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Introduction: German Cities in the World City Network

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Abstract This introduction to the special issue "German cities in the world city network" provides an overview of the current status of research on urban systems in the knowledge economy, with a particular focus on the German urban system. The first part identifies the knowledge economy, particularly the requirements for geographical and relational proximity along the value chain, as a key driver of contemporary urban development. The second part clarifies the concept of polycentricity, distinguishing between its political and analytical roots, while considering its application on different spatial scales. Based on this discussion, the third part emphasizes the importance of relational thinking in analyzing polycentric urban systems and functional urban hierarchies. This is followed by an outline of the specific contribution of each paper to our understanding of the relational geographies of the German urban space-economy.

Keywords Germany · Knowledge economy · Proximity · Polycentricity · Relational economic geography

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Einleitung: Deutsche Städte im Weltstadtnetzwerk

Zusammenfassung Diese Einleitung zum Themenheft „German cities in the world city network" gibt einen Überblick über den aktuellen Stand der Erforschung von Städtesystemen im Kontext der Wissensökonomie, mit besonderem Fokus auf das deutsche Städtesystem. Der erste Teil identifiziert die Wissensökonomie und ihren Bedarf an geographischer und relationaler Nähe im unternehmerischen Wertschöpfungsprozess als zentralen Treiber der räumlichen Entwicklung in Metropolitanräumen. Der zweite Teil erläutert das Konzept der Polyzentralität. Dabei wird zwischen einem politischen und einem analytischen Ansatz unterschieden sowie die Anwendung des Konzepts auf unterschiedlichen räumlichen Maßstabsebenen thematisiert. Basierend auf dieser Diskussion wird im dritten Teil die Bedeutung eines relationalen Ansatzes zur Untersuchung von polyzentrischen urbanen Systemen und funktional-räumlichen Hierarchien hervorgehoben. Zum Schluss wird ein kurzer Überblick über die Einzelbeiträge des Themenheftes gegeben und insbesondere deren Beitrag zum Verständnis der relationalen Geographie im deutschen Städtesystem betont.

Schlüsselwörter Deutschland · Wissensökonomie · Nähe · Polyzentralität · Relationale Wirtschaftsgeographie

1 Introduction

Globalization has entailed a reorganization of spatial development processes on global, European, national and regional scales. Cities and metropolitan areas are increasingly connected to other places in the world in many different ways and through many different actors. The result is a multi-face-

ted city network of global reach that has a significant impact upon—and is in turn shaped by—the world economy, but is not entirely free from state-based direction. Against this backdrop, spatial development policies in the European Union but especially in Germany have been reformulated in recent years to respond to the emerging phenomenon of polycentric metropolitan or 'mega-city' regions. The purpose of this special issue of "Raumforschung und Raumordnung" is to bring together the most recent findings on how German cities are integrated into the world city network.[1] How has the globalization of economic activity affected this highly polycentric 'national' urban system? Are German cities part of two distinct urban configurations, one nation-based, reflecting the federal structure of Germany, the other linking into a global network of cities? Do global network economies increase disparities within the German national urban system?

2 The Knowledge Economy—A Key Driver of Contemporary Urban Development

A key driver of the recent development of the German urban system is the functional logic of the knowledge economy. Firms that are engaged in innovation processes need to create new knowledge constantly and therefore strive to manage knowledge resources in appropriate organizational structures. These knowledge creating and managing processes have led many large corporations to extend their locational networks as part of their overall business strategies in order to compete successfully in global markets.

Location-specific factors such as access to information and access to a highly skilled labour force are becoming increasingly important in corporate decision-making. Knowledge-intensive firms look for high quality infrastructures such as universities with an excellent reputation or seats of leading global companies, as well as for the availability of specialized knowledge, the presence of competitors, business partners and customers (Porter 1990). The concentration of knowledge in specific places creates a strong incentive for firms to locate their internal operations in such knowledge-rich locations all over the world, where they can establish external networks to suppliers, subcontractors and business clients in order to source local skills and expertise. These linkages are woven across physical space, not only connecting firms and parts of firms, but also leading to increased connectivity between the cities and towns in and from which these firms operate.

The growing importance of the knowledge economy—and its requirements for high-quality urban locations—brings about a spatial concentration of added value and innovation in only a very few truly global urban areas (Florida 2005: 48). Although the technological development in information and communication technologies has shrunk the world, the "end of geography" or "the death of distance" has not come to pass (O'Brien 1992; Cairncross 1997), even though there are also strong arguments against over-emphasizing geographical proximity (e.g. Kröcher 2007). However, the debate about the functional logic of the knowledge economy should not be polarized, defined by the dualism between local and global business networks. In fact, knowledge-intensive firms have to make far more complex decisions regarding the geographical and organizational coordination of their activities than the simple global-local dichotomy suggests. Their activities are embedded in a multi-scalar set of networks ranging from the global, through the national and the regional, to the local scale (Dicken 2007: 139). Indeed, the availability of telecommunications facilities can trigger both a process of intensifying concentration and global dispersal, because it allows transnational corporations to communicate from their headquarters with the affiliates located elsewhere. Castells (1989) for example argues that the development of telecommunications infrastructure reinforces the centralization of knowledge-intensive industries in key nodal points of the knowledge economy: "it is only because of the existence of automated telecommunications and on-line equipment that offices located in a very few areas are able to extend their global reach without comparable diversification of location" (Castells 1989: 149).

Many empirical studies emphasize the complementary role of geographical and relational proximity for the creation of new knowledge (Sturgeon/van Biesebroek/Gereffi 2008; Massard/Mehier 2009). For example, Faulconbridge's empirical study (2007) of advertising and law clusters in London and New York revealed that firms in both sectors hold many conversations with internal overseas offices, forming a global learning network based on relational proximity and regular exchange with colleagues and peers worldwide (Faulconbridge 2007: 1645). In this manner, proximity is understood as a comprehensive concept, which incorporates not only geographical, but also organizational, cognitive, social and institutional proximity (Boschma 2005; Torre/Rallet 2005). Interaction among individuals—rather than individuals operating alone—enables them to create new knowledge. Close physical interaction is important for sharing the context and forming a common language among participants (Nonaka/Toyama/Konno 2000). The concept of "communities of practice"—the creation of knowledge by joint learning processes or "knowing in action"—shows that geographical and relational proximity take on complemen-

[1] The papers published here were first presented at the 2010 Association of American Geographers Annual Meeting in Washington, DC, in three sessions on 'German cities in the world city network' organized by the guest editors of this special issue of "Raumforschung und Raumordnung".

tary roles in the innovation process (Amin/Roberts 2008: 353).

Relational proximity is supported by a rich and diversified infrastructure of global travel and communication, including fast and frequent rail and air connections (e.g. Beaverstock/Derudder/Faulconbridge et al. 2010). Good international, regional and multimodal accessibility is crucial for a city's ability to acquire, create, disseminate and use knowledge effectively. Simmie (2002: 886) for example argues that networks conducted through face-to-face contact and facilitated by hub-airports are critical factors for international knowledge transfer. Successful cities manage to combine both rich local knowledge spillovers and international information exchange to enable sustained innovation and economic growth (Simmie 2002: 892).

3 Germany—A Polycentric 'National' Urban System?

Germany is commonly seen as a polycentric urban system (Blotevogel 2000; Blotevogel 2002). However, the concept of polycentricity lacks a clear definition. There are marked differences in the use of the term in the academic literature. In regional science, it is used to analyze urban dynamism and spatial development processes; in planning, it is applied to design spatial strategies and urban development concepts; and in politics, the concept is adapted to promote normative territorial development policies (Davoudi 2007). Efforts to establish a unified definition have proven difficult, because the concept of polycentricity originates from two separate discourses: a political discourse based on strategic thinking and a scientific discourse based on empirical observation.

The recent political discourse in Europe centres on the formation of the European Spatial Development Perspective (ESDP) (Faludi/Waterhout 2002). In this discourse, polycentricity is promoted as a key concept for EU spatial development policies, in order to develop economic potentials strong enough to counterbalance the European 'Pentagon'—the leading economic area bounded by the cities of London, Paris, Hamburg, Munich and Milan (European Commission 1999: 20). There are however, inherent contradictions between the aim of strengthening the EU's economic competitiveness in a global market, and the aim of a more balanced polycentric development across the EU (Krätke 2001: 112).

A similar political strategy has long been applied in Germany, based on the Spatial Planning Law (*Raumordnungsgesetz*) of 1965, which aimed to achieve equivalent living conditions throughout the federal territory. However, in 1995, the Framework for Spatial Planning Policy Implementation (*Raumordnungspolitischer Handlungsrahmen*) marked a policy shift, delineating six 'European Metropolitan Regions'—Berlin/Brandenburg, Hamburg, Munich, Rhine-Main, Rhine-Ruhr and Stuttgart—as the 'engines of societal, economic, social and cultural development' (MKRO 1995: 27). The urban agglomeration of Halle, Leipzig and Dresden (the so-called Saxony Triangle) joined this new league of major city-regions in 1997. In 2005 another four metropolitan regions became members: Rhine-Neckar (Mannheim, Ludwigshafen, and Heidelberg), Bremen/Oldenburg, Nuremberg, and the city-triangle Hanover-Braunschweig-Göttingen. The strategic concept of European Metropolitan Regions has developed into a powerful communicative instrument in Germany in recent years (Blotevogel/Schmitt 2006: 55), even though its analytical foundation remains rather weak.

From an analytical point of view, two aspects are of particular relevance to polycentricity. First, there is morphological polycentricity, which refers to the distribution of urban areas in a given territory. Polycentricity then is associated with a relatively evenly sized distribution of urban centres in a given area (e.g. Hall/Pain 2006) and sometimes also with an equal spacing of these centres (ESPON 2004). Or as Halbert (2008: 1149) puts it: "a region is … morphologically polycentric when no city is so big as to dominate others and … cities are as evenly spread over the territory as possible".

On the other hand, there is relational polycentricity, which is based on the networks of flows between urban areas at different spatial scales. Following Castells' (2000) conceptualization of a 'space of flows', relational polycentricity highlights the importance of exchanges between cities not only within a specific regional system but also beyond, potentially encompassing cities across the world. The more multi-directional the flows are, the more polycentric the functional urban system is. In this sense, relational polycentricity extends the morphological approach by including patterns of interaction between different urban centres (ESPON 2004: 45).

Davoudi also highlights the changing meaning of polycentricity at different spatial scales (Davoudi 2003; Davoudi 2007). At the intra-urban scale, the concept has been used to describe a shift from monocentric urban settings, captured in concentric zone models, towards urban structures with centres and sub-centres generating cross-cutting traffic in complex spatial patterns (ESPON 2004; Davoudi 2007: 65).

At an inter-urban scale, "polycentricity has been seen as a form of 'decentralized concentration' in which activities are clustered across a number of towns and cities of similar size" (Pain 2008: 1163). These polycentric urban regions are associated with a functional division of labour, economic and institutional integration, and varying degrees of political co-operation (ESPON 2004). A well-known example is the Rhine-Ruhr region in Germany, a large polycentric urban region embracing 30-40 towns and cities with a total

population of some 10 million people (see Lüthi/Thierstein/Bentlage in this issue). Another example is the Randstad in the Netherlands, encompassing the cities of Amsterdam, The Hague, Rotterdam and Utrecht, but now extending outwards to include cities such as Arnhem, Amersfoort and Breda. This clustering of many cities and towns in a comparatively small area makes the Randstad an archetypal polycentric urban region (Lambregts 2008: 1174).

At the inter-regional scale, polycentricity refers to the expansion and spatial integration of metropolitan regions on a continental level (for example conceptualized as 'megapolitan regions' in the US context; see Lang/Knox 2009). In Europe, these emerging urban corridors have been described as the 'Golden Triangle', 'Blue Banana', or 'Pentagon' (Davoudi 2007: 68). The latter is characterized in the European Spatial Development Perspective (ESDP) as the only major geographical zone of global economic integration in Europe, representing 40% of the EU's population, 20% of its territory and 50% of its GDP (European Commission 1999: 61). Whether these territorially bounded spatial metaphors and the hierarchical approach to scale outlined above can adequately capture the complex geographies of inter-city linkages in globalization is, however, open to debate.

4 Networks and Hierarchies

Recent academic work has raised fundamental questions about how we think about polycentric urban systems and functional urban hierarchies (Hall/Pain 2006; Hoyler/Kloosterman/Sokol 2008). Regional theory increasingly tries to understand the roles that individual places play as nodes in wider national and transnational networks. Pike (2007) for example argues that "[t]he topographical space of absolute distance is displaced by topological understandings of relative and discontinuous space, emphasizing connections and nodes in networks" (Pike 2007: 1144). To think of economic processes in terms of connections of activities—linked through both physical and non-physical flows—is the key for understanding spatial development and economic dynamism in the German space-economy.

Relational approaches are not only highly influential in contemporary regional science; they also have a considerable conceptual overlap with global/world cities research. One aim of the latter research tradition has long been to evaluate the economic power of cities and their position within a world city hierarchy (Friedmann 1986; Sassen 2001). However, as Taylor (1997: 323) has pointed out, attribute data—on which many studies of world cities are based—can never show hierarchical structures. They produce ordered lists but give no insight into relations between the objects listed. What is needed then, is a relational approach to world cities, one that investigates how cities cooperate as well as compete in the global circuits of financial, informational and embodied flows. A major problem for such a network approach, however, is the lack of suitable relational data between cities. One way to overcome the dearth of accessible flow data is to develop proxies that indicate potential levels of flows in inter-city relations. Perhaps the most prominent concept following such an approach is Taylor's (2004) specification of a 'world city network' on the basis of an interlocking network model, which uses office locations of leading advanced producer service firms to model inter-city relations on the global scale (see also Taylor/Ni/Derudder et al. 2011). This provides one specific way to address the question of how inter-city relations can be empirically measured according to a theoretically coherent conceptualization.

5 Steps Forward

This special issue of "Raumforschung und Raumordnung" also moves beyond the ranking of attribute measures to assess the position of German cities in the world city network. Taking a relational perspective, each of the papers contributes new empirical evidence and conceptual thinking on polycentric urban development and the spatial relations between German cities. The first four papers adopt and adapt the methodological approach described above, first developed by Taylor and the Globalization and World Cities (GaWC) Research Network, centred at Loughborough University in the United Kingdom.[2] The remaining two papers add important complementary perspectives on how German cities are embedded in wider national and transnational contexts.

In the first contribution, Michael Hoyler provides a detailed analysis of the contemporary position of German cities in networks of advanced producer service firms. Using the interlocking network model and global data describing the organizational structure of leading business service firms, the paper measures and interprets changes in the inter-city relations of German cities before the onset of the current financial crisis. One outcome is a relative decline in the network connectivity of major German cities between 2000 and 2008.

Stefan Lüthi, Alain Thierstein and Michael Bentlage investigate functional polycentric patterns and interlocking networks of advanced producer services and high-tech firms in the German space-economy. Also based on an interlocking network model, but using data collected in a 'bottom-up' approach, the paper examines the extent to which the German functional urban hierarchy is associated with different spatial scales and economic sectors. In this interpretation,

[2] See http://www.lboro.ac.uk/gawc.

the German territory is regarded as a hierarchically organized space-economy, in which only a few cities establish substantial international connectivity.

The paper by Anna Growe and Hans Heinrich Blotevogel combines a network perspective with a territorial perspective. Based on employment data and information on multi-location advanced producer service firms, four main types of city-regions are identified: knowledge hubs, stagnating hubs, shrinking regions and start-up regions. The results show a tendency for knowledge-based work to locate in large city-regions as well as an East-West divide in the German urban system.

Angelika Münter analyzes two types of polycentricity in the context of globalization: post-suburban polycentricity around a previously monocentric city, and multi-core polycentricity, due to an increase in the functional connections between different cities in close proximity. The paper shows that post-suburban polycentricity tends to be of little significance with respect to global connectivity, and that the connectivity of multi-core polycentric metropolitan regions—such as Rhine-Ruhr—is often underestimated in the world city network literature.

Britta Klagge and Carsten Peter examine how the dynamics of private equity and its knowledge management lead to a more tiered structure of Germany's financial system. Empirically, the paper studies private equity firms' business relations and networks with external partners as well as their geographical organization. The authors show that the geography of private equity firms in Germany is characterized by decentralized concentration. Frankfurt am Main is the major international financial centre dominating the national market in banking and stock exchange activities but Munich displays an internationally recognized strength in private equity, especially in start-up funding.

Although all of the papers in this special issue move beyond the ranking of attribute measures, work remains to be done to further our understanding of the evolving relational geographies of the German space-economy. The concluding comments by Jonathan Beaverstock offer a number of suggestions on possible ways forward. Nevertheless, we hope that the articles in this special issue provide useful new insights into the spatial logic of the knowledge economy and its consequences for German cities in the world city network.

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