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Restructuring of spatial relations of business services in metropolitan regions – a research project [1]

The present urban-economic and spatial- functional changes in metropolitan regions[2] are both, the outcome of a restructuring process induced by ICT-technologies in all economic sectors, as well as the consequences of globalisation and the growing importance of the tertiary sector at the end of the 20th century. The process of change of metropolitan regions is discussed in conjunction with the question about the emergence and structuring of a new metropolitan type in the “global-city” research. In the view of additional types of metropoles, such as “technopoles of the world” or “informational cities”, the service economy plays a central role in the scientific discourse and analyses.

This contribution[3] will focus on the question, if and how changes in the spatial interconnection of new business services in metropolitan regions are to be expected. The main part of the paper will present the research project to the reader and relating questions. Then, factors and dimensions of the spatial embeddedness of information services will be elaborated. They will form an analytical grid for the empirical research. The research project presented is integrated within a larger research project (lead-project) in the Institute of Regional Development and Structural Planning (IRS) which was executed as an interdisciplinary approach[4]. Finally, methodology and analytical rationale will be introduced for a survey realised which will provide primary data for the research project.

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[1] I want to thank Heike Pethe for the translation.

[2] Observing internationally important and interconnected cities with some million inhabitants, metropolitan regions are defined as metropolitan areas (Blotevogel 1998: 26). According to my definition, they are not confined to the municipal territory of the core city, but also include communities of the urban hinterland and in some cases even other, strongly interconnected core cities (ibid.).

[3] This contribution is based on present research of the author which is embedded in the IRS lead-project 'The impact of the service economy on metropolitan regions: organisation, mobility and communication' in the research department A of the Institute of Regional Development and Structural Planning (IRS) in Erkner near Berlin (see www.irs-net.de). This project interconnects perspectives on the spatial and economic structure of metropolitan regions with the service economy.

[4] Those are related to the structural change in the service economy and the industrialization of services, the importance of information as a public good, metropolitan service profiles as well as certain aspects of mobility.

1. Rationale

Nowadays, services are seen to have an own, separate effect on the spatial formation. Especially business services, which are very unevenly distributed in metropolitan regions, have become a decisive criteria for economic success due to their productivity. They represent the most dynamically growing part of the service sector. Longitudinal analysis confirm tendencies of deconcentration for employment data in the service sector in the Federal Republic of Germany. These tendencies were also proved for business services (Bade 1996). Nevertheless, the increase of this sector is by far the largest in primary urbanized areas of urban cores (ibid.).

Traditionally, services are considered as immaterial goods when compared to industrially produced goods. As a special kind of 'labour performance', they are increasingly provided by using capital (Bade 1998: 5). In the paper, services are of special importance which are created as an economic good, i.e. they are not generated for internal use within a company only. Due to Bade's overview (1998), constitutive characteristics of services are the necessity of an external factor (a necessary object for the generation of services between supplier and demander) and a synchronic contact between supplier and demander.[5] Therefore, necessary interactions imply a special (e.g. spatial and temporal) dependency for customers compared to the production of industrial goods.

On the one hand, a large part of business services maintains a (spatially) symbiotic relation to its customers, especially to the industrial production (Blotevogel 1998: 44). On the other hand, services disintegrate from places of industrial production partially, and a distinct independent spatial formation of service interconnections is generated (Häusermann/Siebel 1995: 94f.). Due to, partly an extreme, specialisation, they depend on a spatially mediated exchange which goes far beyond the ordinary 'face-to-face' contact (ibid. in Brake 1990: 38).

Important factors which lead to agglomerations of business services are: proximity to customers and to high-level infrastructure, as well as the potential disposal over specific conditions of urban locations and soft regional relocation factors. Apart from that, spatial differences in relocation profiles in the service economy can be put down to the distinction into 'back offices' (routine work) and to the so called 'front offices'. According to Blotevogel (1998: 43), the latter can be differentiated in

- simple or medium, often requested services (strongly demand-oriented needing 'face-to-face' communication);
- highly specialised services (with a strong interregional demand) and
- international, highly specialised services (by foreign companies established).

It must be questioned, if this spatial-functional differentiation is sufficient to characterise all types, location demands and spatial relations of business services. Especially, the knowledge and information foundation of economy and society which has rapidly developed since the end of the last century raises questions about fundamental changes of classic characteristics of business services.

[5] Further traditional characteristics which are attached to services such as individuality of the activities, immateriality and impossibility to store service performances tend to depend on the kind of service activity currently (Bade 1998: 4).

On the one hand, necessary knowledge (knowledge as in experience embedded information, Willke 1998: 12) is generated as (globally) codified, accessible information by actors. On the other hand, an implicit knowledge exists which is created by experience and used for problem solving to a large extend. The 'management of knowledge' appears to be the new challenge for society. Following aspects are underlined here (Willke 1998: 13ff.):

- the difference between data, information and knowledge,
- the importance of implicit knowledge (personal 'know-how' which does not need to be communicable) and explicit knowledge (knowledge which is communicable and is communicated) as well as,
- the need to create transitions between both.

Spatial disembedding versus spatial embeddedness

On the one hand, an increasing orientation on services requires a steady interconnection between services and the production of goods. Apart from that, the modern meaning of services is strongly interconnected with the use of communication technology and the processing of information. The use of modern ICT-technologies supports spatial and temporal disembedding of the service production and consumption. Codified knowledge can be globally consumed, is generated at decreasing costs and can be offered as standardized products, e.g. in the case of certain IT-services (Jähnke 2002). In this case, characteristics which are typical of services such as spatial proximity, individual solutions for customers and personal interaction lose importance in general. Those tendencies can be summarized as 'thesis of spatial disembedding'.

This thesis has been undermined by an array of authors since the beginning of the 1990s. The research of Castells (1989) symbolised by the hypothesis of the 'space of flow' was a first step. The thesis of 'spatial disembedding' is strongly connected to the consequences of globalisation. The most important characteristics (Knox 1994: 57), which can be also described as indicators for changing conditions in the development of metropolitan regions, are as following:

- “transformation of the relationship between corporate capital and labour” (i.e. mainly flexibilisation of production and labour market as well as sociospatial differentiation and polarisation),
- “development of new international and intermetropolitan divisions of labour” (i.e. mainly internationalisation of production and capital investment as well as business services and management functions including the centralisation of control and command,
- “emergence of new roles for the state and the public sector” (i.e. mainly deregulation of political and institutional mechanism of governance and privatisation of social services including tasks formerly provided by the welfare-state).

On the other hand, the growing specialisation of business services as well as new processes of product generation demand an intensification of functional interconnections and informal networks. Services, which provide an elaboration of complex problems, go along with a high degree of problem structuring and problem solving capacity. Here they depend on the activation of implicit knowledge. New forms of knowledge generation are often connoted to the reorganisation of the value chain. Therefore, factors as spatial proximity or personal contact gain additional

importance. In this process, they are often interconnected with the generation of 'social capital' and its specific forms of networks (see Jansen 2000). Relating to this, an antagonistic approach to the 'thesis of disembedding' can be developed, the 'thesis of spatial embeddedness' or 'thesis of spatialisation'.

The lines of argumentation or the empirical findings describe an increasing importance of regional interconnections and intraregional networks. Processes of regionalisation are either seen as a strategy of protection against effects of globalisation or as an interrelating part of the globalisation process. Globalisation does not appear to be contradictory to, but rather caused and interrelated to regionalisation (e.g. Fuchs/Klaus/Wolf 1999). The importance of spatial proximity emphasises those approaches which are either interested in analysing 'creative/innovative milieu' (e.g. Ache 2000) or 'regional innovation systems' (e.g. Fritsch et al. 1998).

Information services in metropolitan regions

Today, in a period of transformation into a service society, metropolitan regions create a complex structure of social subsystems. In the beginning of the 21st century, they are characterised by differentiated socio-economic, political-cultural and spatial processes of change.

The new research question elaborated through the consideration of new business services is: How do spatial interconnections of these services in and around metropolitan regions change? Will factors like spatial proximity or personal contacts be unimportant or are they rather reorganised, and what will this reorganised structure look like?

Metropolitan functions of services respond to business services as follows (see Blotevogel 1998, Tayler/Catalano/Walker 2002). An important part of this requires the processing of information or the generation of knowledge (see Kujath et. al. 2001):

- services as innovation carriers in terms of R&D,
- services as mediator of information or information brokers,
- services for exertion of consulting, deciding and control functions,
- services as complex consultations with a high share of problem solving or
- services as producers of “content”.

Relying on a classification of services which was developed in the IRS lead-project[6], it appears that those ‚information services’ are less connected to specific service branches or to the service sector themselves.

The ‚servindustrial economy’ type (see Heinrich 2002a) is based on a structural shift which turns away from mass production to enhance the value chain with information and service based products. The border between the economic sectors blurs, and an increasing tertiarisation and informatisation of the production will develop. The end

[6] Framed by the IRS research on restructuring of the service economies in metropolitan regions, new business services - information services - were newly defined. They are seen as activities which aim to acquire, produce, assemble, store, monitor, interpret and analyse information. (Heinrich 2002b in Dunning 1993: 41). The way and scope of interaction between supplier and demander are an essential indicator, if the service character is substituted in favour for a production of information.

products as specialised services are linked to material goods. The economic shift which is supported by ICT-technologies, leads in the direction of a (re-)industrialisation of services which terminates in the creation of an quarterary informational sector („informational industry", ibid.). The production of information increasingly follows the former logic of the division of labour in the industrial production; human capital is the most important production factor, and the immaterial production can be transported without any limitations over any distances.
A third type, 'global services' (Heinrich 2002b), results from a logic of accumulation or globalisation of a new international division of labour and is rooted in 'world city'- or ‚global city'-research. Special services within the nodes of the flow of goods, capital, information and labour build the infrastructure for global transactions and create control capacities.

It is still unclear, if metropoles are forcefully shaped by information services, or if they merely support the diversification of the metropolitan services. Starting from both lines of argumentation, pro or versus the spatial embeddedness of services, which were mentioned above, three theoretical discourses or debates on metropoles are important. They can be identified by statements on the nature of change of spatial functions in metropolitan regions, by accounts on individual types of metropoles which they represent, and by descriptions on the ability to interconnect information services to specific metropoles. 'Technopoles of the world', 'informational cities' or ' global cities', which are types of interest here, differ by their specific access to urban economic, spatial and/or social aspects. The three discourses serve as a criteria for differentiation, on one hand. Here, an example is represented by "world city"/"global city"–research with statements on the rank of metropoles within the international urban system or in urban hierarchies (see Knox 1994, Krätke 1993). On the other hand, the described differentiation is used to separate specific metropolitan problems analytically (e.g. Storper 1997, Castells 1999). As a result of this, sometimes all three types are reciprocally applied on the same metropolitan area in empirical research.

Relying on the questions of spatial embedding, another aspect should be emphasised: the introduction of a regional dimension. E.g. "global city regions" which are defined by their 'internal linkages' are as a 'regional social formations' in the centre of interest of theoretical considerations and empirical fieldwork (Scott 2001). A essential rationale has been deduced from "the high-level intelligence and control functions of the global cities are increasingly dispersed across a wide geographical area", and "the resultant geographical structure is quintessentially polycentric" (Hall 2001: 73).

Following points are central for the analysis:
A metropolitan region can be characterised as 'technopole' (see Castells/Hall 1994), when it can be related to knowledge-intensive producer-orientated services in context of reorganised value chains of the secondary sector (servindustrial economy). Modern information and communication technologies in connection with flexible or project-orientated forms of production and distribution of goods and commodities support both, the shape of networking technologies as well as new processes of product creation. Do information services in those services complexes have a strong functional and spatial interconnection to modern decentralised production structures of metropolitan regions, and are they also embedded into innovative milieus?

Related to modern ICT-technologies, the conception of an 'informational city' (see Castells 1989 und 1996) conceives networks as a new structure of (service) economies as well as of metropolitan spatial formations. An 'informational industry' is determined by the development and the location of this service complex. Does accessibility and affiliation to the 'space of flows' abolish traditional identity relations to real places? Does a selective spatial connection to places of metropolitan region remain through knowledge holders who contribute to the production of information?

Metropoles conceived as "global-city" or "world-city" (Sassen 1994, Knox/Taylor 1995, Friedmann 1995) are constituted by highly specialised services (global services) offered to headquarters of transnational companies and international financial markets. They are interconnected by a social class who controls the process of globalisation. Although the service complex is spatially, and to a large extend also functionally, separated from industrial production locations in metropolitan regions where it is physically rooted, it is crucial for the international division of labour and the city ranking in the global hierarchy. Will those global service economies stay partly interconnected to metropolitan regions through their highly ranked customers, their complex interconnection with other strategic business services and the demanded urban relocation qualities?

2. Factors and dimensions of spatial embeddedness of information services

Firstly, the embeddedness of information services in space must be explained to analyse the spatial structure. A starting point might be a differentiation between regional embeddedness and interregional embeddedness in space. As it was elaborated elsewhere, the space of analysis is not only designated by the metropolitan areas, i.e. the metropolitan core or cores, but by the entire metropolitan regions, too. The metropolitan regions should be mapped in terms of their intraregional patterns of interconnections. For the study of the range of interregional interconnections additional differentiations should be made. In this case, qualitative questions about their embedding in other metropolitan regions should also be kept in mind.

Secondly, factors determining their spatial interconnection and dependent variables must be identified. Following three aspects which can be drawn from the upper argumentation essentially influence the spatial interconnectedness:

- characteristics of services, i.e. degree of change of traditional service characteristics,
- the relation of services to other sectors of economy, like the degree of dependence on the demand from the industrial production as well as
- differentiation and specialisation of services.

Tab.1: Potential of change of the spatial embeddedness of information services

	servindustrial economy	**informational industry**	**global services**
characteristics of services	X	X	
relation to other	X	X	X

economic sectors			
differentiation or specialisation of services	potential due to exchange with innovation related customers	no specific customer potential	related to globally oriented customer potential

Table 1 shows the assumed potential of change of the spatial embeddedness of information services. Apart from changing characteristics of the service types „servindustrial economy“ and „informational industry“, all three types appear to modify their traditional relation of dependence to the industrial sector. Additionally, regarding the differentiation or specialisation of services a distinction in terms of spatial orientation of customers must be made.

Starting from the special relation between supplier and demander in the service economy, factors such as proximity and interaction must be considered. Will spatial (geographical) proximity be substituted by virtual proximity in the case of information services? How are businesses functionally connected? Apart from customers, or instead of their customers, will there be other partner/actors, who are situated approximately or globally, and therefore, represent a competitive advantage? How must the analysis distinguish qualitatively in terms of different types of space or quantitatively in terms of distance to differentiate metropolitan regions? Which connections can be made between spatial proximity and other differentiated forms of interactions with customers or other partners/actors? Which forms of interactions tend to be important in the range of ‘face-to-face’ interaction to standardized communication via modern media?

Because the question focuses on ‘spatial interconnections through interaction?’, the location of actors must be considered with regard to their relation to certain metropolitan types and forms of interaction. This is an assumption in order to analyse which of the both lines of argumentation about the spatial embeddedness of information-based services must be followed and which spatial structural effect is caused by them.

Related to the upper elaborated thesis of ‘spatial embeddedness’, a question about the importance of the ‚social proximity’ must be posed. It is created e.g. by informal relationships that go beyond functional interconnections of service firms related to the value chain. As mentioned before, ‘social proximity’ can mean spatial proximity. Social relations, however, are also realized over long distances. Therefore in a research project about information services, the relation to ‘information sources’ such as external firms, institutions of education or of research, associations and scientific transfer offices and their spatial embeddedness must be included. It is assumed, that those informal networks can be seen in the context of spatial interconnections associated by functional linkages.

Finally following dimensions of the spatial embeddedness can be elaborated for empirical fieldwork on information services in the European context (see table 2).

Tab.2: Dimensions of spatial embeddedness of information services in and around metropolitan regions

places of interregional spatial interconnection (external from metropolitan region)	• other metropolitan regions • other non-metropolitan regions
places of regional spatial interconnection (in metropolitan region)	• inner city • other municipal area • hinterland
subjects of the spatial interconnection	• information service firms • customers • supplier/external service provider • partners • "Information sources" • labour
range of interregional spatial interconnection	• Germany or other applicable nation state • other EU-countries • non-EU countries
range of regional spatial interconnection	• close proximity (up to 1 km) • local proximity (1 to 5 km) • regional proximity (more than 5 km)

3. Empirical research approach and outlook

To answer questions about the changing spatial embeddedness of information services in metropolitan regions is one part of the above described interdisciplinary research project. Based on causal hypotheses a questionnaire was designed to evaluate the argumentation above and to answer further questions in this IRS lead-project. A mail survey of information service firms of different branches provides the primary data.[7]

A definition of the region for the two case regions, Munich and Berlin, was employed which pays closest attention to the regional interconnections (figure 1).[8] To compare the spatial categories, a classification was designed according to the above mentioned categories: inner city, other municipal area and hinterland of Munich and Berlin (figure 2). In each metropolitan region (city and it urbanized area), 3000 establishments were selected for the sample of the survey. According to the standard industrial classification ('Wirtschaftszeigsystematik WZ 93') metropolitan information service functions were sampled (see Kujath et. al. 2001).[9] The internet databases of

[7] The survey was conducted with the Department of Geography, Humboldt-University Berlin, in spring 2002.

[8] The metropolitan region of Berlin comprises the primary urbanized area ('Engerer Verflechtungsraum Brandenburg-Berlin'). That comprises the central city Berlin, Potsdam as an independent city and more than 200 contiguous suburban communities. The urban region Munich comprises the planning region ('Raumordnungsregion München') as the central city and contiguous suburban towns and suburban communities in adjusting counties.

[9] By referring to the standard industrial classification ('Wirtschaftszweigsystematik WZ93') the comparability to the EU statistical classifications is regarded. The selected branches are financing; insurance and related business activities; computer and related activities: data processing and databases; research and development; business activities: legal, accounting, book-keeping and auditing activities, tax consultancy, business and management consultancy, architectural, engineering and other technical activities, advertising, market research and public opinion polling; publishing,

the local chambers of commerce and professional address providers were two sources to select the addresses of the included establishments.

The mailed questionnaire was structured into eight topics:

- Quality of the location
- Application of information and communication technologies
- Product strategies and customer relationships
- Suppliers of goods and services
- Cooperative relationships to other firms
- Information acquisition
- Labour market
- Organisational structure.

The results of the evaluation of the survey[10] will be available in August 2002. Due to the multi-structural approach, it is possible to draw together different threads of this IRS lead-project and to elaborate further grounding to advice regional policies as well as to consider development potentials for the analysed metropolitan regions. To be able to verify the results in more detail, another aim of the project is to repeat the survey in another European metropolitan area with a suitable partner, later.[11]

printing and reproduction of recorded media, adult education and activities of membership organizations.

[10] The response rate to the questionnaire was surprisingly high. About 15 percent replied in Berlin, whereas even more than twenty percent answered the questionnaire in Munich.

[11] Interested institutions are highly welcome to get into contact with the author or the IRS project team (regional@.irs-net.de).

Fig.1: Metropolitan regions Berlin and Munich in Germany

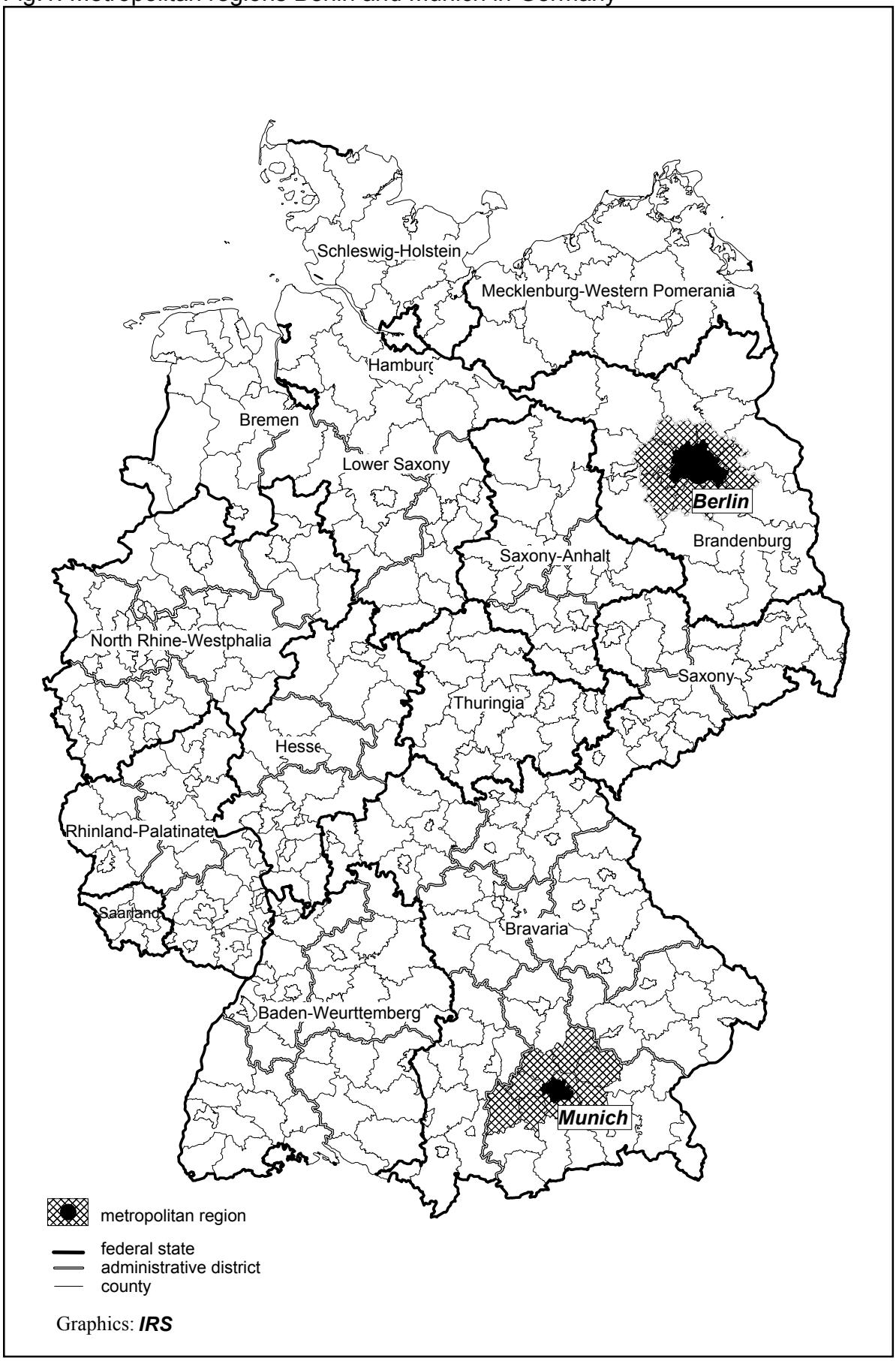
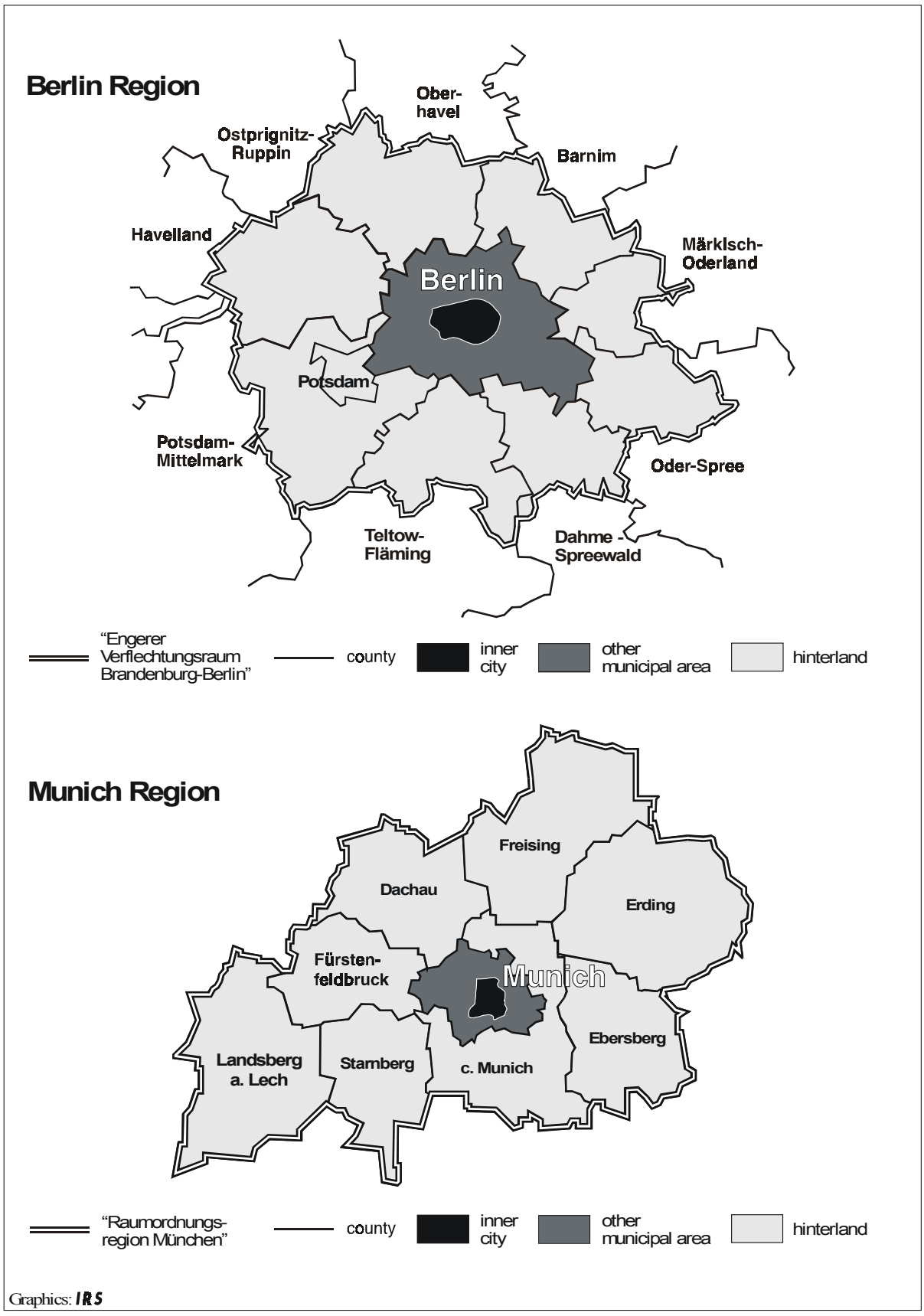


Fig. 2: Structure of the metropolitan regions Berlin and Munich



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