing around the world.  
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5 Indeed, rising competitive pressures, said to emanate from combined  
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7 processes of globalization and increasing knowledge-intensity of economic  
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9 activities, accompanied by growing social and spatial inequalities, create new  
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11 policy imperatives. Policy-makers at all spatial levels are preoccupied with the  
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13 question of how to guarantee competitiveness and, at the same time, to  
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15 safeguard cohesion. This policy dilemma is perhaps most apparent in Europe,  
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17 striving to be the most competitive *and* socially inclusive knowledge economy  
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19 in the world (EUROPEAN UNION, 2000). However, amid difficulties of  
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21 achieving the above self-imposed target there is a growing realization that  
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23 city-regions may be central arenas with regard to both objectives. The  
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25 European Spatial Development Perspective (ESDP) is perhaps the best  
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27 example of this. The document has introduced the concept of 'balanced  
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29 competitiveness' and argued that *polycentricity* is the best tool for achieving it  
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31 at both European and city-regional levels (EUROPEAN COMMISSION, 1999).  
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33 In an interesting circle then, policy agendas and theory developments seem to  
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35 come happily together: the tendencies identified by academics are at the  
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37 same time promoted by policy-makers. However, there are several key  
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39 problematic issues with regard to 'polycentric city-regions' to which we now  
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41 turn.  
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52 While the above theory and policy developments constitute a major shift in our  
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54 approach to spatial urban forms at the beginning of the twenty-first century,  
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56 many questions remain unanswered. Crucially, despite the proclaimed  
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58 importance of polycentric global city-regions, there are serious gaps in our  
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3 understanding of this phenomenon. Indeed, several interrelated challenges  
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5 need to be addressed.  
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### 10 11 12 *Lack of conceptual clarity* 13 14

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17 Some basic conceptual building blocks still await a thorough definition,  
18 including the key terms of 'city-region' and 'polycentricity'. These are currently  
19 used very loosely, indeed can be characterized as 'fuzzy concepts'  
20 (MARKUSEN, 1999) that render the conceptualization of a polycentric 'global  
21 city-region' rather problematic. Current definitions of polycentricity usually  
22 combine morphological characteristics and functional relations, and this  
23 contributes to a conflation of two analytically distinct dimensions of  
24 polycentricity. The various approaches, in addition, cover a whole array of  
25 causes and drivers. They can be *economic* (e.g. disintegration of value chains  
26 in combination with spatial concentration of co-ordination tasks; globalization  
27 versus localization); *technological* (e.g. ICT developments); *infrastructural*  
28 (e.g. mass-commuting by car or public transport in combination with  
29 centralized international airport or high speed train hubs); or simply  
30 *demographic* (population growth and urban sprawl). In addition, analytical and  
31 prescriptive or normative approaches co-exist, sometimes without a clear  
32 demarcation line. There is no doubt that further conceptual work is needed to  
33 clarify the meaning of 'polycentricity' in specific urban and regional contexts  
34 (e.g. KLOOSTERMAN and LAMBREGTS, 2001; DAVOUDI, 2003; CATTAN,  
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3 2005; PARR, 2004, 2005; TUROK and BAILEY, 2004; LAMBREGTS, 2006;  
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6 MEIJERS, 2007).

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13 *Lack of detailed empirical evidence*

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17 The absence of a clear conceptualization makes the empirical investigation  
18 into polycentric city-regions a challenging task. As the different approaches  
19 focus on a variety of aspects of polycentricity and their underlying causes, the  
20 existing empirical evidence is at best fragmented and disjointed, as can be  
21 gleaned from previous special issues of *Urban Studies* (38.4, 2001) and  
22 *European Planning Studies* (6.4, 1998, 12.3, 2004). We can also observe an  
23 array of methods and indicators to capture the polycentric character of  
24 specific city-regions (e.g. city size rankings; commuter data; firm dynamics;  
25 changes in economic profiles; telecommunication flows). There is therefore a  
26 lack of *systematic* evidence on the changing internal geographies of mega-  
27 city regions and the potentially synergetic effects of polycentricity (PARR,  
28 2004; CHESHIRE, 2006). Equally, there is a need for a more detailed  
29 understanding of functional integration of various economic activities within  
30 city-regions and their interconnectedness with the global economy.  
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55 *Problematic policy agenda*

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3 The lack of a sound conceptual framework and the weak empirical evidence  
4 make policies that promote 'polycentricity' rather problematic (KRÄTKE, 2001;  
5 DAVOUDI, 2003). In particular, the implications for competitiveness and  
6 cohesion remain uncertain. An example of this is a situation where the  
7 promotion of polycentricity at one scale (e.g. Europe-wide) may lead to  
8 increased monocentricity at another scale (e.g. nationally). Furthermore,  
9 centrifugal forces that lie behind increasing polycentricity do not necessarily  
10 support the kind of balanced and sustainable development that policy-makers  
11 would like to see. Instead, spatially fragmented and unevenly developed  
12 agglomerations may emerge (SCOTT *et al.*, 2001). Such city-regions present  
13 major socio-economic, transport-related and environmental challenges.  
14 Addressing these successfully may additionally be hampered by politico-  
15 administrative fragmentation and a concomitant lack of strategic planning  
16 capacities (HERRSCHEL and NEWMAN, 2002; HOYLER *et al.*, 2006).  
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## 41 **ADVANCED PRODUCER SERVICES IN NORTH WEST EUROPEAN** 42 **MEGA-CITY REGIONS** 43 44

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48 This special issue aims to move forward the theoretical debate on large  
49 polycentric urban regions on the basis of new empirical evidence from North  
50 West Europe. The first two contributions provide a conceptual introduction to  
51 the POLYNET study and an initial comparative quantitative analysis of  
52 advanced producer service linkages that integrate the eight mega-city regions  
53 into wider economic networks. This is followed by seven regional case studies  
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3 that explore the 'mega-city region' hypothesis based on evidence gathered  
4 during POLYNET and through other complementary work. Each regional case  
5 study follows its own thematic and methodological perspective to develop a  
6 context-specific argument for its city-region. The final paper takes a European  
7 view and critically addresses the promotion of polycentricity in European  
8 spatial planning.  
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20 In the first contribution, Kathy Pain and Peter Hall outline the theoretical  
21 framework of the POLYNET project. They introduce four central concepts –  
22 the mega-city region, polycentricity, advanced producer services, and  
23 information flows – and critically discuss the varied methodological  
24 approaches undertaken to study mega-city regional processes in North West  
25 Europe. Pain and Hall conclude with a brief overview of key conclusions of  
26 POLYNET that set the scene for the following papers.  
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39 Peter Taylor, David Evans and Kathy Pain provide a comparative analysis of  
40 functional polycentricity for the eight mega-city regions studied in POLYNET.  
41 Taking their lead from the world city literature, the authors adapt TAYLOR's  
42 (2001) interlocking network model, originally devised to study inter-city  
43 relations at the global scale, to measure polycentricity within and beyond city-  
44 regions. A key result of their study is the scale-dependency of functional  
45 polycentricity. The authors identify a general decline in polycentricity with  
46 increasing scale (with considerable variation between the eight mega-city  
47 regions) and convincingly argue that polycentricity should not be viewed as a  
48 simple singular property of a city-region.  
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6 In the first regional case study, Michael Hoyler, Tim Freytag and Christoph  
7 Mager further explore the multi-scalar polycentricities produced by business  
8 services. They address the question how intra-firm linkages of advanced  
9 producer service firms in Rhine-Main connect the region internally and  
10 externally across multiple scales. Frankfurt's dominant position as 'first city' in  
11 Rhine-Main is confirmed at all scales but is particularly pronounced at  
12 national, European and global scales, where functional polycentricity is weak.  
13 Despite Frankfurt's primacy at larger scales and its significant gateway role,  
14 the paper identifies sector-specific complementary network patterns of  
15 advanced producer services that connect the other cities of Rhine-Main to the  
16 wider German economy.  
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34 Alain Thierstein, Stefan Lüthi, Christian Kruse, Simone Gabi and Lars  
35 Glanzmann use evidence from both intra-firm and inter-firm networks of  
36 advanced producer services to identify an emerging mega-city region in  
37 Northern Switzerland, focused on the two main centres Zurich and Basel. In  
38 their analysis of changing value chains in the Swiss knowledge economy, the  
39 authors note an increasing concentration of highly advanced functions in a  
40 few centres and a dispersion of associated functions into the wider mega-city  
41 region. The authors conclude that the identified functional spaces of economic  
42 interrelation that constitute the mega-city region Northern Switzerland have  
43 yet to be taken seriously by policy-makers whose attention remains primarily  
44 directed to the local scale.  
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In contrast to the Swiss case, Martin Sokol, Chris van Egeraat and Brendan Williams find little evidence for an emerging polycentric city-region Greater Dublin. Knowledge-intensive business services in Dublin remain concentrated in the metropolitan area and show no significant signs of outward diffusion into the wider city-region apart from some subordinate support functions. The authors analyse corporate strategies, labour market conditions, and the role of the state to account for the observed lack of functional polycentricity in Greater Dublin that sits uneasily with CASTELLS' (1989) concept of the 'informational city', and thus problematize the claim that a dramatically 'new spatial logic' is emerging.

Ludovic Halbert is similarly sceptical in his examination of the mega-city region hypothesis for the Paris city-region. Based on the analysis of population and employment figures and information flows measured by telephone calls between firms, he too finds little evidence for the dispersion of advanced producer services from the Ile-de-France to the wider region of the Bassin parisien. While a functional division of labour exists between Paris and the Paris city-region, the French global 'space of centrality' remains firmly located in the central metropolitan triangle marked by the western districts of Paris, La Défense, and Boulogne-Billancourt/Issy-les-Moulineaux. Halbert explains the limited regional polycentricity with reference to the strategies of real estate developers, advanced producer service firms, and the history of spatial planning policies for Paris and its wider region.

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3 Examining Europe's dominant global city, London, and the South East  
4 England region, Kathy Pain on the other hand uncovers a dense web of inter-  
5 urban linkages that connect the 'first city' London with its extended hinterland.  
6 Her analysis of interviews with senior managers in advanced producer  
7 services in London and eight other urban centres in South East England  
8 reveal 'intense virtual and physical flows', fuelled by London's role as global  
9 hub for the creation of high value business knowledge. In contrast to other  
10 regions studied in POLYNET, such as the Randstad, RheinRuhr or Rhine-  
11 Main, Pain finds little evidence for sectoral specialization in the regional  
12 centres outside London. The growth of advanced producer services in the  
13 wider South East England region is seen as additional to growth in central  
14 London rather than a result of net decentralization.  
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34 Bart Lambregts also uses evidence from corporate interviews, in the Dutch  
35 Randstad, to explore in more detail the geographies of knowledge formation  
36 in advanced producer services. He argues that the global players among the  
37 region's business services are strongly constitutive of external knowledge  
38 relations, which he sees as key to enhance regional competitiveness.  
39 Lambregts explores which types of knowledge are typically acquired by  
40 advanced producer service firms within the mega-city region and which types  
41 may travel – notably through the firms' office networks – between city-regions  
42 with relative ease. He finds that the need for operational market-related  
43 knowledge ties such firms to a specific location and that some types of  
44 product-related knowledge may be acquired over larger distances. The  
45 polycentric layout of the Randstad and the consequent spatially dispersed  
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3 availability of sources from which to derive market-related information, may  
4 explain why many firms service the region through several offices rather than  
5 through one.  
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12 Wolfgang Knapp and Peter Schmitt examine the notion of a mega-city region  
13 RhineRuhr within the new metropolitan policy discourse in Germany. They  
14 observe a process of re-scaling that promotes a number of 'European  
15 Metropolitan Regions' as engines of economic growth in Germany's  
16 polycentric urban system. The cities in RhineRuhr, the POLYNET region with  
17 the highest degree of functional polycentricity at all scales, are characterized  
18 by a high degree of sectoral division of labour and functional specialization.  
19 However, political cooperation in the region is hindered by a lack of a shared  
20 regional vision and continued competitive localism.  
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36 Christian Vandermotten, Ludovic Halbert, Marcel Roelandts and Pierre Cornut  
37 conclude this special issue with a critical engagement with *polycentrism*, the  
38 normative promotion of greater polycentricity in the European urban system  
39 that aims to achieve both competitive growth and sustainable balanced spatial  
40 development. The authors provide a theoretical and methodological critique of  
41 the ESPON 1.1.1 study on polycentric development in Europe (ESPON, 2005)  
42 and question the assumptions that underlie many EU policy documents that  
43 explicitly advocate polycentricity (e.g. the ESDP).  
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58 The various contributions to this issue show that the mega-city region is not  
59 merely a theoretical construct but, in some cases, can indeed be identified in  
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3 social reality. There is, however, considerable variation between the different  
4 regions, which defies easy generalization by researchers and policy-makers.  
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8 These differences can be attributed to several factors:  
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12 First, there is the effect of the morphology of a specific urban system or, in  
13 other words, the sunk-costs of the built environment and its associated social  
14 structures, which mould and shape the impact of globalization/localization and  
15 concentration/deconcentration. The urban systems in, for instance, the Dutch  
16 Randstad and German RhineRuhr, have a very different morphological make-  
17 up compared to the ones of Paris and London. The historical legacy of  
18 concentration and accumulation in national urban systems with its associated  
19 particular population distribution, infrastructural networks, governance  
20 structures and national planning arrangements impinge on the locational  
21 decisions of advanced producers services and, hence, on the functional  
22 relations within the mega-city region (KLOOSTERMAN and LAMBREGTS,  
23 2007).  
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Second, the nature and extent of functional relationships within and between  
mega-city regions is to some degree dependent on the characteristics of  
advanced producer services in a particular region. The leverage of business  
service firms is related to the size of their home market and, increasingly, to  
their role in global markets. The leading position of London in global finance,  
for example, is mirrored in the size and importance, in absolute and relative  
terms, of its advanced producer service sector (BEAVERSTOCK *et al.*, 2001;  
TAYLOR *et al.*, 2003). Further to this, it is important to note that, despite some

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3 commonalities, the functional and spatial organization of advanced producer  
4 service firms does not follow some kind of universal logic. Indeed, significant  
5 differences can be found between and within individual advanced producer  
6 service sectors. The financial services sector, for instance, operates through a  
7 diversity of geographies (Sokol, 2007) with important bearings on the pattern  
8 of internal and external relations of a given mega-city region.  
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20 Third, location decisions of advanced producer services are not taken in a  
21 vacuum, but instead in a complex arena of context-specific rules and  
22 regulations where public (e.g. urban planners) and private actors (e.g. real  
23 estate developers) meet.  
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32 Another finding is that processes of concentration and deconcentration occur  
33 simultaneously in mega-city regions. It seems that high-end advanced  
34 producer services continue to concentrate within the leading city/cities,  
35 whereas activities with lower value-added are moving out of the centres,  
36 either to suburban locations or into the wider urban region. In other words:  
37 advanced global functions tend to concentrate strongly in just one 'first city' as  
38 this is where they can find a suitable environment with other globally  
39 organized firms and related supporting producer services, prime office space,  
40 and a cosmopolitan climate and associated amenities. This finding suggests a  
41 process of *nested globalization* whereby the crucial global linkages within the  
42 mega-city region appear to run through the first city (and within that city  
43 through a special part of the city) and from there to the rest of the region and  
44 beyond (see also SASSEN, 2001, 2007). This is in line with the observation  
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3 that the mega-city region is still very much a differentiated space in terms of  
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5 density, infrastructural endowments, economic activities, mix of functions, and  
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7 social, cultural and ethnic composition of the population.  
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## 10 11 12 13 14 15 **AN UPDATE OF THE RESEARCH AGENDA** 16

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19 The mega-city region, in its various guises, is becoming a more general  
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21 phenomenon in advanced and, arguably, in emerging economies. Research  
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23 on urban issues should, at least partly, be refocused to take into account the  
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25 complex and dynamic picture of different sets of cities connected through first  
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27 city hubs that provide the environment for high end 'connectors' such as  
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29 advanced producer services. Some extensions of the POLYNET project are  
30  
31 already underway, both in terms of expanding the scale of analysis from  
32  
33 regional to national (TAYLOR *et al.*, 2007), and in terms of adding other  
34  
35 knowledge-intensive sectors to the analysis, such as high-tech firms (LÜTHI  
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37 *et al.*, 2008). Below we will suggest a research agenda beyond the immediate  
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39 parameters of POLYNET, following the triad of competitiveness, social  
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41 cohesion and sustainability that underpins viable cities and city-regions.  
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### 53 *Competitiveness* 54 55 56

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58 Advanced producer service firms are important in helping to boost and,  
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60 arguably, even create competitiveness (KAY, 2004). The POLYNET project

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3 used these services as a lens to observe inter-city relations. We now seem to  
4  
5 be witnessing a redistribution of advanced producer services with a  
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7 deconcentration of lower-value added activities and a concentration of high-  
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9 value-added activities in the first city. As these latter activities function as an  
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11 interface – perhaps even gatekeeper – between firms elsewhere in the region  
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13 and the global markets, it is imperative to go beyond the POLYNET lens and  
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15 look at the relations of firms that actually (intend to) export to global markets.  
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17 How do they find suppliers/clients globally and where, if at all, do advanced  
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19 producer services come into play? Are there, in other words, also significant  
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21 lateral network-type relations that bypass the advanced producer services in  
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23 the first city? Is the global economy, thus, less hierarchical than it seems to  
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25 manifest itself in this project? What complementarities between the different  
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27 forms of spatial logic do arise within the mega-city regions?  
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36 A second issue considers not so much the relationship between the first city  
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38 and the rest, but the dynamics within these first cities themselves. The  
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40 combined process of concentration of high-end and deconcentration of low-  
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42 end services may accelerate further. This process of increasing returns in  
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44 combination with expanding financialization might crowd-out other economic  
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46 activities and erode the diversity of the economic base of the first cities.  
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48 Processes of innovation are dependent upon sheltered spaces where new,  
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50 unorthodox insights and knowledge can be generated. To rephrase this in the  
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52 form of a question: is the economic (and social) diversity within the central city  
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54 under threat due to the increasing role of high-end producer services and, if  
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3 so, does the mega-city region as a whole offer a palette of sufficiently different  
4 milieus that include, for example, also incubator spaces for cultural industries?  
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### 10 11 12 *Social cohesion*

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17 So far, little research has been directed towards the issue of social cohesion  
18 at the scale of polycentric regions, and the contributions in this special issue  
19 are no exception. Inequality and social cohesion within the context of these  
20 evolving mega-city regions, however, without any doubt appear on the  
21 agenda of policy-makers, and both drivers and consequences should be  
22 addressed in future research. According to SASSEN (2001) the first or global  
23 cities within global city-regions are both richer and poorer than the other cities.  
24 What are the implications of this for the social cohesion within these cities  
25 and, on a higher level of scale, on that of the mega-city region itself? Are  
26 these city-regions becoming more polarized? To what extent can polarization  
27 be attributed to the first city functioning as a social escalator, whereby (young)  
28 people from elsewhere move to the first city to climb the steps of the social  
29 ladder and then move out again? More generally, how are spatial aspects of  
30 the life cycle of different groups related to the emergence of mega-city  
31 regions? Which groups are stuck in the basement (sometimes even literally)  
32 of the first cities?  
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### 54 55 56 57 58 59 60 *Sustainability*

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6 It seems highly likely that costs of spatial mobility will rise further in the near  
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8 future, as energy prices will increase even more and (national and local)  
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10 governments will impose (higher) taxes and other measures to curb the  
11  
12 emission of greenhouse gases. How will this affect the internal relations,  
13  
14 partly based on mass-commuting, within mega-city regions? Will we see a  
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16 rise of multiple location households (second homes) to straddle the demands  
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18 of being present in high-density, frequent contact 'first cities', and the desire  
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20 for space (and what does this mean for mobility not just on a daily, but also on  
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22 a weekly and even monthly basis)? Other sustainability issues that pose  
23  
24 particular challenges at the megaregional scale include the management of  
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26 resources such as water and agricultural land, increasing intra and  
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28 interregional disparities and resulting equity issues, as well as questions of  
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30 community-building and identity formation in mega-city regions (WHEELER,  
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32 2008).  
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44 The above-mentioned issues are just some of the more pressing research  
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46 lines that could be pursued building on the findings of the work reported here  
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48 and other projects in the field. This new research agenda, however, may also  
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50 require new methodological approaches. As documented in this special issue,  
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52 the POLYNET study explored a range of methods that go well beyond a  
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54 simple measurement of commuter flows in polycentric urban regions. In  
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56 particular, the combination of quantitative and qualitative research has been  
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58 fruitful. But more can be done. For instance, new possibilities are now  
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3 opening up as combinations of qualitative research and GIS techniques  
4 enable researchers to map the movements in the ostensibly *panta rhei* of  
5 mega-city regions in a way that was hitherto impossible (KWAN and KNIGGE,  
6 2006). Importantly, polycentricity appears to be a multi-layered phenomenon  
7 with each layer displaying a distinctive spatial pattern. Investigating the  
8 underlying processes thus requires a variety of methods, from those  
9 measuring commuting to those capturing knowledge spillovers among  
10 advanced producer services. Future research should aim to combine different  
11 aspects of polycentricity in a systematic way, for example by creatively  
12 engaging GIS techniques that may allow a more comprehensive analysis of  
13 how these are interrelated.  
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32 Finally, it remains to be seen in what way the insights gained from studying  
33 eight North West European mega-city regions compare with evidence from  
34 emerging megaregional urban forms and experiences outside of Europe.  
35 Such a truly global perspective would also help to further elucidate the extent  
36 to which the formation of mega-city regions represents a gradual reworking of  
37 inherited urban structures or a genuinely new and qualitatively different spatial  
38 logic.  
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### 53 **Acknowledgements**

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<sup>1</sup> The international consortium was co-ordinated by Peter Hall and Kathy Pain at the Young  
Foundation (formerly Institute of Community Studies) in London from 2003 to 2006 and  
included a further eight European research institutions: Universiteit van Amsterdam;  
Université Libre de Bruxelles; University College Dublin; Institut für Landes- und  
Stadtentwicklungsforschung des Landes Nordrhein-Westfalen, Dortmund; Universität  
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<sup>2</sup> We have adopted the terminology used in POLYNET in this introductory paper. HALL and PAIN (2006, p. 3) define the 'mega-city region' as 'a series of anything between 10 and 50 cities and towns, physically separate but functionally networked, clustered around one or more larger central cities, and drawing enormous economic strength from a new functional division of labour'. This is similar in concept to SCOTT's (2001a) 'global city-region', an exemplar acknowledged by HALL and PAIN (2006, p. 12; see also HALL, 2001). We use both terms synonymously here but would argue that 'global city-region' captures the focus on economic-functional linkages better than 'mega-city region' with its demographic connotation of rapid urban growth (note the different use of hyphen), especially in a European context (see TAYLOR (1999) for a discussion of the dangers of conflating the concepts of global city and mega-city; a point that equally applies to the city-regional dimension discussed here). Both terms share their focus on large (however defined) polycentric city-regions with the term 'megaregion' used in the US planning context (e.g. DEWAR and EPSTEIN, 2007; GOLDFELD, 2007).

<sup>3</sup> In addition, individual research teams have published regionally focused monographs (THIERSTEIN *et al.*, 2006; YARWOOD, 2006) or specialist papers dealing with specific analytical or methodological aspects of the POLYNET project (e.g. AUJEAN *et al.*, 2007; GREEN, 2007; SCHMITT and KNAPP, 2006).