Spatial integration and administrative complexity: Housing, employment, and mobility in the case of the Munich Metropolitan Region

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Abstract

The Munich Metropolitan Region (MMR) is experiencing strong population and employment growth. Already under strain, housing, infrastructure and services need coordinated region-wide efforts to cope with the rising demand and infrastructure bottlenecks. These efforts, however, call for thorough analytical knowledge about locational choices of households and employers, as well as the requirements for transport infrastructure and services, and how these three structural dimensions interact simultaneously with each other.

This paper introduces a study that aims to understand this complex interplay within the MMR. It includes preliminary results of a web-based survey, which invited newcomers to the region as well as citizens who have recently moved to state their locational preferences. The respondents geo-referenced and assessed qualities of their present and former places of residence and work as well as locations considered during the process of apartment search. With this data it is possible to uncover trade-offs and preferences.

A key hypothesis and preliminary finding of the survey is that functional relationships within the city-region have become increasingly integrated, polycentric and complex. This is in contrast to the hierarchical but fragmented administrative reality, which consists of multiple overlapping layers of formal and informal regional planning between diverging local and federal state agendas, further complicated by artefacts like the airport and its economic and governance embedding. A truly regional, strategic approach might be better suited to handle the consequences of growth.

1. Introduction

This paper discusses recent developments in the spatial organisation of housing, employment, and mobility, and their impact on planning and policymaking on the case study of the Munich Metropolitan Region (MMR). In a residents' survey conducted in late 2014 and early 2015, we asked more than 7,000 individuals who have recently moved to or within the metropolitan region on their motivations for moving, the locations they chose for work and residence, and locations they considered during their apartment-search. The paper is footed on the premise that public administration is most efficient if functional and administrative spaces are congruent, and it examines the current governance setup in Munich on the backdrop of this premise and the survey results. After demonstrating the theoretical background in section 2, we will describe the circumstances of the Munich case in more detail in section 3. In section 4, we will outline the methodology used in our survey before we will present the first preliminary results. We will show how functional relationships across traditional nested hierarchies are now significant in our study area in the fifth section. Finally, we will ask what this means for the local and regional decision-making structures and policies on urban and transport development in our concluding remarks.

2. Theoretical Background

Territorial organisation is a fundamental aspect of public administration. The problem of good territorial delineation for an efficient delivery of public services and the question of the right scale for certain policy tasks has thus often been discussed in geography, political science, and planning theory and practice (Blotevogel, 2001; Swyngedouw, 2005; Gabi, Thierstein, Kruse, & Glanzmann, 2006; Parr, 2007). As opposed to socio-cultural or physical geographic attempts to regionalise space, economic geography is interested in spatial economic relations as explanatory factor for such a delineation.

An important aspect of this debate is the congruence between functional relations within geographical entities on the one hand and their administrative subdivision on the other, and the alleged negative effects of its absence. From an economic point of view, a high congruency of administrative areas with functional units, such as commuting areas reduces external effects and therefore inefficiencies and transaction costs for collective action problems. In planning, this challenge is best known to arise in situations where a municipality provides certain amenities that the population of neighbouring municipalities can use as 'free-riders' without contributing to its construction and upkeep with their taxes. The idea to avoid inefficiencies of differing incidences today lies at the heart of spatial economic benchmarking models (Frey, 1984) and is used by NGOs, consultancies and international organisations such as the OECD as a policy standard (OECD, 2013, p. 38).

Accordingly, the first practical attempts to address the problem were territorial reforms to re-match functional and administrational spaces. Early practical approaches for a rational regionalisation of a territory date back as far as the establishment of départements in post-revolutionary France. The territorial reform agenda was strongest throughout the first half of the 20th century as part of the modern project, with a late heyday in the 1960s and early 1970s, when urban growth was strongest. During this time, many European countries went through several waves of municipal and regional incorporations, mergers, and reorganisations. In then West Germany, for example, the number of independent entities at the lowest local level was reduced from about 23,000 to 8,000 between 1969 and 1978.

Despite some positive effects on public service provision (Priebs, 2005) academic debate and public opinion on the matter reversed soon after, often in contrast to the political reality of public administration (Evers & de Vries, 2013, p. 537). The majority of the body of literature on the topic today takes a critical stance on territorial reform on the grounds that constant adaptation to functional contexts is futile and compromises citizen identification with the local authority (Evers & de Vries, 2013, p. 543). This was associated with a general shift of the policy mode from hierarchical government to more multi-stakeholder 'governance' and from comprehensive to incremental planning (Lindblom, 1959). The problem of differing scales for old and new policy areas remains, however. To solve this, the need for (often sectoral and voluntary) cooperation within existing territorial boundaries is emphasized instead (Salet, 2006).

In the German case, many regional transport authorities founded in the 1980s are generally considered a good example of the success of this model of sectoral cooperation (Evers & de Vries, 2013, p. 544), and so are the regional municipal co-operations started in the last decades, such as Stuttgart with an elected regional legislative, or Frankfurt with an integration of regional plan and comprehensive land use plan (Freund, 2003; Heeg, 2003).

Despite the success of the model of joint decision making, it has sometimes led to a proliferation of increasingly fuzzy administrative structures with dispersed responsibilities, especially when it was expected to take place on a voluntary basis, effectively excluding matters that could not yield win-win situations. The effect can be observed best on the backdrop of areas that are characterised by rapidly changing – often growing – functional interconnectedness, where functional urban structures

of the past often continue to exist in the form of administrative delineations (Boussauw, Allaert, & Witlox, 2012).

From the late 1990s on, "new regionalism" emerged as a new paradigm within human geography (Brenner, 2003). The forces of globalisation and liberalised markets as well as the rise of information and communication technologies, it is argued, lead to a weakening of the traditional welfare state, new functional spatial arrangements on a (metropolitan-)regional scale and thus the pressure for territorial administration to reconfigure accordingly (Brenner, 1997; Lambregts & Zonneveld, 2004, p. 300; Evers & de Vries, 2013, p. 539). Metropolitan regions world-wide were seen in growing competition with each other for skilled labour and investments, requiring former local rivals to team up to compete on the global stage (Sassen, 2001, p. 30).

This was accompanied by insights from evolutionary economics that extended the neoclassical economic model. The release of the idea of an inter-regional equilibrium meant that permanent imbalances between regions, lock-ins and path dependencies were theoretically possible, as well as regional specialisations and complementary division of labour within regions (Martin & Sunley, 2006). This also meant a shift of the focus of research towards a polycentric and complimentarily specialised organisation of economic activity in space, which could be identified in different cases (Meijers, 2007; Burger, Meijers, & van Oort, 2014), linking formerly independent cities to form networked mega-city regions (Hall & Pain, 2006).

These trends, together with the deficits of the incremental governance mode, ultimately also meant an increased pressure for administrative restructuring on a metropolitan scale. Metropolitan Regions are in constant state of flux with overlapping forces of centralisation and decentralisation. These developments are strongly linked to the choices of individuals (Storper, 2013). For example, employees have their own spatial logic in order to combine private and working life. Firms depend on the qualification of the labour market and proximity to local partners. These spatial logics might cross the boundaries of administrative regions. While working life is becoming more and more flexible with regard to the place where people work and the time when they work. Consequently, individuals have multiple anchor points within their daily lives (Parr, 2013, p. 10). The question arises what the differences between the individual uses of space and the ascription of functions to space are.

3. Case Study: Munich Metropolitan Region

Economic and Demographic Situation

The city of Munich with almost 1.5 million inhabitants is the third largest city in Germany and a major centre in terms of economy, education, culture and transport. It holds political decision functions as the capital of the federal state of Bavaria and is the seat of several important high-tech and manufacturing enterprises, such as BMW and Siemens, as well as advanced producer services, especially insurances. It also hosts several renowned universities. Since the 1950s, it has shown a remarkable phase of economic growth that is unrivalled by other German cities and that continues until today, making it one of the most prosperous places in Europe. At the same time the high recreational value of its surroundings and its cultural institutions continue to secure it high positions in quality-of-living-rankings.

Together with the surrounding districts it forms a functional city-region of 2.6 million inhabitants, using a travel-to-work area definition. This functional city-region is, according to (Storper, 2013, p. 4), "the principal scale at which people experience lived reality". Pütz (2004, pp. 137-138) accordingly describes it as the "everyday region", as opposed to the "business region" in the core, which attracts most company headquarters.

But Pütz also finds a third type of functional region in the Munich case, a "marketing region": It also integrates the neighbouring regional centres of Augsburg, Ingolstadt, Kaufbeuren, Landshut, and Rosenheim with their respective hinterlands. This larger "Metropolitan Region Munich" (MMR) can be interpreted as outcome of the debate on increasing global competition of cities and the formation of metropolitan regions (Blotevogel, 2002; Fürst, 2003), as well as polycentric mega-city regions with internal division of labour (Goebel, Thierstein, & Lüthi, 2007; Lüthi, 2011). The MMR exhibits a growing functional interconnectedness and complementarity as well as similar characteristics in terms of economic structure (Goebel et al., 2007; Bentlage, Thierstein, & Lüthi, 2015, forthcoming) much more than only in the tourism sector. In its spatial extent it covers 35% of the state of Bavaria, but almost half of its population and more than 50% of its GDP. It is home to 5.8 million inhabitants in 2015 (Figure 1).

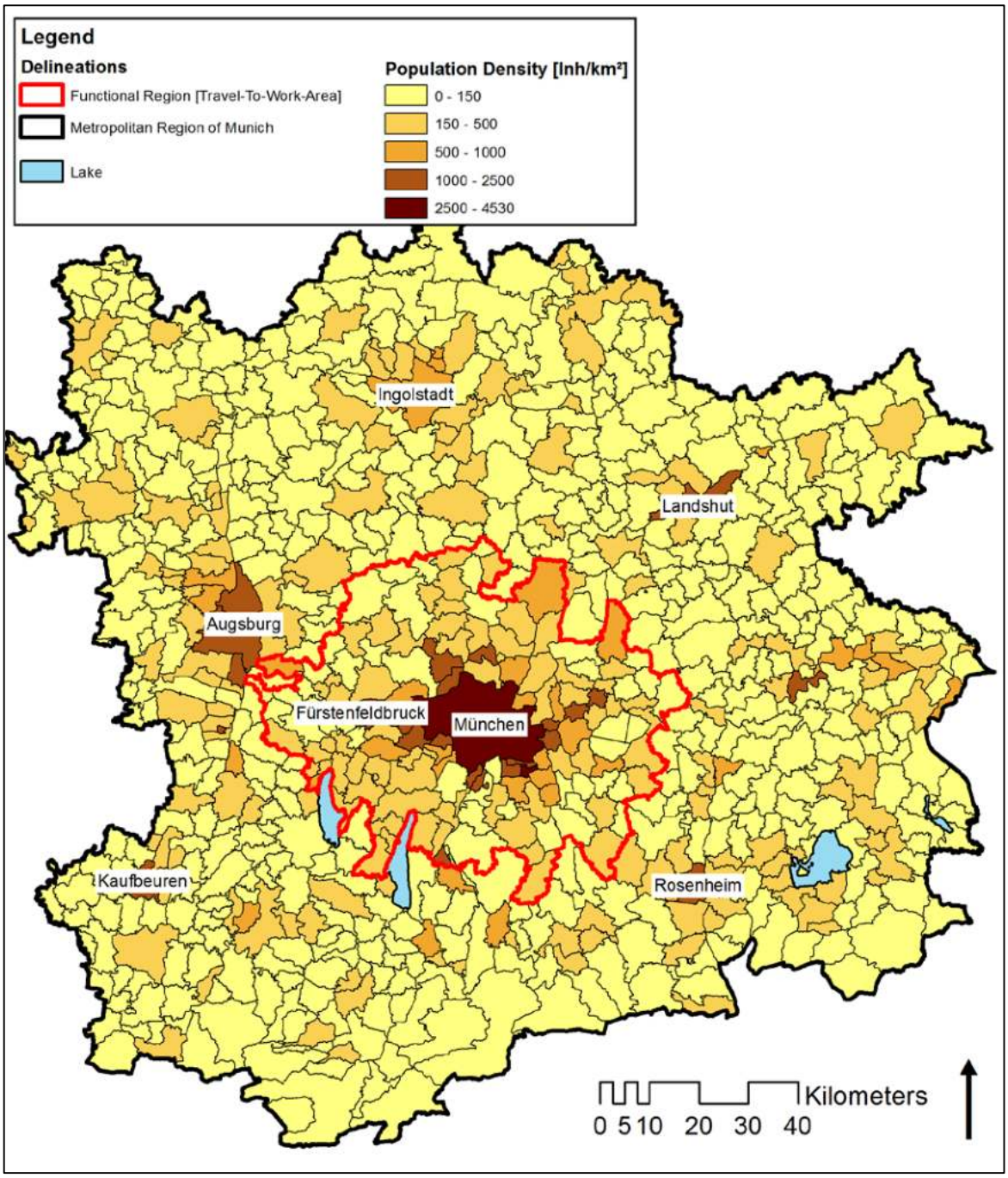

Figure 1: Functional Relationships in the Munich Metropolitan Region

These favourable conditions continue to attract businesses and people, so that Munich and its hinterland are expected to grow further (BBSR, 2014). Despite strong effects of demographic change in other parts of Germany, the official population projection for the city of Munich predicts 1.73 million inhabitants in 2030, an increase by more than 15% compared to today. The population growth is mainly due to migration from other parts of Germany and other European countries, but also positive birth rates. The majority of the influx are people between the age of 25 and 40 (Landeshauptstadt München, 2013, p. 19). Further growth is also estimated for the for the associated city-region, though not as pronounced as for the city itself, and a stable development for most of the wider metropolitan region (Bayerisches Landesamt für Statistik und Datenverarbeitung, 2014).

For a long time, Munich could profit from a good infrastructure and public service endowment that partly came as a legacy from the 1972 Olympic Games. With a certain vanity, city administration and parts of the local population long maintained an image of Munich as a 'large village' or a 'city of villages', a world-city by importance, but not in its built environment.

The recent upsurge in immigration as part of an international trend 'back to the city centres' however puts this narrative into question, and the land markets as well as public services and infrastructure under increasing strain. Munich is a victim of its own success: It shows growing signs of residential segregation on a regional scale, and key workers find it increasingly hard to sustain their livelihood. At the same time, many inner-city building potentials have been used and both public transport and road infrastructure have reached their capacity limits on key sections (Thierstein, Förster, Conventz, Erhard, & Ottmann, 2013; Büttner et al., 2014).

In this context, it is important to note that historically Munich had a relatively monocentric structure in functional terms, with a strong concentration of workplaces and retail in the centre of Munich itself. The most prominent descriptions of this spatial disposition of the Munich region certainly goes back to Walter Christaller (1933) and his central place theory: Christaller, whose research area was southern Germany and whose work has been very influential in German regional planning had described the (conflicting) forces of segregation (administration) and supply (function) on spatial structure and the location of towns. Christaller characterised the spatial structure of Munich as above-average monocentric and the surrounding regional centres as underdeveloped and functionally dependent in comparison to other large cities in southern Germany. He also identified cases where the "administrative" principle of segregation had prevailed over the "supply" or "transport" principles, which dominated spatial structure under unimpeded circumstances in central place theory, leading to a higher number of sub-centres oriented towards Munich, such as Augsburg and Passau. This structure prevails until today, and is reflected by the built radial structure of public transport and highways, but to a large degree also by commuting patterns. The recently identified upscaling of interdependencies from the Munich functional region to the larger metropolitan region could not reduce pressure on transport infrastructure so far.

Administrative structure and planning powers

The growing functional complexity and upscaling in the Munich Metropolitan Region is in contrast with its administrative (non-)organisation. It consists of a five-tiered government as part of a federal nation state, with at least three more additional bodies with relevant powers in the planning field (see Table 1, Figure 2).

Administrative Entity	Planning Powers
National government	Nonbinding national planning strategy
Federal State of Bavaria	Binding state plan
European Munich Metropolitan Region	Voluntary association of municipalities, districts, public institutions and enterprises for marketing and strategic purposes
Administrative Region [Intermediate tier]	Building Permission Appeals Planning of large infrastructure projects, e.g. airports
Outer Munich Planning Cooperation	Voluntary association of municipalities and districts, consultation on planning matters
Regional Planning Area	Binding regional plan
Regional Transport Authority	Strategic Transport Planning
Districts [Cities have functions of Municipality and District]	Building permissions, Heritage conservation Property valuation, reallocations and expropriation
Municipality	Binding land use plans (zoning) Comprehensive land use plans for entire municipality Setting of land tax multiplier, beneficiary of land tax and business rates

Table 1: Important planning and related powers in the German planning system for the case of Munich

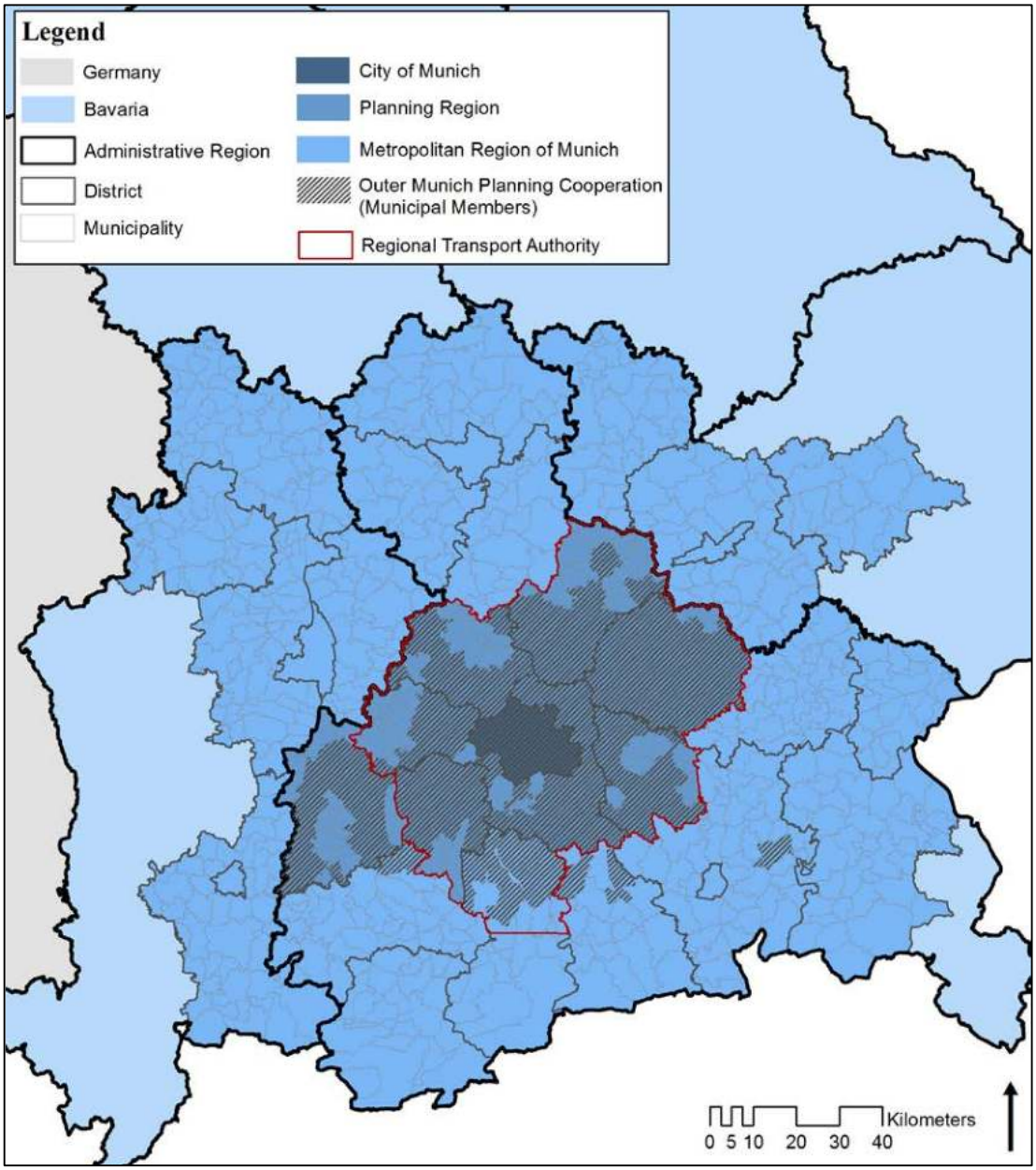

Figure 2: Governance Structures in Southern Bavaria

Planning powers in Germany, like in most jurisdictions, mainly rest with the municipalities as lowest tier of government. They have the responsibility to set up two different types of plans: On the one hand, binding land use (zoning) plans ("Bebauungsplan") for single plots or larger areas which legally determine allowed construction in terms of both use and dimension. On the other hand, a comprehensive land use plan ("Flächennutzungsplan") for their respective territory, which is however only legally binding for the administration itself and has a more strategic scope. Binding land use plans and comprehensive land use plans may not be in conflict, however, and either has to be adapted in case of a change to the other, which occurs frequently. For new construction to take place it is not necessary that a binding land use plan is in place – in fact, most neighbourhoods that were built before the 1960s have no binding land use plans. In this case the usage and size of the existing surrounding built environment determines the allowed form of construction instead, for example in the case of infill housing.

Municipalities are not entirely free in their decisions on land use, since the municipal plans have to conform to the relevant aims set out in the applicable regional plan and the state-wide plan. These set out land use decisions of regional importance such as transport infrastructure and large industrial zones as well as strategic decisions on growth poles, central places and axes (Bayerische Staatsregierung, 2013). Their functioning is not entirely top-down, however: For their development, existing municipal plans have to be taken into account in turn. Thus the plans on different layers of government influence each other mutually (Principle of countervailing influence). Studies on the functioning of regional planning in Munich have shown however that its actual capacity to direct development is limited, as municipalities manage to exempt development frequently (Pütz, 2004, p. 156; Thierstein, 2015). The German national spatial plan on the other hand is non-binding, as regional planning powers rest with the federal states. All plans include statutory participation processes in their preparation.

In the case of Munich several other institutionalised stakeholders are also involved in planning: The "Outer Munich Planning Cooperation" is a voluntary cooperation of municipalities and districts in the functional region to pool expertise on planning issues and consult on questions of regional importance. It was founded in the 1950s as a first attempt at regional coordination and is thus older than the regional planning bodies. Despite personal overlapping with the regional planning authority, their membership differs significantly.

A very recent addition to the regional governance is another voluntary association, the "European Munich Metropolitan Region" (EMM). It unites municipalities, districts, public institutions and enterprises and covers a much wider area also encompassing neighbouring centres within the Metropolitan Region with their own travel-to-work areas such as Augsburg, Ingolstadt and Rosenheim. It has no planning powers, however, and so far mainly fulfils marketing purposes, even though it is trying to spark a common identity in the region. The EMM can be interpreted as an outcome of the up-scaling of functional ties and global competition of metropolitan regions.

These co-operations have to be understood on the background of the political alignment of Munich and its surrounding municipalities. While Munich is governed by a social-democrat majority for almost 70 years in a row, the environs municipalities as well as the Bavarian parliament are largely dominated by the conservative party since the post-war times.

Further government agencies are important players in the region: The regional transport authority Münchner Verkehrs- und Tarifverbund GmbH (MVV) covers an area that is almost congruent with the regional plan and strongly influences commuting patterns as well as a sense of community. Munich airport, the seventh largest in Europe, is located 40 km north-east of the city and has a profound influence on spatial structure. The airport premises sit amidst two municipalities and its airside operations have been followed by strong non-aviation activities on the landside. The municipalities within the airport corridor between the City of Munich and the airport itself have shown above average benefits from the continuous settlement and expansion of companies in the past few years since the start of the airport's operation in 1992 (Droß & Thierstein, 2011). From an

economic point of view, the axis between the airport and the city of Munich is considered the most powerful airport-city corridor across Europe, and it is home to a variety of multinational corporations, such as SAP, Microsoft, Baxter, Airbus-Aerospace, BMW, GE Electric, Swiss RE, and others.

To sum up, planning in the Munich Metropolitan Region is characterised by a multitude of hierarchical layers of government, weak regional governance, overlapping and fuzzy but influential informal governmental bodies and private actors. Of course, planning and its organisational structures are just one player in the management of complex urban regions.

It has not followed other metropolitan regions towards greater institutionalisation so far. At the same time Munich faces strong economic and population growth. It is also important to note here that the city of Munich itself has a relatively small perimeter, which also makes it one of the most densely populated places in Germany statistically. The city administration resisted schemes for an amalgamation with neighbouring municipalities in the 1970s in order to retain the two-tiered internal administrative structure (Vogel, 2015). Now, few land reserves are left within the city and regional effort to cope with the rising demand are needed.

4. Methodology

Study

As described above there is an awareness among scientists of the deficiencies that a mismatch of functional relations and administrative responsibilities can cause. Hence, there is a need for a thorough understanding of households' decision making processes and their influence on spatial developments on the macroscopic scale. In order to obtain new findings on these interrelations we conducted a large resident's survey that addresses three main issues: housing, working and mobility and underlying interdependencies.

Core element of the study is a web-based survey, in which inhabitants – newcomers and long-established – as well as people working in the Munich Metropolitan Region were invited to report residential and workplace location choices they made. A condition for participation was that a change of either workplace or place of residence had occurred in the last three years. The study has been supported by a large board of stakeholders, consisting of not only public authorities but also enterprises based in the region and interested in the topic. This cooperation provided the opportunity to spread the survey throughout various channels. The survey was conducted between November 2014 and April 2015.

The survey is largely based on the approach of revealed preferences, which means household's preferences are indirectly expressed by their decisions made in the past. Survey-participants therefore provide not only information on their current residential and workplace location, but also on former locations as well as locations considered during their last apartment search, including quality assessments and price information. The questionnaire is linked to an interactive map, so that all indicated locations are geo-referenced, which allows a comparison by spatial features among them. Additionally participants are asked about the importance of certain spatial characteristics such as accessibility of the indicated locations (stated preference). Questions on peoples' mobility enable analyses of their mobility behaviour before and after residential or workplace relocation. The revealed preferences are combined with socio-demographic data such as income of the household.

Hypotheses

Preliminary works and literature research led to a set of hypotheses, which where the base for the development of the research design of the study and the questionnaire. There are numerous underlying socio-economic trends, which are highly diverse and complex: reorganization of labour, changes in household structures, which go along with a shift from suburbanisation to reurbanisation and an unprecedented importance of networking for individuals and enterprises combined with growing individualization at the same time.

People choose their locations based on a number of influencing factors, which are highly individual and very much dependent on a household's specific situation. The choice is usually result of complex considerations; however, compromises often have to be made. The revealed preferences approach ties up on these compromises by analysing taken decisions.

One of our main hypotheses was that, besides a general increase of commuting distances, a high level of commuting patterns across municipal borders could be detected. By the analysis of individual search patterns, which can be detected by the geo-referenced locations, we expect not only data to test our hypothesis, but also to better understand trade-offs and patterns of changing spatial preferences within the MMR.

A second hypothesis was that, on a regional as well as inner-city scale, centripetal forces of the knowledge economy and the "trend back to the cities" would lead to a more pronounced polycentric functional structure instead of dispersed development. This polycentric structure would, as described earlier, be characterised not only by its network, but especially by reciprocal complementarity.

Therefore we combined a macro-perspective analysis of indicators of socio-economic structures and spatial accessibility with the micro level of individuals who face decisions where to live, where to work and how to optimize daily mobility patterns. Comparable longitudinal data on simultaneous workplace and housing decisions was not available for Munich before, and it is rarely available for other areas in Germany.

5. Preliminary Results

After the closure of the survey on April 19, 2015, and a data quality assurance phase, we could undertake some first evaluations. Due to the short timeframe between the end of the survey and the finalisation of this paper, the results presented here have to be seen as a first approximation to the data and are of a preliminary nature.

The questionnaire was answered by 7,308 respondents, which is equal to 0.126% of the MMR inhabitants. The turnout was higher than expected, also thanks to a distribution strategy that involved both social media and traditional channels such as mailing lists of cooperation partners and flyers. With 2,523 respondents living in Munich, the city itself is slightly overrepresented in the sample (0.17% of inhabitants). In some municipalities, the turnout was exceptionally high due to the participation of the municipal administration in the promotion (e.g. Ohlstadt 1.48%, Pfaffenhofen 1.41% of inhabitants). It is hence very important to consider the impact of this uneven spatial distribution on a small scale if generalising statements for certain areas are made. This also applies to the sociodemographic distribution of participants, since the dataset is also biased towards people with a high social and educational status.

In a first step, we examined the location pairs of residence and primary workplace for the respondents who were in employment (Figure 3). Due to the even distribution on a region-wide scale, generalising statements can be made.

Expectably, the commuting patterns show a strong concentration on Munich as the dominant centre of employment in the region. To a lesser degree, regional centres around Munich such as Rosenheim, Landshut, and Ingolstadt emerge as commuter destinations. Regarding the choice of transport modes, the dominance of private transport in the regional centres is surprisingly high (65%), while a high share (61%) of in-commuters to Munich use public transport. Cycling only plays a significant role within the larger cities Munich, Augsburg, Landshut, and Rosenheim.

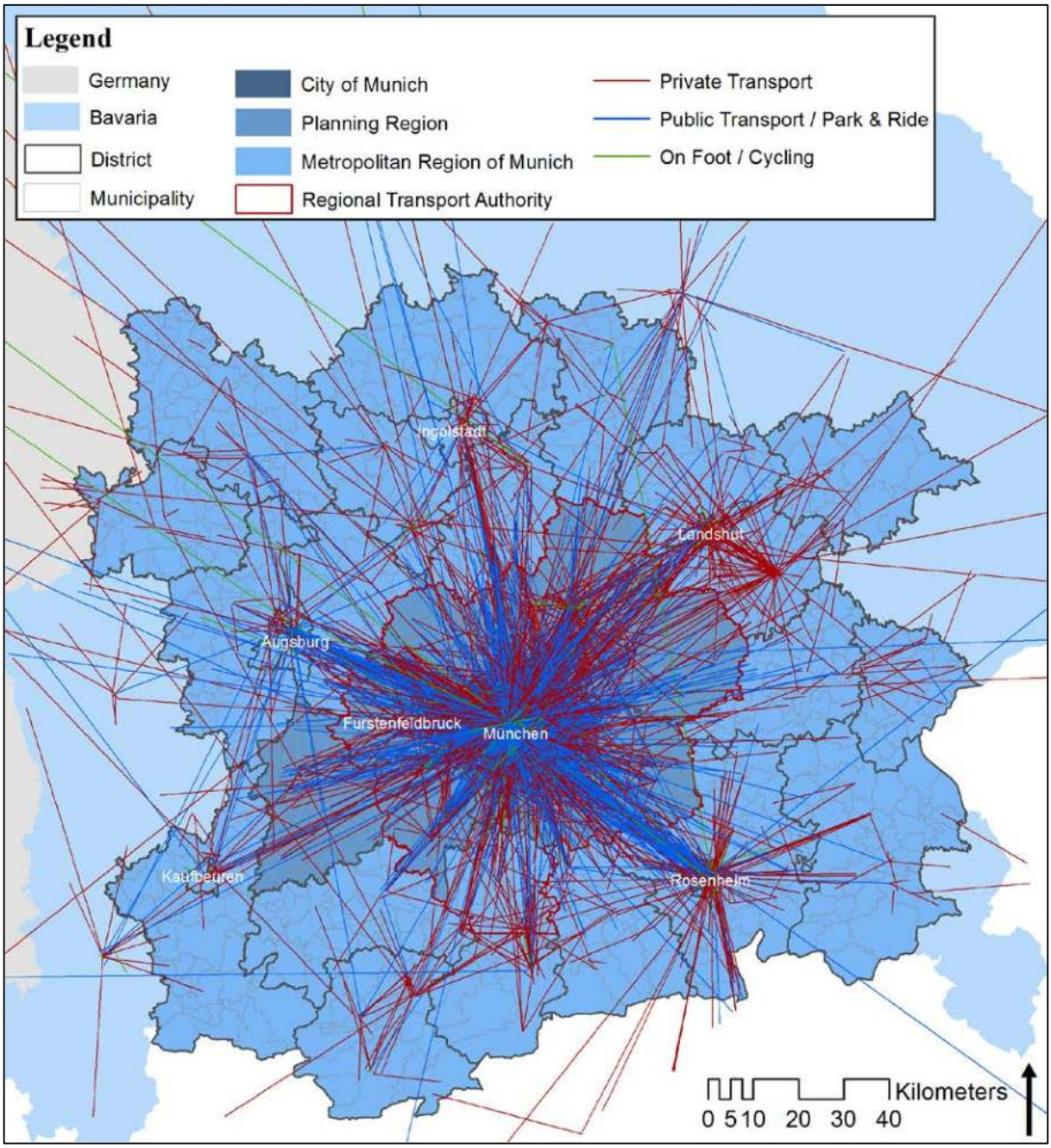

Figure 3: Commuting Patterns in the Munich Metropolitan Regions

Regarding our first hypothesis, it becomes obvious that a large share of the functional relations within the Metropolitan Region is not contained within the boundaries of the Planning Region, or the Regional Transport Authority. Instead, regional centres like Augsburg and Ingolstadt, which used to be relatively independent city-regions, now show a significant level of functional interaction in the Metropolitan Region, confirming basic tenets of the "new regionalism". The high rents in Munich contribute to an overspill of population to the wider region, as stated by many respondents (27.9% of those moving further out).

Households aim to optimize distance and transportation costs between residence and work place without consideration of municipal borders. Statistical analyses of past spatial developments show clear links of the development of residences and employment. But a zoom to the smallest scale of municipalities also reveals that the links on this scale are not as distinct as on the regional scale. It seems that there is a general trend towards short distances until a certain scale, the actual choice

however is highly dependent on local circumstances, whereas municipal borders become less important.

As for our second hypothesis, an emergence of a polycentric metropolitan region cannot be observed from the first evaluation of the residential location movement data. More respondents moved from the centres (Munich, Augsburg, Ingolstadt, Landshut, Rosenheim, Kaufbeuren) to other districts then vice versa (Table 2).

		Before Moving			Total
		Regional centres	Other districts in MMR	Outside of MMR	
Now	Regional centres	1340	642	744	2726
	Other districts in MMR	1121	1457	650	3228
Total		2461	2099	1394	5954

Table 2: Movement between regional centres and other districts in the MMR and outside the MMR

On a region-wide scale, a trend away from the cores seems to prevail. To appreciate this result better, one has to take into account however that our dataset covers mainly people in employment (83,7%), most of them in their 30s and 40s. This group has the highest share of 'family starters', who typically move outwards. Students, who have the opposed movement profile, represent only 9,8% of our sample. Furthermore, Munich is a special case within the German and most European Metropolitan Region since it is growing strongly and thus causing a high overspill of movement into the region. Thirdly, people moving from outside the region to the MMR predominantly chose the centres as their new residential location, contrary to the inner-region trend.

From statistical government data, we know that areas with access to a high number of opportunities and to a choice of different transport modes are characterized by the highest growth rates within the MMR. The general societal trends lead to an increasing need to be flexible, stay connected and able to easily adjust to changes to remain successful in competition for labour and housing. In this context accessibility becomes one of the key location factors, and thus a driver for a more central location choice. So, polycentric development might still be happening, but it needs further analysis on different scales, combining also workplace and residential location changes. Further clarity in this question can also be expected from the study of the location options not chosen in the course of apartment-searching which we also asked for in the survey.

6. Discussion

What do these preliminary results mean for the management of the Munich urban region? We want to raise three points here.

Foremost, the observed increase in functional relations across boundaries requires steps to rematch functional and administrative space, i.e. a stronger cooperation of relevant municipalities in the metropolitan region, especially on the domain of transport provision, integrated transport and settlement development policy, as well as open space protection. The perimeters of the Planning Region and the regional transport authority are too small for these institutions to adequately deal with the challenges resulting from the upscaling of functional relations. We think that, for these policy areas, the recently founded voluntary municipal association for a "European Metropolitan Region" (EMM) reflects a more suited scale. The existing fuzziness and fragmentation with respect to regional governance furthermore prompts that the Munich Metropolitan Region needs not only more cooperation, but also a certain streamlining of forums and hierarchies. A truly regional, strategic approach might be better suited to handle the consequences of growth.

Second, the evaluation of transport modes for commuting in the metropolitan region has shown that while for radial commutes public transport dominates, it is almost absent for tangential relations. A sustainable, transport oriented development policy must aim to encourage a polycentric settlement structure where adequate on the one hand to make public transport more efficient on these tangential links on the other. This goes with the mentioned extension of the regional transport authority. Furthermore, the airport has turned out to function as a significant centre of employment, which is however only appropriately served by public transport in direction to and from the city of Munich. All commutes from other residential locations, especially to the east and north, are done with private transport. Here, adequate tangential links should be established.

Third, by asking the citizens themselves about their locational choices, preferences and wishes in a survey, we can hope to trigger innovations in our management approaches for example by creating a broader understanding of existing challenges. This can also contribute to initiate a change in awareness and provide further arguments for future research and policy-making that are ultimately necessary to cope with the challenges of growth.

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