ESPON

POLYCE
Metropolisation and Polycentric Development in Central Europe

Targeted Analysis 2013/2/12

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Abbreviation

ATTREG	Attractiveness of European Regions and Cities for Residents and Visitors (ESPON Project 2012)
CAEE	The Case for Agglomeration Economies in Europe (ESPON Project 2010)
CEC	Central and Eastern European Countries
CC	Core City, synonymous with administrative boundaries of capital city
CED-zone	Central Europe - Danube Global Integration Zone
CLIMATE	Climate Change and Territorial Effects on Regions and Local Economies (ESPON Project 2011)
CORDIS	Community Research and Development Information Service
DEMIFER	Demographic and migratory flows affecting European regions and cities (ESPON Project 2010)
EFP	EU Research Framework Programme
EFTA	European Free Trade Association
ESDP	European Spatial Development Perspective
ESPON	European Observation Network for Territorial Development and Cohesion
ETC	European Territorial Cooperation, European objective supporting cross-border, transnational and interregional cooperation
EUROSTAT	European Statistical Office, detailed statistics on the EU and candidate countries
EUSDR	EU Strategy for the Danube Region
FIRE	Finance, Insurance, and Real Estate firm networks, as indicated in GaWC database
FMA	Functional Metropolitan Area, as defined in the POLYCE project via commuter flows
FOCI	Future Orientation for Cities (ESPON Project 2010)
FUA	Functional Urban Area, spatial delimitation for urban agglomerations in Europe as identified in ESPON 1.1.1 (ESPON Project 2005)
FUR	Functional Urban Region
GaWC	Global and World City Research Network
GDP	Gross Domestic Product
GVA	Gross Value Added
ICT	Information and communication technologies
ISCO	International Standard Classification of Occupations
INTERCO	Indicators of Territorial Cohesion (ESPON Project 2012)
KIT	Knowledge, Innovation, Territory (ESPON Project 2012)
LAU	Local administrative unit
LUZ	Large Urban Zone, spatial concept, as defined in Urban Audit
MEGA	Metropolitan European Growth Area, FUAs with metropolitan functions as identified in ESPON 1.1.1 (ESPON Project 2005)

MR	Metropolitan Region, as defined in the POLYCE project via commuter flows
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organization for Economic Co-operation and Development
OFMA	Outer Functional Metropolitan Area
OMR	Outer Metropolitan Ring
POLYCE	Project acronym: 'Metropolisation and Polycentricity in Central Europe'
SURE	Success for Convergence Regions' Economies (ESPON Project 2010)
TEN	Trans-European Networks
TRACC	Transport Accessibility at regional/local scale and patterns in Europe (ESPON Project 2012)
UA	Urban Audit, comparable statistics and indicators for European cities
URBACT	European Programme promoting sustainable urban development
WP	Work package of POLYCE

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1 Introduction

Author: Rudolf Giffinger, Johannes Suitner

1.1 Background

In 2002 John Friedmann (p. XV) concluded that 'Almost the whole world will coexist in a single global urban network, driven by worldwide competition.' This underpins a shift in the understanding of the role of cities. They cannot be regarded as single and independent elements anymore. Their economic importance and development potentials cannot arise from their regional 'Hinterlands' alone. Rather cities are part of a network of different forms of relations, where competition becomes decisive.

Looking at the development perspectives of the urban system in Europe – and Central Europe more specifically – the reasons for an increasingly competitive context can easily be found. The allocation of investments and economic activities across different types of cities follows distinct characteristics on the basis of comparative advantages that cities are able to provide. Under conditions of globalization 'World city formation' is the process by which the global economy impinges upon cities and transforms their social, economic and physical dimensions in relation to their role in the global urban hierarchy (Friedmann, 1986; Sassen, 1991). The emergence of specialized city systems is defining new roles for particular cities or groups of cities in the global urban hierarchy. Those cities integrated into the 'functional city systems' (i.e. cross-border inter-regional urban networks) are also undergoing the process of world city formation - affecting urban form, structure and development. Besides, the issue of competitiveness gained increasing importance in recent years (Parkinson, 2003; Begg, 1999). The fall of the Iron Curtain and the process of integration changed the conditions for urban development - especially for cities in Central Europe. New opportunities and perspectives for economic activities arose along the integration process, providing new market potentials and new patterns of mobility of labor forces and capital. (Rodriguez-Pose, 2002)

Hence, the pressure of competition has increased with globalization. Cities lost their centrality and dominant central functions on the regional and national level and have become part of the new urban hierarchy on an international level.[1] Consequently, cities need to re-orient their development perspectives – a fact which is particularly true for capital cities experiencing processes of metropolisation. They are stipulated to re-define and re-elaborate place-based strategies that are able to increase their territorial capital with specific assets. (Camagni, 2007; 2009; Giffinger et al., 2010)

Thus, the stakeholders of the five POLYCE capitals emphasized the importance of a research effort that takes these changing conditions into account. They expressed the need to elaborate recommendations that support their work in managing the changing contexts of European metropolitan development processes. This implies:

- Providing an environment for agglomeration growth, sustaining the unique cultural and historical heritage of international importance
- Strengthening relevant networks to create prosperity, better living conditions and long-term, stable work places
- Supporting a network-like metropolitan structure by implementing effective governance approaches
- Increasing the cooperative endeavor with capital cities in Central Europe, in particular in the areas of business, research, culture and urban planning
- Enabling and enforcing strategic metropolitan planning which supports EU Cohesion Policy

[1] For an overview of the Central European urban system, please see Figure 6.

- Improving cooperation and establishing polycentric structures that lead to more cohesion in macro-regions
- Supporting territorially cohesive development in Central Europe and the Danube region
- Learning from and supporting each other through the exchange of information and experiences, promoting common interests and developing common projects

1.2 Objectives

The basic project idea is to analyze recent trends in and perspectives of metropolitan and polycentric development in order to elaborate specific recommendations supporting/strengthening balanced territorial development between competitiveness and social inclusion. Evidence-based policy recommendations will be elaborated to foster a territorially cohesive development for the five single metropolises, as well as for the Central European territory as part of the wider Danube region.

POLYCE's main objective is to identify the importance of the mutual links between the process of metropolisation and polycentric development and the challenges and perspectives of future urban development. Theoretical and empirical research addresses structural, functional and strategic relations that are based on competition or cooperation, targeting the five metropolises with their territory and the CED-zone. Final conclusions and recommendations will take into account a metropolitan perspective regarding the five capital cities Bratislava, Budapest, Ljubljana, Praha and Wien as well as a European perspective based on the 5 metropolises as part of the macro Danube Region. Besides, POLYCE will provide added value in a methodological and policy perspective:

- Theoretical and empirical analysis will go beyond recent research efforts through the consideration of traditional factors as driving forces of urban development.
- Knowledge of stakeholders regarding potentials, resources and assets of metropolitan development are going to be considered explicitly. Important actors will be involved and their perceptions of assets as driving forces of metropolitan development are going to be considered comprehensively.
- Policy relevance of POLYCE will be fostered through the discussion and assessment of processes of metropolisation and polycentric development under the perspective of competitive and inclusive metropolitan development.

The following questions are addressed empirically:

- What is the relation between metropolitan size and preconditions for demographic growth? Do metropolitan functions and polycentricity have a decisive impact on demographic growth? What is the meaning of polycentric relations for metropolitan development at different spatial levels?
- What are the characteristics of polycentricity? What do the polycentric systems of the metropolitan level and the CED-zone look like? What are the specific assets/factors driving or hindering polycentric development? Is there a mutual relation between metropolisation and polycentricity?

Analytical methods based on quantitative information from official statistical sources and officially acknowledged and published ESPON-data sources are applied to answer these questions. The results are used in discussions with stakeholders to answer policy-related questions on the challenges of smart metropolitan development. The term describes the balanced and territorially cohesive development between the strengthening of metropolitan competitiveness and social inclusion according to the EU-Agenda 2020. (EC, 2010) Hence, questions target the policy-level as well:

What do the metropolitan profiles of the five POLYCE metropolises look like? Do they show any decisive similarities or differences among each other and among a wider sample of European metropolises? Which development factors have a potential for metropolitan distinction?

- Are polycentricity and metropolisation important issues of strategic endeavors in local governance approaches of the five metropolises? How to strengthen the current position of

the five major cities as metropolises? Which activities are of importance in supporting smart metropolitan development?

- Which activities are necessary to strengthen polycentric development in the CED-zone? How can the polycentric system in CE be enhanced? What can we learn from project results for the strengthening of territorially cohesive development in the macro Danube region?

Furthermore, *policy relevance will be achieved through the discussion and assessment of processes of metropolisation and polycentric development under the perspective of competitive and inclusive metropolitan development.* Besides, evidence-based recommendations foster learning processes that strengthen cooperative and strategic planning endeavors within metropolitan areas and between European metropolises.

1.3 Conceptualization

The following chapters concentrate on the conceptualization of the POLYCE-project which corresponds to Work Package 2.0. Hence it serves as a guideline for the content-related part of the project and therefore has the following specific objectives:

- Elaborate a comprehensive understanding of the mutual relation between metropolisation and polycentric development
- Improve knowledge regarding the role of specific potentials and assets for metropolitan development in order to formulate strategic recommendations
- Assure comparability and transferability of information

In order to meet these challenges of a guide-line the scientific report of POLYCE concentrates on a basic understanding of metropolitan development, its policy relevance, basic assumptions, and methodological aspects across all Work Packages.

1.3.1 Basic understanding: metropolitan development based on specific potentials and assets

Over the last twenty five years there has been a remarkable shift in the conditions of urban development leading to specific new trends within cities. Processes of socioeconomic polarization and marginalization and increasing immigration of new ethnic groups endangered territorial cohesive development through strong processes of gentrification and segregation. Hence, discussion in urban development policy and planning was then shifting towards issues of mono- and polycentric development concepts (Kunzmann, 1996) and, more recently, towards strategic planning approaches in front of post-modern form of urban development (Friedman, 2002; Healey, 1999).

In literature these trends of urban development are discussed under different perspectives of urban restructuring. First, research in this context concentrated on the identification and assessments of nodes in global networks according to the emergence and meaning of new functions. Empirical research focused on the new definition of the meaning and role of cities in a global perspective and defined new urban systems and rankings according to their size and their functions in different fields of urban development (Hall, 1984; Sassen, 1991 and 2001; Keeling, 1995). According to this perspective even ESPON 1.1.1 report classifies European cities as Metropolitan Growth Areas (MEGA) and defines a specific hierarchy due to following criteria: size (Population), economic performance, connectivity and knowledge intensive activities.

A second but related topic of research is the discussion of urban restructuring on the urban regional level under the term ‘metropolisation’. Of course, this is done from different points of views leading to a specific understanding of the process of ‘metropolisation’. It is regarded as:

- the result of a mutual process of spatial concentration and aggregation of (new) economic functions and population having an effect on its growth and spatial extension through immigration (Friedman, 1986 and 2002; Geyer, 2002);

- a node of global networks of material and immaterial flows exercising command and control functions with excellent connectivity between each other (Keeling ,1995);
- economic restructuring towards knowledge intensive economic activities in specialized branches of production or service (Krätke, 2007);
- relative high concentration of metropolitan functions in the urban agglomeration (BBSR, 2010), or
- the allocation of specialized and specific functions as driving forces of economic and demographic development within the city or increasingly centered in a polycentric form within the agglomeration (Kunzmann, 1996; Leroy 2000; Sassen, 2002; Elissade, 2004)

Concentrating on the second topic, in this project the process of metropolisation is regarded as a specific form of urban restructuring based on the city's ability to compete with other cities and to enable the establishment (new allocation or local evolvement) of specific metropolitan functions in the respective urban agglomeration. Therefore, this process of metropolisation reaching beyond city borders provides a specific social, economic and spatial outcome which - generally spoken – is depending on specific local factors of influence. Because of this place related influencing factors metropolisation leads to specific local metropolitan characteristics producing in a general and aggregated perspective a metropolitan profile which differs across European cities, although metropolisation is a general trend.

Based on a comprehensive understanding we assume that metropolitan competitiveness is very much linked to its territorial capital. This territorial capital consists of different endowment related factors and potentials but also of specific forms of cooperative efforts with strategic planning character which – in combination - provide competitive advantages for the establishing of metropolitan functions (Camagni, 2007 and 2009; Giffinger et al., 2009). In this perspective, metropolisation we therefore regard as the outcome of mobilized territorial capital.

1.3.2 Territorial capital as a base for metropolisation

Along with the process of European enlargement heterogeneity and differences in the conditions for urban-regional development increased enormously across regions. Due to specific political and economic conditions provided through the process of transformation in Central European countries, recent socioeconomic conditions, regional structures as well as political structures and administrative capacities vary strongly across different nations and regions. A comparative report of the OECD (2001) emphasized great differences in the preconditions for regional development as well as in economic performance. This report presupposed the first time that same investments respectively same external economic demand obviously will lead to different regional effects due to its specific 'territorial capital' - even on the national level. More specifically the OECD recognizes (p. 13) that "prosperity is increasingly a matter of how well each city, each region, can achieve its potential. It is a supply-side concept. Territorial capital refers to the stock of assets which form the basis for endogenous development in each city and region, as well as to the institutions, modes of decision-making and professional skills to make best use of those assets." Accordingly, territorial capital is regarded as a distinct bundle of factors which attracts investments and which makes the return of certain investments higher than in other regions and which generates a higher return for certain kinds of investments than for others (OECD, 2001, p. 15).

Over the last years, in the European discussion on competitiveness the term 'territorial capital ' was used partly. However, its basic idea and relevant arguments are considered increasingly in the drive on Territorial Cohesion (European Council 2007, Faludi 2007). Recently, the terms Territorial Capital and Territorial Governance have found prominent attention in the document 'The Territorial State and Perspectives of the European Union: Towards a Stronger European Territorial Cohesion in the Light of the Lisbon and Gothenburg Ambitions' (Luxembourg Presidency 2005) and in the paper titled 'Territorial Agenda of the European Union: Towards a More Competitive and Sustainable Europe of Diverse Regions' (http://bmvbs.de/Anlage/original_1005295/Territorial-Agenda-of-the-European-Union-Agreed-on-25-May-2007-accessible.pdf, 25.06.2010).

This approach of 'territorial capital' takes up this discussion on competitiveness in an increasingly comprehensive perspective. Its basic endowment and functional related elements are natural features, material and immaterial cultural, technical and social heritage; fixed assets as infrastructures and endowment related qualities of distinct places. Its basic relational elements are 'untraded' interdependencies (like customs, informal rules, understanding) or specific environments (such as institutions, rules and practices, common strategies and policies) (Storper, 1997). In a more systemic perspective, Camagni (2009, p. 123) identifies 9 different goods which characterize a territory under the aspect of materiality and rivalry (see Figure 1).

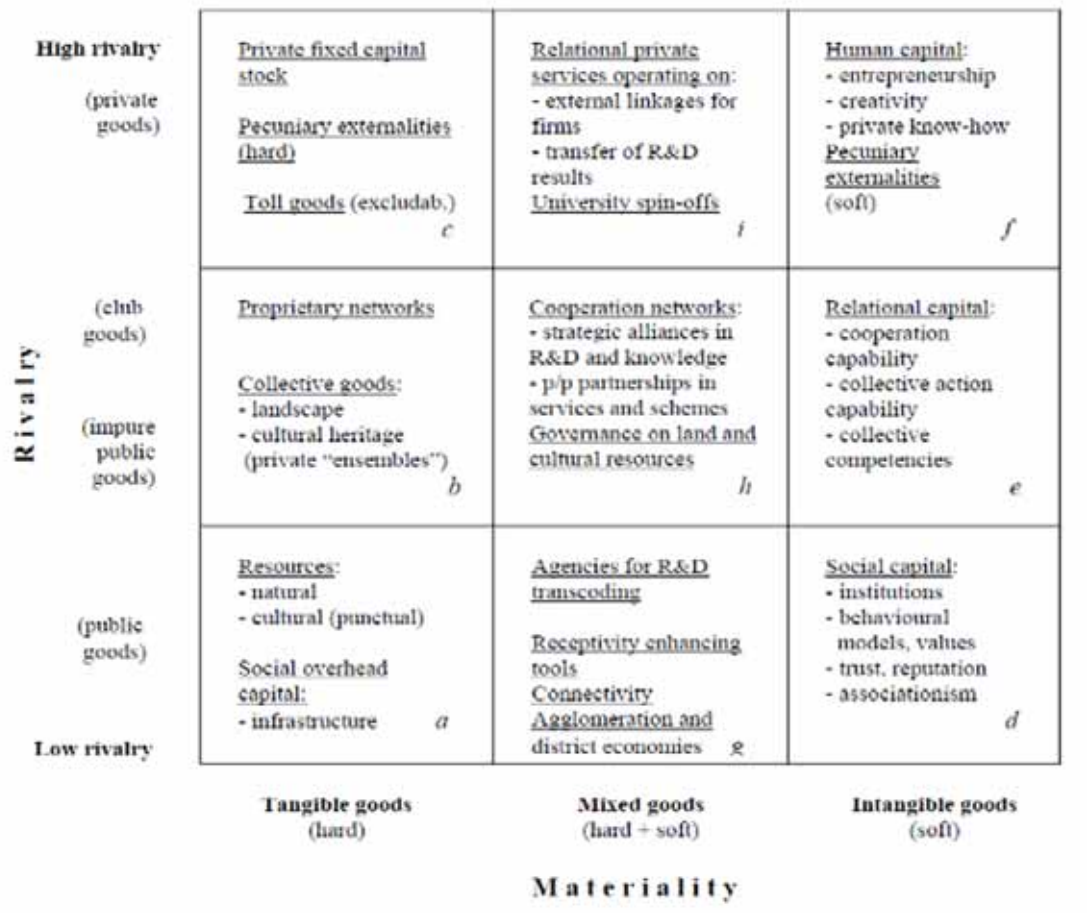

Figure 1: Theoretical taxonomy of the components of territorial capital

(Source: Camagni, 2009, p.123)

This classification emphasizes that different forms of non-material capital are important as intangible assets for metropolitan development. The focus of the theoretical analysis is no more merely on physical factors, which can easily be transported, but rather on space-specific assets, that cannot be reproduced by moving people and goods, and stem from local culture, values, and norms. In this view, urban competitiveness is linked to the territorial capital of cities, as a major driving force of metropolisation. Territorial capital consists of different endowment related factors and potentials but also of specific forms of co-operative efforts with strategic planning character which –in combination - provide competitive advantages for the realization of metropolitan functions (Camagni, 2009; Giffinger et al., 2009). In this perspective we regard metropolisation as the outcome of mobilized territorial capital as assets which provide specific area based advantages. Consequently, territorial capital with its specific assets is regarded as a precondition as well as the result of metropolitan development in different dimensions.

1.3.3 Metropolisation and polycentricity

The above described concept allows relating assets of strategic positioning regarding functional polycentricity on different spatial levels. Co-operative initiatives (strategic efforts of governance) and relational capital are regarded as two important assets in the context of metropolisation (Camagni, 2007 and 2009; Giffinger et al., 2009): This process is usually characterized through the cooperation of stakeholders who represent different sectors, municipalities and even different regions. (Ottgar, et al., 2008) Therefore, intangible assets in form of cooperative efforts and relational capital will increase the more learning processes strengthen truth and common competences as influencing factors. These intangible assets, finally, provide rather absolute than relative area bounded advantages. This means that a metropolis' territorial capital is in particular enhanced through any form of cooperative initiatives and relational capital which enforce the linkage of cities or specific groups of actors (public, private), or the provision of clusters that are located in places where people can acquire and share tacit knowledge about how things work.

And indeed, agglomerations are the places of businesses, where social networks would thrive most (Storper and Venables, 2004). In cities characterized predominantly by the presence of small and medium enterprises, networks of firms interconnected by common knowledge of people and facts can share information and reduce transaction costs, thus allowing urban agglomerations to generate innovation, the absence of large firms notwithstanding (Aydalot, 1986; Camagni, 1991 and 1995). The concept of territorial capital therefore allows a more comprehensive systematization of the notion of urban innovative milieu, through the notions of relational capital and co-operative networks.

Consequently, the approach will consider the most relevant dimensions of territorial capital: on the one hand side traditional factors like private fixed capital or human capital are taken into account, and on the other side non-traditional factors of the more recent discussion like relational capital, social capital or cooperative networks are considered more or less explicitly. In particular relational capital and different forms of co-operative networks on different levels are discussed and operationalized in detail in order to work out the meaning of polycentricity in a morphological, functional and strategic perspective. Metropolitan competitiveness of a capital city therefore refers to a 'metropolitan territory' which is influenced by polycentric networks on different levels from a city's perspective enhancing and strengthening metropolitan polycentric development in a morphological, functional and a strategic perspective.

The debate on the concept of polycentricity already emerged in the European Spatial Development Perspective (ESDP) (CEC, 1999) and is still well represented within and beyond the ESPON programme (ESPON 1.1.1, 2005; Waterhout, 2002; Tatzberger, 2008). In very simple words, polycentrism means the existence of more than one spatial pole. Polycentrism can be understood in more morphological or functional ways, in more analytical or normative/strategic ways. However, large parts of the debate on polycentrism are linked to the question of scale. Hence, in theoretical and empirical discussion the characteristics of the relations between spatial entities as well as the spatial level of polycentricity became increasingly important.

In POLYCE polycentricity is going to be analyzed according to definitions made in the most recent ESPON projects. This holds in particular for the terminology of spatial entities, which will build similar to the concepts used in FOCI. FOCI distinguishes four analytical levels: European (macro level), the inter-regional (meso level), the intra-regional (micro level) and the intra-urban level (ESPON FOCI Interim Report). POLYCE will concentrate on the first three levels in a slightly modified way as shown in Figure 2.

Also, FOCI defined three spatial entities to empirically analyze polycentricity. A Core City (CC) which corresponds to the administrative city, a Metropolitan Area (MA) corresponding to LUZ/FUA and a Metropolitan Region (MR). As in POLYCE functional relations are of main interest "metropolitan areas" will be renamed into "Functional Metropolitan Areas (FMAs)". The operationalization of FMAs will be conducted in the Work Package 2.1 (see chapter 2) based on the posed question.

The micro level: Polycentricity within the metropolitan region

In the POLYCE approach the Metropolitan Region (MR) consists of a Core City (CC), a Functional Metropolitan Area (FMA) and a surrounding Outer Metropolitan Ring (OMR). Polycentricity at the micro-level will be analyzed regarding all three entities. Empirical analysis does not only concentrate on empirical results of the aggregated entities as such but will in particular analyze interconnected elements within the Metropolitan Region (MR). These could be elements such as cities and municipalities, cross-border networks, infrastructural networks, etc. In Particular, WP 2.1 will focus on this definition and delimitation of the FMA in order to support empirical research on different forms of polycentricity in an accurate way.

The meso level: Polycentricity between metropolitan regions

Relations interlinking metropolitan regions will be identified and described. Polycentricity will be analyzed for all MRs which are member of the CED-zone. Interrelations will be elaborated as far as indicators are not available from other ESPON projects.

The macro level: Large scale polycentricity

Relations of the five metropolises in the CED-zone will be analyzed and compared to other metropolises as well as groups of metropolises in other European macro-regions. Quality and intensity of the inner polycentric structure can be assessed through the comparison with its outside relations.

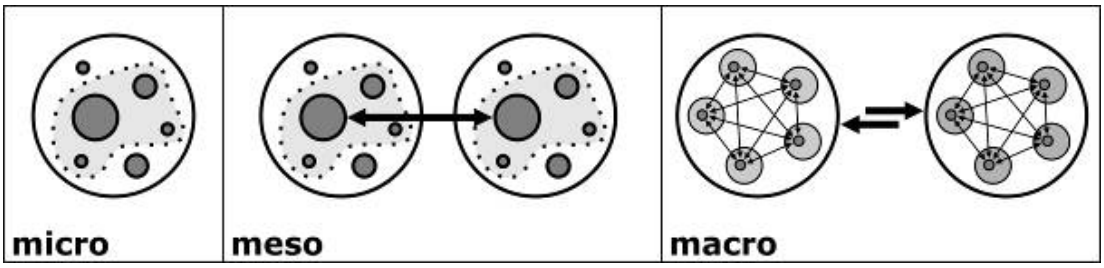

Figure 2: Scales of Polycentricity

1.3.4 Challenges of governance within the process of metropolisation

Since the 1990s, the nature and role of metropolitan governance for reaching common policy goals in metropolitan areas have been widely discussed, both politically, as it touches the competencies, preferences and interests of policy actors nested in different spatial scales (EU, national policies), and scientifically, as it brings together research interests of scholars from different scientific disciplines (e.g. regional economics, planning, political science). Up to now the scientific debate on metropolitan governance has been dominated by four strands of thought (Heinelt et al., 2005): the metropolitan reform tradition, the public choice concept, the new metropolitan governance approach and the concept of territorial capital. While the metropolitan reform tradition and the public choice approach have been partially marginalized because of their limited guidance for dealing with challenges of metropolitan governance, the latter two strands of research have developed well in terms of empirical research and political relevance. They will receive special attention in the following paragraphs in order to sketch out the crucial analytical dimensions of metropolitan governance used in the project.

The new metropolitan governance approach basically refers to the debate about the transformation of the state, which is packed in the well-known notion of the “shift from government to governance” (Koimann, 1993; Le Galès, 2002; Pierre, 2000; Rhodes, 1997). Broadly speaking, from this point of view governance is grasped as an ongoing process, which is based on different rule systems (market, hierarchy, networks; Mayntz et al., 1995) and on different structures of interaction (e.g. cooperation). Its main goal is to facilitate the coordination and steering of collective actions. New metropolitan governance has been increasingly used for describing new ways of governing in metropolitan areas (Heinelt et al., 2005; Basten, 2009; Salet et al., 2003), whereby “new” implies a form of governance, which is more inclusive and participatory compared to traditional hierarchical government. Governance is regarded as the capacity to influence and integrate interests of different

social groups, organizations and policy actors in order to develop common strategies and to emerge as a collective actor. Consequently, in contrast to 'government', the idea of new metropolitan governance involves working across boundaries within the public sector (cross-departmental) or between the public and the private or civil society sector. Networking and partnership building are the key blocks of metropolitan governance, which, of course, do not upend the more formalized dimensions of politics, but should supplement them considerably.

1.4 Basic assumptions regarding metropolisation, urban size, polycentricity and governance

Based on these considerations through which factors processes of metropolisation are driven, the project is based on following general assumptions:

A1: According to the territorial capital approach metropolisation is driven by different hard endowment related factors and soft relational factors which in combination activate and mobilize perceived potentials and transform them into assets. These assets provide area based advantages which strengthen the competitiveness of cities and attract specific metropolitan functions. Hence, metropolisation is the outcome of the activation of relevant potentials in a highly competitive situation between cities.

A2: Depending on the objectives and effectiveness of governance initiatives, polycentric relations and thereby metropolitan development can be stimulated and fostered. This includes the realization of strong functional complementarities as area-bound advantages (structural/functional relations) and cooperative efforts (institutional/strategic relations) at the micro-, meso- and macro level. Thus, functional and strategic polycentric structures which create area-bound advantages are assumed to become an asset for metropolisation.

A3: New governance exhibits 'soft' forms of policy-making and conflict avoidance, for example bargaining and learning processes. New metropolitan governance implicitly shows up an understanding of "territory" as a social and political product or construction, and sheds light on the role of actors and their interaction in solving problems of coordination and steering in a highly fragmented context. Hence, metropolitan development is driven by the process of accumulation of assets based on relevant cooperative governance initiatives. This process is the more effective and strong the more metropolitan assets are created which have a recursive and positive influence predominantly on the accumulation of economic and human capital and at the same time on relational capital - notwithstanding the high and unquestionable costs associated to large urban scales.

A4: In the concept of territorial capital the functional meaning of specific factors of influence is emphasized. One argues that a territory's competitiveness is influenced by tangible or intangible assets. Due to their intrinsic character intangible assets are of great importance because they are not subject of market dynamics which may change in short terms. At the same time it is emphasized that the competitiveness as a driving force of metropolisation is given only if potentials are perceived and activated and transformed into specific assets. Learning processes are crucial between stakeholders on a metropolitan level.

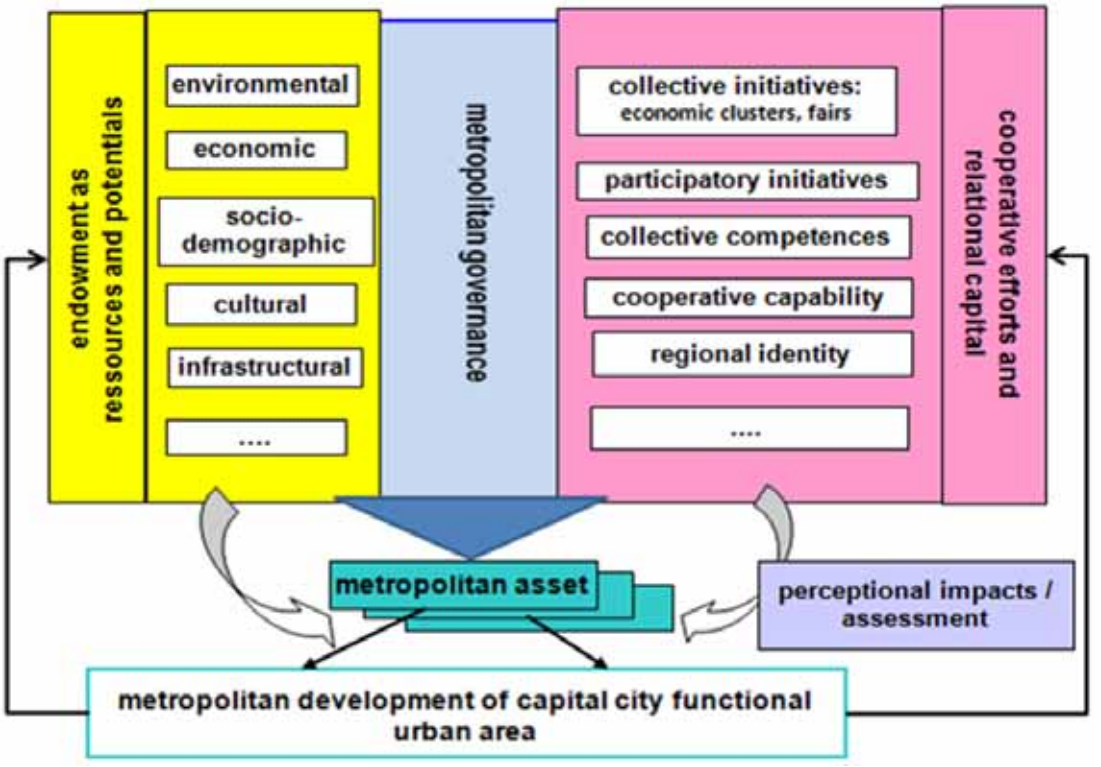

Figure 3: Hypothesis on metropolitan governance

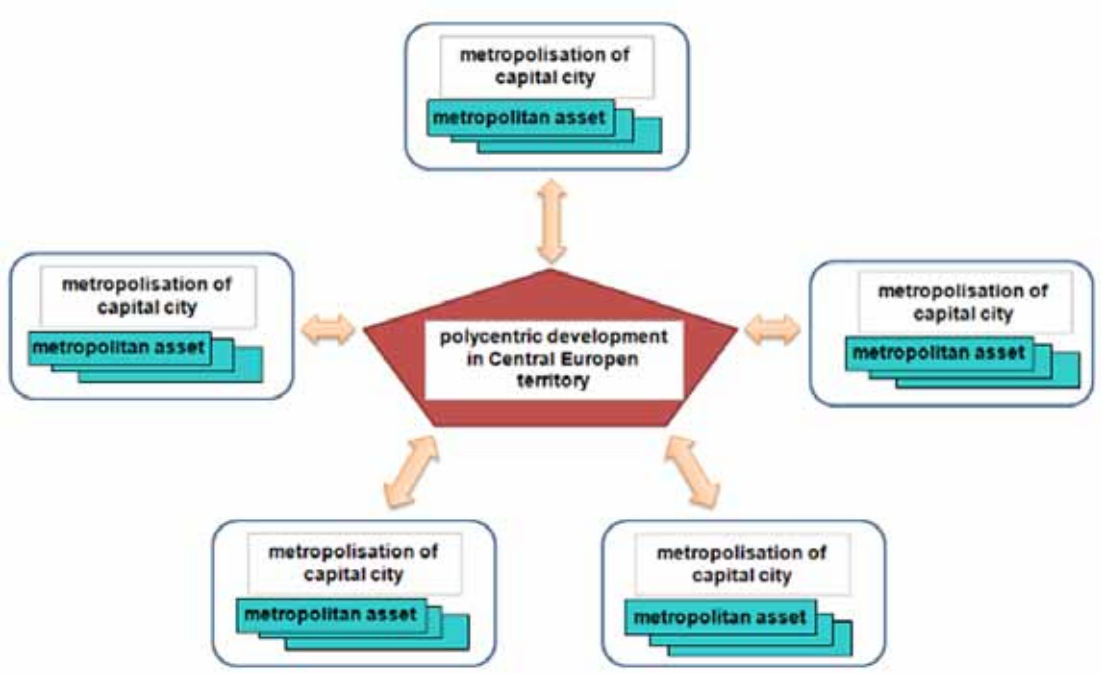

Figure 4: Hypothesis on polycentricity and metropolisation

A5: Metropolitan functions are established on the base of area bounded advantages. Due to endowment related factors very often metropolisation goes far beyond city borders. According to capacity and ability of governance approaches to steer allocation of metropolitan functions the process is realized in a polycentric way on the micro and meso level: strong functional

complementarities of area bounded advantages (functional relations) and respective cooperative efforts (strategic relations) are assumed even to enforce polycentricity on the micro and meso level. Functional and strategic polycentric structures which enhance area bounded advantages on the meso level are likely to become an asset for metropolisation.

A6: Polycentric development between metropolises on the Central European level depends on two basic aspects. First, functional relations are likely to exist the more specific and individual are metropolitan characteristics and profiles and the more complementary the specialization of metropolises is. Of course, functional relations between metropolises are only realized if there is respective infrastructure enabling specific forms of interrelations. Thus, connectivity and accessibility in the global or at least European perspective plays an important role. Functional relations may be based on the principle of competition (specialization of metropolises) or on the principle of cooperation in respective strategic efforts. Therefore, polycentricity on the global or European level is even a specific asset of metropolisation and positioning.

Besides these basic assumptions concerning the project as a whole, some specific assumption are focusing on the specific topics or Work Packages and on methodological issues:

A7: Polycentricity on the micro level is a main base for future development of the core city and the whole Metropolitan Regions (MR), as it determines the possibility to strengthen and expand existing networks and to establish new ways of co-operation between the settlements and actors involved. Therefore the detailed analysis and comparison of both the morphological and the relational dimension of polycentricity in different cities is an essential requirement to assess the cities' potentials and to shape effective development strategies. Relational Polycentricity on the meso and macro level, which includes institutional relations, interactions and flows both among the five partner cities and between them and the "rest of the world", is the backbone of political and market integration of the metropolises. They have the choice between a close interaction and co-operation with the partner cities or a more global orientation towards other cities and regions. Still, there are some restrictions, since economic, political and research networks seem to be strongly influenced by geographic conditions and historic ties.

A8: The process of metropolitan growth implies, from an economic point of view, the concentration on specific factors defining urban benefits and costs and determining optimal size of the city. Beyond this 'traditional' view on cities the factors of polycentricity (on different spatial levels) as well as of power functions are assumed to have a positive impact on demographic growth in metropolises.

A9: Two main preliminary interpretations to metropolisation can be provided at this stage: on the one hand, cities are different in terms of functions and of territorial capital they are specialized in. A high-value added service city reaches the decreasing return threshold for a size different than that of a manufacturing city. On the other hand, the way in which a city organizes its activities within the general urban system, setting up relations with other cities in a polycentric way on different levels, allows the city to overcome some of its physical limits.

A10: The metropolitan development is regarded as the outcome of the specific competitiveness resulting from its area based advantages through growth in terms of population, jobs and traffic, through the attraction of specific and high ranked functions and economic specialization. Hence the outcome of this process provides specific metropolitan profiles in the different fields of metropolitan development indicating a metropolises' specialization and strengths and weaknesses. These metropolitan profiles indicating relative differences between metropolises provide and in a benchmarking way the impulse for learning processes how to identify and how to meet new challenges.

A11: Two different perspectives regarding competitive and inclusive metropolitan development is the challenge of a strategic governance approach that becomes evident supporting a smart development as: 'Smart metropolitan development' indicates the ability of a metropolitan agglomeration to cope with the challenges of competitiveness and inclusive development which is based on its territorial cohesion under the polycentric perspective. The similarities and differences

between the metropolises in Europe are assumed to be an outcome of the competitive and at the same time strategically steered process of metropolisation based on the specialization in metropolitan functions.

1.5 Policy Relevance

Challenges of competitive metropolitan development have become subject of a comprehensive academic governance discussion (Parkinson, 1997 and 2003; Begg, 1999; Ottgaar et al., 2008; Salet et al., 2003; Healy, 1997). At the same time, challenges of intra-urban development already found attention in the policy debate within the URBAN-initiative of the first and second programme period at the European level. Based on the Lisbon-Agenda of 2000 the policy debate concentrated for some years on competitiveness predominantly. Up from 2008 The Green Paper stresses three issues regarding Territorial Cohesion: (EC, 2008, Green Paper on Territorial Cohesion Turning territorial diversity into strength; (found July 27, 2011 at: http://eur-lex.europa.eu/LexUriServ /LexUriServ.do?uri=COM:2008:0616:FIN:EN:PDF)

- concentration and specialization of urban and rural/peripheral regions strengthen functional regional links,
- connection by different infrastructures: hard, ICT, networks in knowledge economy and research;
- cooperation: at various levels, horizontal and vertical multilevel governance.

Since some years policy discussion shifted to issues of social and territorial cohesion in front of problematic and divergent processes at least on the interregional level. Recently the Europe 2020 Strategy is raising again the issue of cohesion and emphasizes the objective of 'smart growth'. (found July 27, 2011 at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF) In this Europe 2020 Strategy the discussion of an EU Cohesion Policy after 2013 focuses on smart, sustainable and inclusive growth. This policy initiative is based on the premises that

- metropolises have decisive importance for Europe's competitiveness,
- connectivity between highly developed and specialized places and good accessible metropolitan areas is crucial,
- networks on different geographical scales are linking global market places, and
- good governance and territorial cooperation are vital elements for the enforcement of economic and social cohesion (ESPON, 2010, p.6).

From the spatial perspective inclusive growth should be based on its urban and regional competitiveness and at the same time it is regarded as "…not just economic and social cohesion, but also territorial cohesion." (ESPON, 2010, p.29) Very obvious, it is acknowledged that competitiveness on the one hand and economic and social cohesion on the other hand are two clear complementary aims. Stressing these complementary or even conflicting goals territorial cohesion becomes the most important challenge – as a political goal but also as a means to meet the respective challenges within a certain territory. Correspondingly, in the ESPON point of view inclusive development is directly linked to territorial cohesion overcoming the contradiction and mutual obstacles between competitiveness and economic performance on the one hand and cohesion, environmental standards and quality of life on the other. Hence, the notion of inclusive development clearly stresses the importance of territorial cohesion as one of its crucial pre-requisites. So, inclusive development has become an important aspect and political agenda of territorial development. However, its comprehensive understanding is described in a short review on its use in literature. (see 10.2 Annex II: Conceptual Review of "Inclusive Growth")

To conclude from a policy perspective: Metropolisation is a process of attracting specific new activities, jobs and residents which is predominantly based on its competitiveness. This means, that the attraction of specific metropolitan functions and activities is based on a cities specific and usually strongest assets and important potentials which provide specific area based advantages. These pre-

conditions make certain places/areas more attractive than others – even within cities or at least in a wider metropolitan territory. Along with this process new sub centers emerge and metropolitan development usually goes far beyond city borders in a more or less polycentric way. In this context metropolitan governance approaches become of crucial importance regarding territorial development: Through the enforcement of competitiveness and the attraction of such functions the risk of socioeconomic polarization increases and spatial fragmentation is enforced increasingly because not every social group of metropolitan inhabitants and not every area is able to participate on competitive processes. Hence, the stronger these divergent processes are, the more will social polarization increase and social cohesion is presumably jeopardized. At the same time such specific allocation of metropolitan function steers spatial development but even the risk of increasing spatial disparities. If this polycentric development implies mutual interlinks a cohesive economic and territorial development is secured. But, very often a metropolis's territorial development is enforced through spatially divergent processes which increasingly show the risk of spatial fragmentation the more distinct areas are not able to compete for new metropolitan functions.

In a territorial perspective policy on inclusive development is challenged as a normative approach on the socio-spatial level. Facing the impacts and risks of urban competitiveness inclusive development policy has to ask for the enforcement of territorial cohesion explicitly. Of course this goal is the more challenging the more metropolitan competitive development affects exclusively most attractive areas across different administrative entities and enforces divergent economic development trends and disparities within a metropolitan area.

1.5.1 Policy for Smart metropolitan development

Over the last years the term 'smart' has become a buzz-word in the discussion on processes of urban growth and urbanization. But its meaning still varies. So the question on the definition of the term 'smart' in the context of metropolitan development needs to be answered next.

Originally the term 'Smart City' was used to describe a city with a 'smart' industry indicating economic activities in the field of information and communication technologies (ICT). In this discussion its invention and production as new technologies as well as its implementation and use in specific production processes is regarded as very important for urban growth (Giffinger et al., 2007; Caragliu, et al., 2009). This ICT-dominated understanding of 'smart city' has become rather prominent over the last years discussing its implementation in different fields of urban development: from industry over the fields of urban traffic systems, mobility, energy efficiency and logistics to governance as so called e-governance . Accordingly, the availability and quality of ICT infrastructure are regarded as crucial components of smartness.

Besides the 'wired' (hard infrastructure) city other factors had been discussed as decisive arguments of a smart urban development (Caragliu, et al., 2009, p. 4/5): business-led urban development in a predominantly managerial understanding, social inclusion and equity-based urban growth, soft infrastructure-based development (e.g. knowledge networks), social and relational capital as preconditions for smart growth and social and environmental sustainability as decisive components of urban development. Hence, the emphasis on these different aspects makes evident that there is still no- clear definition.

Basically 'smart growth' is discussed in three dimensions within the European Union:

- Education which encourages people to learn, study and update their skills;
- Research/innovation which creates new products, services and jobs; and
- Digital society which uses ICT in the run of urban development.

Again, the link to technological issues is very obvious (European Commission, Europe 2020; found at http://ec.europa.eu/europe2020/priorities/smart-growth/index_en.htm). In a more spatial and policy-related perspective it is emphasized that "To achieve smart growth Europe will need smart places" (European Commission, 2010, p.31). Smart places are then defined in the perspective of competitiveness as such places which attract people and firms and where knowledge and innovation, strategies and territorial governance, networks and connectedness are crucial

characteristics. In this respect smart cities can be seen as 'smart places' that are competitive due to their use of assets deriving from functional specialization and connectedness. Hence, even the concept of smartness indicates that the connectedness becomes important but it does not go into detail regarding the different forms of polycentricity.

Based on different arguments of urban development theory Giffinger et al. (2007) identified several fields within which the smartness of urban development is challenged. Accordingly smart cities are defined "… with regard to their ability to come to terms with the challenge of increasing city competition in a knowledge-based economy. For that purpose the cities have to be described from a functional perspective by new indicators which go far beyond conventional location related factors. These indicators must not be confined solely to local facilities of endowment; they also have to cover the activities of self-decisive and independent citizens in terms of awareness and participation of a city's inhabitants in addressing new challenges. Accordingly, 'smart' implies in particular the implicit or explicit ambition of a city to improve its economic, social and environmental standards and consequently its competitiveness in urban competition" (Giffinger et al., 2010, p.304 f.). This understanding does not exclusively concentrate on technological issues but emphasizes in particular the interplay of inhabitants, economic actors and policy and asks for governance approaches which have to cope with different challenges. Hence, this concept does not focus merely on the potentials and endowments in the different fields of an urban agglomeration but it underpins the activation and acceptance of assets (but not only those in the ICT sector) by metropolitan actors as decisive driving forces.

To conclude, scientific literature, public discussion and governance concepts do not provide a clear definition of 'smartness' of a territory. However, the definition of a 'smart city' in POLYCE will stay in line with what was defined in the project 'European Smart Cities' (www.Smart-Cities.eu), whereby the emphasis lies on the different challenges (through technological innovation, sociodemographic processes and economic restructuring) a city has to cope with balancing competitive and inclusive metropolitan development. In particular this policy related perspective allows considering the complementary and sometimes even conflicting issues of competitiveness and social cohesion as basic elements of territorial cohesion with regard to metropolitan development driven through processes of metropolisation and polycentric development.

1.5.2 Understanding Smart Metropolitan Development

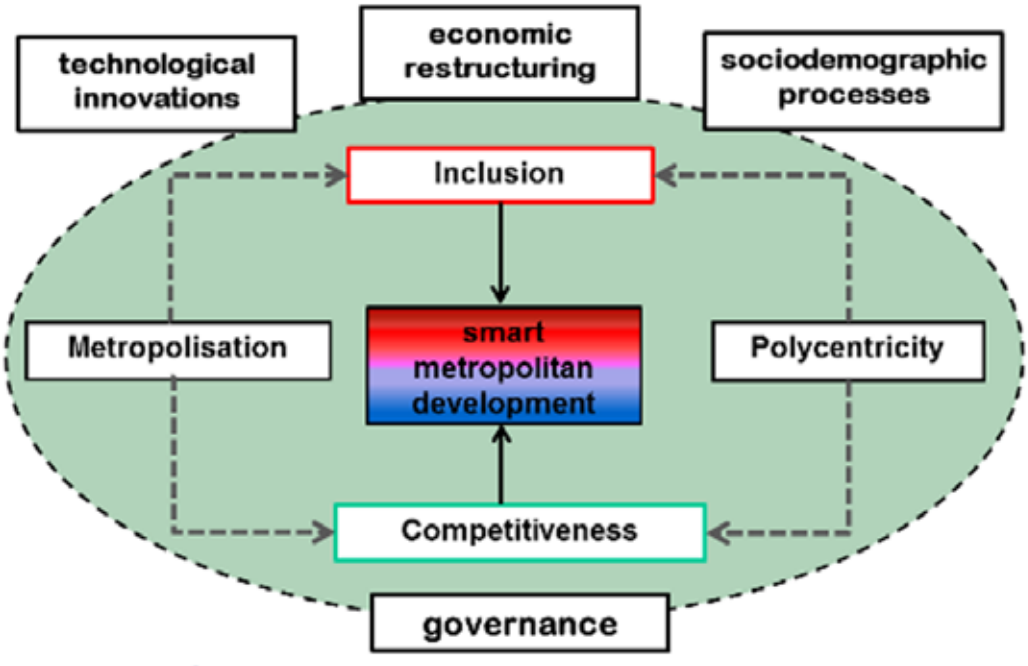

Figure 5: Understanding Smart Metropolitan Development

Based on the above discussion of 'smartness' a smart metropolis is therefore understood as a functional and polycentric metropolitan area within which competitive and inclusive development takes place in a mutually supporting or conflicting form which has to be steered by relevant governance approaches in a balancing way. Hence, the formerly broad definition of a 'smart' city is now précised in the following way:

> *'Smart metropolitan development' indicates the ability of a metropolitan agglomeration to cope with the challenges of competitiveness and inclusive development which is based on its territorial cohesion under the polycentric perspective. Besides, this ability is not related to local facilities of endowment as potentials only, but it also considers covering the activities of self-decisive and independent citizens in terms of awareness and participation of a city's inhabitants in addressing and activating new potentials and supporting and strengthening existing assets.'*

To conclude, policy integrating competitive and inclusive development in a smart way becomes even more challenging the more metropolisation provokes social polarization and processes of precarisation jeopardize social cohesion (having a negative impact on competitiveness again). However, polycentricity – in particular on the micro-level within the functional metropolitan area – is likely to enforce territorial cohesion the more corresponding polycentric factors support functional relations and the more economic growth is distributed across all intra-metropolitan areas. Hence, policy supporting smart metropolitan development has to foster and enhance institutional polycentricity in form of strategic development approaches.

1.6 Methodological perspective

From a methodological point of view the concept of POLYCE on the one side demands for the description and analysis of specific 'phenomena' of metropolitan development and components of a metropolis's territorial capital. On the other side the concept demands for an evidence based explicit identification and assessment of potentials and assets and a place related elaboration of strategic recommendations. Hence, a combination of two types of methodologies is applied in the run of the empirical analysis under an ontological perspective. (Werlen, 1995) First, empirical research is realized applying an analytical-objectivistic approach. Accordingly, concepts and hypothesis are formulated based on recent theoretical discussion and in WP 2.1, 2.2 and 2.3 empirical analysis applies relevant quantitative methods. Then – based on finding of analytical Work Packages – in WP 2.4 and 2.5 qualitative methods are applied in order to improve perception of potentials and to provide assessments of assets and the elaboration of strategic findings. Hence, distinct qualitative methods are used which support learning processes and discursive identification of strategic recommendations.

Based on the understanding of polycentricity which considers different forms and different spatial levels, distinct dimensions of morphological and relational (i.e. functional) polycentricity are defined and operationalized through corresponding quantitative indicators and measures. Most of these indicators are related to the micro level. According to our understanding this means empirical description of morphological and or functional polycentric characteristics for the five metropolises. Besides, some indicators describe functional characteristics of polycentricity on the meso and macro level. This empirical analysis not only provides information on strengths and weaknesses of polycentricity with in this potential integration zone of the five metropolises, but also to its polycentric features towards other potential integration zones in a wider European context, in some aspects even the Danube macro-region. Empirical analysis is based on detailed data collecting and respective calculations.

In a combined neo-classical and regional science perspective urban size, metropolisation and polycentricity are analyzed in front of the counter-intuitive trend occurring in most EU cities,

showing a continuous population increase notwithstanding the high and unquestionable costs associated to large urban scales. First, in an econometric approach based on assumptions of spatial equilibrium optimal city size has to be detected discussing benefits and costs of urban size. Then, beyond the traditional view, some additional hypothesis on city size through metropolisation and polycentricity are tested. Building on a macro urban growth model, a specific discussion of relevant influencing factors of urban growth, through the interpretative lenses of the paradigms of urban rank, metropolisation and urban polycentricity is realized. The model finally provides information discussing future expected urban growth patterns. Empirical analysis is based on a sample of 50 EU27 Functional Urban Areas in the period from 1989 to 2010. Relevant indicators are elaborated on the base of ESPON data sources.

In order to describe metropolises in a comparable and quantitative way 'urban profiles' will be defined and operationalized through corresponding indicators. Special attention is given to the empirical description of both terms 'metropolisation' and 'polycentricity'. According to former empirical studies this description of metropolitan development should comprehend in particular characteristics in the fields of economy, people, environmental and living standards, mobility, policy and governance conditions. In particular, here the concept of territorial capital is used for the definition of indicators which describe every city in a bundle of characteristics which are related to metropolisation and/or polycentricity. In order to describe metropolises in their territorial capital dimensions a large sample of indicators is defined based on ESPON data sources of different former projects or even from Urban Audit. This large group of indicators will be aggregated applying a relevant aggregation procedure considering statistical problems. As a result the empirical analysis provides quantified metropolitan profiles for every city included. Hence, the position of every city in the European urban system as well as the comparison and benchmarking against other cities will be described through this approach. The city sample is based on about 100 European metropolitan growth areas (MEGAS – ESPON, 2005, Report 1.1.1.) including the five metropolises Bratislava, Budapest, Ljubljana, Prague and Vienna.

Based on different quantitative results regarding metropolisation and polycentricity in the second phase of POLYCE project the main objectives are to identify further metropolitan potentials and to assess findings regarding their meaning and importance as an asset for metropolitan development. Two different qualitative methods will be applied.

Questionnaire

Interviews with about ten to fifteen important stakeholders are to be realized in every metropolitan area. Three different groups of questions were asked according to the project's objectives: Recent urban development trends and city profile of the respective city, Perspectives for future development, and Realization of inclusive metropolitan development through cooperation. Further details and questions see 10.6 Annex VI: Questionnaire.

Local workshop

A workshop with about 25 stakeholder participants will provide the opportunity to assess quantitative empirical results and information taken out of the interviews. Due to specific forms of moderation the analytical results will be condensed to most relevant potentials which should be activated, and defined as most relevant assets for positioning in the European urban system.

Of course, policy relevance of empirical research will be considered in detail. Based on the empirical findings assets and potentials are discussed and evaluated regarding their meaning for future smart metropolitan development. This means that in the last phase of POLYCE project the discussion and empirical analysis of strategic documents will focus on the meaning of metroplisation and polycentricity as steering factors of inclusive and/or competitive development. This discussion and assessment is realized in the second part of the local workshops with metropolitan stakeholders and – most of all - in a final analysis of recent strategic documents and initiatives. Outcome which is documented in chapters 6.2 Metropolitan Agendas and 6.3 A Central European Development Agenda are recommendations regarding smart development for the five metropolises (on the micro

level) and for the CED - zone as part of the wider macro Danube region (most of all on the meso level, partly on the macro level) (see Figure 6 below).

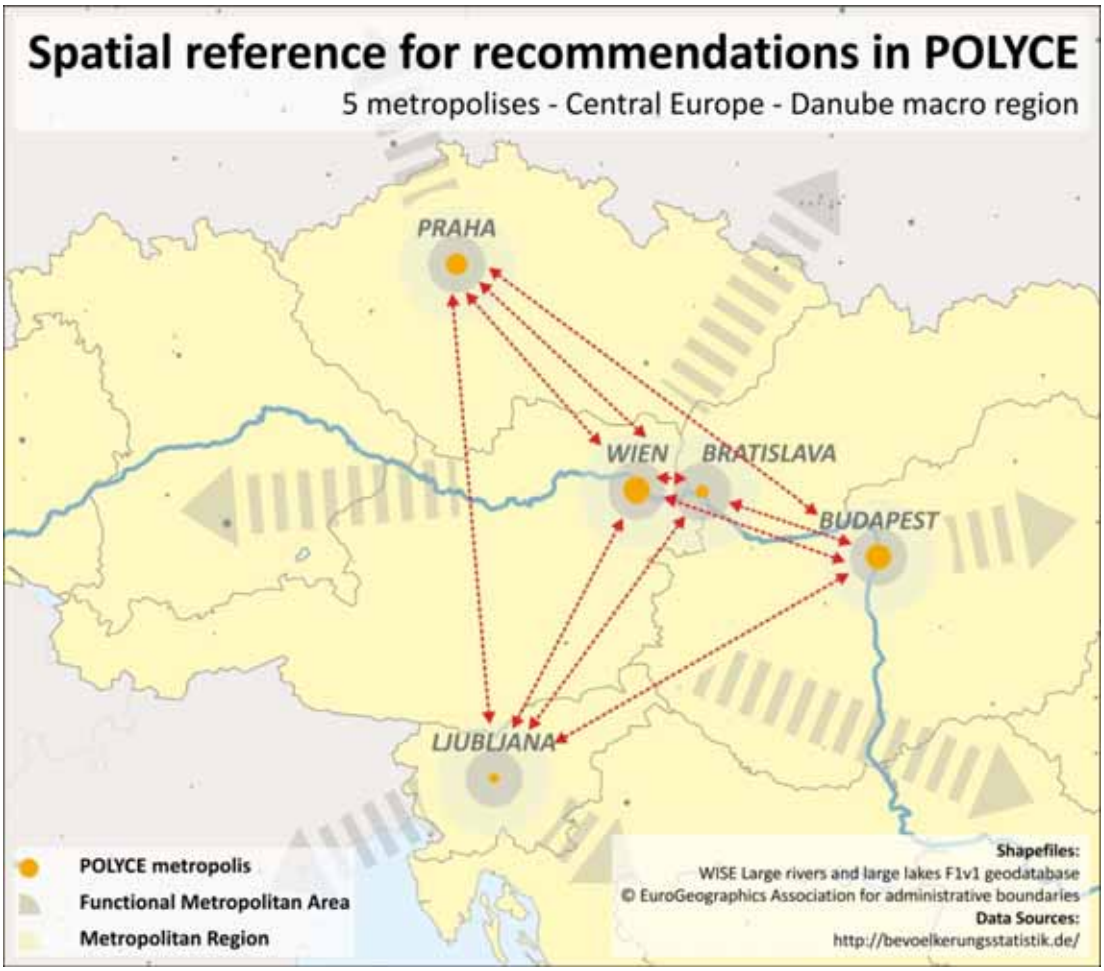

Figure 6: Spatial reference for recommendations in POLYCE

2 The Polycentric System in Central Europe

The aim of the analysis in WP2.1 was the assessment of polycentricity in urban systems of the CED-zone on **three territorial scale levels**:

- Intra-metropolitan polycentricity;
- Polycentricity within the Central European - Danube global integration zone;
- Position of the CED-zone within Europe.

The analysis focused on **capital cities, their functional metropolitan areas (FMAs) and metropolitan regions (MR)** as major growth poles and engines of regional development, while reflecting their position within national urban and regional structures.

2.1 Definitions and methodological approach

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2.1.1 The concept of polycentricity

Polycentricity in POLYCE is conceptualized as an important feature of urban systems, which are understood as functionally integrated socio-spatial entities (in ESPON POLYCE, these are Functional Metropolitan Areas (FMA), Metropolitan Regions (MR) and Central European Danube Zone (CED zone)). A functionally integrated urban system consists of multiple nodes (centers) with several possible internal spatial arrangements ranging from the dominance of one center over the rest of the system (monocentric) to plurality of centers of the same size and significance (Clark, 2000; Kloosterman and Musterd, 2001; Hall and Pain, 2006). In reality, any system of centers in a functionally integrated urban system is hierarchically organized, however with tendencies to higher monocentricity or higher plurality between more centers. The later is usually associated with polycentricity. Polycentricity in terms of higher plurality between centers in an integrated urban system is from a normative point of view seen as creating better conditions for efficient, cohesive and sustainable development in comparison with a monocentric form (CEC, 1999; ESPON, 2005; Kragt, 2006). This is why it is attractive as urban and regional planning concept (Davoudi, 2003; Faludi, 2004; Meiers, Waterhout and Zonneveld, 2005a,b).

Polycentricity has several mutually interlocked aspects, which operate together. They include:

- more even (polycentric) structure of nodes according to their size and significance (rank and size) – this is called **morphological polycentricity** (as indicator we use regression coefficient that measure the slope of rank size distribution of centers)
- reciprocal and multidirectional flows and interactions between nodes (as opposed to unidirectional to single center), including conditions for these flows and interactions – this is called **relational polycentricity** (as indicator we use the share of reciprocal component of lows on the total commuting to work)
- mutual interests, considerations, inspiration, collaboration, complementarity in decision making in the nodes and between nodes (beside individual bottom up activities, the whole system can have holistic integrated top-down/bottom up strategy for enhancing polycentricity) – **relational polycentricity in governance** (we evaluate policies and planning strategies at FMR, MR and CED zone levels)

Polycentric urban system is functionally integrated socio-spatial entity that consists of multiple urban nodes that may differ in size yet all play important role in the system, are linked through intensive reciprocal and multidirectional relations with further development influenced by governance strategies that recognize, consider and support future enhancement of mutual interests, complementarities, synergies and potentials for collaboration.

2.1.2 Territorial units

There are three key methodological questions for the analysis of polycentricity: **territorial units of analysis, identification of centers** and **indicators of polycentricity**. As indicators cannot be treated out of territorial framework, both issues are tightly related. Furthermore, territorial units and data should well consider and reflect **natural, organic, integrated socio-economic spatial formations**.

Territorial units of analysis reflect work done up to present within ESPON framework, yet they are further developed it in relation to the specificities of **local and regional context of Central European - Danube Zone**. The basic territorial unit of analysis is metropolitan area. ESPON POLYCE investigates intra-metropolitan polycentricity within metropolitan areas and **inter**-metropolitan polycentricity between these areas within Central European – Danube Zone and in relation to wider European space.

For the study of polycentricity we use three types of delimitation of metropolitan areas:

- **Core City (CC)** - capital cities in their administrative delimitation
- **Functional Metropolitan Area (FMA)** - daily urban system at micro-regional level delimited as areas of intensive commuting to work (micro level)
- **Metropolitan Region (MR)** - wider economic mezzo-region reflecting the territorial networks of a city's economy (meso level)

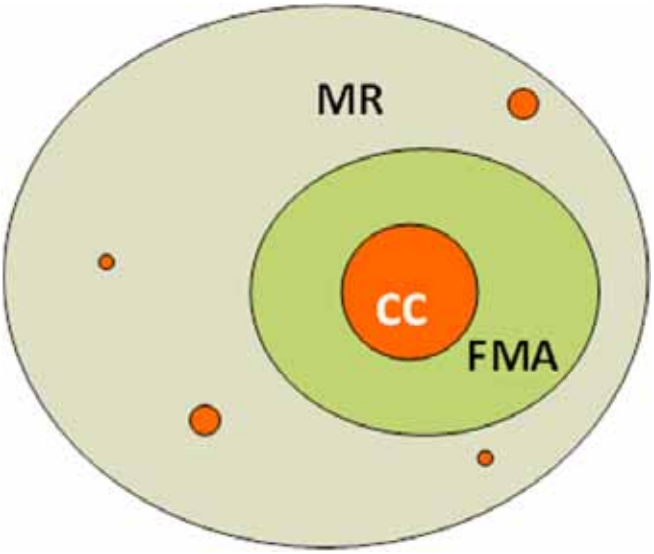


Figure 7: Territorial units

Notes: MR = FMA+Outer Metrop. Ring (OMR), FMA = CC+Outer FMA (OFMA)

The intra-metropolitan polycentricity is assessed within Functional Metropolitan Areas (FMA) and Metropolitan Regions (MR). The basic unit of intra-metropolitan polycentricity analysis is municipality or aggregate of neighboring and functionally integrated municipalities. Polycentricity within the Central European - Danube global integration zone and position of the CED-zone within Europe is assessed based on Core City (CC), Functional Metropolitan Areas (FMA) and/or Metropolitan Regions (MR) as the basic units of analysis.

The **intra-metropolitan polycentricity** assessment uses Functional Metropolitan Areas (FMA) and Metropolitan Regions (MR). Both are organic territorial units that reflect real socio-economic-spatial

systems. **Functional Metropolitan Areas (FMA)** represent daily urban system of the capital city at micro-regional level understood as areas of intensive commuting to work. They are a good base for comparative analysis as the organic territories are better comparable than administrative regions that substantially differ between countries. Metropolitan Region (MR) represent wider economic mezzo-region that includes territorial networks of the capital city's wider regional economy. **Metropolitan Regions (MR)** itself consists beside FMA of several other functional urban areas (FUAs) with their urban cores. Hence the assessment of polycentricity involves larger and more independent urban centers.

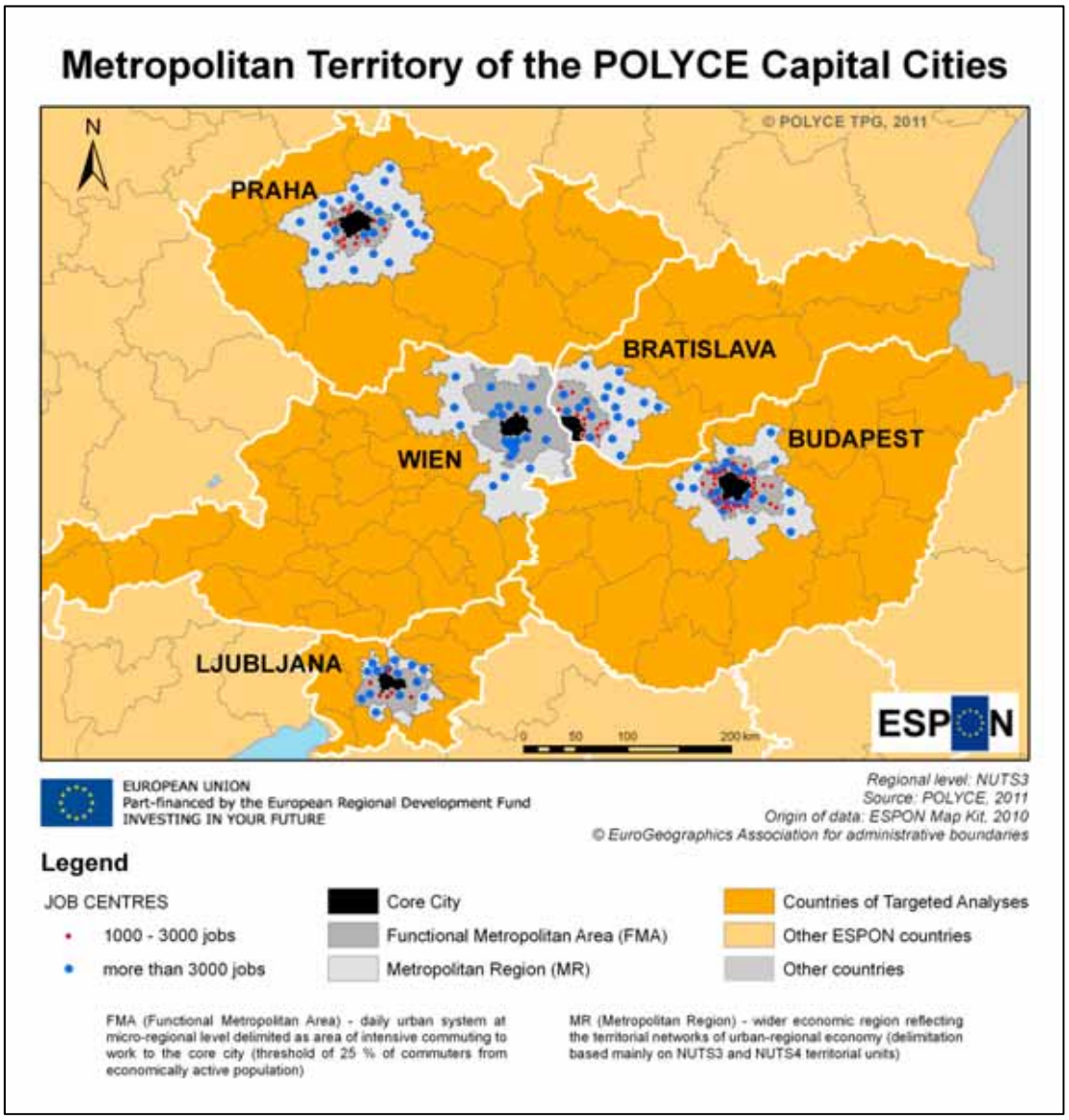


Figure 8: Metropolitan Territory of the POLYCE Capital Cities

For the assessment of **polycentricity within the Central European - Danube global integration zone and position of the CED-zone within Europe** we can use Core Cities (CC), Functional Metropolitan Areas (FMA) and/or Metropolitan Regions (MR) as the basic units of analysis. Capital cities in their administrative delimitation, i.e. Core Cities (CC) well represent the majority of population, economic activities and relations. Therefore, we do not necessarily need to use FMAs. Data are readily available for CC in comparison with FMA, that are not government and statistical units for which data would be readily available. Hence for FMA we can use only data available at municipal (LAU2) level and aggregated for FMA. It also has some cons - we do not use FMAs as basic territorial building blocks, despite they are the most organic socio-spatial entities. Alternatively, we can use whole

Metropolitan Regions (MR) which represent wider regional economies clustered around the capital city and its FMAs. For MR, especially economic data are available.

Core City (CC) is central/capital city in its administrative boundary. **Functional Metropolitan Area (FMA)** was delimited using data on commuting to work reflecting the threshold of 25 percent of commuters to core city from economically active population was used respecting the principle of territorial consolidation (excluding municipalities that are islands outside the core territory and including those that form windows inside the territory). There can be certain differences in the level of economic development and spatial mobility of population between individual countries, so the arbitrarily set threshold of commuting levels might slightly differ from realities in individual countries and their settlement and regional systems. However, the main aim of ESPON POLYCE is to assess the level of internal morphological and relational polycentricity based on the structure of and relations between centers within FMA and small differences in the FMA delimitation has only negligible, if any, influence on polycentricity indicators. **Metropolitan Regions (MR)** cannot be delimited using more precise/accurate methodology of spatial integration flows as in the case of FMA and commuting to work. The delimitation in ESPON POLYCE was based on the expert assessment of national teams and consultations with the stakeholders. In general, NUTS3 and in some cases, such as Budapest, NUTS 4 regions were used for the delimitation of MR.

2.1.3 Indicators of intra-metropolitan polycentricity (micro level)

Polycentricity in urban system is given by the structure of and relations between urban nodes within given urban and regional system. Hence, first we had to **identify urban centers** in FMA and MR of each capital city.

We identified employment nodes at municipal (LAU2) level using data about the number of jobs. **Job center** was considered to be a municipality or cluster of neighboring municipalities that provide proximity of employment areas (municipality in a cluster must have a minimum of 500 jobs) with a total of certain concentration of number of jobs. Job centers within FMAs were identified using a threshold of 1000 jobs: these are job centers with local influence. Within MRs we used a threshold of 3000 jobs for the identification of job centers with microregional influence. There must be difference in analyzing two spatial levels of FMA and MR as the nature of socio-economic relations constitutive of these two spatial levels is different.

Based on local expertise, municipalities with less or more than indicated thresholds could be included/excluded from the list of job centers within FMA and MR, due to specific local circumstances. As statistical sources usually do not provide data on number of jobs in municipalities we calculated it from economically active population, less economically active women on maternity leave, less unemployed, less out-commuting for work plus in-commuting for work.

Two approaches were used to measure the level of polycentricity in FMA and MR: **morphological** analysis and relational analysis. Both analyses work with the core city and centers identified within FMA and MR territories.

Morphological polycentricity was analyzed evaluating rank-size distribution of centers. We used two analytical tools. First, we compared the real distribution of population/jobs with the “ideal” rank-size curve based on the presumption: 1. = 2. + 3. + 4. = 5. + 6. +...+ 11. +12. = 13. +...+ 34. (the size of the city of the first rank is equal to the sum of sizes of second, third and fourth city, etc.). Second, we used the Zipf regression function describing the nature of rank-size distribution within FMA and MR (see Annex 10.3.1: Zipf regression function). The level of polycentricity is given by the measure of the slope of regression line (regression coefficient). The coefficient expresses the theoretical decrease of size (job or population size measured on log-scale) when increasing the rank of the center by one unit. The higher the coefficient, the steeper is the regression line – indicating higher hierarchy and lower morphological polycentricity. For each job center and the evaluation of morphological polycentricity, we collected data on population, jobs, jobs in III and IV sector if available, economically active population, ea in III and IV sector if available, for 1990 – 2000 – 2010 (if

available). For morphological polycentricity in MR we used only job centers with microregional influence, i.e. with at least 3000 (or so) jobs.

Relational polycentricity was analyzed evaluating functional linkages between centers within FMAs and MRs. Analyzing the matrix of commuting-to-work flows between centers in FMA and MR, we distinguished between reciprocal and hierarchical component of each commuting flow. Reciprocal component is the sum of commuting fluctuation between the two centers. Hierarchical component is the remaining unidirectional flow (see Figure 9).

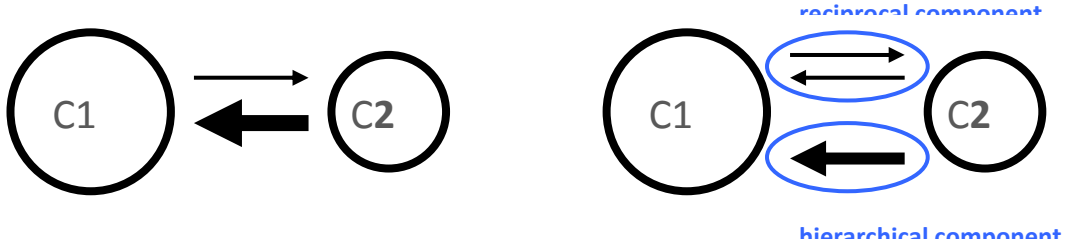


Figure 9: Reciprocal and hierarchical components of commuting flows

We have calculated the share of reciprocal component on total commuting for the relation between each couple of centers and distinguished between three levels of reciprocity. In instances with reciprocal component accounting for over 65% we considered the relation as **reciprocal**, while relations with reciprocal component below 35% were considered as **hierarchical**. Relations with reciprocal component between 35% and 65% were considered as plural relation that maintains certain hierarchical subordination yet with significant reciprocal both directional relations.

All relations were visualized in maps of metropolitan areas showing the composition and possible predominance of either hierarchical or reciprocal relations and thus the character of relation polycentricity in the area. Furthermore, we have calculated the **level of relational polycentricity** in the whole FMAs and MRs of individual cities as the share of reciprocal flows (reciprocal component) on the total sum of flows between all centers within given territory.

2.1.4 Overview: Basic data of the five metropolises

The basic indicators of population size and no. of jobs in CC, FMA and MR and in centers within FMA and MR of individual metropolises are provided in Figure 10, which also gives the number of municipalities and number of job centers in FMA and MR.

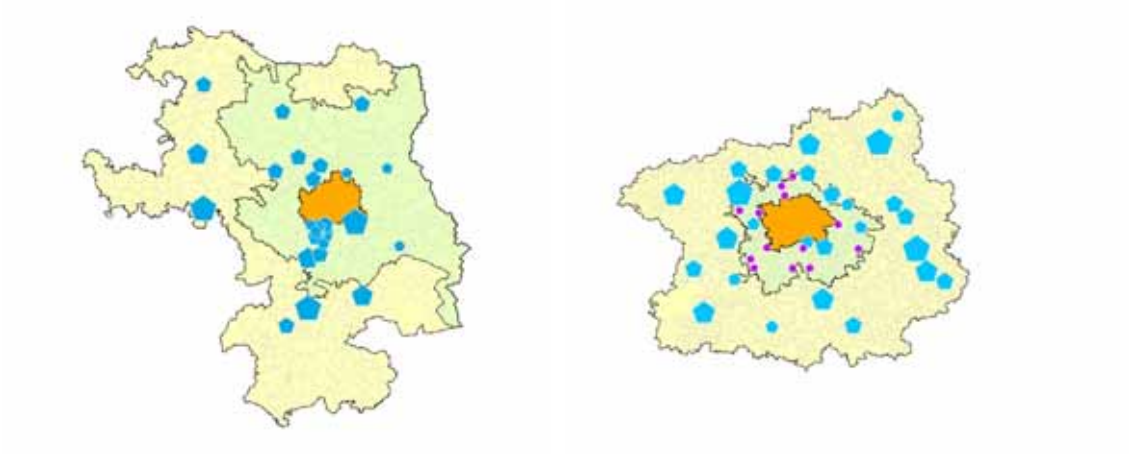
Indicators	Wien	Praha	Budapest	Bratislava	Ljubljana
Population CC	1 550 123	1 169 106	1 777 921	442 291	256 881
Population FMA	2 227 580	1 391 579	2 545 841	655 674	456 915
Population MR	2 900 846	2 291 579	3 208 658	1 337 586	650 119
Jobs CC	821 458	746 427	856 193	317 322	178 020
Jobs FMA	1 060 921	837 017	1 051 127	403 309	230 135
Jobs MR	1 306 051	1 230 856	1 231 143	733 496	299 037
Population in FMA centers	1 788 029	1 266 753	2 382 582	569 729	426 004
Population in MR centers	1 927 263	1 619 180	2 370 414	859 870	541 004
Jobs in FMA centers	982 150	794 666	1 025 514	376 865	224 827
Jobs in MR centers	1 092 606	1 016 289	1 061 810	575 516	277 212
No of FMA municipalities	220	236	109	100	24
No of MR municipalities	507	1149	284	372	35
No of FMA centers	20	20	47	19	14
No of MR centers	26	27	26	18	15
area CC	415	496	525	368	275
area FMA	6 490	2 104	3 479	2 385	2 206
area MR	14 625	11 510	10 291	7 082	4 014

Figure 10: Basic data of CC, FMA and MR

Notes: FMA (functional metropolitan area) - daily urban system at micro-regional level delimited as area of intensive commuting to work to the core city (threshold of 25 % of commuters from economically active population). MR (metropolitan region) - wider economic region delimited reflecting the territorial networks of a city's economy (delimitation based mainly on NUTS3 territorial units).

Wien

Praha



Budapest

Bratislava

Ljubljana

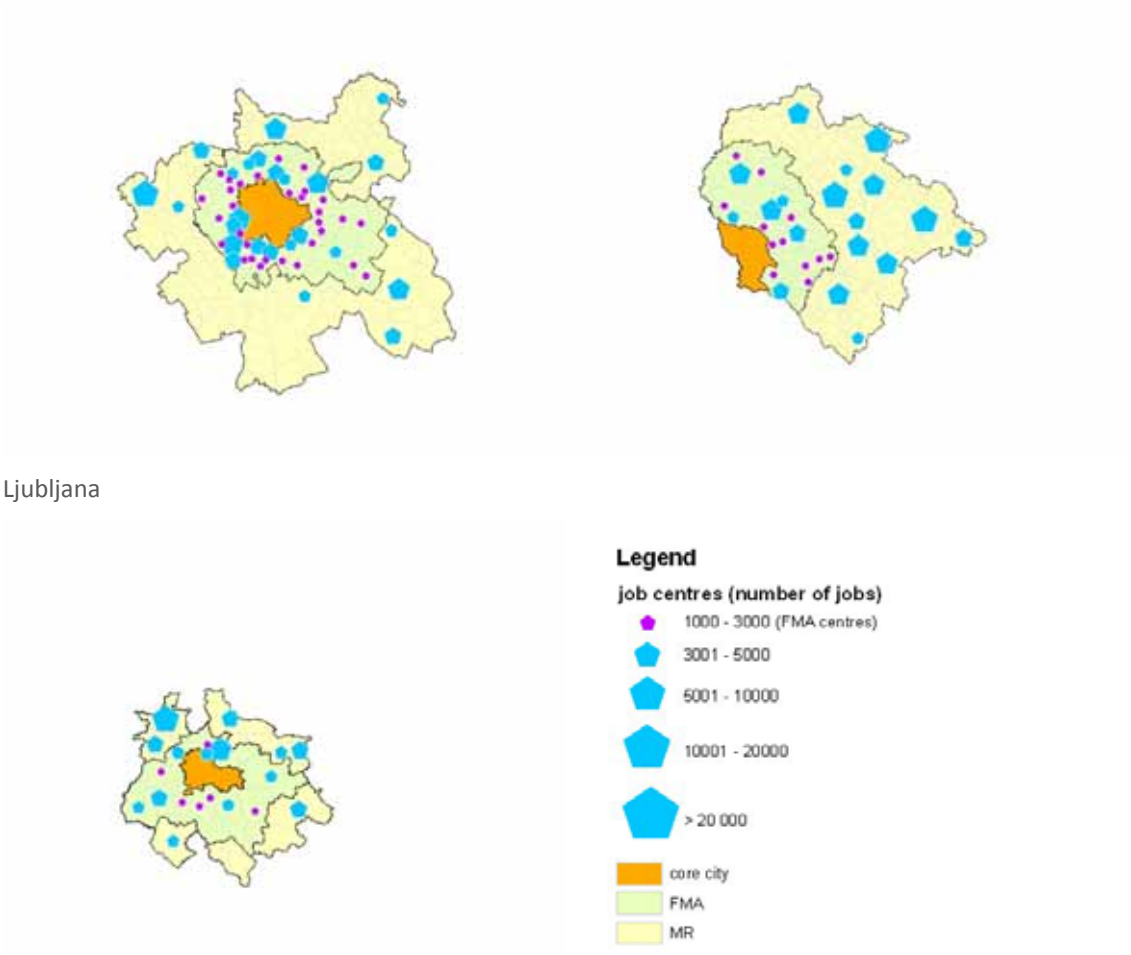


Figure 11: Metropolitan regions, functional metropolitan areas and job centers (Wien, Praha, Budapest, Bratislava and Ljubljana)

2.2 Morphological and relational polycentricity

Authors: Ludek Sykora, Ondrej Mulicek, Petr Kucera, Branislav Machala

2.2.1 Morphological polycentricity

For measuring morphological polycentricity we used population size and no. of jobs in FMA and MR centers (job centers in FMA with below 3000 jobs are not considered as job centers within MR). Figure 12 provides an overview of rank size distribution for centers in FMAs and MRs. FMAs are sharply dominated by their core cities especially in terms of jobs. Ljubljana shows the lowest and Praha the highest level of dominance in FMA. Core cities also dominate their metropolitan regions (MR), yet on lower level than in the case of FMAs. Bratislava and Ljubljana have both relatively high and similar levels of morphological polycentricity which substantially differ from the other three metropolitan regions that are strongly monocentric, with the highest dominance of Wien in terms of population concentration to core city and Budapest in terms of job concentration to the core city.

FMA pop.	**1.**	**1. (%)**	**2.-4.**	**2.-4. (%)**	**5.-12.**	**5.-12. (%)**	**13.-34.**	**13.-34. (%)**
Wien	1550123	100	69704	4,50	105360	6,80		
Praha	1169106	100	36205	3,10	38302	3,28		
Budapest	1777921	100	117125	6,59	163978	9,22	245167	13,79
Bratislava	442291	100	53528	12,10	51382	11,62		
Ljubljana	265881	100	66751	25,11	84542	31,80		
FMA jobs	**1.**	**1. (%)**	**2.-4.**	**2.-4. (%)**	**5.-12.**	**5.-12. (%)**	**13.-34.**	**13.-34. (%)**
Wien	837173	100	45980	5,49	63447	7,58		
Praha	746427	100	19686	2,64	18732	2,51		
Budapest	856193	100	41717	4,87	51898	6,06	58547	6,84
Bratislava	317322	100	28896	9,11	22159	6,98		
Ljubljana	178020	100	20969	11,78	23596	13,25		
MR pop.	**1.**	**1. (%)**	**2.-4.**	**2.-4. (%)**	**5.-12.**	**5.-12. (%)**	**13.-34.**	**13.-34. (%)**
Wien	1550123	100	111545	7,20	141619	9,14		
Praha	1169106	100	151273	12,94	155283	13,28	176754	15,12
Budapest	1777921	100	167092	9,40	214346	12,06	309520	17,41
Bratislava	442291	100	188177	42,55	165691	37,46		
Ljubljana	265881	100	107604	40,47	142507	53,60		
MR jobs	**1.**	**1. (%)**	**2.-4.**	**2.-4. (%)**	**5.-12.**	**5.-12. (%)**	**13.-34.**	**13.-34. (%)**
Wien	837173	100	90852	10,85	90289	10,78		
Praha	746427	100	93386	12,51	96217	12,89	91920	12,31
Budapest	856193	100	61419	7,17	79179	9,25	88338	10,32
Bratislava	317322	100	122779	38,69	99528	31,36		
Ljubljana	178020	100	45569	25,60	43493	24,43		

Figure 12: Rank size distribution (2001, Ljubljana 2002)

Figure 13 shows a comparative summary of indicators of morphological polycentricity, for which we used the regression coefficient from the Zipf regression function describing the nature of rank-size distribution within FMA and MR. MR and FMA are less polycentric using job data. This is given by the higher level of job concentration compared to population. There is higher level of polycentricity in MR compared to FMA for all cities but Budapest. This is not surprising as the capital city usually has higher dominance over immediate FMA rather than its wider region. The regression line is strongly influenced by the capital city, which is in all cases dominating the system, i.e. is above the regression line. However, it is also impacted by the evenness or unevenness between other centers in FMA and MR. Therefore, we have to consider both these impacts in our interpretations of morphological polycentricity.

MR/FMA	MR pop.	MR jobs	FMA pop.	FMA jobs
Wien	1,1 696	1,2418	1,2202	1,2620
Praha	1,2469	1,2421	1,4371	1,5901
Budapest	1,0680	1,1881	0,9432	1,1522
Bratislava	1,3021	1,3246	1,3898	1,6084
Ljubljana	1,0841	1,2545	1,2715	1,5361

Figure 13: Indicator of morphological polycentricity (regression coefficient) (2001, Ljubljana 2002)

Comparing both measures of morphological polycentricity the highest contradiction is between the high level of dominance of Budapest in both FMA and MR compared with the lowest slope of regression line and thus the relative evenness between the job centers concerning their population and job size. This is given by the rank size distribution that on one hand side is characterized by the dominance of 1st city but on the other hand side shows relatively smooth decrease between sized of other centers. In other words, Budapest FMA and MR would have very high level of morphological polycentricity provided there is not the dominance of the Budapest itself. Another example is Bratislava with the lowest dominance of the core city in metropolitan region, yet highest slope of regression line, due to higher slope and faster pace of descending of job centers in MR.

2.2.2 Relational polycentricity

For the measuring relational polycentricity within FMA and MR we used commuting-to-work flows between job centers. We distinguished between reciprocal and hierarchical component of each commuting flow (see methodology) and calculated the share of reciprocal flows on the total commuting within each FMA and MR. Figure 14 shows the indicator for 2000/2002.

		total flows	reciprocal flows	share (%)
Wien	flows in FMA between centers 2001	94214	55362	58,76
	flows in MR between centers 2001	111887	66458	59,40
Praha	flows in FMA between centers 2001	25712	11008	42,81
	flows in MR between centers 2001	67689	24910	36,80
Ljubljana	flows in FMA between centers 2002	42029	12942	30,76
	flows in MR between centers 2002	64530	23132	35,85
Budapest	flows in FMA between centers 2000	147562	54782	37,12
	flows in MR between centers 2000	164328	58760	35,76
Bratislava	flows in FMA between centers 2001	7578	886	11,69
	flows in MR between centers 2001	44359	10524	23,72

Figure 14: Indicator of relational polycentricity: share of reciprocal commuting flows

There is striking difference between Wien, with high levels of commuting reciprocity (approaching 60%) and thus functional or relational polycentricity, and other cities with reciprocal flows between centers in FMA and MR accounting for 20-40%. Only Praha FMA has the share of reciprocal flows over 40% in 2001, reflecting residential and job suburbanization that started in the second half of the 1990s. Unfortunately, up-to-date information, which would reflect situation around 2010 is not available. It is likely, that due to rapidly developing suburbanization the share of reciprocal flows will be quickly increasing.

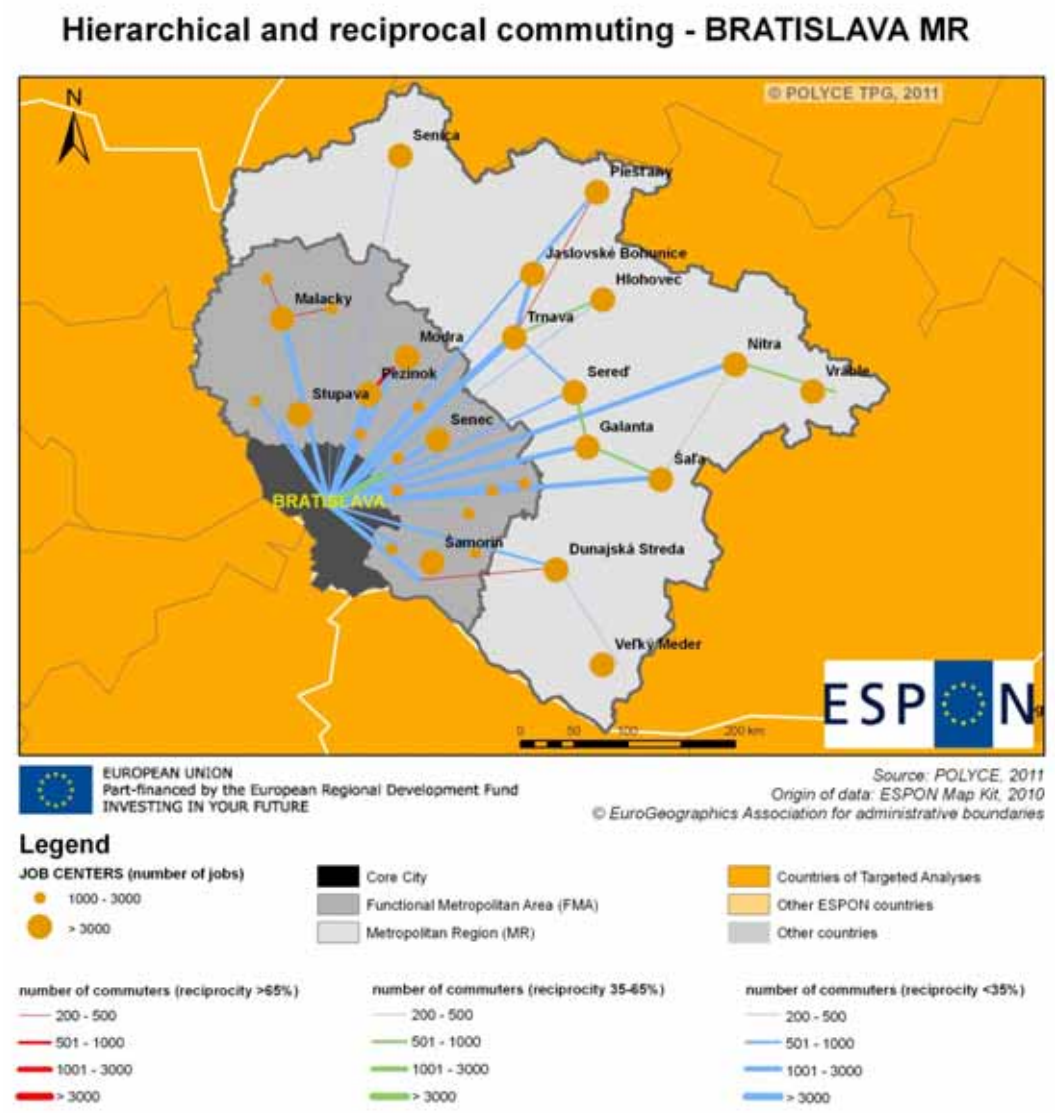


Figure 15: Bratislava: hierarchical and reciprocal commuting

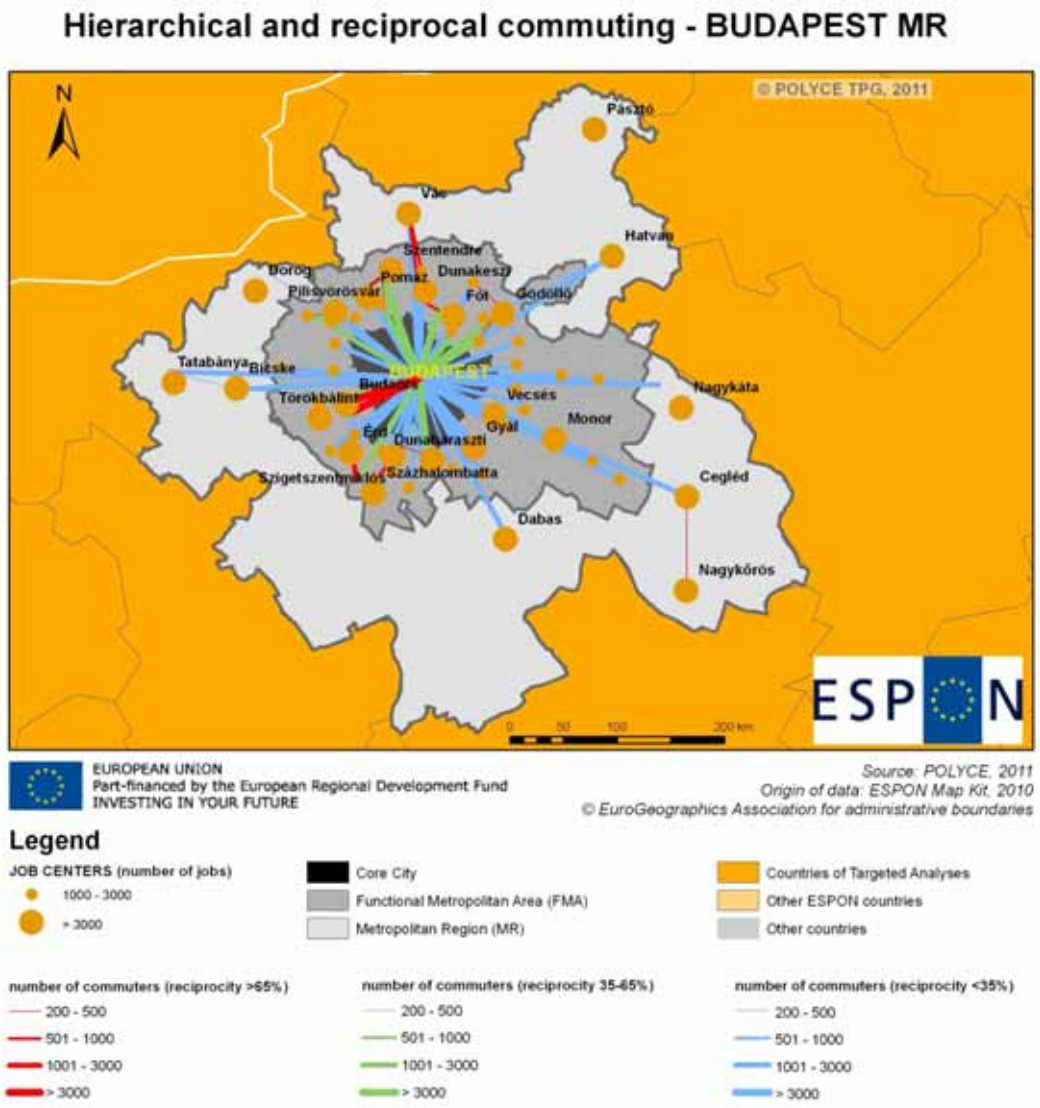


Figure 16: Budapest: hierarchical and reciprocal commuting

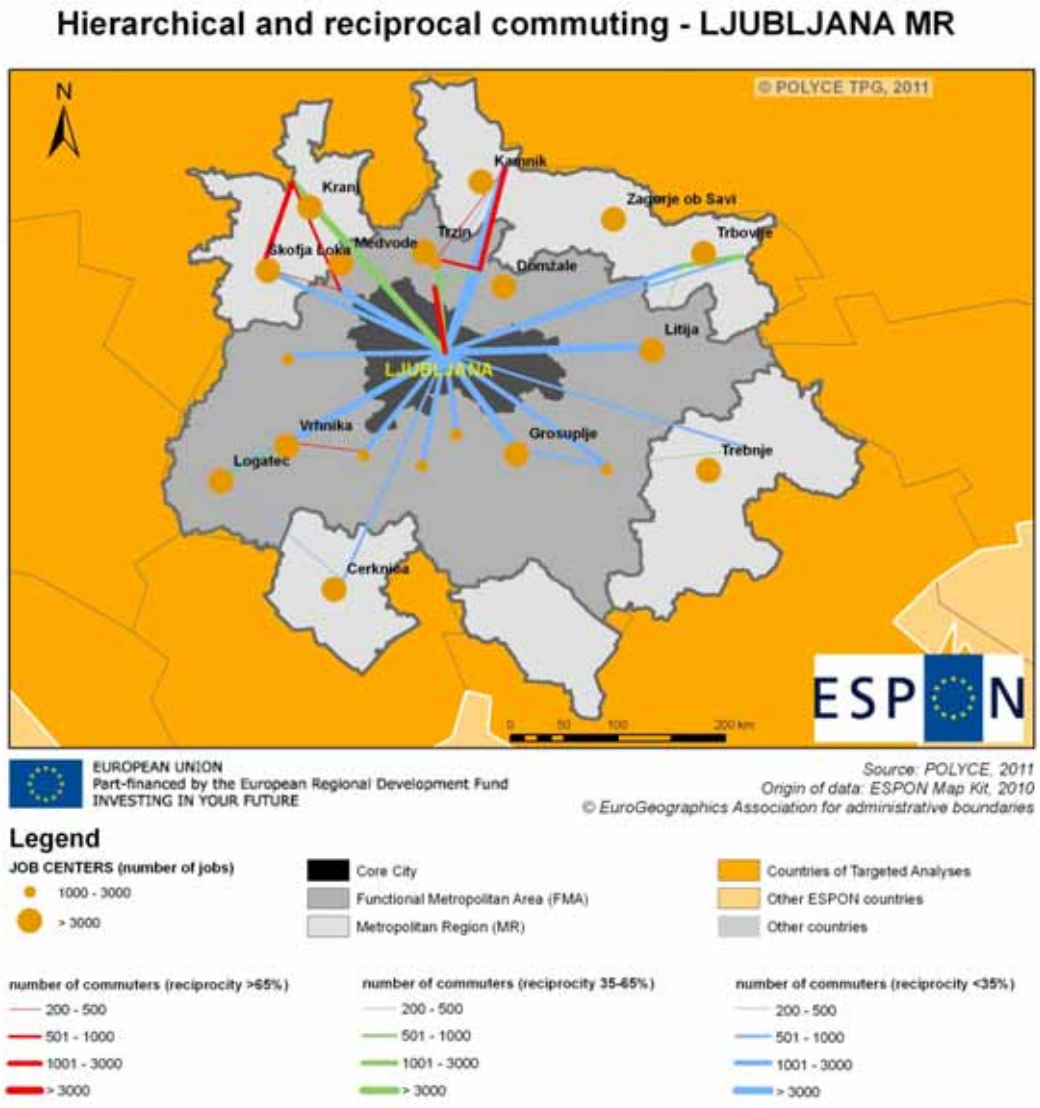


Figure 17: Ljubljana: hierarchical and reciprocal commuting

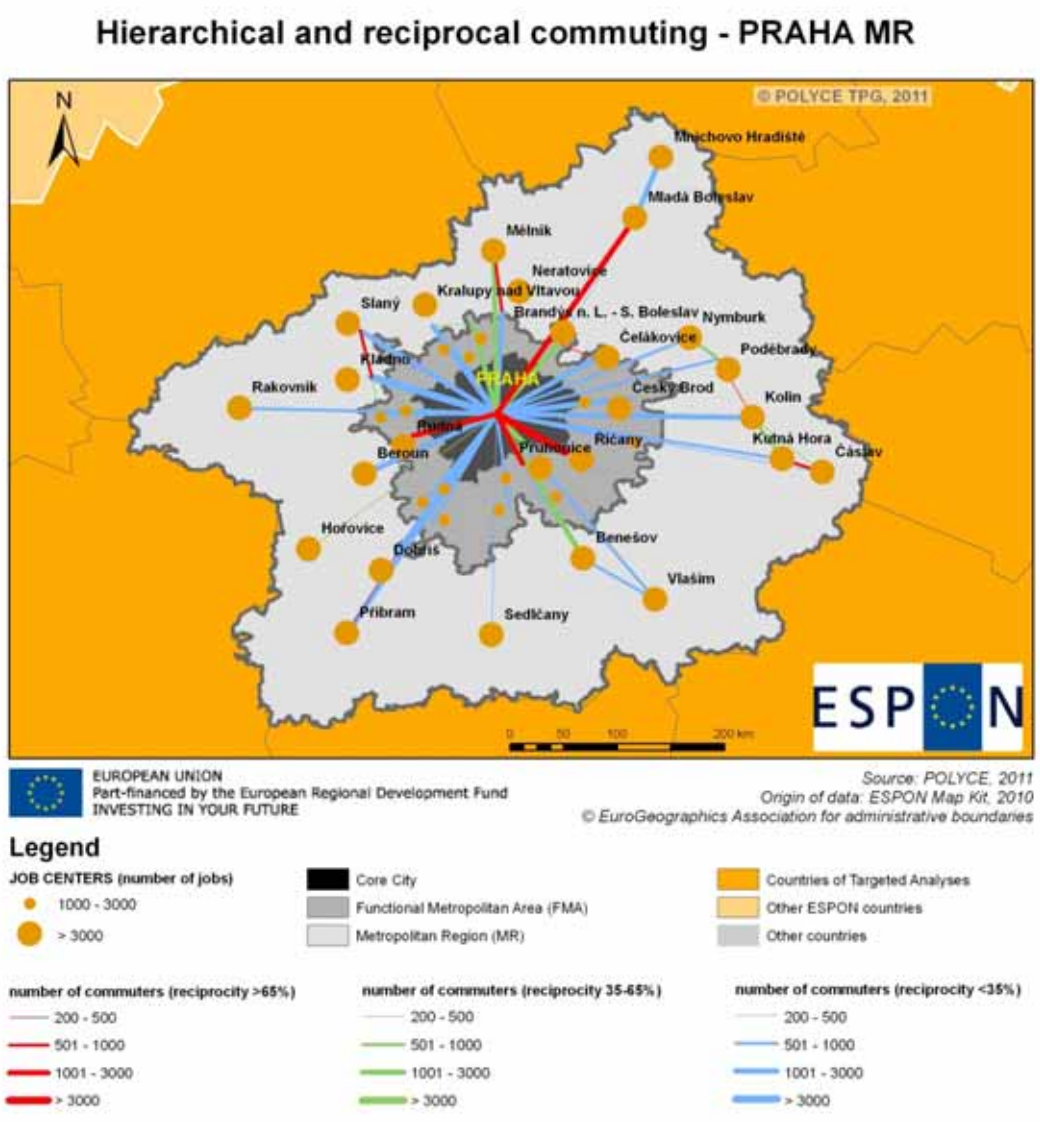


Figure 18: Praha: hierarchical and reciprocal commuting

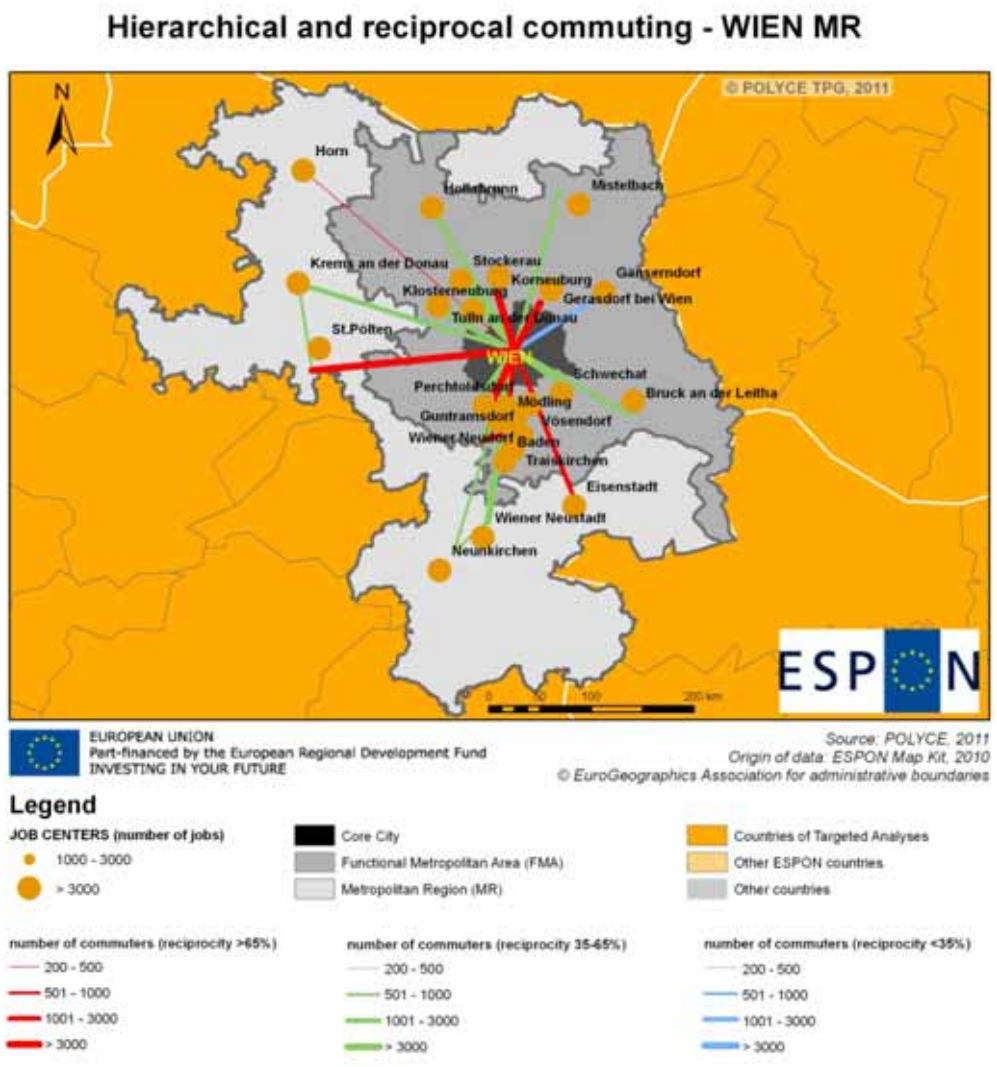


Figure 19: Wien: hierarchical and reciprocal commuting

The situation around 2000 clearly demonstrate the difference between the more open and functionally integrated organic urban system of Wien metropolitan area and urban systems of metropolitan areas in former communist countries dominated by capital cities and their labor markets through unidirectional commuting to core city and hierarchical subordination of centers in metropolitan area to the core city.

The aggregate view on all relations between job centers in MRs and FMAs (Figure 15, Figure 16, Figure 17, Figure 18 and Figure 19) clearly shows the difference between Wien region where hierarchical unidirectional flows virtually do not exist, regions of Praha, Budapest and Ljubljana where hierarchical relations still dominate accompanied with first signs of developing reciprocal linkages between selected centers and Bratislava with only 23 % of reciprocal flows in MR and bare 12 % in FMA. We can see several examples of developing reciprocal flows in metropolitan areas of post-socialist cities. There are usually two instances. First is reciprocal commuting between the core city and new suburban job centers in FMA. Second is reciprocal commuting between job centers in MR and/or FMA. Very exceptional is commuting with high level of reciprocity between the core city and larger job centers in MR (Mladá Boleslav in Praha MR).

Comparing measures and indicators of morphological and relational polycentricity, we can find that they do not correspond. For instance, metropolitan area of Wien is in morphologic terms highly

dominated by Wien core city, yet the region shows high levels of functional relational polycentricity. On the other hand side, Ljubljana metropolitan area is much less dominated by the core city of Ljubljana itself. Therefore, we could say that this means high predispositions for functional polycentricity. However, the level of reciprocity and hence relational polycentricity is in Ljubljana region lowest among the investigated cities.

While the morphology in terms of rank-size distribution of cities can create certain conditions for the development of functional polycentricity, there seems to be more important conditions and causes of transition from monocentric and hierarchically organized metropolitan areas to more polycentric and mutually organically interrelated metropolitan areas. We can only suggests that this might be partly related to new metropolitan economies with industrial job locations outside core cities and advance service jobs in central cities, which is causing so called spatial mismatch in job and housing location of respective working strata and reverse commuting. It can also be caused by higher levels of choice on the job market and especially in various locations well related to places of residence by efficient transportation system that decreases commuting times and increases accessibility of jobs for residents in different parts of metropolitan areas. As post-socialist cities do not have so well developed transportation systems in their metropolitan areas, they still lag behind of the trend, which we can observe in Wien.

2.3 Polycentricity in policy, planning and decision making

Authors: Ludek Sykora, Ondrej Mulicek, Petr Kucera, Branislav Machala

European Union Territorial Agenda specifies that cities which act as regional centers should cooperate within a polycentric model of urban and regional development. The object of ESPON POLYCE study is a specific region of territorial co-operation within Europe, the area where Central Europe and Danube regions overlaps. The region consists of Austria and former socialist countries of Czech and Slovak Republics, Hungary and Slovenia. Under socialism, the development of national urban systems was an integral part of central planning. National settlement structure was conceived as a hierarchically organized system of central places with balanced division of roles between individual levels of national, regional and local centers. Issues of balanced development within an urban system were implicitly present in socialist policies. This also included intra-urban level with the development of neighborhood centers accompanying the city core and planning of urban agglomerations with secondary centers to the main core(s). While this settlement planning system was radically refused in Czech and Slovak Republics and Hungary, Slovenian case shows continuity from pre 1990 to recent developments. A new issue which appeared on the agenda for all countries and their capital cities after the breakdown of Iron Curtain and the rapid development of internationalization was competition for investments, labor, firms, organizations, etc. within unifying European space. In the former socialist states, macro-economic reforms and faith in free market dominated the 1990s. The role of planning regulation of spatial development has begun to be recognized only since the turn of the century and especially since the accession to the EU. The new agenda of territorial development considers polycentric settlement and regional systems as guarantees of balanced, functional and effective growth.

In ESPON POLYCE we understand polycentric urban system as functionally integrated socio-spatial entity. It consists of multiple urban nodes whose development is influenced by governance strategies that recognize, consider and support future enhancement of mutual interests, complementarities, synergies and potentials for collaboration. In ESPON POLYCE we focused on two levels of polycentricity in policy, planning and decision making:

1. position of capital city region within Central European Danube region and Europe;
2. position of capital city region within national urban and regional system and internal polycentric organization within capital city region.

2.3.1 Position of capital city regions within national system, Central European Danube region and Europe

Is the position of the capital city region or the capital city itself within Central European and Danube region and European space recognized and specified in capital city documents, national government documents, and documents of regional governments and urban governments of centers in metropolitan region? All the five metropolises (Wien, Praha, Budapest, Bratislava, Ljubljana) are major nodes and key command and control centers in their respective national urban and regional systems playing the role of gateways between home country and external world. All capitals pay attention to trans-European transport networks (TEN-T) that link them into wider European space and especially to Western Europe. The capitals differ in their explicit attention to the enhancement of their international positioning. Wien and Budapest clearly pronounce their ambitions to play the role of a supranational center. Budapest aims to strengthen its role as the capital of the Danube region and of a gateway city to South Eastern Europe and the Balkan. Wien claims to be an economic center of South-East Central Europe. Instead of cooperation in wider region Wien, Praha and Budapest see themselves as direct competitors for business investments and functions. Neither Ljubljana nor Praha have any aspiration for supranational roles. Specific is the relation between Wien and Bratislava due to their proximity. Bratislava understands that joining Wien can enhance its international position. Both capitals see potential in common growth of the so called Twin City Wien-Bratislava as a core of Euroregion Center (Euroregio Mitte - Euroregión Stred). The initiative Centrope with the motto "We grow together – we adhere together" clearly defines Wien – Bratislava as the nucleus of the wider region involving parts of Austria, Slovakia as well as Czech Republic (Brno) and Hungary (Györ).

2.3.2 Internal polycentric organization of capital city regions and their position in national urban and regional systems

What is the position of the capital city region or the capital city itself within the national urban and regional system? Is there a strategy or plan of polycentric organization within metropolitan region? Is polycentricity recognized as an important normative concept? Are there other concepts of urbanization or urban system management in the metropolitan region? Is the collaboration between cities in the metropolitan region institutionalized? Are there coordinating institutions at metropolitan region level? Is there metropolitan strategy of urban system development approved by metropolitan government, regional/provincial governments? Or is there cooperation based on a bottom up coordination among municipalities in metropolitan area?

Praha and Wien metropolitan regions suffer from the lack of coordinated spatial planning. Core cities and their FMAs / MRs are separated in independent regions (Praha and Central Bohemia) or provinces (Wien, Lower Austria and Burgenland). Recent Austrian Spatial Development Concept ÖREK (2011) recognizes polycentric structures and the City Development Concept: Stadtentwicklung Wien 2005 - STEP 05 stresses decentralized concentration as key principles for strengthening international competitiveness of Wien. Wien City Development Concept emphasizes the need for mutual voluntary cooperation between the city of Wien and surrounding provinces. However, planning and policy documents in Austrian provinces discuss interregional cooperation of micro-regions, however, they do not consider Wien.

Praha strives for coordination of spatial development with surrounding Central Bohemia Region. Regional Development Programme of Central Bohemia admits that Praha is the natural center of the settlement-regional agglomeration that economically, historically and culturally connects Central Bohemian region with the City of Praha. However, these priorities have not been fulfilled and the issue of urban system and its hierarchic or polycentric organization is not systematically discussed and implemented. Cooperation between the Central Bohemia Region and Praha is most developed in the area of public transport aiming at region-wide integration of all transport services into a single tariff payment system through the commitment and cooperation of municipalities of the Central Bohemia Region with the City of Praha.

The Hungarian National Spatial Development Concept declares a need to balance Budapest's dominancy in the national settlement structure through the strengthening the position of the regional poles (cities of cc. 100-200 thousand inhabitants). There are several strategic and spatial planning documents that influence and govern the development in Budapest metropolitan region operating on three spatial levels: Central Hungarian Region, Budapest Agglomeration and Budapest city. The development of polycentric spatial structure is not a major issue. Budapest's metropolitan region is seen as a network of micro-regions with autonomous service centers, rather than partners of the core city. The Spatial Development Concept and Strategic Programme for the Budapest Agglomeration (2007) distinguishes a three tier system of sub-centers in the wider metropolitan area proposing that the coordination between the core city and its agglomeration should be managed by the Budapest Agglomeration Development Council, which however, has only limited decision-making powers.

Spatial Development Conception of Slovakia (2001) does not address the issue of polycentricity. The more recent National Strategic Reference Framework of Slovak Republic for 2007-2013 deals with polycentricity at national level in terms of transport infrastructure connecting regional centers. On the metropolitan region level, Bratislava dominates its administrative region characterized by rural settlements and small towns and intensive daily commuting to work, schools and services. There is a priority for deconcentration of employment to suburban municipalities. The impact of the city of Bratislava transcends the boundaries of the Bratislava region to areas in the neighboring Trnava region. However, there is no inter-regional cooperation between the two regional governments of Bratislava and Trnava concerning settlement development.

Despite Ljubljana is the largest urban center in Slovenia it contains only about 15 percent of country population. Slovenian urban network and settlement system is the most polycentric among ESPON POLYCE countries. The Spatial Development Strategy of Republic of Slovenia (2004) promotes polycentric urban development of Slovenia through 51 centers of (inter)national, regional and inter-municipal importance, which are the key employment and service centers in Slovenia. Ljubljana and Central Slovenian region do not enjoy any special position in the framework of national regional policy and programming activities. Regional Development Agency of the Ljubljana Urban Region supports integrated regional development based on the hierarchy of central places in the region rather than metropolitan polycentrism. Spatial Plan of the City Municipality of Ljubljana (2010) pays attention to the threat of the decline of the city center and urban sprawl with using the concept of decentralized concentration emphasizing the development of larger number of small centers.

2.4 Relational Polycentricity within the CED-zone and its position within Europe

Authors: Hans Kramar and Justin Kadi

The following chapter deals with the relational aspect of polycentricity on the meso and macro level, which means that it tries to provide an insight into the institutional and structural relations both between the five cities and with other cities outside the CED-zone. According to the definitions given in ESPON 1.1.1 institutional (or political) relations rely "on co-constructions, co-operation, and on the willingness of territorial agencies to work together on joint projects and strategies" (ESPON, 2005 pp.46), whereas structural relations are constituted by the interactions between the actors, including transport, financial, migration or information flows. Due to the poor availability of relational data, it is not possible to cover all aspects of these two dimensions of relational polycentricity. The challenge, however, is to provide relevant data, which give some evidence on the relations between the five cities (meso level) and with the "rest of the world" (macro level). In this context the share of "internal" and "external" relations will be of special interest.

The analysis of relations will be based on some evidence on the physical distances and travel times between the five cities. Additionally, ethnic and historic relations will be analyzed on the national level by nationality data, which reflect long-term relations between nations, regions and cities on the one hand and are a driving force of future interaction on the other. Based on these determining

factors the actual internal and external interactions of the five cities are investigated firstly through firm networks of service industries, secondly through research co-operations and thirdly through an analysis of Google web search queries. Since these data only cover a small part of relevant inter-city relations, the indicators given in the following sections should be treated as proxies, which provide a rough indication of relational polycentricity on the meso/macro level without considering all relevant aspects of this issue.

2.4.1 Travel time

Contrary to some theoretical approaches, which postulated the decreasing role of physical distance in the post-industrial information society (e.g. Cairncross 1998), there is empirical evidence that the location of economic actors still strongly determines their behavior and decisions. From that point of view it is necessary to consider travel times as an important determining factor of actual flows and interactions between different cities. For that reason the average travel times between the five cities were collected for road and rail connections by querying common websites for shortest car and train connections (see Figure 20).

	Bratislava		Budapest		Ljubljana		Prague		Vienna		Total	
	road	rail	road	rail	road	rail	road	rail	road	rail	road	rail
Bratislava			117	161	259	426	191	228	54	57	621	872
Budapest	118	152			272	507	297	405	143	155	830	1219
Ljubljana	260	453	274	513			421	651	231	347	1186	1964
Prague	193	252	297	416	420	659			211	265	1121	1592
Vienna	54	58	143	156	229	336	211	269			637	819

Figure 20: Travel time road / rail

Source: Austrian Federal Railways (www.oebb.at), ViaMichelin (www.viamichelin.at), own calculations

The right column in Figure 20 proves the central location of Vienna and Bratislava within the CED-region, which is expressed by the shortest travel time to the other partner cities. Additionally, the immediate vicinity of two "twin-cities" implicates very good accessibility with each other. Contrary, Prague and Ljubljana as the northern and southern outposts of the region are less connected to the other partner cities, which means much longer travel times (especially by train) to the partner cities. The distances between some of the five cities are short enough to allow one-day-trips for business meetings. Assuming a maximum travel time of three hours as the upper limit, one-day-trips between Vienna, Budapest and Bratislava are possible both by car and by train, whereas all other relations require at least one overnight stay to have a meeting. For these trips air traffic plays an important role, there are daily connections from Vienna (Vienna Airport can be reached within less than one hour from Bratislava) and Budapest to the two other partner cities. The connection between Prague and Ljubljana, which takes about 7 hours by car and almost 11 hours by train, is the only relation, for which car and train transport play a negligible role for short-term business trips.

	Bratislava			Budapest			Ljubljana			Prague			Vienna		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Bratislava				17	74,5	1,38	11	63,1	1,64	11	88,4	1,19	36	82,1	1,06
Budapest	13	79,3	1,29				17	54,6	1,86	10	78,4	1,36	30	94,1	1,08
Ljubljana	11	59,5	1,74	16	54,0	1,87				10	65,2	1,55	11	66,2	1,50
Prague	10	80,2	1,31	11	76,3	1,40	13	64,4	1,57				12	75,6	1,26
Vienna	35	81,7	1,07	26	93,5	1,09	11	68,2	1,47	14	74,5	1,27			

Figure 21: Quality of train connections

Source: Austrian Federal Railways (www.oebb.at), ViaMichelin (www.viamichelin.at), own calculations

(1) … Number of daily connections

(2) … Average travel speed

(3) … Ratio travel time rail / road

The attractiveness and competitiveness of rail transport between the cities is not only determined by the absolute but also by the relative travel time (in comparison to the travel time by car) and by connection frequency. As the first column in Figure 21 shows, all relations have an acceptable supply of train connections with at least 10 trains per day in both directions (see also Figure 22). The three "central" cities Vienna, Bratislava and Budapest are even better connected: In the daytime there are about two train connections per hour from Vienna to both Budapest and Bratislava.

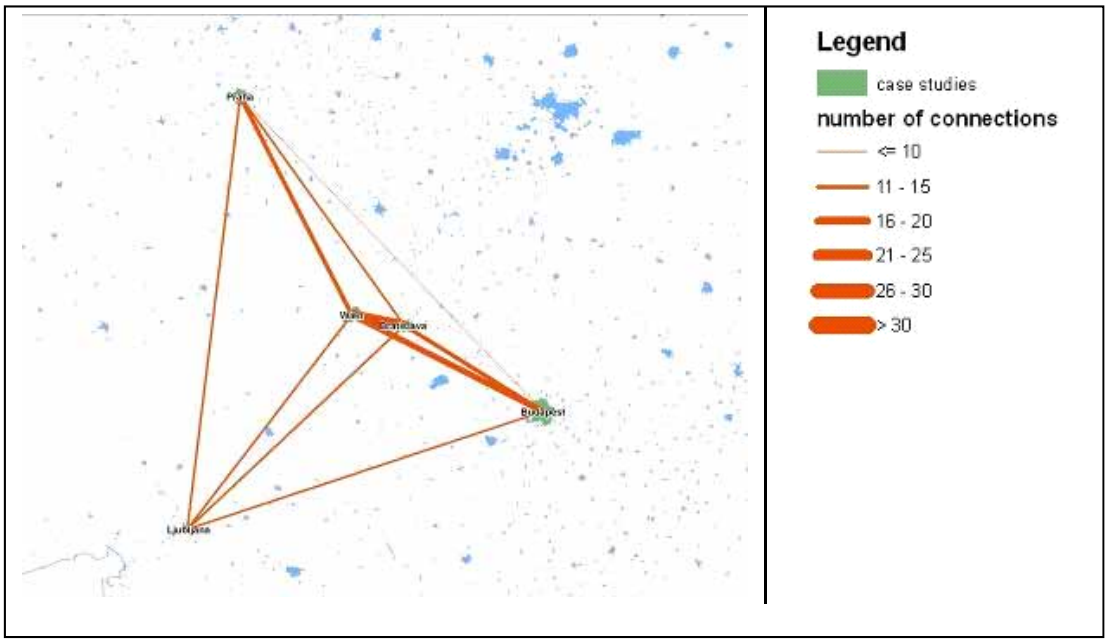


Figure 22: Railway connections between the POLYCE cities (2011)

Note: the number of connections between two cities is an average from the two flows

The high deviations of average travel speed reflect the different quality of rail infrastructure. According to the results shown in column 2 most connections have a reasonable travel speed between 75 and 95 km/h, which is, however, still very low in relation to comparable polycentric regions in Western Europe. The worst situation can be detected for the city of Ljubljana, which seems to be totally cut off from high-speed rail networks. The travel time to all other cities shows average travel speed of about 60 km/h, for most connections passengers have to change trains two or even three times. Consequently, trips per train are much longer than by car (see factors given in column 3), which makes trains totally uncompetitive. According to this indicator, the most competitive relations are from Vienna to Prague, Budapest and Bratislava and between Prague and Bratislava. Still, the fact that all train connections are slower than a trip by car proves that the CED region has got a lot to catch up concerning its rail infrastructure.

At the macro level of polycentricity railway connections were analyzed with regard to the position of the CED zone within Europe. Daily connections between the 5 ESPON POLYCE cities and the set of MEGAs cores were analyzed (including the 5 metropolises), based on the web search-engine of Deutsche Bahn (www.bahn.de). All connections were queried for Wednesday May 11th 2011 as a typical day in the middle of the week where there were no major European holidays.

In total there were 3100 connections with Vienna accounting for the largest and Ljubljana for the smallest share (Figure 24). There were more connections from Bratislava than from Budapest indication better connectivity of Bratislava within Europe. The analysis shows furthermore a prevailing overall orientation of POLYCE cities to the MEGAs in PENTAGON, especially Germany,

Benelux, France and northern Italy, plus Switzerland (Figure 25, Figure 23). Importantly, the 5 ESPON POLYCE metropolises are among the 8 most important railway connection destinations (Figure 23).

There are important differences between the 5 capital cities concerning their relations to ESPON POLYCE metropolises in the context of overall connections. While 12% of all connections from Vienna, Budapest and Bratislava are towards the ESPON POLYCE metropolises, Ljubljana accounts for mere 9% and Prague only for 5% (Figure 24). This seems to be influenced by the proximity between the three cities and their more central position within Central Europe – Danube space. The analysis shows that Prague is least integrated within the other ESPON POLYCE metropolises while being more oriented to Western Europe.

rank	destination	no. of connections
1	**Wien**	77
2	Lille	72
3	**Ljubljana**	49
4	Bremen	66
5	**Bratislava**	73
6	**Budapest**	55
7	Hamburg	56
8	**Praha**	46
9	Dusseldorf	52
10	Milano	59
11	Amsterdam	55
12	Marseille	58
13	Zurich	45
14	Rotterdam	55
15	Lyon	58
16	Bern	53
17	Munchen	73
18	Berlin	60
19	Stuttgart	66
20	Napoli	55

Figure 23: Cumulative ranking of destination positions from the 5 POLYCE metropolises

	Vienna	Praha	Budapest	Bratislava	Ljubljana	Total
No. of connections to all MEGAs	727	685	538	674	476	3100
Share of connections to POLYCE cities on all MEGA connections	11,69	4,96	11,52	11,57	8,61	9,68

Figure 24: Railway connections from POLYCE cities to MEGAs

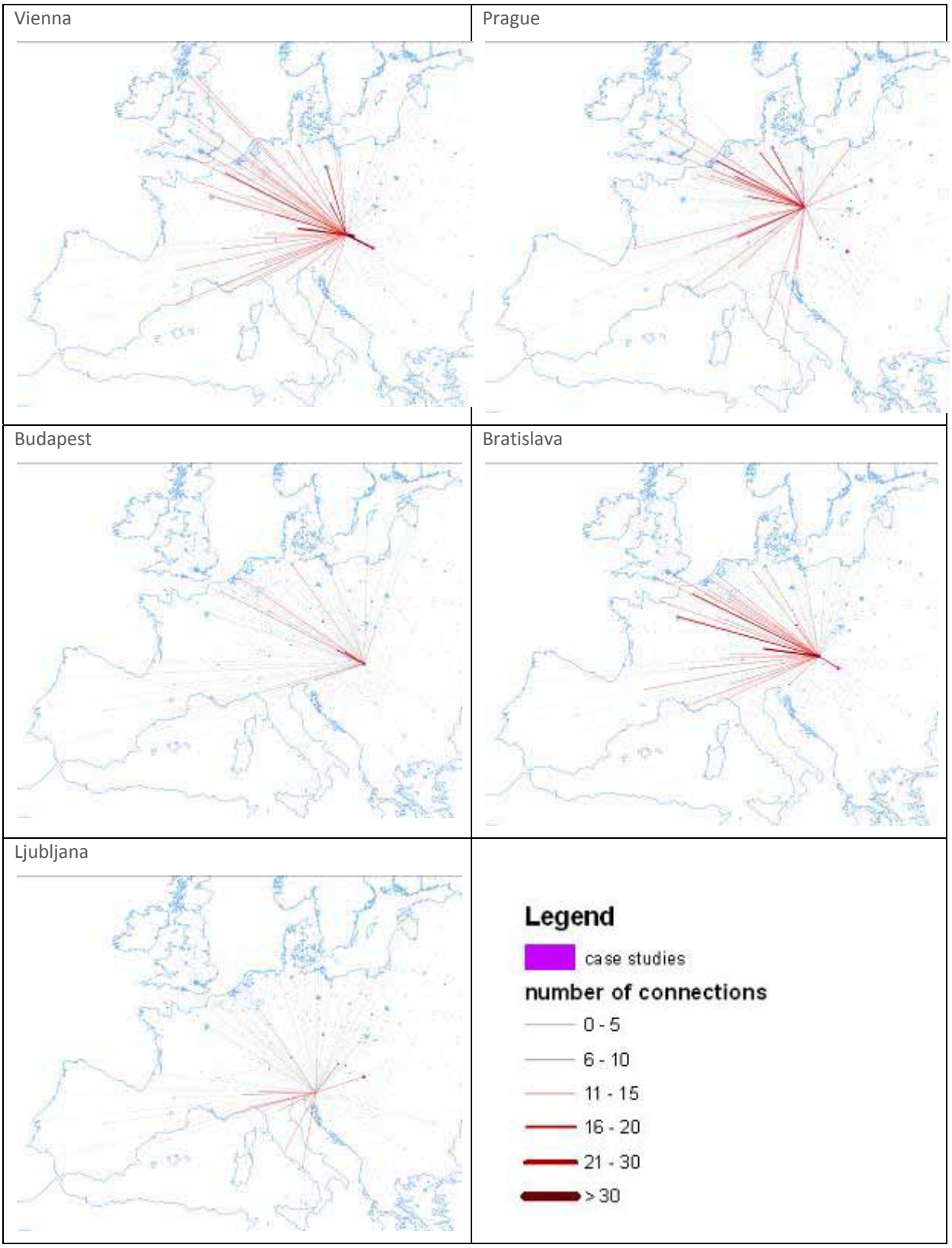


Figure 25: Railway connections of POLYCE cities with core cities of MEGAs (2011)

2.4.2 Ethnic and historic relations

Economic, social and institutional interaction does not happen in a vacuum, but is always embedded in an existing network of established relations and traditions. From that point of view the ethnic and historic relations between two cities (common history, culture, language,…) are a main influencing factor of any interaction. In order to consider the relevance of these conditions, which have often grown and developed over centuries, an indicator on relevant ties between cities has to be generated: The simplest way of defining an applicable indicator is to consider ethnic relations based on nationalities. This was done by collecting the number of inhabitants with the other country's nationality and comparing it to the total number of foreigners. Due to the lack of available data on the city level this indicator could only be provided for the home countries of the five cities (see Figure 26).

	Foreigners from						Share of foreigners		
	SK	HU	SL	CZ	AT	CED	CED	EU27	total
Slovakia		2702	132	5965	1472	10271	0,19%	0,48%	0,76%
Hungary	4944		133	284	2571	7932	0,08%	1,00%	1,76%
Slovenia	457	127		118	295	997	0,05%	0,20%	3,39%
Czech Republic	67889	587	211		3373	72060	0,69%	1,27%	3,35%
Austria	15665	19318	6973	8287		50243	0,60%	3,48%	10,04%
CED countries	88955	22734	7449	14654	7711	141503	0,19%	0,48%	0,76%

Figure 26: Population by Nationality

Source: EUROSTAT

One of the main results of this analysis is Austria's role as an immigration country. Contrary to the four partner states, Austria has become an attractive destination for migrants over the last 50 years. Consequently it is the only country with a remarkable share (10%) of foreign population, which can presumably be considered as an asset for establishing international networks and co-operations. The values in the 4 partner states are at the end of the European scale, which can easily be explained by the fact that they accessed the European Union only in 2004. The relatively high share in Slovenia can probably be attributed to non-EU foreigners from the former fellow states in the Balkans to a large extent, the value in the Czech Republic is caused by a large group of Slovakian inhabitants.

Although the number of Slovaks in the Czech Republic is more than ten times higher than the other way round, there is still a strong ethnic connection between Slovakia and the Czech Republic, which can easily be attributed to the fact that these two countries were united until the year 1992. Another remarkable ethnic relation, which can be explained by historic ties, exists between Slovakia and Hungary. Nevertheless, migration between the five partner states seems to be rather weak, since the share of people from one of the other countries is extremely low. Apart from the special situation between the Czechs and the Slovaks, only Austria hosts a remarkable number of people from the neighboring states. The enhancement of common networks and co-operations will definitely increase these numbers as a sign of close social and economic interaction on the one hand, and be a good condition for the further deepening of mutual relations on the other.

2.4.3 FIRE Firm networks

As has been repeatedly argued, one way of understanding cities under conditions of accelerated globalization is by analyzing the intensity and reach of their external linkages and by identifying their position in a global network of cities (see Taylor, 2004). Building on the conceptual work on the global city (Friedmann, 1986; Sassen, 1991) one strand of research devoted to this endeavor has established in recent years that analyzes inter-city linkages based on FIRE firm locations (Taylor and Walker, 2001). Out of this broader project emerged the Global and World City Research Network

(GaWC), which also provides publicly available datasets on FIRE[2] firm locations. For the present analysis a GaWC dataset was used that is based on a sample of 100 FIRE firms and their locations in 315 global cities.[3] [4]The data stem from the year 2000 and include two types of information relevant for the analysis: Firstly, information on the presence or absence of a FIRE firm in a city, and secondly, information on the importance of a firm's location in a city (international headquarter, regional office, local office, etc.). Through the proxy of firm locations the data reveal whether or not a relation exists between two cities. If a firm has a location in two cities, there is a relation between them. Hence, the data can be used as an indicator for relational polycentricity. The described dataset was extracted from the GaWC website and analyzed for the five POLYCE cities. Both relations between the five POLYCE as well as relations of the POLYCE cities to cities in other regions were calculated, in order to account for inner-regional connectivity as well as extra-regional, global embeddedness of the five cities (Figure 27).

	Bra	Bud	Lju	Pra	Vie	CED	Europe	Overseas	Share CED
Bratislava		26	10	27	22	85	1006	1875	2,87%
Budapest	26		16	50	41	133	1745	3254	2,59%
Ljubljana	10	16		15	16	57	662	1395	2,70%
Prague	27	50	15		43	135	1917	3560	2,41%
Vienna	22	41	16	43		122	1792	3395	2,30%

Figure 27: FIRE firm networks 2000

Source: GaWC Research Network

Most importantly the analysis reveals that within the CED zone, Prague, Budapest and Vienna are much better connected through international FIRE firm networks than Bratislava and Ljubljana. Prague has the highest number of relations, closely followed by Budapest. Vienna ranks third. The two smaller cities in the region have much less relations than the three major capitals, indicating that they are not the first locational choice for FIRE firms. This pattern is replicated in the relations between the individual cities, with Budapest, Prague and Vienna having by far most relations with each other but much less with Ljubljana and Bratislava. Also when looking at extra-regional relations with all other European cities and with cities overseas Prague takes the lead and shows the highest embeddedness, followed by Vienna and Budapest. The importance of inner-regional relations within the CED zone for the five cities hardly differs (see column Share CED). However, especially Vienna and Prague are relatively less dependent on inner-regional relations, underlining their greater embeddedness in firm networks in Europe and overseas.

Since the GaWC data classify the firm locations according to their importance, it is also possible to provide an indication of hierarchies and dominances in these relations. For that purpose each firm which is situated in two of the five partner cities is assigned to the city with the higher-ranked location. If both locations have the same importance, each of the two cities involved gets half a point. In that manner the number of relations between the 5 cities as shown in Figure 27 are divided to the two cities involved according to the importance of the firm locations. The values given in Figure 28 show for each relation the number of firms, which are situated in both cities with a higher-ranked location in the city indicated in the row and a lower-ranked location in the respective column.

[2] FIRE stands for Finance Insurance and Real Estate

[3] For a detailed data description see http://www.lboro.ac.uk/gawc/datasets/da11.html

[4] Certaily, FIRE firms make up only a share of all economic activtites, and therefore also only a share of economic relations between cities can be displayed on the basis of FIRE firm networks. However, FIRE firms are considered to be the most growth-intensive services and are therefore of high importance for urban economies.

	Bra	Bud	Lju	Pra	Vie	Dominant relations	Inferior relations	Difference
Bratislava		11,5	5,5	11,5	8	36,5	48,5	-12
Budapest	14,5		9,5	26,5	19,5	70	63	+7
Ljubljana	4,5	6,5		5,5	4,5	21	36	-15
Prague	15,5	23,5	9,5		20	68,5	66,5	+2
Vienna	14	21,5	11,5	23		70	52	+18
CED	48,5	63	36	66,5	52			

Figure 28: Dominance in FIRE firm networks 2000

Source: GaWC Research Network

The most significant information of this matrix is the difference between the number of dominant relations (sum of the single columns) and the number of inferior relations (sum of the single rows). The results show that the two smaller capitals (Bratislava and Ljubljana) are predominantly dominated by other cities in these firm networks, which might be caused by their comparable small size and low functionality in global city competition. The positive differences between dominant and inferior relations in Vienna, Budapest and Prague indicate that the main control functions are to be found in the three bigger cities. Especially Wien seems to cope successfully with its role as a central economic player in the region: A positive difference with all four partner cities proves that the city hosts higher-ranked firm locations than their opponents. This fact, which could be well expected for the relation to Bratislava and Ljubljana, is also true in a highly competitive situation with Budapest and Praha.

2.4.4 Research networks

Another way of measuring relations between cities is to look at co-operation of institutions in research projects. The CORDIS online database provides a useful information source for such an analysis. It includes data on EFP (EU Research Framework Programme) projects differentiated by participating institutions. Thus, the database makes possible to analyze research cooperation between institutions in different cities and thereby to determine the general degree of embeddedness of a city in research networks as well as, more specifically, to identify relations between cities based on these networks. For the present analysis data were extracted from the CORDIS online database and analyzed for the five POLYCE cities. In a first step the overall embeddedness of the five cities in research networks was examined (Figure 28) followed by a second step in which the interrelations between the five cities in the CED zone were investigated (Figure 29 below).

	Project participations		Domestic lead partner[5]	
	Total 2001-10	Change 01-05 to 06-10	Total	Share
Bratislava	502	-31,5%	48	9,6%
Budapest	1539	-3,4%	202	13,1%
Ljubljana	919	+3,8%	75	8,2%
Prague	1271	-5,7%	119	9,4%
Vienna	2088	-13,7%	613	29,4%

Figure 29: Participations in EFP research projects 2001-2010

Source: CORDIS online database

[5] Number of projects with participation of research institutes located in the city and leaded by an institution located in the same country.

The total number of participations in EFP (EU Research Framework Programme) projects show that especially Vienna seems to be excellently integrated in European research networks. Compared with Budapest and Prague, which are both about the same size, Vienna takes part in significantly more research projects than the two direct opponents, which might probably be attributed to established networks and co-operations with the Western EU member states. Surprisingly, Ljubljana is not far behind Prague but stays far ahead of Bratislava, although the city is much smaller in population and employment. In addition, the Slovenian capital is one of the few cities, which have increased their project participations from the first to the second half of the decennium, although the number of projects has been reduced due to bigger project sizes. The decline in Vienna, Prague and Budapest does not indicate that these cities have been downgraded relatively, since the change rates are on European average, whereas the numbers suggest that Bratislava has further deteriorated its position in European research networks.

The query of the CORDIS database on the internet does not allow to ask for the exact location but only for the nationality of the lead partner. Therefore the share of projects, which have a "domestic" lead partner, also includes projects leaded by an institution located somewhere else in the country. Since the five cities play a similar role within their countries (all with a population share of about 10 to 20%), these values can be well compared in spite of this inaccuracy. The results clearly demonstrate the dominant role of Vienna in EU-research projects: Even if the more dispersed spatial structure of scientific research in Austria is taken into consideration, a share of almost 30% of projects leaded by Austrian institutions suggests that the city of Vienna (as the centre of most research institutes) plays in central role in many scientific networks. In this respect Budapest with a share of 13% performs a bit better than the other three cities, where just under 10% of the projects are leaded by a domestic institute.

The second part of the CORDIS data analysis focused on the relations of the five partner cities in the research projects of the EFP. For that purpose, the number of projects, in which two of the five cities take part, was collected (see Figure 30). Since the query was done separately for all pairs of cities, the numbers partly coincide due to double counts, which means that they must not be added for different relations. The shares which are also displayed for all internal relations, provide the percentages of all project participations, in which another partner city is also involved.

	Bratislava		Budapest		Ljubljana		Prague		Vienna		total
	no.	share	no.	share	no.	share	no.	share	no.	share	no.
Bratislava			148	29,5%	101	20,1%	123	24,5%	158	31,5%	502
Budapest	148	9,6%			198	12,9%	253	16,4%	351	22,8%	1539
Ljubljana	101	11,0%	198	21,5%			149	16,2%	232	25,2%	919
Prague	123	9,7%	253	19,9%	149	11,7%			244	19,2%	1271
Vienna	158	7,6%	351	16,8%	232	11,1%	244	11,7%			2088

Figure 30: Cooperations in EFP research projects 2001-2010

Source: CORDIS online database

The absolute numbers given in Figure 30 point out that there are especially strong ties in scientific research between Vienna and Budapest, which are both comparably less connected with Prague. The relative shares show that Bratislava, which is lagging behind in total FP participation, is highly dependent on research co-operations with the other partner cities, especially with Vienna and Budapest. This result indicates that the Slovakian capital is less integrated in research networks with other European partners. Vienna seems to be in a much more comfortable situation, because in spite of big number of project co-operations with the partner cities, the city is much more integrated in "external" research networks than the other cities, which is expressed by relatively low shares in the table.

2.4.5 Google web search queries

Another analysis of relational links between cities studied the intensity of web searches on Google's web search service (http://www.google.com/insights/search/). Queries are scalable to regions, although not in the case of Slovenia and Slovakia. Web searches are evaluated for the period 2004 to June 2011. The research question was "How intense were search queries for the names of cities B, C, D, E in the country of the city A"?

First, 5 ESPON POLYCE metropolises were analyzed as closed system of mutual relations mirrored in intensity of web searches on each other. Figure 31 shows the relative distribution of web search from one city to the others. The thicker line means larger portion of searches on name of the connected city compared to searches on names of the other cities in our sample.

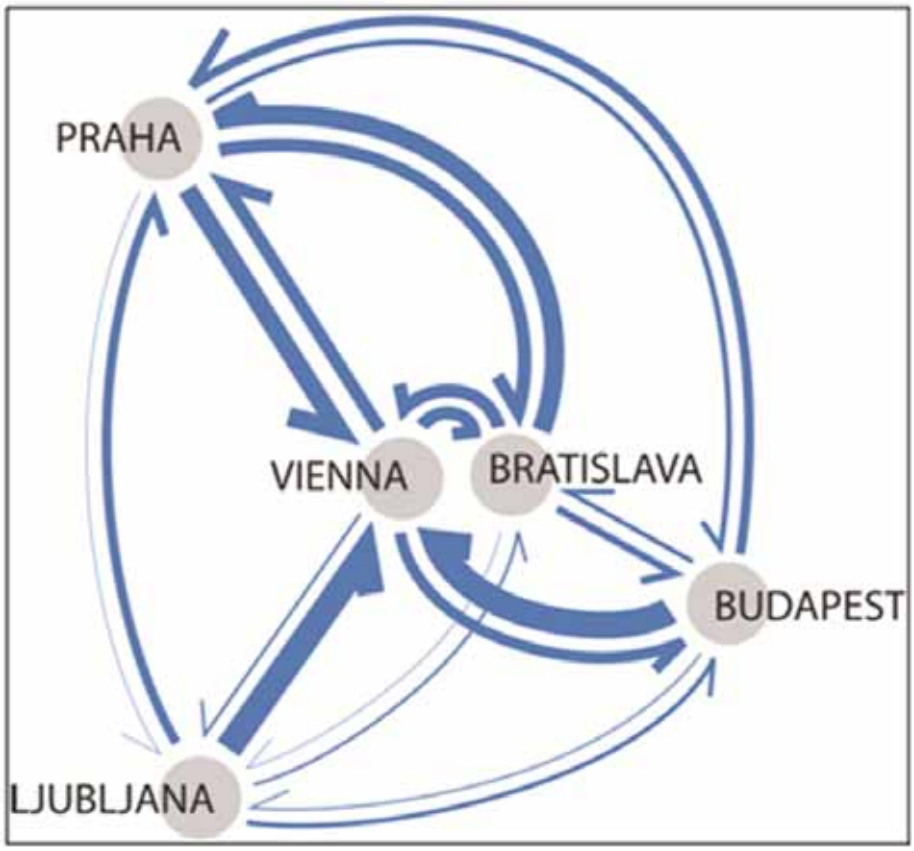


Figure 31: Relative web search intensity on name strings of POLYCE cities

search from / search for (%)	Prague	Bratislava	Vienna	Budapest	Ljubljana
Czech Republic	---	34	49	15	1
Slovakia	47	---	36	16	1
Austria	37	31	---	27	5
Hungary	24	10	63	---	2
Slovenia	19	8	60	13	---

Figure 32: Relative web search intensity on name strings of POLYCE cities

Vienna seems to be the most important node in the regional system of 5 cities as it is the main destination for searches from Ljubljana and Budapest. Vienna distributes its attention to Prague, Bratislava and Budapest almost evenly. Ljubljana has very low incoming search connectivity, indicating its peripheral position within the region. Prague has strongest linkage to Vienna than to

Bratislava. But Bratislava is more strongly connected to Prague than to Vienna. Budapest is strongly oriented to Vienna, but it is not mutual; Bratislava stands aside of Budapest attention.

Second was the analysis of web search based relations among metropolises positioned within the European network of MEGAs. Searches from each of 5 ESPON POLYCE cities for MEGAs were analyzed. Most of the attention to ESPON POLYCE cities is paid from Slovakia/Bratislava (41%) and least from Vienna (10%) (Figure 33). Among ESPON POLYCE cities, Vienna receives the highest share from the total attention (8%) followed by Prague, Bratislava and Budapest with Ljubljana receiving least attention. The standing of cities is influenced by their tank-size position and proximity, which is apparent especially in the case of Bratislava.

	(1)	(2)
Prague	19,2%	4,3%
Slovakia/Bratislava	40,7%	3,4%
Vienna	9,8%	7,6%
Budapest	19,2%	2,2%
Slovenia/Ljubljana	15,6%	0,4%

Figure 33: Web search based attention paid to and received from POLYCE cities

(1) … Relative attention from the city to ESPON POLYCE cities from total attention to all MEGAs

(2) … Share of attention to the city from the total attention to all MEGAs

rank	city	relations	average rank
1	**Wien**	161	3,0
2	London	183	3,4
3	Paris	175	3,6
4	Barcelona	96	6,0
5	**Praha**	120	6,2
6	Berlin	106	6,4
7	Munchen	97	8,2
8	**Budapest**	55	8,4
9	**Bratislava**	44	8,8
10	Madrid	65	10,4
11	Amsterdam	45	11,8
12	Milano	53	12,0
13	Frankfurt am Main	39	13,6
14	Manchester	43	13,6
15	Bruxelles	31	15,6
16	Hamburg	30	16,4
17	Dublin	21	19,2
18	Stockholm	18	22,0
19	Koln	19	22,6
20	Zurich	24	23,2
39	**Ljubljana**	5	37,2

Figure 34: Cumulative ranking of MEGAs by Google search from the 5 POLYCE metropolises

Vienna is the most searched for city among all MEGAs from ESPON POLYCE cities, followed by London, Paris and Barcelona (Figure 34). Prague ranks as second among ESPON POLYCE cities, followed by Budapest and Bratislava, all among the 10 most searched cities within MEGAs. Ljubljana dwarfs only on 39th position. Figure 35 shows ranking of outgoing and incoming relations among ESPON POLYCE cities in the context of relations to all MEGAs. Vienna is no. 1 for searches from Budapest, 2 from Slovakia, 3 from Prague and 4 from Slovenia. The other high ranking city is Prague being 1st on the search list from Slovakia, but only 8th on searches from the other 3 metropolises.

to/from	Prague	Slovakia	Vienna	Budapest	Slovenia	average
Vienna	3	2	---	1	4	2,5
Prague	---	1	8	8	8	6,25
Budapest	9	5	11	---	12	9,25
Bratislava	5	---	7	12	15	9,75
Ljubljana	50	50	40	39	---	44,75

Figure 35: Rank of web search based attention for outgoing and incoming relations

2.4.6 Correlations and dependencies

Though all the indicators can only be considered and interpreted as proxies for relational polycentricity, it is interesting to see whether they correlate in some way. Therefore a simple correlation analysis between the actual relations of firms and research institutions on the one hand and travel times and ethnic ties (as "explaining factors") on the other should give some indication of interrelations and dependencies of these indicators. A main limitation of the analysis consists in the low number of cases: Since the relations between the five cities are symmetrical in both directions, this analysis is based on only 10 observations, which makes the results rather uncertain and insignificant. Still, the results shown in Figure 36 might indicate some interesting conclusions.

	Travel times[1]		Ethnic ties[2]	Relations[3]	
	Car	Train	Foreigners	Firms	Research
Firm relations (GaWC)	-0,106	-0,202	-0,144	+0,674	
Research relations (CORDIS)	-0,181	-0,353	+0,138		+0,674

Figure 36: Correlation coefficients between travel time, ethnic ties and intercity relations

Source: own calculations

1… Average travel time between the two cities in both directions

2… Population with the other country's nationality (in both directions)

3… Absolute number of relations between the two cities

The first issue refers to the role of physical distance for interaction, co-operation and networking. Even though the technological revolution in the telecommunication sector offers new opportunities for exchanging information and knowledge, there is some evidence that distance still matters. With regard to the results presented in this section that would imply that travel times between the 5 cities have a significant influence on firm and research networks. The analysis shows low negative correlation coefficients between both modes of transport and the two indicators on actual relations, which slightly hints at the accuracy of the assumption.

Contrary to this result, the data do not prove any influence of ethnic ties on current relations. This first result, however, is distorted by the very high value of ethnic relations between Prague and Bratislava (expressed in big numbers of foreigners from the other country), which is due to the common history of Slovakia and the Czech Republic. Eliminating this value from the sample changes the correlation coefficients to 0,549 (firm networks) and 0,380 (research networks). With all reservations due to the poor empirical base these results indicate that historic and ethnic ties do have some influence on present relations.

Finally, the clearly positive correlation between the extent of firm and research relations demonstrates that different kind of flows, networks and co-operations between cities cannot be separated but often go hand in hand with each other. Although the two proxy indicators only represent a very small part of intercity relations it can be assumed that all kinds of interactions are connected in some way and therefore stimulate and strengthen each other. In this context it would be very helpful to make other data sources available and to broaden the sample of cities, in order to get more significant and stable results on dependencies, discrepancies and determining factors of intercity relations.

3 Urban Size & Metropolisation

Authors: Roberto Camagni, Andrea Caragliu, Ugo Fratesi

"Things have certainly changed around here. I remember when this was all farmland as far the eye could see".

3.1 Introduction

For centuries the fundamental questions "Why do cities exist?" and "What are the determinants of urban performance?" have been asked. Economists now enjoy a rich set of theories aiming at explaining the strikingly increasing concentration of people in urban areas. Figure 37 shows for instance that the percentage of EU27 citizens living in cities rose to slightly less than three-quarters of the total population; this increase has been equally matched by a simultaneous concentration of European citizens in large urban agglomerations.[6]

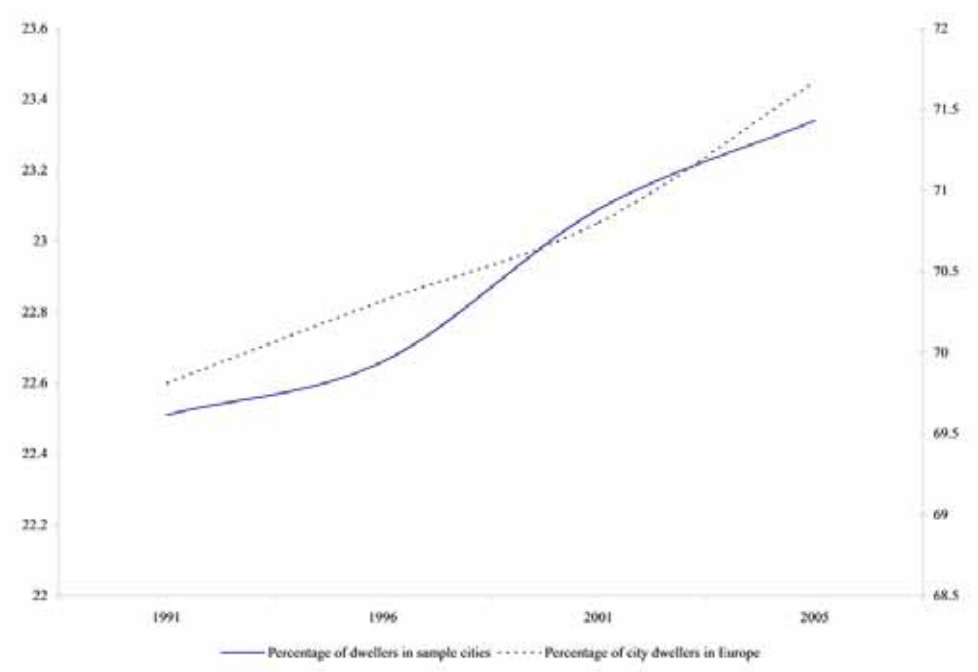


Figure 37: Metropolisation in the EU27

Source: authors' calculation. Raw data from Urban Audit and UN's World Urbanization Prospect 2009.

This concentration of people and firms in large urban areas changes the form of the environment, and pushes most urban areas towards incorporating significant shares of the green space around them. However, such process of increasing concentration is simultaneously matched by a lasting validity of a hierarchical structure, with large cities cohabiting with smaller centers, much as predicted in classical location theories (Christaller, 1933; Lösch, 1954); stylized facts suggest that the urban system is slowly polarizing with the emergence of larger and larger urban agglomerations of skilled labor, characterized by a wealth of amenities, along with a process of stagnation of medium-small urban centers.

In this report we address simultaneously the fundamental questions above mentioned, and tackle at the same time the issue of the reasons of existence of cities, as well as the determinants of their

[6] The continuous line represents the total population living in the 59 cities on which the empirical analysis in this paper is run. For a complete list of such cities, see Annex 10.4.4.

sizes. To this aim, we first critically and briefly review some highlights of the rich literature preceding this paper (Section 3.2); next, we set down a theoretical model capable of predicting different (optimal) city sizes, on the basis of city-specific costs and benefits (Section 3.3); then, in Section 3.4 we describe the data set assembled to test our model. Section 3.5 shows the results of the empirical validation of the model, while finally Section 3.6 concludes.

3.2 Literature review

3.2.1 Traditional views on cities

Cities attracted only relatively recently the interest of economics. Most often, theories and models analyze the way cities work, how the land rent generates and is regulated by market forces, the effects of agglomeration economies on urban performance, and so on. All such theories agree on the primacy of the object "city" in terms of the spatial organization of economic activities.

Cities are also complex to manage; this is probably why no proper "urban agglomeration" ever existed before the invention of agriculture (Bairoch, 1988).[7] In this Section we offer a brief and critical overview of the wealth of theories aiming at explaining why cities exist in the first place, and which factors explain best their performance over time. For a comprehensive review of the rich set of theories being here summarized, the reader may resort on Nijkamp and Mills (1986), and Capello and Nijkamp (2004).

Apparently the main reason for the emergence of cities can be synthesized in the benefits stemming from agglomeration. As forces exist exerting centripetal and centrifugal forces on economic activities, some benefit has to prevail in the former, which has been variously declined over time:[8]

- Localization economies, best known as "Marshallian economies" (Marshall, 1920), which can in turn be synthesized as encompassing:
    - A thick labor market, with easier contacts between employers and potential employees;
    - An industrial atmosphere, providing a fertile soil for the emergence of start-ups, and a better environment for their success;
    - The possibility to share costly common production factors.
- Economies related to the industrial structure of the city, and in particular:
    - Urbanization economies, i.e. reductions of production costs due to the possibility of firms and individuals to share the costs of public intervention, to create a large common market, and to exploit the city as an incubator of production factors (Camagni, 1993);
    - Diversity (Jacobsian) economies, stating that agglomerations of people working in technologically different industries would be more creative;
- Learning economies, or more precisely, localized knowledge spillovers, due to the decay process affecting what is traditionally known as "tacit knowledge (Polanyi, 1966; Bathelt et al., 2004)". The crucial relevance of this last set of theories, in particular in a world where pure geography seems to matter less, is advocated Capello (2010).

Moreover, structural views have been developed also on the way cities are organized internally as well as externally. Internally, cities based on market systems are regulated with the rent mechanism (whereas activities with a higher willingness to pay for a higher accessibility are assigned locations

[7] This view has nevertheless been famously contested by Jacobs (1969), where the birth of cities is assumed to precede the invention of agriculture.

[8] In this paragraph we follow the classification first proposed by Rosenthal and Strange (2004).

closer to the Central Business District). Internal traffic flows and external connections of a city have been successfully described with gravitational models (Lakshmanan and Hansen, 1965; Zipf, 1949), while external relations of cities have been modeled with hierarchical theories (Christaller, 1933; Lösch, 1954).

This theoretical body has been matched by an equally impressive array of empirical estimates, mostly confirming the validity of these assumptions on the rationale for agglomerative behavior. However, more recently a new stream of studies has focused the attention of academics and policymakers on more subtle, yet insightful, reasons why people decide to agglomerate in the first place, and then which additional, other than pure hierarchical or gravitational, factors rule the urban system we live in. This second wave of studies is summarized in the next Section.

3.2.2 Beyond traditional views

Recently different views on the structure of urban systems and the reasons for urban performance have emerged. Among the most influential, we review here the effects of polycentricity, metropolisation and density.

Polycentricity *"occurs when the system is characterized by several cities at different levels rather than just being dominated by one city"* (ESPON 2004, p. 17). Within the POLYCE project, and following previous work carried out in other ESPON projects, polycentricity is defined in three, not entirely mutually exclusive, ways, depending on the spatial scale at which polycentric urban structure is looked at, which in turn relates to the type of definition underlying the final measure (Figure 38):

Spatial scale	Micro	Meso	Macro
Definition of polycentricity	Presence of multiple job centers within the Metropolitan Region	Ratio of wealth production within the FUA w.r. to lower rank areas outside the FUA	Openness of the metropolitan area to external relations (i.e., urban networks[9])
Type of polycentricity	Structural	Morphological	Relational

Figure 38: Definitions of polycentricity according to the POLYCE project

In this report, we review the impact on urban efficiency of third definition of polycentricity. However, future work may include a measure of the first and second types of polycentricity, provided a cross-sectional data set with data on both the first and the second kind of polycentricity is made available.

A second interesting and massive process is referred to as "metropolisation". This process, both morphological as well as functional, is in fact a way to describe the spatial organization being increasingly centered around large cities (Elissalde, 2004; Leroy, 2000). In this paper we focus on the second definition of metropolisation, which is strongly connected with the work described in Sassen (2002).

A third element here taken into account related with the positive effects of pure density. In fact, agglomerative forces as summarized above in Section 3.2.1 imply more indirect effects. A relatively recent wave of quantitative assessments found that pure density may offer a consistent explanation of the variation of productivity levels across space (Ciccone and Hall, 1996). These positive effects may be best conceived as the reduced spatial impedance in a dense and agglomerated area, which is expected to raise the levels of competition, thus fostering productivity increases.

[9] This argument is made, among others, by Meijers (2005).

Finally, we dig into the notion of sprawl and verify whether, as mostly expected in the urban literature, a compact urban form contributes to a more efficient allocation of economic resources within metropolitan areas, thus in turn fostering – once again – productivity increases, and allowing cities to reach on average a larger size. Besides, we verify the assumption that, ceteris paribus, cities hosting relevant administrative power functions (i.e., being the capital of the country) may on average enjoy a large size.

Both traditional and recent work on urban performance leads us to the fundamental question on this work package:

RQ. What are the determinants of equilibrium city size?

This research question will be answered by setting up a simple urban growth model (Section 3.3), which will be tested on a sample of 59 European Metropolitan areas. The data set we assembled to estimate our model is described in Section 3.4, while empirical results are summarized in Section 3.5.

3.3 The model

In order to answer the research question previously introduced, we set up a simple urban growth model which provides the framework for our empirical analyses. The model is rooted in the literature summarized in chapter 5 in Fujita (1989), and moves from the work in Capello and Camagni (2000).

We start by assuming the following implicit urban cost and benefit functions:

(1.) $C = f\left(size, rent, malaise, sprawl\right)$

and

(2.) $B = f\left(size, amenities, diversity, density, functions, networks\right)$

The choice of the arguments for the costs and benefits function is based on the literature summarized in Section 3.3. In particular, the literature usually finds a non-compact urban form to represent a cost for dwellers (e.g. Jacobs, 1961; with however a notable exception in Glaeser and Kahn, 2004), and equally identifies in a general distress effect the possible consequence from over-concentration of people in large urban areas. This last cost to agglomeration is here labeled as "malaise".

On the benefit side, we include as arguments the quality of urban amenities (Carlino and Saiz, 2008), urban functions (in line with the learning economies assumption summarized in Section 3.2 (see for instance Black and Henderson, 1999), and sectoral diversity (Jacobs, 1969). Also, relevant benefit elements include non-traditional urban characteristics, such as the intensity of urban networks *(i.e. relational polycentricity*) and the quantity and quality of urban functions, or the concentration of highly-skilled professionals into large urban areas *(viz., functional metropolisation)*.

Notice that in both equations we assume that urban size represents both a cost as well as a benefit for the city. Size is therefore a dual concept, representing a joint source of positive as well as negative externalities for city dwellers; this assumption is the key to solve the model and obtain an estimable function.

We choose to adopt a standard Cobb-Douglas specification for both functions. This specification is more tractable than most others, while also enabling us to avoid the implausible assumptions about the elasticity of the function's arguments (Uzawa, 1962).

Equations (1.) and (2.) therefore, become, respectively:

(3.) $C = size^{\alpha} rent^{\beta} malaise^{\delta} sprawl^{\gamma}$

and

(4.) $B = size^{\kappa} amenities^{\zeta} diversity^{\vartheta} density^{\chi} functions^{\mu} networks^{\nu}$

We also assume, in order to increase the tractability of the model and without losing generality, that all cost and benefit coefficients are bounded in the interval (0,1), but the size parameter in the cost function, which, à la Alonso, is larger than one in absolute value, reflecting an exponentially increasing cost function.

Notice that both equations are well-behaved with respect to city size. In fact, we assume that urban costs are increasing in city size, more than proportionally; conversely, we assume that urban benefits are increasing with city size, but less than proportionally. Analytically, this implies the following conditions:

(5.) $\frac{\partial C}{\partial size} = \alpha size^{\alpha-1} rent^{\beta} malaise^{\delta} sprawl^{\gamma}$ >0,

$\frac{\partial "C}{\partial size"} = \alpha(\alpha-1) size^{\alpha-2} rent^{\beta} malaise^{\delta} sprawl^{\gamma}$ >0

and

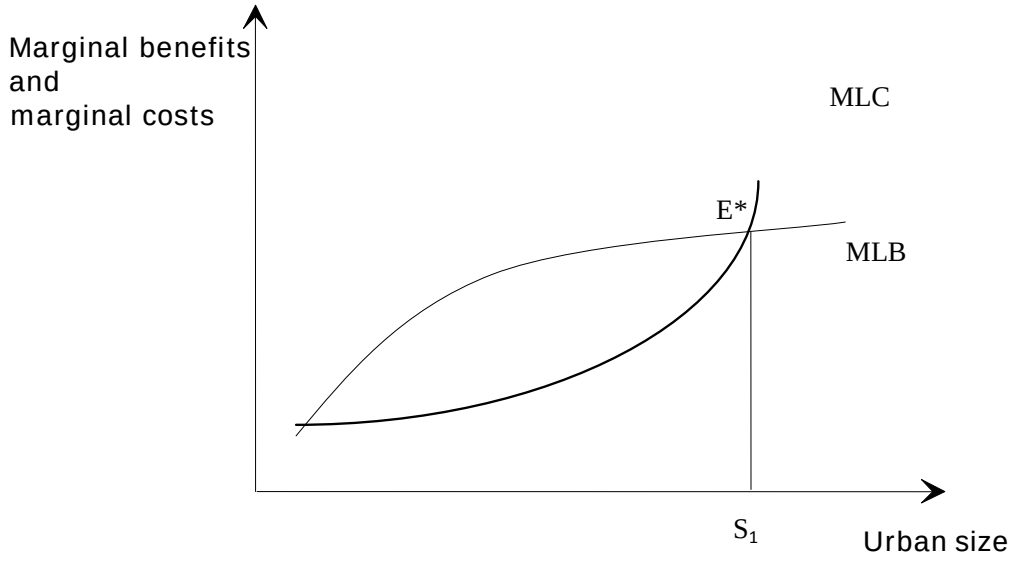
(6.) $\frac{\partial B}{\partial size} = \kappa size^{\kappa-1} amenities^{\zeta} diversity^{\vartheta} density^{\chi} functions^{\mu} networks^{\nu}$ >0,

$\frac{\partial "B}{\partial size"} = \kappa(\kappa-1) size^{\kappa-2} amenities^{\zeta} diversity^{\vartheta} density^{\chi} functions^{\mu} networks^{\nu}$ <0

For the model to be sustainable, the α and κ parameters must be different, so that the costs and benefit curves cross each other, thereby allowing an equilibrium to exist.

The way we close the model is to assume spatial equilibrium across the analyzed urban system. In other words, as people can freely move across space in order to look for better living conditions (in other words, they can look for cities characterized by higher benefits or lower costs).

Therefore, in order to be in equilibrium, the urban system must satisfy the condition in which marginal costs equal marginal benefits (MC=MB). This condition is represented in Figure 39.[10]



[10] As Figure 39 shows, the equilibria may actually be two, with the first being not sustainable, since to its right the marginal benefit curve remains above the marginal cost one.

Figure 39: Marginal costs and marginal benefits for city size

Analytically, this implies the following condition:

$$(7.)\quad \frac{\partial C}{\partial size} = \frac{\partial B}{\partial size}$$

i.e.

$$(8.)\quad \begin{aligned} &\alpha size^{\alpha-1} rent^{\beta} malaise^{\delta} sprawl^{\gamma} = \\ &= \kappa size^{\kappa-1} amenities^{\zeta} diversity^{\vartheta} density^{\chi} functions^{\mu} networks^{\nu} \end{aligned}$$

which in turn implies:

$$(9.)\quad \frac{size^{\alpha-1}}{size^{\kappa-1}} = \frac{\kappa}{\alpha} \frac{amenities^{\zeta} diversity^{\vartheta} density^{\chi} functions^{\mu} networks^{\nu}}{rent^{\beta} malaise^{\delta} sprawl^{\gamma}}$$

That is:

$$(10.)\quad size^{\alpha-\kappa} = \frac{\kappa}{\alpha} \frac{amenities^{\zeta} diversity^{\vartheta} density^{\chi} functions^{\mu} networks^{\nu}}{rent^{\beta} malaise^{\delta} sprawl^{\gamma}}$$

Eq. (9.) can be log-linearized in order to obtain an estimable function. This process yields to the following functional form:

(11.)

$$\begin{aligned} &(\alpha-\kappa)\ln(size) = \ln\left(\frac{\kappa}{\alpha}\right) + \zeta \ln(amenities) + \vartheta \ln(diversity) + \chi \ln(density) + \mu \ln(functions) + \\ &+\nu \ln(networks) - \beta \ln(rent) - \delta \ln(malaise) - \gamma \ln(sprawl) \end{aligned}$$

and finally

$$(12.)\quad \begin{aligned} \ln(size) = &\frac{\ln\left(\kappa/\alpha\right)}{(\alpha-\kappa)} + \frac{\zeta}{(\alpha-\kappa)} \ln(amenities) + \frac{\vartheta}{(\alpha-\kappa)} \ln(diversity) + \\ &+ \frac{\chi}{(\alpha-\kappa)} \ln(density) + \frac{\mu}{(\alpha-\kappa)} \ln(functions) + \frac{\nu}{(\alpha-\kappa)} \ln(networks) + \\ &- \frac{\beta}{(\alpha-\kappa)} \ln(rent) - \frac{\delta}{(\alpha-\kappa)} \ln(malaise) - \frac{\gamma}{(\alpha-\kappa)} \ln(sprawl) \end{aligned}$$

Eq. (12.) is the basis of our analyses.

The model in eq. (12) can be drawn for simplicity in a linear fashion (Figure 40). Notice that the variables entering the model are those traditionally devised in the literature as the substantial determinants of urban performance.

However, in this work package we bring together traditional and modern theories on urban performance, by letting measures of polycentricity, metropolisation, density and sprawl in the model as "vertical shifters" of the benefit function (vertical arrows in Figure 40). This point will be discussed further in Section 3.5.

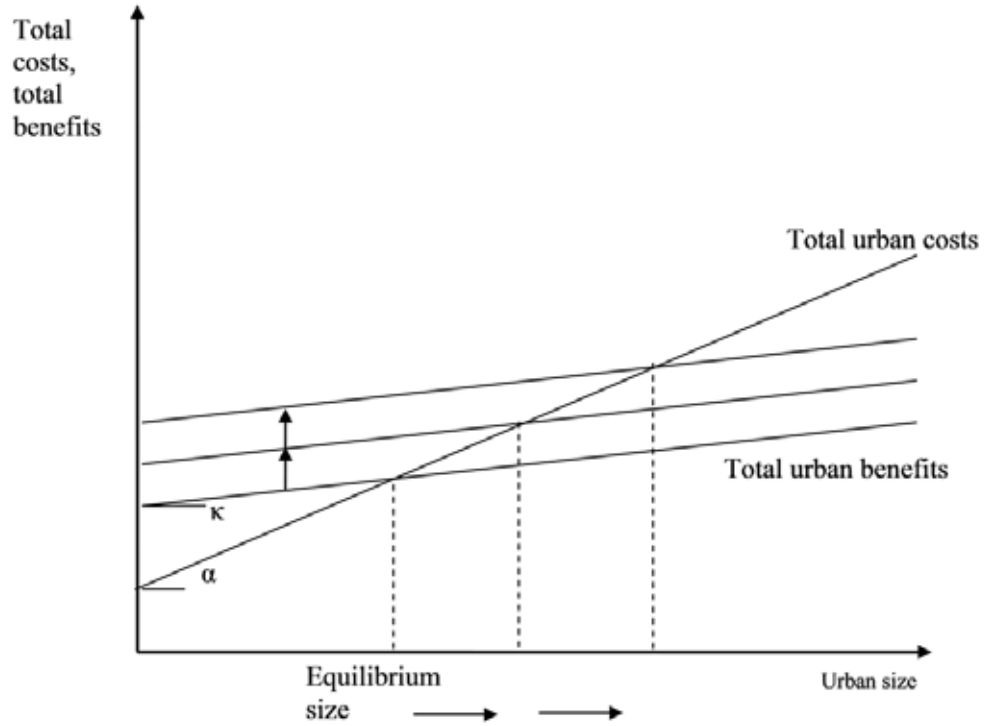


Figure 40: A linearized version of the model in ea. (12)

3.4 The data set

Our empirical test of the model in eq. (12) is based on a set of 59 Larger Urban Zones, EUROSTAT's definition of the concept of a Functional Urban Area. This choice is mainly motivated by data availability, since the data set merges information from two main sources, viz. EUROSTAT and the ESPON project "Future Orientations for Cities (FOCI).

Annex 10.4 shows a map of the city sample employed in this analysis, and presents some revealing figures on the consistent percentage of wealth produced, and population and labor force living, in the metropolitan areas covered.

Figure 41 presents instead a summary of the data set built for the empirical analysis.

Type of variable	Class of variable	Variable	Measure	Years	Source of raw data
Dependent	Physical size of cities	Size	Population levels in 59 LUZ (1)	Average 2004-2006	ESPON/Urban Audit
Independent	*Traditional urban benefits*				
	Quality of life	Amenities	Tourist inflows over available years	Average 2001-2004	Urban Audit
	Urban creativity	Diversity	Sectoral diversity index measured as 1 - the share of top 5 NACE 2 digits industries (2)	1990	ESPON
	Agglomeration economies	Density	Population density	Average 1989-2003	Urban Audit
	Traditional urban costs				
	Cost of the city	Rent	Cost of average quality apartment per square meter	Average 1991-2004	Various (see Appendix 2)
	Social conflict	Malaise	Number of crimes per 1,000 population per year	Average 1989-2003	Urban Audit
	Nonconventional urban benefits				
	Relational policentricity	City networks	Number of participations in Framework Programme 5 projects over labour force	Average 1998-2002	CORDIS
	Metropolisation	High level urban functions	Workforce in ISCO professions 1 and 2 (respectively, legislators, senior officials and managers and professionals) over total FUA labour force (2)	Average 2002-2004	ESPON
	Nonconventional urban costs				
	Diffused urban form	Sprawl	Percentage of non-built-up area of the total area of FUA. Built-up areas include artificial areas according to the CORINE Land Cover nomenclature.	1990	ESPON

Figure 41: The data set

Both urban benefits and costs are classified according to their more conventional or unconventional consideration in the literature. For what concerns *traditional urban benefits*, among the multiple urban factors considered in the literature, this WP focuses on:

- urban amenities, proxied by the inflows of tourists in the Metropolitan Area representing a measure of urban attractiveness;
- the Jacobsian source of externality stemming from a diversified labor market, calculated as the share of non-top 5 industries (at NACE 2 digits) in total employment (Glaeser et al., 1992);
- finally, a measure of agglomeration economies, measured as population density, including the vertical development of the metropolitan area (and therefore the pure probability of "contagion" of new ideas).

For what concerns *nonconventional urban benefits*, among elements previously only seldom covered by empirical studies on the determinants of urban performance, in the following are considered:

- city-networks (*relational polycentricity*), proxied by the number of Framework Programme 5 projects to which institutions of Metropolitan Areas jointly participate over the LUZ workforce;
- high level urban functions (*functional metropolisation*), measured as the share of the labor force in ISCO professions 1 and 2 (respectively legislators, senior officials, managers and professionals);

Along the same lines, urban costs can be classified according to whether their role is properly and structurally described in previous studies, and, consequently, well tested in applied works, or whether their inclusion presents elements of novelty.

Traditional urban costs include:

- the pure location costs associated to urban size, as indicated by land rent (measured with the prices per square meter of average quality apartments in downtown metropolitan areas);[11]
- the social distress associated to urban life, captured by the number of crimes recorded for the FUA;

Nonconventional urban costs take into account the notion of sprawl, which is here measured with the percentage of non-urbanized land inside FUA. This indicator captures the degree of fragmentation of a FUA territory, typical of a dispersed urban form.

All variables, following the theoretical model above outlined, are in natural logs.

3.5 Empirical results

Figure 42 presents OLS estimates of the model presented in equation (12.). The results show a remarkable adherence with theoretical ex-ante expectations. If the spatial equilibrium assumption holds, and people are, with some limitations, free to move and search for better life conditions, these estimates provide a reliable first-layer assessment of urban size determinants in the European urban system.

The first model presents a simple regression where the equilibrium size is explained by land rent, which captures a synthesis of all costs and advantages of city size. Results show a significant and positive relationship between land rent and equilibrium city size; land rent is therefore in this case an indicator of net urban advantages.

When both conventional and unconventional costs of urban size are inserted in the regression, the results have the expected negative and significant sign (Model 2), while urban rent still keeps a

[11] See Appendix 10.4.2 for more details.

positive sign even if it loses significance. In order to capture the determinants of urban size, a first synthetic indicator of urban advantages is added to the regression, that of density which should conceptually include agglomeration economies (Model 3). The results indicate that a higher density is a source of higher equilibrium sizes, as always claimed by the literature.

An additional interesting step is to better identify "agglomeration economies" through different sources of urban advantages. Models 4 and 5 present the results once density is substituted or accompanied, in the regression, by diversity and amenities; both variables are significant and related positively to equilibrium urban size. Model 5 shows that the more generic density variable is still significant, suggesting that other elements are still embedded in a dense urban form, providing advantages to a large city.

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	8.80***	12.54***	11.05***	3.93***	1.58	9.93***
	(1.49)	(1.57)	(1.49)	(2.70)	(2.29)	(2.01)
Land rent	0.70***	0.43**	0.36**	-0.12	-0.15	-0.35**
(0.20)	(0.18)	(0.17)	(0.15)	(0.12)	(0.14)	
Malaise	-	-0.16*	-0.16**	-0.12*	-0.11**	-0.10*
		(0.09)	(0.08)	(0.06)	(0.05)	(0.05)
Urban amenities	-	-	-	0.47***	0.43***	0.32***
				(0.07)	(0.07)	(0.07)
Urban diversity	-	-	-	1.69**	2.05***	0.83*
				(0.68)	(0.57)	(0.46)
Density	-	-	0.27***	-	0.26***	-
			(0.10)		(0.07)	
Relational polycentricity	-	-	-	-	-	0.12**
						(0.05)
Metropolisation	-	-	-	-	-	0.20**
						(0.09)
Dummy small countries	-	-	-	-	-	-0.25*
						(0.13)
Dummy financial capital	-	-	-	-	-	0.60***
						(0.17)
Sprawl	-	-0.37***	-0.20**	-0.29***	-0.21***	-0.30***
		(0.10)	(0.09)	(0.07)	(0.08)	(0.08)
R^2	0.20	0.39	0.45	0.70	0.75	0.78
Joint F test	12.51***	13.31***	12.73***	37.56***	32.67***	21.01***
Robust standard errors	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	59	59	59	59	59	59

Figure 42: Empirical results for estimating eq. (12)

*Note: Standard errors in parentheses. * = significant at the 90% level; ** = significant at the 95% level; *** = significant at the 99% level.*

Model 6 presents the whole specification of eq. (12), since the two unconventional variables, city-networks (*relational polycentricity*) and high level urban functions (*metropolisation*), are added to our estimate. Moreover, model 6 controls for the likely distortion introduced in the analyses by

ignoring out-of-ordinary city-specific characteristics that may further enhance, or be detrimental to, the capability of cities to reach a larger equilibrium size. First, a dummy variable for small countries (viz. all countries in the sample but Germany, France, Spain, Italy, Poland, and the UK) is introduced, allowing to control for two differentiated modes of development, where small countries are characterized by an urban system with smaller cities. Results show that in fact smaller countries present lower equilibrium city sizes, coeteris paribus.

Second, in model 6 a dummy for financial cities is added (including London, Paris, Frankfurt, Madrid, and Milan). Also in this case empirical analysis proves the validity of the ex-ante intuition: cities hosting a relevant stock exchange benefit from an extra premium in size terms with respect to cities with identical characteristics. Model 6 embraces all variables of the theoretical model (12.) plus the last two dummy variables: the main conclusions on all relevant variables hold, while the two dummy variables simultaneously used further improve the linear fit of the model (78% of total variance explained).

In sum, results show that:

- agglomeration economies, generically measured by urban density, do matter;
- traditional views on urban advantages, linked to diversity and amenities, increase the explicative power of the model (R2) from 45% to 70%;
- most recent non-conventional views on urban growth, pointing out the relevance of new elements like the presence of economic and power functions and participation to an urban network, are corroborated: these elements allow cities to achieve equilibrium at higher sizes, withstanding the higher urban costs implied. The conclusions of the city-network theory are confirmed: the explicative power of the present model is enhanced;
- land rent, after netting out its relations with other benefit and cost variables, is the single highest cost for urban population, reflected in the highest parameter estimate within the final model (6).

3.6 Conclusions

Since the birth of the object city, urban agglomerations have been the loci of innovation, where human capital is attracted as is paid its highest return, and, as one famous saying goes, the place where people are truly free.[12] Recent developments in the urban world, however, prompted the emergence of new trends for urban location. Not only does it pay off to accumulate human capital and locate where the returns associated to education are highest, but also, it becomes increasingly important to enjoy the more open atmosphere which characterizes modern urban agglomerations.

In this scientific report we review traditional and recent urban trends as sources of urban performance, framing them in a theoretical model which brings together the neoclassical and modern approaches to urban performance. This model is then tested on 59 Functional urban Areas within the EU27.

The evidence suggests that indeed modern paradigms explain much of current disparities in terms of urban performance (and in particular of city size). While rent, net of the urban benefits it reflects, still represents the single highest cost associated to urban size, cities now benefit not only from attracting highly educated professionals, and hosting a rich and diversified labor market, but also from pure amenities, which are found to be associated with a better urban performance.

Besides, results clearly and consistently show that being connected to a network (in this case, of scientific relations), i.e., being relationally polycentric, also fosters urban performance. Less clear, although still positive, is the effect of a metropolised urban system on overall city performance.

Planning matters, when smartly integrated with a sound urban economic strategy.

[12] Stadtluft macht frei.

4 Metropolitan Profiles

Authors: Natasha Pichler-Milanovic, Alma Zavodnik-Lamousek, Samo Drobne, Miha Konjar

4.1 Objectives

The key objective of WP2.3 is to identify the similarities and differences between the five POLYCE capital city regions - metropolises - and other metropolises in (Central) Europe. This differentiation is assumed to be an outcome of metropolisation and more or less of polycentric development based on the specialization in metropolitan functions (Krätke, 2007; Friedmann, 2002).

WP2.3 analyses the profiles of POLYCE metropolises in two ways:

- a group of European cities (MEGA) including the five POLYCE metropolises are described by a set of key policy development characteristics (*i.e. Economy, People, Mobility, Environment, Living*);
- additional factors regarding the characteristics of metropolisation and polycentricity (with input from POLYCE WP2.1, WP.2.2. and WP2.4 and other ESPON projects) provide a more specific analysis of the territorial capital characteristics of five POLYCE metropolises.

4.2 Benchmarking as a strategic tool steering metropolitan development

Generally, the process of urban development is more since ever driven by processes of economic restructuring, socio-demographic changes and technological innovations. Some cities in particular are characterized through the process of metropolisation (see chapter 1) which is regarded as the outcome of the specific competitiveness through growth in terms of population, jobs and traffic, through the attraction of specific and high ranked functions and economic specialization.

In front of increasing competition European cities are challenged in a particular way because the allocation of investments respective of economic activities is done predominantly according to comparative advantages between cities. And comparison is done increasingly across large cities and independent of countries – due to less importance of national borders. Hence, in a globalizing economy metropolitan regions find themselves in competition with other cities and regions. This means, high ranking cities with their respective territories should attract not only basic economic functions on the interregional and national level but should compete on an international level transforming their potentials into tangible and intangible assets which provide respective place-based comparative advantages (Camagni, 2009). Competitiveness in a strategic perspective becomes important. At the same time processes of globalization and increasing competition enforce socio-economic trends of unemployment, social polarization and precarious conditions of living for increasing numbers of residents. Very often – based on housing market dynamics – social segregation is combined or even enforced through processes of gentrification and spatial segregation. Although the allocation of high ranked metropolitan functions is a pre-condition for structural and functional polycentricity in a wider functional metropolitan area, at the same time it may become a driving force of urban sprawl. In some cases it will even become a driving force for spatial fragmentation. Hence, metropolitan competitiveness will jeopardize economic and social cohesion with corresponding negative effects on inclusive metropolitan development. Hence, inclusive development in a strategic perspective becomes important, too.

In front of these two different perspectives regarding competitive and inclusive metropolitan development the challenge of a strategic governance approach becomes evident supporting a smart development as defined above: *'Smart metropolitan development' indicates the ability of a metropolitan agglomeration to cope with the challenges of competitiveness and inclusive development which is based on its territorial cohesion under the polycentric perspective.*

Following this definition cities are challenged to introduce more strategic instruments in order to concentrate relevant organizational capacities and to identify most relevant strategic projects steering urban and metropolitan development in a smart way. As one of several consequences comparative approaches like city rankings have experienced a remarkable boom: On the one hand the comparison of cities can support investors in their choice of location, on the other hand it can be an important guide for the cities to judge their position in an urban system and to define their goals and strategies for future development (Giffinger et al., 2009). However, there is some evidence that the discussion of city rankings is mainly concentrated on the final ranks totally neglecting (1) the methods and indicators used respectively, (2) its purpose and effectiveness for strategic planning.

Acknowledging these deficits of a ranking approach, the main attention in this WP2.3 is therefore not put on the meaning and results of ranks but on the definition of metropolitan profiles which are defined according to the i.e. "Smart City approach" implemented in year 2007 (Giffinger, et al., 2007; Giffinger et al., 2010) This approach (see below) delivers results in a multidimensional way. The main focus is put upon key policy development characteristics in different fields of urban development but with special attention to aspects of metropolisation and polycentric features. (See chapter 1)

Instead of ranks, the main results in form of visualized metropolitan profiles (bundle of key characteristics and factors for every city) allow an easy benchmarking between cities. In particular, results provide the base for a further assessment of competitive or inclusive development and a starting point for the evidence based elaboration of strategic recommendations on territorial cohesion as a pre-condition for a balanced *smart metropolitan development*.

4.3 Methodology

The metropolitan profiles are defined by a set of key development and policy-oriented characteristics (*Economy, People, Mobility, Environment, Living*). They are composed of a bundle of factors describing metropolitan development in a multidimensional way. Empirically each metropolis is defined through a set of indicators (key, core, research) and factors describing specific properties of the mentioned fields of development characteristics as they are assumed to be relevant for the process of metropolisation.

In a (non)hierarchical approach a corresponding method - already applied in the 'European Smart-City project' (see Giffinger et al., 2007) is implemented. This allows the identification of metropolitan profiles derived from indicators, factors and key policy development characteristics (*e.g. Economy, People, Mobility, Environment, Living*).

Also, the metropolitan structure of the five POLYCE metropolises is defined on the level of factors and related indicators defined from other ESPON projects, especially urban related projects FOCI (2008-2010), ATTREG (2010-2012) and some other data from the URBAN AUDIT / EUROSTAT and ESPON 2013 DB.

Data collected from publicly available data sources (URBAN AUDIT / EUROSTAT, ESPON 2006 - 2013 DB) allow for a comparison between five POLYCE metropolises and other MEGA cities in Europe as defined by ESPON 1.1.1 project (2005) and provide the basis for an improved positioning of the POLYCE metropolises within the European urban system (Giffinger et al., 2007; Giffinger et al, 2009).

4.3.1 Selection of European cities for POLYCE benchmarking analysis

According to ESPON 1.1.1 (2005) project about 1595 FUAs (Functional Urban Areas) with more than 20,000 inhabitants have been identified in Europe. MEGAs (Metropolitan European Growth Area) correspond to FUAs with the highest average score with regard to Population, Transport, Manufacturing, Knowledge and Decision Making. About 76 MEGAs have been identified in Europe 27 divided into 5 categories, including a specific category for the two global nodes of London and Paris.1

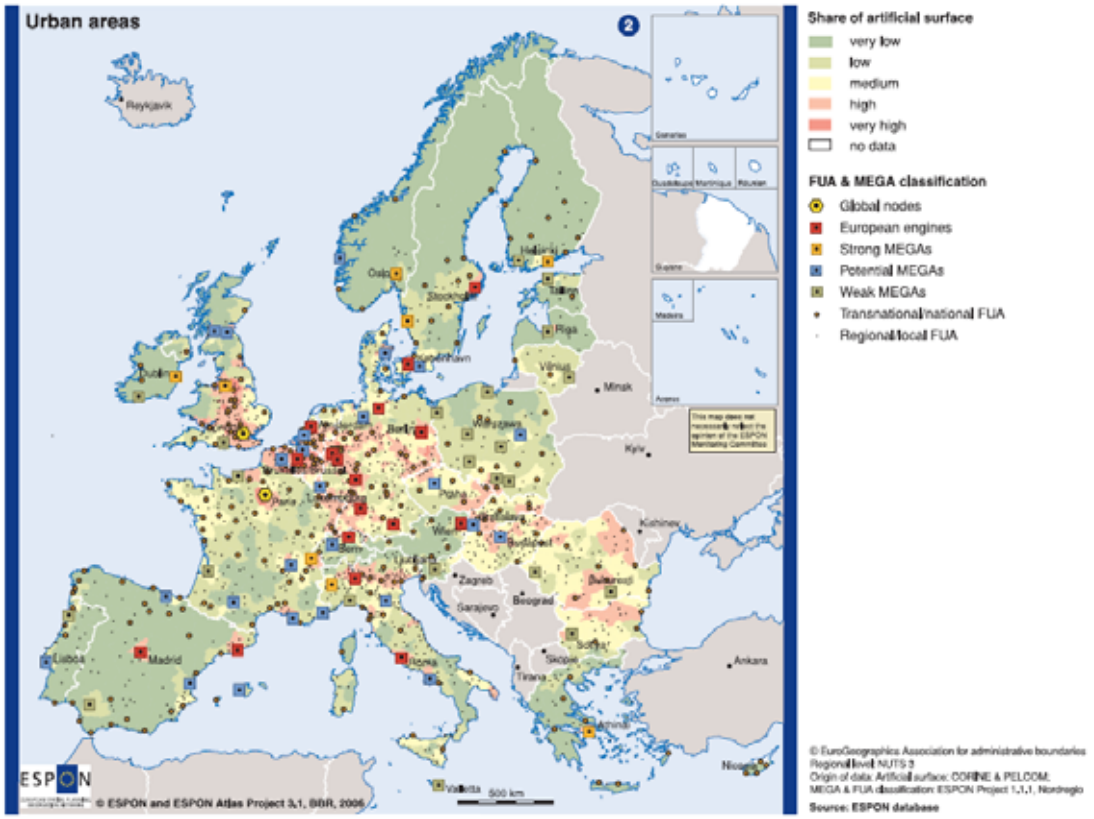


Figure 43: FUA and MEGA classification of European urban system (ESPON 1.1.1, 2005):

- 1st. rank (2 MEGA): London, Paris;
- 2nd. Rank (13 MEGA): Munich, Frankfurt, Madrid, Milan, Rome, Hamburg, Brussels, Copenhagen, Zurich, Amsterdam, Berlin, Barcelona, and Stuttgart;
- 3rd. rank (11 MEGA): Stockholm, Helsinki, Oslo, Düsseldorf, Geneva, **Wien**, Cologne, Manchester, Athens, Dublin, Gothenburg;
- 4th. Rank (26 MEGA): **Praha**, Warsaw, **Budapest**, **Bratislava**, Bern, Luxembourg, Lisbon. Lyon, Antwerp, Turin, Rotterdam, Aarhus, Malmö, Marseille, Nice, Bremen, Toulouse, Lille, Bergen, Edinburgh, Glasgow, Birmingham, Palma de Mallorca, Bologna, Bilbao and Valencia;
- 5th. Rank (24 MEGA): Bucharest, Tallinn, Sofia, **Ljubljana**, Katowice, Vilnius, Krakow, Riga, Lodz, Poznan, Szczecin, Gdansk-Gdynia, Wroclaw, Timisoara, Valletta, Cork, Le Havre, Southampton, Turku, Naples, Bordeaux, Seville, Porto, Genoa.

POLYCE metropolises - Wien is ranked as 3rd MEGA, Praha, Budapest and Bratislava as 4th MEGA, Ljubljana is ranked as 5th MEGA.

4.3.2 Selection of cities and indicators for (non)hierarchical analysis

First step: selection of MEGA (ESPON 1.1.1): 76 MEGA in Europe including all 27 EU member states as well as Norway and Switzerland (but excluding Iceland and Liechtenstein);

Second step: selection of MEGA that are also covered with URBAN AUDIT (UA) database for the Core City (CC) and Larger Urban Zone (LUZ) and approximation of LUZ to NUTS 3 and NUTS 2 regional level as defined by the ESPON FOCI project;

Third step: exclusion of MEGA 1st class: London and Paris as well as The Hague (not defined as MEGA) and some 5th rank MEGA: Bilbao (Spain), Le Havre (France), Turku (Finland), Southampton (UK) and Cork (Ireland) that are not included in FOCI LUZ list with approximation to NUTS 3 and NUTS 2 levels.

Therefore 69 MEGA were selected for data collection (including 25 capital cities). This was the starting point for establishing the database file i.e. WP2.3 **"Master (or MEGA) Data File"**.

Fourth step: data collection are implemented primarily for LUZ (according to UA definitions and database coverage for 1999-2008) as proxy to MEGA, as well as LUZ approximation to NUTS 3 and NUTS 2 level from the ESPON FOCI database, FUA/MEGA data (from several ESPON projects), NUTS 2 level data (as proxy to LUZ) collected directly from the EUROSTAT or from ESPON ATTREG project, or data for LUZ or CC collected directly from UA (i.e. if data are not included in the FOCI database);

Fifth step: after collection of data for approx. 160 indicators decision for exclusion of some MEGA (from 69 to 50 MEGA) that are insufficiently covered by data (more than 80% data coverage) as well as selection and reduction of the number and type of indicators (from 160 to 149 and finally to **123 indicators**) are necessary for statistical (non)hierarchical analysis of **50 MEGA** in Europe including 5 POLYCE metropolises.

Sixth step: statistical analysis with grouping of selected indicators (123) in a bundle of factors (25) and five key policy development characteristics with transformation of indicator values in z-values, weighing of factors to provide scoring of factors, characteristics and overall city scores and ranks. This was necessary in order to obtain the starting point for evaluation of "metropolitan profiles" for selected MEGA and further benchmarking of five POLYCE metropolises.

POLYCE WP2.3 Master (MEGA) Data File is also utilized for other descriptive statistical and benchmarking analysis of five POLYCE metropolises (CC, LUZ, LUZ approximation to NUTS 3 or NUTS 2 level, MEGA) vis-à-vis other 64 (or 45) MEGA (e.g. 23 capital cities within 50 MEGA, EU12 / EU15 vs. new 10 EU member states, Pentagon vs. other macro-regions (e.g. Central and Eastern Europe, Danube region), etc. WP2.3 Master (MEGA) Data File represents the state-of- the-art or the level of metropolisation of 69 (50) MEGA between 1998 and 2008.

For benchmarking analysis Master (MEGA) Data File was complemented with data file of five POLYCE metropolises (CC and LUZ) covered by URBAN AUDIT database for five periods from 1989-1993, 1994-1998, 1999-2002, 2003-2006, and 2007-2010. Missing data in URBAN AUDIT POLYCE database (see POLYCE Interim Report) proved very difficult to be completed by POLYCE TPG from local/national statistical data sources or from individual research projects, or estimates based on expert evaluation of trends in POLYCE metropolises. that could complement data and results from other ESPON projects. Statistical offices in POLYCE countries and cities use different methodology for data capture of UA indicators or there is a difference between UA / EUROSTAT requests and local statistical sources. Therefore this data file is used only as additional information for preparation of Local Conferences and POLYCE City Reports but not for statistical analysis as POLYCE TPG used the data in WP2.3. Master (MEGA) Data File.

Based on the results of statistical analysis of 50 MEGA including five POLYCE metropolises in (Central) Europe – the metropolitan profiles of POLYCE metropolises are developed based on **territorial capital assets** – *five key policy development characteristics (Economy, People, Mobility, Environment, Living) with 25 factors (and 123 indicators)* as necessary input for policy recommendations and further governance and stakeholders actions in POLYCE metropolises.

4.3.3 WP2.3 empirical analysis focuses on:

- Collecting and processing comparable data from different publicly available data bases (ESPON 2006-2013 DB, EUROSTAT, URBAN AUDIT, etc.) for 69 MEGA (including five POLYCE metropolises) and establishment of POLYCE WP2.3. Master (MEGA) Data File with meta-data. Final selection of 50 MEGA and 123 indicators for statistical analysis are based on more than 80% data coverage for 69 MEGA and 149 indicators. Five POLYCE metropolises are covered well (98-100%) with data for 123 selected indicators.
- Elaboration of a (non)*hierarchical approach describing metropolitan characteristics of* POLYCE metropolises through a bundle of factors (25) which are defined by set of relevant indicators (123) based on final selection of 50 MEGA in Europe (including 23 capital cities);

- Analysis of POLYCE metropolises based on comparable data, analysis and results of other POLYCE WP and other (inter)national/local research projects describing resources, potentials and assets of **smart, inclusive and sustainable** metropolitan and polycentric development of five POLYCE metropolises in Europe;
- Based on these results five POLYCE Metropolitan Profiles are developed based on **territorial capital assets** – *through five key policy development characteristics* (Economy, People, Mobility, Environment, Living) as necessary input for policy recommendations of POLYCE TPG and further stakeholders (city region) actions in future.

4.4 Data Sources and Indicators Formation

All indicators and data which are used for analysis and ranking of five POLYCE metropolis and other 45 MEGA in Europe are obtained from publicly available databases: UA (CC, LUZ), EUROSTAT (NUTS 3, NUTS 2), and data sources developed within new ESPON 2013 projects – especially FOCI and ATTREG projects. The majority of all indicators in WP2.3 Master (MEGA) Data File are defined on the local / regional level (LUZ, CC, MEGA). Others which are derived from data on the NUTS 3 and NUTS 2 levels are also included based on the approximation of selected MEGA to NUTS3 or NUTS 2 level (as defined by the FOCI project) because they provide additional information not only about the endowment of MEGA and POLYCE metropolises but also about the perception and assessment of specific urban and regional policy developments before year 2008.

4.4.1 ESPON 2006 - 2013 DATABASE

The **ESPON 2013 Database** is a complex information system dedicated to the management of statistical data about the European territory, spanning over a long period of time. The ESPON 2013 DB aims to improve the access to regional and spatial information. This process has been initiated by the previous ESPON 2006 Programme in order to increase the number of variables that may positively support the analysis of spatial structures and trends across European cities and regions. The ESPON 2013 DB project collects important information for the ESPON programme mainly derived from EUROSTAT and other regional sources and included indicators and typologies generated by the various ESPON projects. This database gives a detailed picture of a large number of statistical fields in the 27 Member States of the EU, as well as in EFTA and in some cases in CEC countries.

A broad set of regional indicators can be extracted from the ESPON 2013 DB covering aspects of demographics, labor market, gross domestic product, household accounts, structural business statistics, information society, science, technology and innovation, education, transport, tourism, health, agriculture, geographical specificities, and a study on a new urban-rural typology. All the information collected is already recorded with the NUTS 2006 classification, which is an important feature of the data to allow temporal comparability. Changes between the codification used in 2003 and 2006 are minor and are often associated to codes/names changes at least at the NUTS 2 level.

4.4.2 ESPON FOCI: Future Orientations for Cities (2008-2010)

ESPON FOCI project provides important analyses and information on the current state, trends and development perspectives for the largest cities and urban agglomerations within the European territory. It provides information on the forces driving urban development in Europe and scenarios for the development of Europe's cities and generates associated policy options. FOCI project is also complementary to the (new) State of European Cities Report (DG Regio, 2011). The aims of FOCI project are to: (i) review of current literature to extract the knowledge about trends, perspectives and, most importantly, driving forces for urban development in different thematic fields; (ii) each of the teams focused on one or two innovative empirical research questions, generally tapping new data sources, (iii) scenario team has taken the work of the other teams, and substantially augmented it through additional literature review, aiming at covering an even larger horizon and to provide a complete knowledge base on urban development, necessary for integrated prospective thinking. On

this basis the scenarios were developed. The structure of the main report reflects these three strands, adding a fourth, new strand, which consists in an assessment of the current national policy visions on urban issues across Europe.

POLYCE project uses the data collected (and developed) by FOCI projects for selection of indicators and MEGA cities in order to develop the POLYCE WP2.3*. Master (MEGA) Data File*. The results of different research tasks within FOCI project are presented in the FOCI Final Report (December 2010). The final FOCI results are utilized for metropolitan profiles of five POLYCE metropolises. Most FOCI indicators and data come from the URBAN AUDIT (LUZ / CC), EUROSTAT (NUTS 3 / NUTS 2) and ESPON 2013 DB (FUA/MEGA) as well as from some independent databases (e.g. ORBIS, CORDIS, etc)

4.4.3 ESPON ATTREG: Attractiveness of European Regions and Cities for Residents and Visitors (2010-2012)

ESPON ATTREG projects identifies the main attraction factors of European cities and regions with respect to a wide range not only of population mobility of residents and visitors (migration flows associated with labor vs. leisure) but also a continuum of mobilities differentiated by different attraction factors, in order to categorize European regions (and cities) in relation with other established ESPON regional classifications. ATTREG project builds on findings of ESPON 1.3.3 (2004-2006) as the first attempt to map attraction factors in European regions and to explain their differential capacity to "valorize" their attractiveness as a development asset. In many cases ATTREG collected data directly from EUROSTAT for NUTS 2 (and in some cases NUTS 3 level) but data were also collected using alterative data sources, as the ICCA (congress events), Touring Club Guidebooks series (touristic points), DG Regio (e.g. number of universities and university students), EC Education and Training (e.g. Erasmus students).

POLYCE WP2.3. reviewed indicators and data collected (and developed) by the ATTREG project and their relevance for building the POLYCE WP2.3 Master (MEGA) Data File and the five POLYCE metropolitan profiles. POLYCE project partner (University of Ljubljana) was also involved as a project partner in the ATTREG project and therefore participates in data collection and analysis of indicators collected for NUTS 2 regions in Europe. ATTREG project has also developed own indicators and indices as well as new typologies.

4.4.4 ESPON INTERCO: Indicators of Territorial Cohesion (2010-2012)

Builds on ESPON 4.1.3 project "Feasibility study on monitoring territorial development based on ESPON key indicators" has developed a framework for the selection of a first set of appropriate territorial indicators. ESPON 2013 Database project has designed and implemented a framework for the integration of the data (and metadata) needed to calculate and to map indicators. The INTERCO project intends to build on these results by inserting additional/new/more detailed indicators, developing additional metadata specifically designed for describing indicators, defining conceptual/logical links between the different sets of indicators and refining the tools and procedures for selecting / validating the relevant indicators. INTERCO has created a preliminary inventory of indicators containing a large number of ESPON 2006 and 2013 projects indicators as well as EUROSTAT classified per themes and subthemes, types, scales, as well as other characteristics and sources of indicators mostly for NUTS 3, NUTS 2 or NUTS 1 level (subject to availability of data). In addition, statistical data from the European Environment Agency (EEA), Spatial Planning and Geoinformation (RRG), SILC, and the UNDEP have been used. Some statistical data have also been calculated by using GIS methods and tools, i.e. concerning land use indicators. Other indicators have also been generated with the help of complex simulation models, such as different accessibility indicators combining different GIS and statistical data into one model.

POLYCE WP2.3 reviewed the selection of indicators for NUTS 3 and NUTS 2 level from the ESPON INTERCO Interim Report and their relevance for the POLYCE W.P. 2.3 Master (MEGA) Data File. Some indicators and data from the INTERCO project (originally from EUROSTAT) have been also included in the FOCI, ATTREG, DEMIFER and/or other ESPON projects. INTERCO project has been implemented parallel to POLYCE project and POLYCE TPG has decided not to rely on INTERCO data collection for

selected MEGA and POLYCE metropolises due to specific time constraints but to revise the set of POLYCE WP2.3 indicators and data relevance after completion of both projects in year 2012. The revision of selected indicators and corresponding data will improve and update the POLYCE Master (MEGA) Data File in order to inform POLYCE stakeholders about new urban trends and performances as well as additional policy recommendations.

4.4.5 Other ESPON projects

Some other new ESPON 2013 projects have been also reviewed but most of the data are available for NUTS 1-2-3 regions and not for urban areas as such (e.g. FUA/MEGA, CC/LUZ) – or only through selected city / regional case studies. For establishing the POLYCE metropolitan profiles some conclusions from these projects are used to confront the situation in the POLYCE metropolises such as: *DEMIFER, CLIMATE, SURE, CAEE*.

- **DEMIFER project: Demographic and migratory flows affecting European regions and cities** examines how different regions of Europe are affected by the demographic changes (natural change, migratory flows, change in active population etc) that have already taken place as well as what changes are expected to happen.
- **CLIMATE project: Climate Change and Territorial Effects on Regions and Local Economies** examines the climate change, the factors that cause or deteriorate it, how it affects different areas (which areas are more vulnerable etc) as well as the consequences of climate change (also with the use of case studies).
- **SURE: Success for convergence Regions' Economies** structured empirical analysis for convergence regions identifies success factors for consolidated growth. Final goal of the project is to better understand and explain economic imbalances between different European regions, providing insight into the processes and factors behind the economic development of Convergence Regions.
- **CAEE: The Case for Agglomeration Economies in Europe** examines the relationships between agglomeration economies and city-regional/metropolitan governance.

4.4.6 EUROSTAT / URBAN AUDIT

In many cases collected data used in ESPON projects come directly from EUROSTAT Regio database for NUTS 2 (and in some cases from NUTS 3) regional level for time period between 2001-2009. Under the coordination of EUROSTAT, URBAN AUDIT (UA) aims to gather comparable data covering most aspects of urban life in European cities and towns. UA was conducted at the initiative of the DG Regional Policy at the European Commission. It aims to collect comparable statistics and indicators for cities, at three different spatial scales: *Sub-Districts, City Core (CC) and Larger Urban Zones (LUZ)*. National Statistics Offices in EU member states is the link between EUROSTAT and the cities involved. They collect and gather data in their respective countries before passing it to EUROSTAT. Four different rounds of data collection occurred until year 2011. A first phase (pilot phase) was launched in year 1998, a second round between 2003 for EU Member States and 2004 for Candidate Countries (UA II 2001), a third round between 2006 and 2007 (UA III 2004). The last round (UA IV 2008) is ongoing now and data dissemination has been available since year 2011.

UA is not a top-down approach (starting from identical definition criteria and trying to enrich it by taking into account national diversity but a bottom-up approach – that proved to be difficult to be adjusted by national statistical offices – as a lot of data are missing for particular CC and especially LUZ in Europe. Countries are required by UA to choose and send national definitions of LUZ, sometimes changing them when taking into account some recommendations. The *Larger Urban Zone* (LUZ) is conceived by UA to approach the functional urban region (FUR) definition. To ensure a good data availability, the UA works primarily with administrative boundaries that approximate the FUR However, each UA participating city has not systematically developed the three spatial representations: some UA cities have no LUZ but one CC, other have the same perimeter for LUZ and CC; sometimes two CC share the same LUZ. In 2004 UA round number of indicators was 338 and number of participating cities 367 but with different data coverage.

ESPON FOCI project has identified in their *Interim Report* (2009) three fundamental problems with the UA data: lack of data, insufficient quality of data, problems with city delimitations. The ESPON DB team has spent a considerable amount of work trying to understand the different city delimitations and compare them. The definition of LUZ has very different meanings between countries, thus leading to different meanings of the data related to them. The UA has great potential as an important source of information and data in the future, but at this stage it is still somewhat work in progress. Therefore the FOCI project has decided to use in some cases the alternative sources based on data availability and approximation of LUZ to NUTS 3 and NUTS 2 from EUROSTAT DB (see Annex 11 of the FOCI Interim Report) if data for LUZ was not sufficiently covered in UA database.

The POLYCE TPG while establishing the WP2.3 Master (MEGA) Data File has also experienced the problems of missing values for selected MEGA using UA data either directly from the ESPON FOCI database or using the original UA database. Therefore further cooperation is needed between ESPON 2013 DB and EUROSTAT / URBAN AUDIT for comparative urban studies with definition of indicators and data collection for NUTS 2 and NUTS 3 as well as LAU 1-2-3-4 level in order to examine FUA / LUZ level for European metropolises.

4.5 Factors and indicators describing key policy development characteristics in POLYCE metropolitan profiles

POLYCE WP2.3 Master (MEGA) Data File has been developed using data from above mentioned sources – EUROSTAT / URBAN AUDIT, ESPON 2006-2013 DB, especially FOCI and ATTREG projects for 69 MEGA – European metropolises including five POLYCE metropolises. Data were collected for approximately 160 indicators grouped in a bundle of approximately 30 factors and five key development characteristics as relevant territorial capital assets and policy areas: *Economy, People, Mobility, Environment, Living*. According to data coverage (more than 80%) for each of 149 indicators and for each of 69 MEGA – the final selection of 123 indicators and 50 MEGA was made for (non)hierarchical statistical analysis. POLYCE metropolises have had high data coverage (98-100%) in the POLYCE WP2.3 *Master (MEGA) Data File*. The finally selection of indicators for statistical analysis was also achieved with some additional cross-correlating analysis of indicators within each type of endowment factor. Where there was a high degree of inter-correlation between indicators, some indicators were removed leaving the other indicators to represent groups of relevant ones for further (non) hierarchical statistical analysis.

From a methodological point of view the POLYCE metropolitan profiles are based on a (non)hierarchical approach - already applied in the *'European Smart-City project'* (see Giffinger et al., 2007). This approach allows for the identification of metropolitan characteristics in relevant policy development areas which deliver the respective profile of a metropolis as a bundle of metropolisation factors and key policy development characteristics. Each characteristic is derived from indicators and factors and – at the same time allows the comparison with respective average values of all considered MEGA - European metropolises or the comparison between POLYCE metropolises with other MEGA cities which are included in the empirical analysis. Based on a corresponding sample of about 123 indicators a group of 50 MEGA - European metropolises - is described in a hierarchical way in five policy development characteristics. Each characteristic is defined by a set of factors (together 25 factors) whereby every factor is empirically defined through a corresponding group of indicators (all together 123). At the same time metropolitan profiles (defined through the combination of characteristics) are comparable to the metropolitan profiles of other MEGA cities because the standardized values (z-transformation) of indicators and factors or key characteristics are elaborated in relation to its deviance from 50 MEGA average values across all cities within the sample.

Based on this methodology the results of the POLYCE WP2.3 *Master (MEGA) Data File* and the POLYCE TPG application of statistical approach allow the following descriptions:

(i) a simple description of all European metropolises of the regarded sample of MEGA cities in their values of characteristics, their deviation from European average and finally of their position against other metropolises;
(ii) a precise comparison of POLYCE cities in their metropolitan profiles (based on the aggregated values for respective key characteristics and metropolitan factors as z-values but also through absolute or relative original data file) as well as an easy benchmarking across metropolises in key characteristics;
(iii) a comprehensive in-depth analysis of most interesting fields of urban development (key characteristics) through the discussion of respective factor values and further analysis of indicator values; and
(iv) a more policy oriented discussion of smart, sustainable and inclusive metropolitan development in terms of competitiveness against inclusive/cohesive development through the use of different types of indicators and values.

ECONOMY	PEOPLE
Economic Performance	*Demography*
Entrepreneurship	*Education*
Knowledge-based Economy	*Ethnic Diversity*
Labor market	
R&D Funding	
International Embeddedness	
Structural Disparities	
MOBILITY	**ENVIRONMENT**
Public transport	*Land Use*
Commuting	*Environmental Conditions*
International Accessibility	*Pollution*
Availability of ICT	*Resource Consumption*
	Environmental Quality
LIVING	
Cultural facilities	
Health facilities	
Housing	
Safety	
Touristic Attractivity	
Urban Services	

Figure 44: Metropolitan factors describing key policy development characteristics

FACTORS		INDICATORS	spatial level
ECONOMY	Economic Performance	GDP (PPS) per capita	regional
		Difference between GDP (PPS) per capita according to EU average	regional
		Difference between GDP (PPS) per capita according to EU average 1995-2006	regional
		Total GVA of LUZ	regional
		Total GVA per capita in LUZ	regional
		GVA NACE (J-K) in total GVA (%)	regional
		Disposable income	regional
	Entrepreneurship	New businesses registered	local
		Companies gone bankrupt	local
		Companies with HQ in the city quoted on stock market	local
		Number of congresses held in region*	regional
		Private sector employment	regional
		Self employed	regional
	Knowledge-based Economy	R&D expenditure of GDP	regional
		Scientific and technical employment	regional
		Creative class	regional
		Patent applications	regional
	Labor Market	Unemployment rate in LUZ	regional
		Unemployment rate LUZ/national	regional
		Public sector employment	regional
		Perception to find a good job (survey)	local
		Difficulty paying the bills at the end of the month (survey)	local
	R&D Funding	ERDF funding*	regional
		Regional policy funding	regional
	International Embeddedness	Number of headquarters of transnational firms	regional
		Foreign subsidiaries owned by HQ located in MEGA	MEGA
		Foreign subsidiaries owned by HQ located in MEGA (%)*	MEGA
	Structural Disparities	Change of disparities in the development level between the metropolis and its region	regional
		A synthetic view of the structural differences between the metropolis and the region for the three principal sectors.	regional
		Structural similarity changes in metropolis-region	regional

FACTORS		INDICATORS	spatial level
PEOPLE	Demography	Population of LUZ	local
		Population density of LUZ	local
		Average growth of LUZ	local
		Life expectancy	regional
		Elderly population in LUZ	local
		Demographic dependency: (<20 + >65) / 20-64 in LUZ	local
		One-person households in LUZ	local
		Net in-migration rate	regional
		Net out-migration rate	regional
	Education	Active population with tertiary diploma in LUZ	regional
		Population qualified at levels 5-6 ISCED in region	regional
		Students at universities in CC	local
		Students at universities in region among 15-24 age groups	regional
		Participation in life-long-learning	regional
	Ethnic Diversity	EU nationals	local
		Non-EU nationals	local
		Erasmus students	regional
		Foreigner here are well integrated (survey)	local
MOBILITY	Public Transport	Public transport network per inhabitant	local
		Public transport ticket	local
		Satisfaction with public transport (survey)	local
	Commuting	Inbound/outbound commuters per inhabitant	local
		Journey to work by car in CC	local
		Register cars in LUZ	local
		Time of journey to work in CC	local
		Road accidents	local
	International Accessibility	Potential ESPON accessibility*	regional
		Accessibility of MEGA*	MEGA
		Air transport of passengers*	regional
		Air transport of freight*	regional
	Availability of ICT	Households with Internet access (at home)*	regional
		Households with broadband access*	regional
		Satisfaction with public internet access	local
		Satisfaction with internet access (at home)	local

FACTORS		INDICATORS	spatial level
ENVIRONMENT	Land Use	Land area of LUZ	local
		Total area of CC divided by total area of LUZ	local
		Share of built-up area of LUZ	local
		Increase of built-up areas in LUZ 1990-2000	local
		Increase of built-up areas in LUZ 2000-2006	local
		Growth rate of residential areas in LUZ 1990-2000	local
		Growth rate of residential areas in the LUZ 2000-2006	local
		Share of new industrial, commercial and transport in new built-up areas in LUZ 1990-2000	local
		Share of new industrial, commercial and transport in new built-up areas in LUZ 2000-2006	local
		Sealed area per inhabitant in CC	local
	Environmental Conditions	Sunshine	local
		Rainy days	local
		Cold temperature	local
		Warm temperature	local
		Tourism Climatic index in warm months	regional
	Pollution	Summer smog	local
		Particulate matter	local
		Fatal chronic lower respiratory diseases	regional
	Resource Consumption	Consumption of water	local
		Collected solid waste	local
		Regional generation / treatment of municipal waste pc	regional
		Green space	local
		NATURA 2000*	regional
	Environmental Quality	Resources are spent in a responsible way (survey)	local
		This is a clean city (survey)	local
		Air pollution is a big problem here (survey)	local
		Noise is a big problem here (survey)	local
		Satisfied with green space (survey)	local

FACTORS		INDICATORS	spatial level
LIVING	Cultural Facilities	Cinema attendance	local
		Cinema capacities	local
		Museums	local
		Museums visits	local
		Theatres	local
		Theatre attendance	local
	Health Facilities	Hospital beds in CC	local
		Hospital beds in region	regional
		Doctors	regional
		Number of hospital discharges of in-patients per capita	local
	Housing	Average living area per person in LUZ	local
		Owner-occupied dwellings in CC	local
		Owner-occupied dwellings in LUZ	local
	Touristic Attractivity	Tourist overnights	regional
		Foreign overnights in hotels	regional
		Non-resident arrivals*	regional
		Tourist overnights in CC	local
		Monuments and tourist sights*	regional
	Safety	Crime rate per inhabitant	local
		Car thefts	local
		Homicides	local
		Suicides	local
	Urban Services	Satisfied with hospitals (survey)	local
		Satisfied with doctors (survey)	local
		Satisfied with cinemas (survey)	local
		Satisfied with cultural facilities (survey)	local
		Easy to find good housing at reasonable price (survey)	local
		Satisfied with schools (survey)	local
		Feel safe in this city (survey)	local
		Satisfied with sport facilities (survey)	local
		Satisfied to live in this city (survey)	local
		synthetic indicator of satisfaction	local

Figure 45: Metropolitan factors and indicators in 50 MEGA and 5 POLYCE metropolises

	POLYCE MEGA				
LUZ CODE	AT001	CZ001	HU001	SK001	SI001
Factor name	***WIEN***	***PRAHA***	***BUDAPEST***	***BRATISLAVA***	***LJUBLJANA***
Economic Performance	0,34	-0,36	-0,36	0,02	-0,26
Entrepreneurship	0,42	0,30	0,60	0,06	-0,32
Knowledge-based Economy	0,29	0,12	0,11	0,47	-0,22
Labor Market	-0,35	0,92	-0,04	0,79	0,50
R&D Funding	-0,41	-0,41	-0,18	-0,49	-0,50
International Embeddedness	0,69	-0,13	-0,27	-0,19	-0,43
Structural Disparities	0,18	0,46	-1,03	-0,56	-0,29
ECONOMY	**0,17**	**0,13**	**-0,17**	**0,01**	**-0,22**
RANK (1-50)	**16**	**19**	**37**	**26**	**39**
Demography	-0,17	-0,03	-0,17	-0,01	-0,03
Education	-0,42	-0,47	0,02	0,74	0,56
Ethnic Diversity	0,17	0,12	-0,29	-0,37	-0,27
PEOPLE	**-0,14**	**-0,13**	**-0,15**	**0,12**	**0,09**
RANK (1-50)	**34**	**31**	**37**	**17**	**18**
Public transport	-0,06	0,35	-0,47	-0,38	-0,04
Commuting	0,72	0,19	-0,41	0,48	-0,35
International Accessibility	0,62	0,05	-0,19	-0,60	-0,70
Availability of ICT	0,18	-0,36	0,10	-0,13	-0,19
MOBILITY	**0,32**	**0,15**	**-0,27**	**-0,13**	**-0,27**
RANK (1-50)	**6**	**13**	**41**	**32**	**42**
Land Use	-0,08	0,54	-0,78	-0,11	-0,08
Environmental Conditions	0,09	-0,02	0,41	0,34	-0,49
Pollution	0,01	-0,13	-0,79	-0,51	-0,23
Resource Consumption	-0,28	0,21	-0,04	-0,35	0,23
Environmental Quality	1,20	-0,62	-1,09	-0,88	-0,13
ENVIRONMENT	**0,19**	**0,00**	**-0,46**	**-0,30**	**-0,14**
RANK (1-50)	**12**	**26**	**48**	**45**	**39**
Cultural facilities	0,89	0,85	0,39	-0,49	0,11
Health Facilities	0,29	0,79	0,22	0,81	-0,17
Housing	1,06	-0,43	-0,57	-0,37	-0,24
Touristic Attractivity	1,27	1,45	0,84	0,69	1,03
Safety	-0,09	-0,05	-0,17	0,18	0,08
Urban Services	0,80	0,08	-0,57	-0,74	0,08
LIVING	**0,53**	**0,52**	**0,12**	**-0,07**	**0,19**
RANK (1-50)	**3**	**5**	**26**	**28**	**18**
TOTAL POLYCE CITIES	**0,21**	**0,13**	**-0,18**	**-0,04**	**-0,07**
RANK (1-50)	**11**	**15**	**43**	**30**	**37**

Figure 46: Average factors z-values and key policy development characteristics z-values of POLICY metropolises within 50 MEGA in Europe

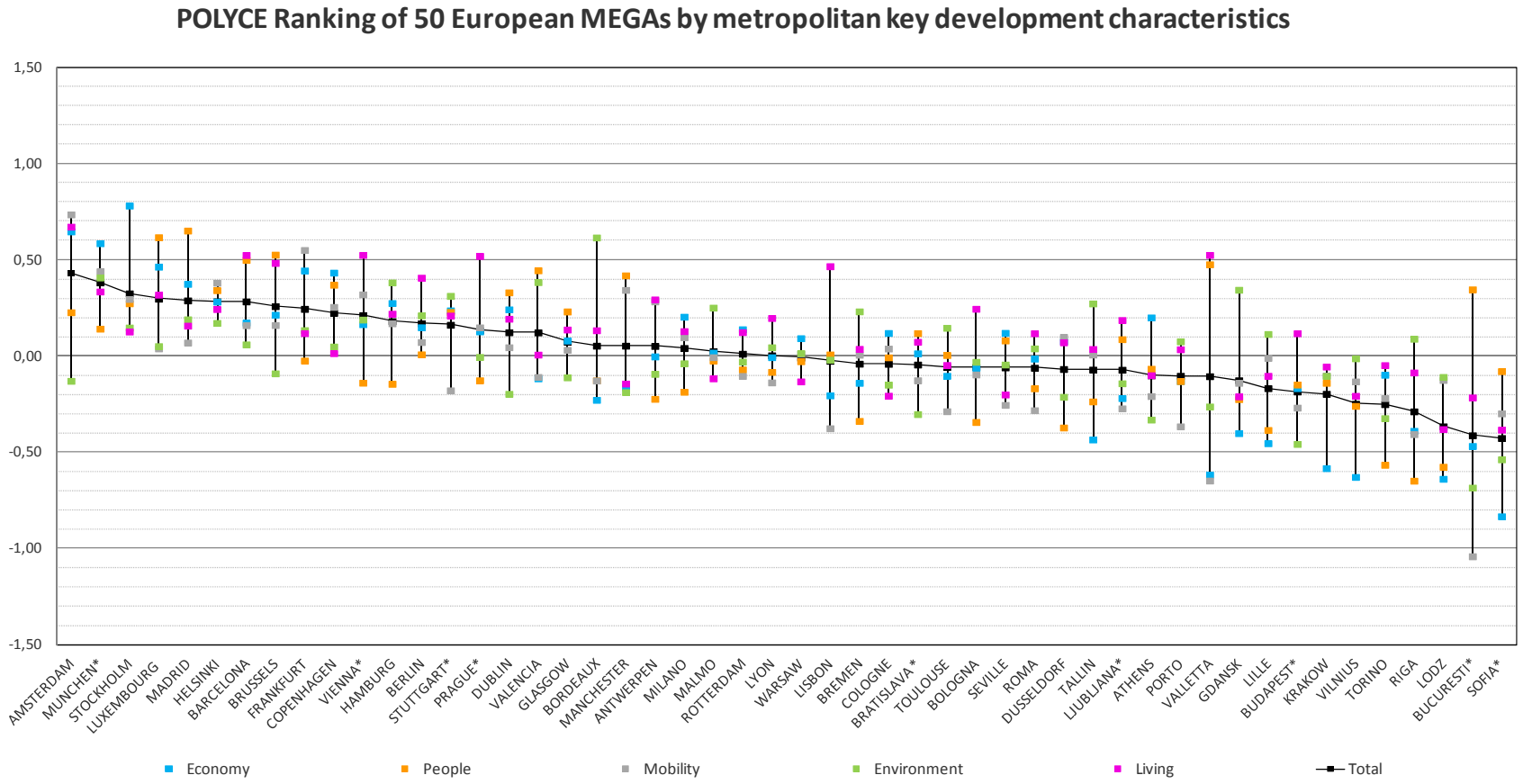


Figure 47: POLYCE ranking of 50 MEGA in Europe including 5 POLYCE metropolises by key policy development characteristics

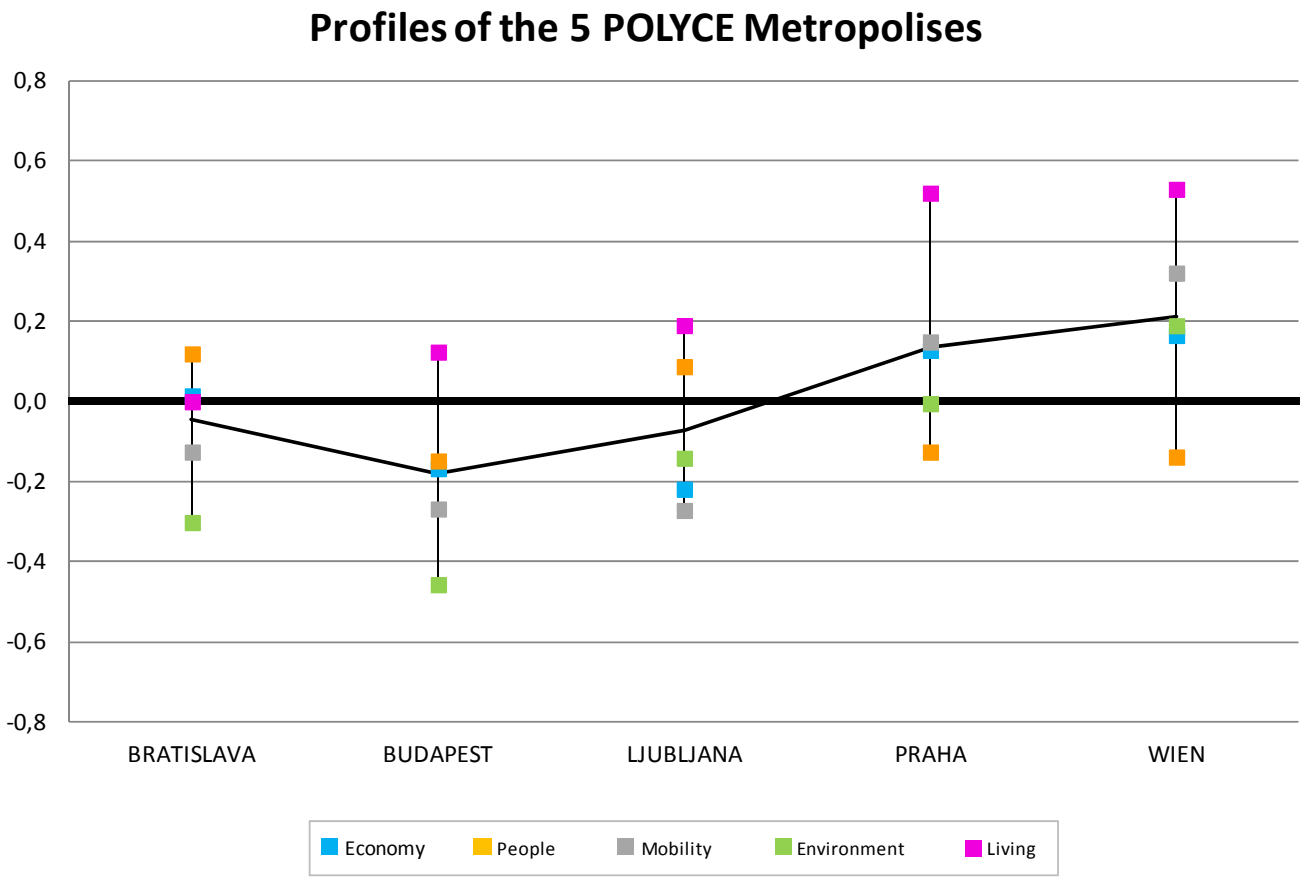


Figure 48: Metropolitan key policy development characteristics in 5 POLYCE metropolises (z-values)

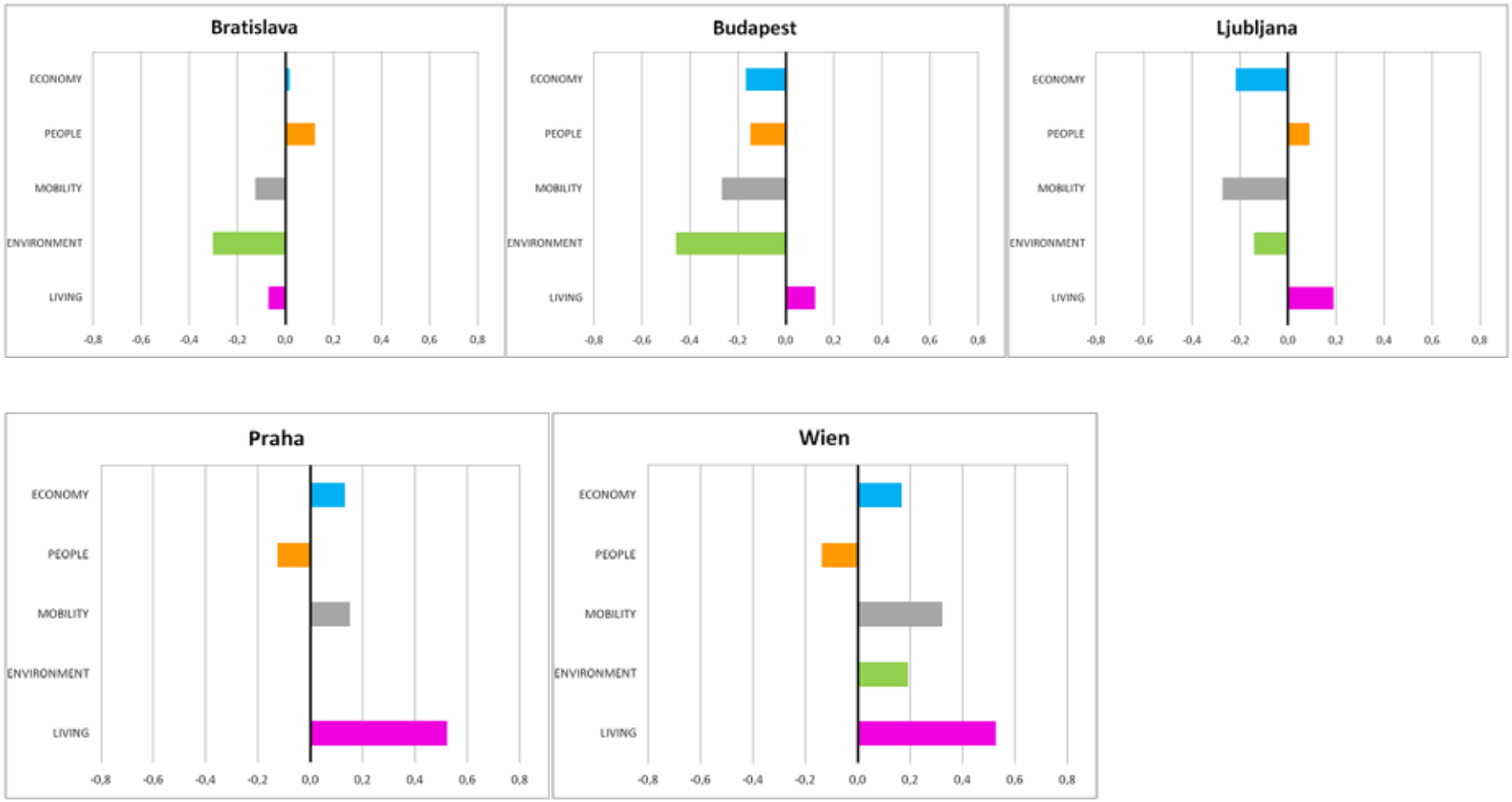
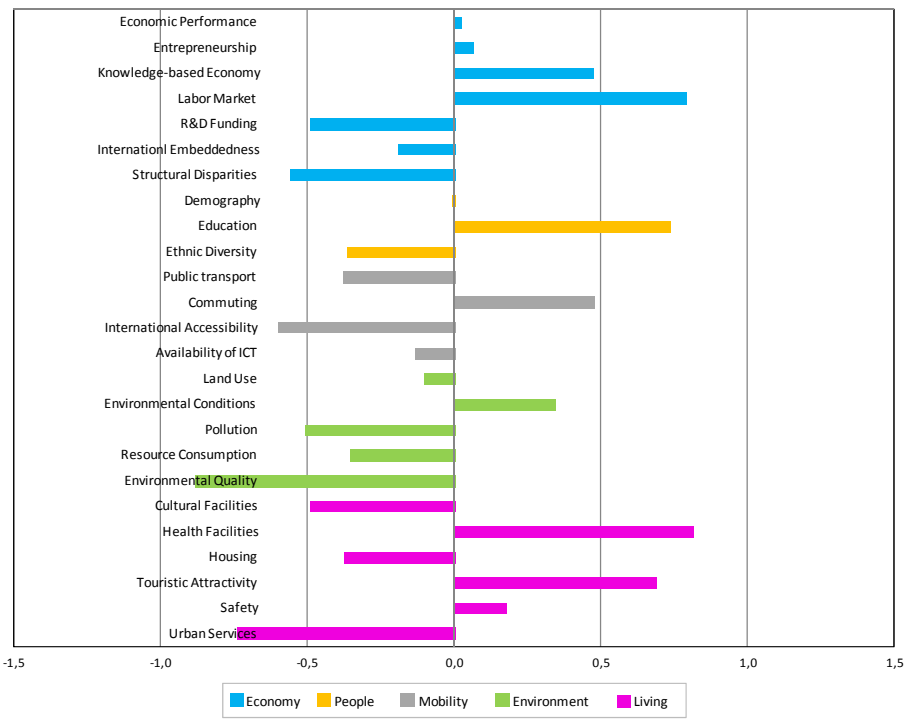
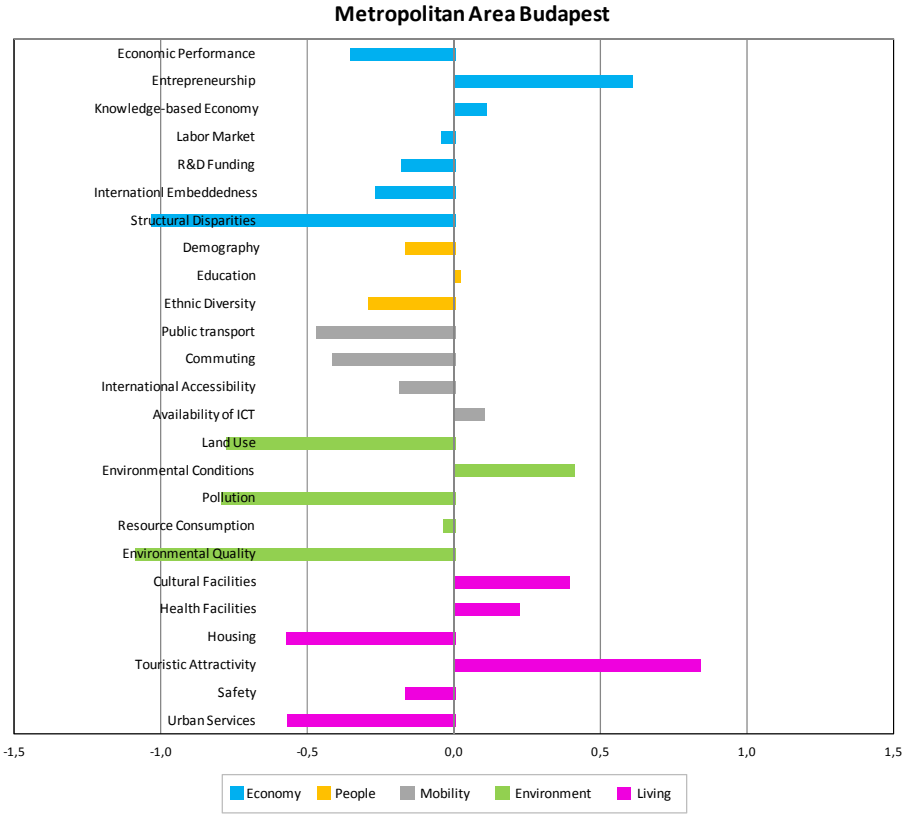


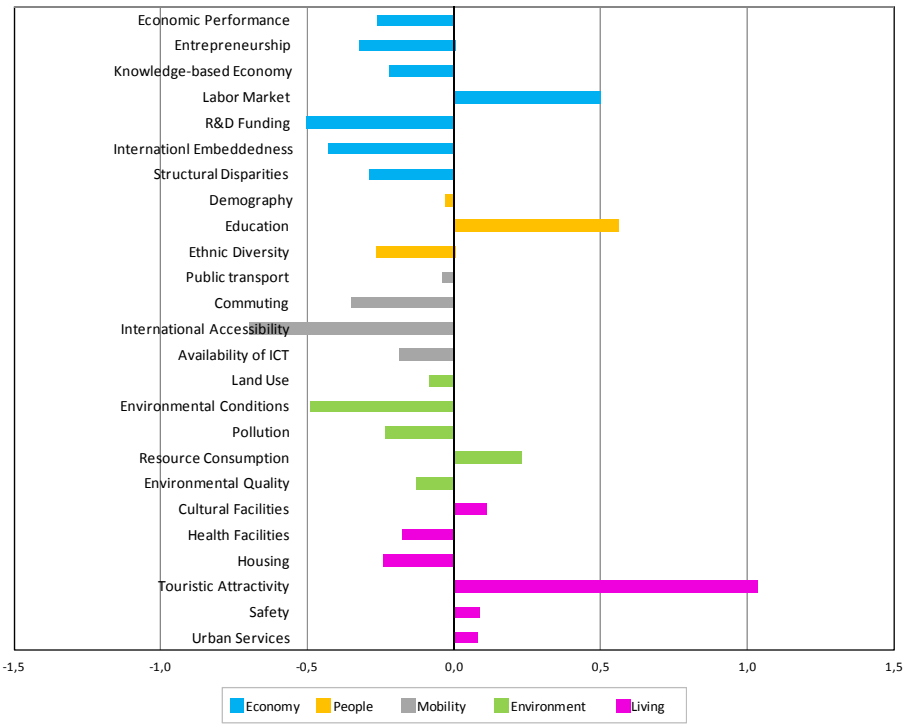
Figure 49: Key policy development characteristic (z-values) in POLYCE metropolises



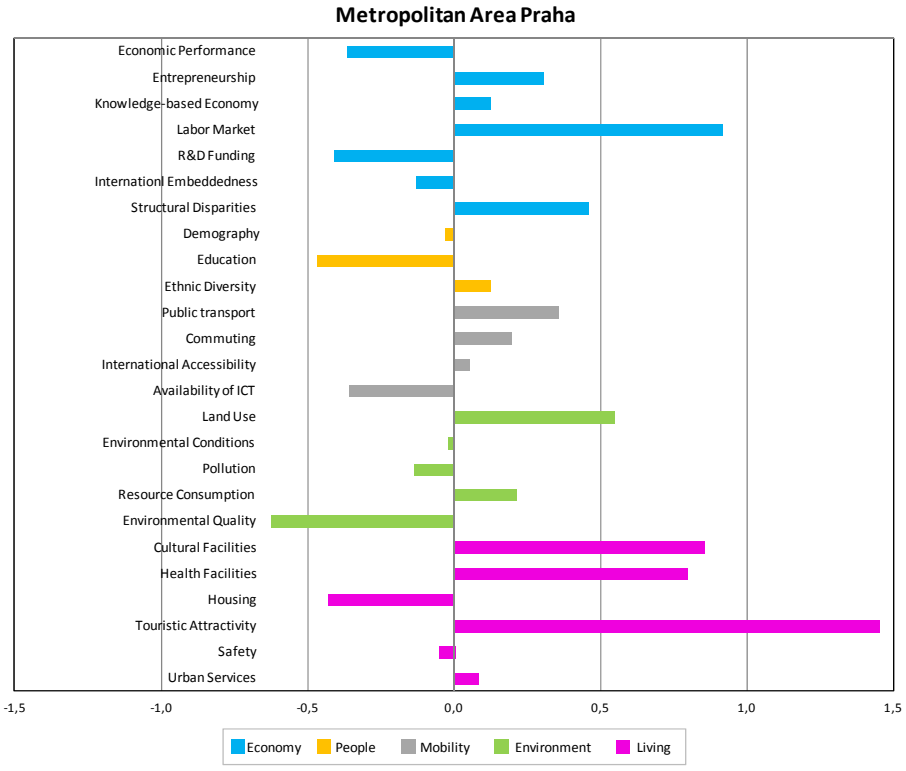
Note: The represented deviations from the sample's average result from selected indicators that may not draw a comprehensive picture of each factor's performance within the metropolitan area. Underlying indicators comprising these factors are listed in the annex to this report (chapter 10.1: 'Metropolitan profiles: underlying structure').



Note: The represented deviations from the sample's average result from selected indicators that may not draw a comprehensive picture of each factor's performance within the metropolitan area. Underlying indicators comprising these factors are listed in the annex to this report chapter 10.1: 'Metropolitan profiles: underlying structure').



Note: The represented deviations from the sample's average result from selected indicators that may not draw a comprehensive picture of each factor's performance within the metropolitan area. Underlying indicators comprising these factors are listed in the annex to this repor (chapter 10.1: 'Metropolitan profiles: underlying structure').



Note: The represented deviations from the sample's average result from selected indicators that may not draw a comprehensive picture of each factor's performance within the metropolitan area. Underlying indicators comprising these factors are listed in the annex to this report chapter 10.1: 'Metropolitan profiles: underlying structure').

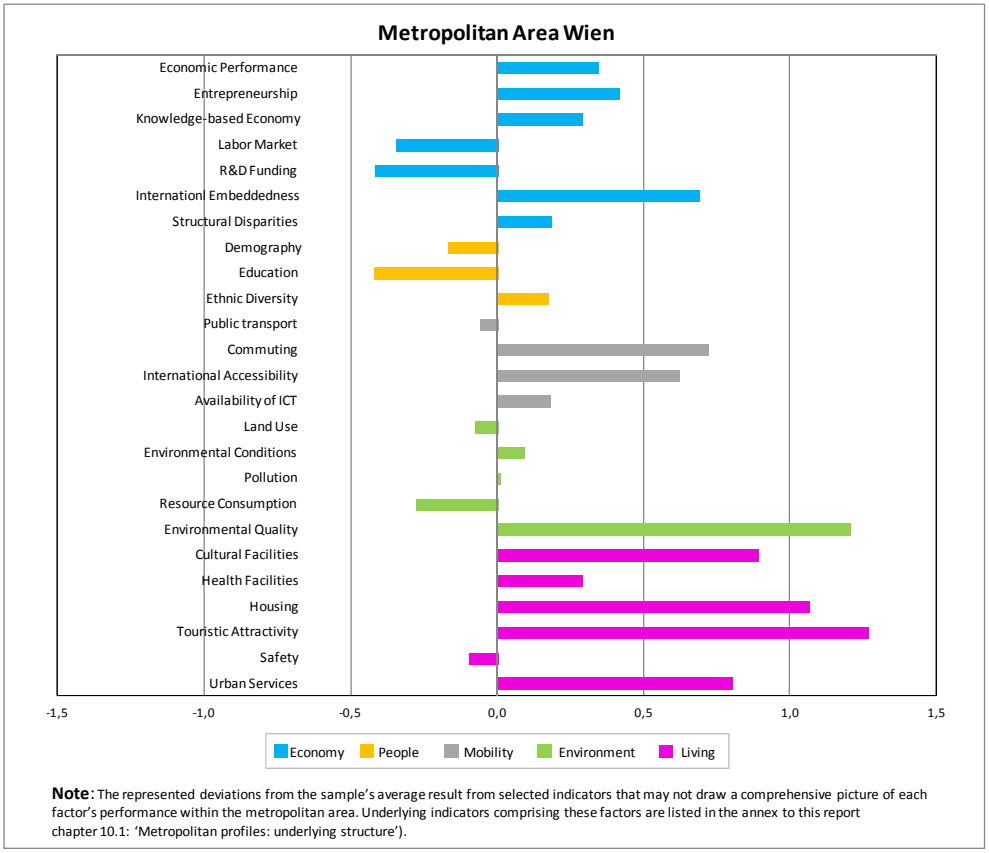


Figure 50: Metropolitan factors (z-values) in POLYCE metropolises

id_LUZ	MEGA	ECONOMY	PEOPLE	MOBILITY	ENVIRONMENT	LIVING	TOTAL	RANK	Class	Coverage (%)
NL002	AMSTERDAM	2	15	1	38	1	0,43	1	1	85
DE003	MUNCHEN*	3	16	3	2	9	0,38	2	1	81
SE001	STOCKHOLM	1	12	7	14	23	0,33	3	1	85
LU001	LUXEMBOURG	4	2	19	21	10	0,30	4	1	93
ES001	MADRID	7	1	17	11	19	0,29	5	1	97
FI001	HELSINKI	8	10	4	13	13	0,28	6	1	82
ES002	BARCELONA	15	4	12	20	4	0,28	7	1	99
BE001	BRUSSELS	12	3	11	33	6	0,26	8	1	100
DE005	FRANKFURT	5	25	2	16	25	0,25	9	1	84
DK001	COPENHAGEN	6	8	9	22	33	0,22	10	1	83
AT001	*WIEN**	16	34	6	12	3	0,21	11	2	99
DE002	HAMBURG	9	36	10	4	14	0,18	12	2	84
DE001	BERLIN	17	20	16	10	8	0,17	13	2	99
DE007	STUTTGART*	11	14	37	6	15	0,16	14	2	94
CZ001	*PRAHA**	19	31	13	26	5	0,13	15	2	99
IE001	DUBLIN	10	11	18	42	17	0,12	16	2	89
ES003	VALENCIA	33	6	30	3	34	0,12	17	2	97
UK004	GLASGOW	23	13	21	37	20	0,07	18	2	91
FR007	BORDEAUX	40	32	33	1	21	0,05	19	2	86
UK008	MANCHESTER	36	7	5	41	43	0,05	20	2	91
BE002	ANTWERPEN	27	40	8	34	11	0,05	21	3	97
IT002	MILANO	13	39	15	31	22	0,04	22	3	100
SE003	MALMO	25	24	25	8	41	0,03	23	3	94
NL003	ROTTERDAM	18	28	29	29	24	0,01	24	3	97
FR003	LYON	28	30	35	23	16	0,00	25	3	81
PL001	WARSAW	22	26	22	25	42	-0,01	26	3	81
PT001	LISBON	38	21	47	28	7	-0,02	27	3	83
DE012	BREMEN	35	44	24	9	30	-0,04	28	3	99
DE004	COLOGNE	21	23	20	40	45	-0,04	29	3	83
SK001	*BRATISLAVA **	26	17	32	45	28	-0,04	30	3	100
FR004	TOULOUSE	32	22	44	15	35	-0,06	31	4	95
IT009	BOLOGNA	30	45	27	30	12	-0,06	32	4	83
ES004	SEVILLE	20	19	40	32	44	-0,06	33	4	81
IT001	ROMA	29	38	43	24	27	-0,06	34	4	100
DE011	DUSSELDORF	24	46	14	43	29	-0,07	35	4	99

EE001	TALLIN	43	42	23	7	31	-0,07	36	4	93
SI001	*LJUBLJANA**	39	18	42	39	18	-0,07	37	4	100
GR001	ATHENS	14	27	38	47	39	-0,10	38	4	81
PT002	PORTO	34	33	46	19	32	-0,10	39	4	95
MT001	VALLETTA	47	5	49	44	2	-0,10	40	4	93
PL006	GDANSK	42	41	36	5	47	-0,13	41	5	94
FR009	LILLE	44	47	26	17	40	-0,17	42	5	95
HU001	*BUDAPEST**	37	37	41	48	26	-0,18	43	5	100
PL003	KRAKOW	46	35	28	35	37	-0,20	44	5	97
LT001	VILNIUS	48	43	34	27	46	-0,25	45	5	99
IT004	TORINO	31	48	39	46	36	-0,25	46	5	79
LV001	RIGA	41	50	48	18	38	-0,29	47	5	93
PL002	LODZ	49	49	31	36	49	-0,36	48	5	97
RO001	BUCURESTI*	45	9	50	50	48	-0,41	49	5	97
BG001	SOFIA*	50	29	45	49	50	-0,43	50	5	94

Figure 51: POLYCE 50 MEGA Metropolitan Ranking with Key Policy Development Characteristics

4.6 POLYCE Metropolitan Profiles: Results

4.6.1 ECONOMY

Economic factors relates to the performance of the economy assessing the **competitiveness** of MEGA and POLYCE metropolises as important attributes of the process of metropolisation of European cities covering the period between 1995-2008. Most of selected indicators are showing the situation before the economic and financial crisis in Europe (< year 2009). Since than many MEGA and POLYCE metropolises have been under different impacts of these changes on economic endowments that are not evaluated in the POLYCE project due to lack of comparable data between 2008-2011. Economic factors relate to the performance of the economy within the LUZ and/or their approximate NUTS 2 or NUTS 3 regions, as well as within the core city CC (due to lack of data for LUZ). The selected indicators cover factors of *'economic performance, 'entrepreneurship', 'knowledge-based economy', 'labor markets', 'investments', 'international embeddedness' as well as 'structural disparities'*. Data come from different sources such as EUROSTAT, UA, ESPON (FOCI, ATTREG projects) (see Annex 10.5 for the list of indicators).

The overall results favor equally metropolitan areas and national capitals, with a higher concentration of above average results in economically stronger MEGA in EU 15 but also in some POLYCE metropolises – Wien, Praha. The key policy development characteristic ECONOMY in Wien metropolis shows relative high performance values in comparison to most of other POLYCE metropolises with the exception of Praha. In particular, the economy at the metropolitan level indicates comparatively rather high values regarding factors such as *'international embeddedness' (headquarters of transnational firms and subsidiaries), 'knowledge-based economy' (research and development expenditure, patents applications, scientific and technical employment), 'entrepreneurship' (a dynamic private service sector) and 'economic performance'* (in terms of GDP / GVA values). But, *'R&D funding'* (in terms of regional public and ERDF funding) and *'labor market flexibility'* (higher unemployment rate in the core city, higher shares of public sector employment and negative perceptions of the labor market) indicate strong deficits in comparisons to other MEGA in Europe. On the opposite Praha shows above the average values in factors *'labor market flexibility'* (due to lower unemployment rate) together with Bratislava and Ljubljana, and in factor *'entrepreneurship'* together with Budapest. In Bratislava the factor *'knowledge-based economy'* (due to higher scientific and technical employment and as a location of creative activities) is showing above the average values in comparison to 50 MEGA in Europe.

However, the economic development of Wien is not surprising due to the ongoing process of strong restructuring of economic activities over last decades and due to the increasing challenges on metropolitan competitiveness of Wien as a (Central) European metropolis. The other POLYCE metropolises – Praha, Budapest, Bratislava and Ljubljana – were for the past 20 years engaged in the process of intensive transformation of their economic systems, policies and societies, while at the same time competing with other European cities for investments and global attractiveness.

4.6.2 PEOPLE

Social and human factors capture the characteristics of the people living within selected MEGA and POLYCE metropolises assessing the social and human capital - competitiveness as well as inclusion attributes as important factors of the process of European metropolisation. Human capital endowments are classically related to social cohesion -policy interventions such as the provision of education programmes and active labor market programmes, including the integration of foreigners, and disadvantages social groups. The selected indicators cover three metropolitan factors in terms of *'demography', 'education', 'ethnic diversity'* assessing the social and human capital assets as well as inclusion attributes of selected MEGA and POLYCE metropolises as important factors of the process of metropolisation of European cities. Data cover different spatial levels of selected MEGA and come

from different sources such as EUROSTAT, UA, ESPON (FOCI, ATTREG, DEMIFER projects) (see Annex 10.5 for the list of indicators).

The overall results favor equally metropolitan areas and national capitals, with a higher concentration of elderly, well educated people and foreigners especially in EU 15 MEGA but also in five POLYCE metropolises, especially in Bratislava and Ljubljana. The urban policy development characteristic PEOPLE shows a relative below the average value in Wien and Praha as a result of clear deficits of the factors *'education'* (concentration of university educated people, students, participation in life-long learning activities) and 'demography' (proportion of elderly population and consequently higher demographic dependency). The *education* factor is performing better in Ljubljana and Bratislava due to higher concentration of university educated people and students in these two capital city regions vis-à-vis the (smaller) size of Slovenia and Slovakia in comparison to Austria, Czech Republic and Hungary. Relative high performance in the factor *'ethnic diversity'* is evident in Wien and Praha due to higher proportion of foreign population in these two (Central) European metropolises. Wien has been a traditional center of immigration especially from Central and South-East Europe while Praha has been gaining foreign population during the past 20 years as attractive global tourist destination.

4.6.3 MOBILITY

Mobility factors relates to the nature of infrastructure and the facilities that frame the intra-urban and inter-urban accessibility of MEGA and POLYCE metropolises. The nature of infrastructure provision is open to multi-level policy action (i.e. investments in transport and ICT infrastructure). The other dimensions of accessibility and access are their role in endogenous development, since they permit to every territory, whatever its territorial capital is, to increase the development potential (particularly thanks to ICT) and to participate to global competitiveness. Accessibility and infrastructures of all types are crucial for territorial competitiveness and cohesion since they should contribute to the reduction of disparities. Accessibility and social inclusion is about quality of life and participation of every MEGA and other territories to a balanced and sustainable development with reduction of poverty and access to basic services, jobs and market.

Mobility factors are related to *'public transport', 'commuting' patterns, '(inter)national accessibility'* and *'availability of ICT infrastructure'* (Internet and broadband access) of selected MEGA and POLYCE metropolises as important factors of European metropolisation process. Data cover mainly CC level but also LUZ, FUA, NUTS 3 and NUTS 2 spatial levels of selected MEGA and come from different sources such as EUROSTAT, UA, ESPON (FOCI, ATTREG, other ESPON projects) (see Annex 10.5 for the list of indicators). Some additional indicators from ESPON 2013 projects KIT and TRACC were also revised, but the indicators and data availability could not sufficiently covered all 50 MEGA at the time of establishing the POLYCE WP2.3 *Master (MEGA) Data File*.

The overall results favor larger metropolitan areas with national capitals, with a higher accessibility, good public transport and access to ICT infrastructure. Urban key policy development characteristic MOBILITY in Wien metropolis performs rather well but factors show differences. Very obvious, *'ICT-availability', 'international accessibility'* of Wien metropolis and (reciprocal) daily *commuting* are organized on high quality levels. Public transport shows some deficits across city borders into neighboring areas in Lower Austria, although some other studies show relative high standards in the organization of public transport within the city of Wien in comparison to other European cities. *Public transport factor* performs relatively well in Praha, as well as (reciprocal) *commuting patterns*, unlike in Bratislava and Ljubljana metropolises with more daily commuters towards the core city than vice versa. The *availability of ICT* factor shows above the average values also in Budapest while the *international accessibility* factor is below the average in Budapest, Bratislava and Ljubljana in comparison to Wien and Praha or other MEGA metropolises.

4.6.4 ENVIRONMENT

Environmental factors relate to the *'land use patterns', 'environmental conditions', 'pollution levels', 'resource consumption*, and '*assessment of environmental quality'* of MEGA and POLYCE metropolises. Environmental endowments determine an advantage of some MEGA with interesting spatial differences regarding some factors and indicators. Environmental endowments are related to different multi-level policy interventions such as land use, the provision of water supply, sewage and waste management infrastructure, provision of green and open spaces, and anti-pollution measures. Environmental endowments encompass risks, resources and quality of life. Climate change is a global challenge which must be tackled at all scales and it represents a multi-dimensional risk in future, since its impacts are numerous and asymmetric. Finally, better quality of life in a preserved natural patrimony will ensure attractiveness of MEGA and POLYCE metropolises as smart and sustainable places in Europe.

Data cover mainly CC and LUZ spatial levels of selected MEGA cities and come from different sources such as EUROSTAT, UA, ESPON (FOCI, ATTREG projects) (see Annex 10.5 for the list of indicators). The overall results favor different metropolitan areas and national capitals, with a better climate conditions, protected green areas, land use patterns and resources management in both South and North Europe. Even the urban policy development characteristic ENVIRONMENT shows in Wien metropolis clear differences in respective factor values. Whereas the *'assessment of environmental conditions'* is relatively positive, the factors *'resource consumption'* (in terms of water consumption, waste treatment, protected green areas) and *'land use'* (proportion of sealed areas as well as of new built-up patterns in Wien metropolis) show some deficits in comparison to other MEGA cities. In Praha *'land use'* factor is above the average showing that not much urban land in the metropolis was built-up until year 2006. The factor value for *'resource consumption'* is above the average in Ljubljana metropolis due to NATURA 2000 areas. The factor of pollution shows negative values in all POLYCE metropolises (with the exception of Wien) that are also reflected in bellow the average values for *'environmental quality'* in post-socialist metropolises. Hence, future demographic change and economic growth in POLYCE metropolises will provide new challenges for metropolitan governance regarding land use development as well as different impacts of new traffic management and environmental policies.

4.6.5 LIVING

Living or quality of life factors measure the provision of public services/investment in selected MEGA and POLYCE metropolises as well as the degree of satisfaction of residents with public services and the city itself. These factors and indicators can be taken as proxies for good *governance* and frame the likely capacity of place-based institutions to maintain quality of life in European cities. Quality of living endowments is related to different national/local policy interventions such as provision of housing, health services, cultural facilities, anti-crime measures, or provision of tourist services for smart, inclusive and sustainable European cities and regions.

Living or quality of life indicators describe factors of *'cultural facilities', 'heath facilities', 'housing quality', 'safety'* as well as *'tourist attractivity'* and *'assessments of the urban services delivery and quality of life in the city'*. Data cover mainly CC and LUZ spatial levels of selected MEGA and come from different sources such as EUROSTAT, UA, ESPON (FOCI, *ATTREG projects) (see Annex for the list of indicators). The overall results favor* metropolitan areas and national capitals in EU 15, but there are also differences between new EU 10 accession countries - in favor of Wien and Praha that are at the top 50 MEGA metropolises in key urban policy development characteristic LIVING. For Wien metropolis this is not surprising - based on city *'cultural heritage and facilities'* (theatres, museums, cinemas), *'tourist attractivity'* and a provision of non-profit and good quality housing since many decades, as well as on high standards of health facilities (number of doctors and hospital capacities). The situation is similar in Praha showing even better factor values for *health facilities* and larger number of *tourists* and *visitors* than in Wien but below average value for the housing provision and rather average assessment of urban services delivery in the city. LIVING area also shows high overall average values in Ljubljana with above the average values for *safety*, and *tourist attractiveness* (since

EU membership in 2004). LIVING is also relatively highly performed in Budapest due to tourist *attractiveness and cultural facilities* but below the average for the *housing provision* and *safety* factors. Bratislava shows slightly below the average values in LIVING area but factors such as *health facilities* and *safety* are above the average in comparison to other POLYCE and other selected MEGA metropolises.

4.7 POLYCE METROPOLITAN PROFILES: AN OVERVIEW

Wien shows a metropolitan profile which makes evident that the city performs very well in the key policy development characteristic of **LIVING** and **MOBILITY** and still quite well in the area of **ENVIRONMENT** and **ECONOMY.** Whereas these four policy area show clear positive values from European average (above zero-line) Wien shows relative bellow the average performance in the area of **PEOPLE**. At the same time Wien's profile is relative heterogeneous like those of Praha and Budapest and unlike those of Bratislava and Ljubljana. In total, the high overall performance of the Wien metropolis is ranking within the first quarter of all 50 European MEGA. The metropolitan profile of Wien even differs in comparison to those of other top 50 MEGA - Scandinavian cities like Stockholm, Copenhagen or Helsinki, or to those of Western European cities like Munich or Brussels. Hence, Wien - like many other European metropolises - shows clear differences regarding its metropolitan development indicating their specific assets for positioning in the European urban system.

Praha shows a metropolitan profile that performs well in the key policy development characteristic **LIVING** and quite well in **ECONOMY** and **MOBILITY**. Praha performs about the average in comparison to other 50 MEGA in the **ENVIRONMENT** and bellow the average in the key policy development characteristic **PEOPLE**. Taking in consideration the overall metropolitan performance Praha is ranked after Wien but still the first half of all 50 MEGA.

Budapest is similar to the size of Wien and Praha but metropolitan performance is not as expected in comparison to other two POLYCE metropolises. Budapest performs relatively well in key policy development characteristic **LIVING** but below the average in other key development characteristics especially in the **ENVIRONMENT**. The overall performance of Budapest is below the average and ranked in the last quarter of all 50 MEGA.

The metropolitan profiles of **Bratislava** and **Ljubljana** are relatively similar to each other but different from profiles of Wien, Praha and Budapest. Bratislava and Ljubljana perform above the average in the key policy development characteristic **PEOPLE**. Bratislava shows average value while Ljubljana bellows the average performance in **ECONOMY** in comparison to 50 MEGA. Key policy development characteristic **LIVING** is above the average in Ljubljana while bellow the average in Bratislava. In both Bratislava and Ljubljana metropolises key policy development characteristics **ENVIRONMENT** and **MOBILITY** performs bellow the average in comparison to Wien and Praha or vis-a-vis other 50 MEGA in Europe.

Hence, **POLYCE** metropolises perform differently within the European urban system in a comparative perspective. **Wien** and **Praha** perform relatively well in the key policy development characteristics of LIVING, ECONOMY, MOBILITY and ENVIRONMENT with some weakness in the key policy development characteristic of PEOPLE. The opposite performance has been observed in **Bratislava** and **Ljubljana** metropolitan profiles with good results in the key policy development characteristic PEOPLE. Ljubljana metropolis shows the above average values in the key policy development characteristic LIVING while Bratislava metropolis shows the average value in ECONOMY. Below the average values are observed in both Ljubljana and Bratislava in key policy development characteristic of MOBILITY and ENVIRONMENT.

4.8 POLYCENTRICITY OF POLYCE METROPOLISES

In order to evaluate "**polycentricity**" of MEGA and POLYCE metropolises - there are two paths:

(i) **Polycentricity on meso and macro level**: through e.g. networking of MEGA including five POLYCE metropolises looking at the level of their internationalization - showing international embeddedness, accessibility, connectivity, cooperation – through concentration of transnational firms and foreign subsidiaries, number of international conferences, air passengers, foreign residents and students, tourist flows, participation in EU-funded projects, etc) – that are describing the role and position of different POLYCE and MEGA in European urban system. According to these indicators Wien and Praha are more embedded in intra-urban polycentric networks than other POLYCE metropolises – Budapest, Bratislava, Ljubljana - that was also confirmed by analysis in POLYCE WP2.1.

(ii) The other path to access **polycentricity** is through analyses on the **micro level** (as partially performed in WP2.1) – relationship between CC and LUZ (or LUZ approximation to NUTS 3 / NUTS 2) in five POLYCE metropolises - showing the differentiation in performance of selected indicators between CC and LUZ – or as defined in WP2.1 between CC-FMA-MR and the performance of various indicators over period of time (e.g. people, jobs, economic activities, housing, services, investments, wealth, etc.). Therefore for micro level analysis of intra-urban polycentricity in WP2.3 – more data are needed for both CC and LUZ of five POLYCE metropolises for different time periods. The initial aim of WP2.3 was to cover several time periods between 1991 - 2008 in order to explore the spatial and temporal differences between CC and LUZ in POLYCE metropolises. As URBAN AUDIT does not provide sufficient data for all POLYCE CC and LUZ within the several timeframes, and POLYCE TPG could not add missing values for their respective cities in cooperation with national statistical offices due to methodological problems and incompatible data capture – the intra-urban polycentricity has not been evaluated in full using the URBAN AUDIT data.

4.9 TERRITORIAL COMPETITIVENESS AND INCLUSION IN POLYCE METROPOLISES

Besides, this identification of POLYCE metropolitan profiles enables a policy oriented discussion of i.e. *smart metropolitan development* in terms of competitive against cohesive development. Using the relevant types of indicators based on information until 2008 the discussion of smart metropolitan development shows following findings:

- **Competitiveness** in the metropolitan development is characterized through relative good standards of economic performance, in the restructuring towards knowledge intensive, innovative and creative activities and most of all through international embeddedness, accessibility and attractivity for international businesses and congresses. According to WP2.3 results – Wien is the most competitive POLYCE metropolis. At the same time Wien's competitiveness is lacking labor market (higher unemployment rate) and experienced rather smaller R&D funding until year 2006. Economic Performance, international embeddedness, (public) investments and international accessibility need to be improved in Ljubljana, Budapest, Bratislava and in order to enhance their competitiveness in comparison to Wien, Praha, or other European cities.
- There is some deficit in human capital potential in Wien and Praha because high level qualification concentrates on a small share of highly educated population and their participation in life-long learning activities is not well and broadly established, like in Ljubljana and Bratislava. There are a higher number of foreigners in Wien and Praha than in other POLYCE metropolises that can be closely correlated to economic performance and city competitiveness. Highly educated and diverse labor force is important attribute for competitiveness of European cities.

- Although resource management, land use patterns and (anti)pollution levels show strong deficits in most POLYCE metropolises, the environmental situation is evaluated positively and are likely to be an asset in Wien in comparison to other POLYCY metropolises. Environmental management should be improved in other POLYCE cities as a competitive advantage in order to attract educated labor force and provide high quality living standards for local population and attractive location for visitors and tourists.

Therefore international accessibility and business embeddedness, educated labor force as well as good environmental and living conditions for residents and visitors are in fact the most important competitive assets of European metropolises, including POLYCE cities.

- Regarding **inclusive/cohesive** development in POLYCE metropolises, the WP2.3 results show that economic performance in Wien indicates relative high average values of economic wealth but at the same time relative strong problems of unemployment in the city, and finally lower income levels indicate strong deficits in social inclusion. In other POLYCE metropolises the economic transformation and development in the past 20 years has produced lower unemployment rates and more diverse jobs in the private sector and new business ventures. Despite intensive economic development however, structural differences in economic activities within POLYCE city regions are evident especially in Budapest and Bratislava, while the situation is better in Wien, Praha and Ljubljana. Structural disparities in the POLYCE city-region context are increasing due to concentration of propulsive economic activities and better paid jobs in the capital cites more than in surrounding region, as the most attractive locations in Central Europe. But the recent economic and financial crisis since year 2009 in (Central) Europe has had direct effects on increase of unemployment, decline of real and disposable incomes, etc., with direct impact on decline of economic and social cohesion in POLYCE metropolises.
- Higher proportion of elderly population and hence demographic dependency is also evident in POLYCE metropolises that are important for evaluation of social cohesion and provision of social and health services, as well as public transport facilities. In Ljubljana, Bratislava and Budapest there is smaller proportion of foreign citizens especially from the EU countries – in comparison to Wien or Praha. In addition integration of immigrant minorities in Wien (mostly from new member states and Turkey) does not take place in a sufficient extent. Hence, social and ethnic inclusive/cohesive development shows clear deficits in POLYCE metropolises that will need to be improved in future.
- Although there are some deficits in the public transport organization in the metropolitan regions of POLYCE cities, in general there is high satisfaction in Wien and Praha with the public transport system in the core city – indicating relative good pre-conditions for territorially inclusive/cohesive development. The situation could be improved in Budapest, Ljubljana with better public transport facilities in the urban region. The availability of ICT in the metropolis is also important indicator of inclusion of different social groups and territorial cohesion - that despite great efforts in the past 10 years in POLYCE metropolises need to be further improved.
- Finally, natural conditions (green and protected areas, climate conditions, sustainable land use, low pollution, etc) and living conditions in terms of cultural and health facilities, social services, provision of affordable and good quality housing - are assessed differently in POLYCE metropolises – with positive results in Wien, Praha and Ljubljana. Based on relative good metropolitan accessibility and attractivity conditions and according to the positive assessment of specific supply in the social, cultural and natural sphere, very evidently, the Wien metropolis is characterized mostly through territorially cohesive conditions in comparison to other POLYCE metropolises. Although intra-metropolitan disparities in living conditions between the core city and surrounding region are increasing in all POLYCE metropolises that will need to be improved though equal provision of attractive jobs and services in the metropolitan areas not only in the core (capital) cities.

4.10 The Way Forward

One of the aims of the POLYCE WP2.3 has been to convert the concepts of metropolisation into factors and indicators for analysis and to utilize the publicly available databases (EUROSTAT, URBAN AUDIT, ESPON, other institutional / research databases) and results of some new ESPON projects that have become available during 2010-2011. This process has involved specification of metropolitan factors/indicators in WP2.3. in terms of content (e.g. what does the factor tell us), in terms of time (e.g. at what time periods is the factor measured) and in terms of scale (e.g. at what scale is data available to construct robust metropolitan factors). The other challenge was the data availability and accessibility from publicly available data sources as well as documentation (meta-data) and structure of POLYCE WP2.3 Master *(MEGA) Data File* database followed by the calculation of indicators according to chosen statistical models.

The POLYCE working hypothesis was that the metropolisation capacity of POLYCE - and MEGA cities in Europe - depends on a different (at least in part) set of factors and indicators, relating to key policy development characteristics that could be defined also as their territorial capital assets in different dimensions *(Economy, People, Mobility, Environment, Living)*. They all are more likely to occur in place where there are good jobs, infrastructure and public services, high quality environmental and cultural assets, and good environmental conditions. The results of POLYCE WP2.3. clearly show the differences in endowment factors between MEGA and POLYCE metropolises. After the process of verification of sources and existing data, it was possible to collect the data for chosen indicators describing bundle of factors and key policy development characteristics in 50 MEGA including five POLYCE metropolises. Selected indicators are close to each metropolitan factor within the key policy development characteristics. Showing the linkages between each indicator and factors is important – taking in consideration that territorial development of »smart, inclusive and sustainable« European (both MEGA and POLYCE) metropolises are supposed to improve in future – under different constraints – and taking in consideration the effects of economic and financial crisis, climate mitigation and adaptation measures, or demographic and social factors. Most of the data are covering the time period 1998-2008 - as the most prosperous years for European cities - before the period of recent economic crisis. Selected indicators are showing more competitive nature of metropolitan development, some of them are showing inclusive development - some are the indicators of both - depends of POLYCE understanding and perception of the process of metropolisation, as well as the selection of indicators, data and statistical analysis.

In WP2.1 the POLYCE TPG defined the concept of metropolis consisting of CC (Core City) – FMA (Functional Metropolitan Area) - MR (Metropolitan region) for five POLYCE metropolises based on population and labor market data (especially travel-to-work data) from national censuses or national annual registry databases. In WP2.2 the concept of metropolis was econometrically analyzed taking in consideration 59 LUZ (Larger Urban Zone from URBAN AUDIT) in Europe including five POLYCE LUZ through a bundle of 15 indicators (and available data taken mainly from the ESPON FOCI project (originally from UA database). In order to broaden the set of indicators and factors of the process of metropolisation the aim of WP2.3. was to select a larger set of indicators from different publicly available databases (ESPON, URBAN AUDIT, EUROSTA, etc) for LUZ or FUA/MEGA (ESPON 1.1.1 project) in Europe in order to complement analysis from WP2.2. with the main focus on POLYCE metropolitan profiles. But due to insufficient data availability and accessibility – different spatial levels have to be used in WP2.3 analysis – as LUZ, FUA/MEGA, approximation of LUZ to NUTS 3 / NUTS 2 regions (as defined in the ESPON FOCI project) or CC in order to obtain sufficient data for selected indicators and MEGA (with more than 80% data coverage) and to evaluate the level of metropolisation of POLYCE and MEGA cities in Europe.

Therefore the evaluation of the *state-of-the art* - or the level of *metropolisation* of five POLYCE (and 50 MEGA) cities in Europe represents a good research exercise but not a detailed evaluation of the process of metropolisation. Not the same metropolitan territory was observed in each indicator and not at the same time period – due to different data availability and accessibility of selected indicators and incompatible databases. Hence for any further (and complex) comparative analysis of European city regions and metropolises - the most desired situation will be to have an access to data

covering not only NUTS 2 regions but also NUTS 3 regions (corresponding to LUZ level) as well as LAU 2 / LAU 1 levels as building blocks for FUA/MEGA spatial level. This is also one of the recommendations from the POLYCE TPG to - ESPON, URBAN AUDIT, EUROSTAT – in order to inter-link their data – and improve, establish and maintain comparable database that can be used not only by urban researchers, but also by stakeholders in European metropolises to formulate and implement their urban policies, spatial planning initiatives and strategic projects, using benchmarking approach as an instrument of efficient urban and regional management and territorial governance.

5 Assessment of Metropolitan Characteristics

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5.1 Objectives

WP2.4 focused on the perceived spatial characteristics of the five cities with regard to environmental, economic, social and psychosocial aspects. The main goal of this WP is to help perform qualitative evaluation of the strengths, weaknesses, potentials, assets and challenges of the examined core cities and their metropolitan regions. Data and research outputs generated by the activities within WP2.4 are meant to be complement to thorough quantitative assessment of spatial characteristics surveyed in other WP, mainly in WP2.3. Methods and tools used in this WP will be developed in close coordination with other WPs.

Hence, the main focus lies on the interplay of objectively described and individually (stakeholders) perceived characteristics. Results generated by the tools used in WP2.4 will shed additional light and reveal the contexts in which the exact data examined in the other WPs are settled.

The three main objectives of WP2.4 are:

- Identification of most relevant potentials, factors and assets of the five cities on the meso and macro level. These potentials, factors and assets of the examined five core cities and their metropolitan regions will be mutually compared using both qualitative and quantitative methods.
- Widening the perception of important assets and potentials among the stakeholders
- Assessment of assets for future positioning of the five cities as metropolises on the macro level

Main tasks within this WP were the following:

- to prepare a methodological framework for the implementation of major tools: questionnaires, desk research and workshops
- to implement an methodology for participative assessment of perceived strengths, weaknesses, potentials, assets and challenges for each city
- to compare major strengths and weaknesses of each city
- to analyze and compare the profiles of the five cities at the local and regional level
- to detect relevant synergy effects of the five cities and their cooperative efforts
- to implement these tools and sum up the results

5.2 Tools

5.2.1 Questionnaire

5.2.1.1 Methodology

Questionnaires (completed and précised by an additional interview, if necessary) have been set up as the main interactive method for WP2.4. They served as a tool to identify and assess perceived spatial characteristics of each core city and its metropolitan region. The word “perceived” indicates that we are not measuring/examining knowledge but rather subjective category of attitudes, opinions and leans. These categories are not measurable directly.

The most renowned definition states that attitudes are learnt predisposition to favoring or refusing reaction toward given object, person or event (Fishbein, Ajzen 1975, In Hayes, 2003, p. 95).

Generally, the attitudes are learnt, mutually consistent, stable in time and space and are concerning the positive or negative reactions. Each attitude has cognitive (opinion based on rationalities), emotional (feelings and emotions) and behavioral (willingness to act) dimension.

Ajzen and Fishbein formulated in 1980 the theory of reasoned action (TRA). Theory of Reasoned Action is based on the supposition that individual behavior is based upon the intention to perform the behavior and that intention is a function of individual set of attitudes. Expressed behavior is always based on the intention which might be unconscious. Intention is thus the cognitive representation of a person's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior.

Each intention is basically determined by the underlying attitude, the set of subjective norms and the individual behavioral control. Subjective norms might strengthen or diminish the intensity of the expressed attitude. In other words, the people with rather strong subjective norms might inhibit their attitudes and behavior in significant way. For example, if the reference social group is rather condemning some attitudes and behavior, the mere belief or individual assumption might not be strong enough to modify the attitudes and intentions into open expression (or behavioral act). More e.g. on: www.utwente.nl/cw/theorieenoverzicht/Theory%20clusters/Health%20Communication/theory_planned_behavior.doc/

Attitudes can be modified and changed both internally and externally. Modifications and shifts within the one´s attitude in time and space is conceivably explained by theory of cognitive balance and cognitive dissonance (Heider, Festinger 1957, In Hayes 2003). Discrepancy within own attitude system is solved by the change or shift of one or more attitudes. The internal harmony and balance is restored.

Other theory, so called „self-perception theory“ (Bem, Cooley, in Hayes 2003) interpret attitudes as a result of continuous individual comparative analysis. Each individual is taking into consideration the following assumptions:

3. supposition how own individual is influencing others
4. supposition, how the others evaluate own behavior
5. feeling of pride, shame and disappointment conducting own behavior

There is a range of subtle distinctions between attitudes and opinions. In general the following ones are considered to be most significant:

Attitudes

- are more difficult to research, because they might be hidden and invisible
- are stable in space and time, deeper anchoraged and usually are modified continuously
- are more consistent within each other
- are resistant to arguments
- are more related to abstract and philosophical themes (ethic, truth, moral...)
- have certain logical structure

Example of attitudes in our questionnaire is question Nr.10.

Opinions:

- are more rational and civil
- are more focused on external, non-personal issues (e.g. the right approach toward technical difficulties conducting the revitalization of urban area...)

- are more sensible toward contra-arguments
- are more easily to modify or shift
- are easier to measure and to evaluate

Example of opinions in our questionnaire is question Nr. 3

We assume that the attitudes, opinions and leans of respondent are influenced mainly by the following patterns and factors:

- professional experience and background
- situational context (whether the respondent is now working on projects regarding the examined city, the political situation, previous experiences from similar surveys etc.)
- personality of respondent (his/her personal values, characteristics, interests, hobbies)
- social desirability (tendency to answer in expected way, especially when the researcher is somebody who is personally known/respected by the respondent)
- individual motivation and engagement of the respondent

The questionnaires included open, as well as semi-open and closed questions. The following techniques were used to structure the particular items of the questionnaire:

5.2.1.1.1 Likert scales

Likert scales are one of the most frequently used methods for evaluation of attitude/behavior related to the proposed topic/statement/thesis. Most frequently, this tool is measuring the degree of agreement with the proposed statement – e.g. measuring the degree of trust, positive affiliation, willingness to act etc. This degree reflects the attitude of the individual.

The Likert-type scale has been used for measuring the attitudes by researchers for over many decades. The original scale of this type was developed by Rensis Likert and is explained in his article, "A Technique for the Measurement of Attitudes," in Achieves of Psychology (1932). He reported very satisfactory reliability data for the scales developed with his procedure. Subsequent research has generally confirmed the fact that the Likert-type attitude scales are quite reliable and valid instruments for the measurement of attitudes.

The most essential criteria for using Likert-type scales are the following (according to Maranell 1974):

- each statement should enable to express an individual opinion
- the statements are measuring the subjective attitude/behavior not a knowledge of objective fact
- the statements should measure the present attitude not a past one or a future possibility
- the statements should be clear, concise and straight-forwarded
- the vocabulary should avoid double-edged, unclear and ambiguous formulations
- each statement should measure only one attribute (avoid double negation).

A Likert-type scale consists of a series of declarative statements. The subject is asked to indicate whether he agrees or disagrees with each statement. Commonly, five options are provided: "strongly agree," "agree," "undecided," "disagree," and "strongly disagree." Other Likert-type scales include four or six steps rather than five, excluding the undecided position. We used the 4-option scale in

one question and 5-option scales in two questions. The 4-point scale tends to over-scale the answers, going to extreme values more than the 5-point Likert scale. To some extent and in some cases, it can exaggerate the answers, so we restricted this scale (4points) to only one question.

The measured attitude was modified from the simple approval (agree-disagree) toward the expression of perceived importance (low-high) and performance (low-high).

Originally, scales developed by the Likert method included from six to thirty declarative statements. Some of these statements were stated in a positive manner and other in a negative manner. Optimizing our questionnaire, we decided to use only positively formulated items. In Questions Nr. 10 and 11, we tried to cross-check the perceived importance in general, and the satisfaction with the current state of art of each measured factor. The negative differential between the high importance and low satisfaction indicate the critical issues. Generally, the Likert-type scale provides a very useful and relatively uncomplicated method of obtaining data on people's attitudes (Arnold, Croskey, Prichard 2011).

Example from our questionnaire:

Question 10:

Independent of the situation in (add city here), which of the following factors do you generally consider to be important preconditions for cooperative efforts? Please rate the following factors according to their importance and add others you regard as important. (1 = low importance, 5 = high importance)

Legal stability	*‘1 ‘2 ‘3 ‘4 ‘5*
Political stability	*‘1 ‘2 ‘3 ‘4 ‘5*
Leadership and decision-making qualities	*‘1 ‘2 ‘3 ‘4 ‘5*

Etc.

Assets of Liker-type scales:

- easy to score and evaluate
- allow statistical summaries and further application of data (although in our case the sample of respondents is numerously too small for further utilization of advanced statistical tools).
- enable to repeat the survey in certain time and thus make a profound longitudinal research
- in our case, this tool enables to compare the examined core cities and their metropolitan regions altogether and to make individual bilateral comparison between any given cities
- rather simple tool to comprehend the scope of the question, the used scales make the scope of the question rather comprehensible and understandable
- enables to set up the hierarchy among the examined factors (combination of importance and satisfaction)

Possible drawbacks of Likert-type scales:

- a lot of neutral answers, risk of influencing responses by forcing choices
- social desirability (tendency to answer in expected way)
- measured items must avoid any ambiguity in interpretation!
- measured items must not measure the facts, but they must be focused on attitude/behavior!

- we are working with small number of respondents, therefore individual selection may significantly bias the final results

5.2.1.1.2 Semantic differential

Semantic differential is a scale designed by Osgood (1957). Its main aim is to measure connotative meaning of persons, objects, events or concepts. Respondents have to evaluate the connotative characteristics of given object/concept on the bipolar scale consisting from mutually opposite adjectives („good-bad"). Connotative meaning means that they are not assessing the objective facts, but rather subjectively evaluating the proposed characteristics and traits of the examined object/concept. Respondent should indicate his/her personal opinion within the given scale. Attitude measurement has been examined in sociology, psychology, political science etc, in many ways and approaches and semantic differential technique has proven to be a well-respected measuring device within this filed.

Osgood performed a factor analysis of various scales and divided their content onto three principal scopes: evaluation, potency, and activity:

1. The first scope (evaluation) measures the impression within the categories of acceptance or refusal (good-bad, agreeable-obnoxious)
2. The second scope (potency) measures the strength or vitality (dominant-submissive, strong-weak, vigorous-unprofiled).
3. The third scope (activity) measures the dynamics (active-passive, hectic-calm).

The studies of Osgood and his colleagues revealed that those three scopes of factors deliver most precisely the essence of the most of personal attitudes. Thus, the semantic differential is today one of the most widely used scales used in the measurement of attitudes. One of the reasons is the versatility of the items. The bipolar adjective pairs can be used for a wide variety of subjects and topics and the principle of the questionnaire is easily understood for all individual familiar with the used language.

In our questionnaire, the semantic differential (measuring the leaning of respondents toward certain connotations, e.g. the perceived characteristic/trait of the city) was used in one question (city image). Respondents were asked to express their personal evaluation of the examined characteristic of the city on the bipolar scale.

Question 3:

How would you describe the city following the below-mentioned categories?

	Very	*Rather*	*Neutral*	*Rather*	*Very*	
attractive	‘	‘	‘	‘	‘	*unattractive*
ordinary	‘	‘	‘	‘	‘	*unique*
friendly	‘	‘	‘	‘	‘	*hostile*
etc.						

Assets of semantic differential:

- this method enables to compare the examined cities altogether as well as to make individual bilateral comparisons between them
- rather simple tool to comprehend the scope of the question

- measuring the connotative meaning of the objects and displaying (indirectly) the attitudes of the respondents
- particular items might be analyzed by factor analysis which enables to survey both the individual (degree of consistency of attitudes) and group diagnostics (prevailing attitudes)

Possible drawbacks:

- selection of the adjectives might be biased by culture, language, linguistic parameters etc.
- it is not easy to obtain bipolarity in all requested fields (e.g. what is opposite adjective of "boring" – "manifold/exciting/creative"?)
- national language specificities (some adjectives might be translated/interpreted differently in different languages), some adjectives might bear more double-edged connotations in certain languages
- social desirability (tendency to answer in expected way)
- tendency to prefer medium/average points of scale
- we are working with small number of respondents, therefore individual selection may significantly bias the final results

All in all, semantic differential is a useful tool of measuring subjective connotations, and this method is used in our questionnaire as an additional tool.

5.2.1.1.3 Semi-forced option

Several items in our questionnaire were constructed via semi-forced option method. Respondents had to opt from the proposed list of options. Multiple answers were possible.

Selection of the adjectives should inspire the respondents to take into the consideration different aspects of the evaluated subject. Even the mutual compatibility/incompatibility of the selected characteristics might bear a diagnostic value (if somebody picked up the social environment both as friendly as well as split/apart, it may indicate that social environment within the city significantly differ in various locations/segments/milieus).

Question 4:

What is your experience regarding the social environment in the city?

supportive ‘

inspiring ‘

friendly ‘

cooperative ‘

etc.

Assets:

- broad choice of alternatives. The respondents have the option to choose from 10 alternatives
- opportunity to compare different cities altogether and an opportunity to compare the examined cities bilaterally

- possibility to include multiple options makes this method an excellent opportunity to express own attitude in more optimal, balanced way
- possibility to include own choice is an excellent opportunity to tackle characteristics which might have been overlooked by author of questionnaire

Possible drawbacks:

- the semantics of the selected option might be interpreted differently (e.g. “inspiring social environment” might refer to inspirative “governance culture” as well as to selected characteristic of the broader social milieu including rather in-formal communities and genres etc.)
- the selection of the proposed characteristics might be influenced by the cultural variables, language specificities and cognitive styles of the authors of the questionnaire

5.2.1.1.4 Open-ended questions

Open-ended questions provide more space for individual assessment, presentation of own particular point of view and the feedback toward the survey. Respondents are not forced to opt from the given answers, but are encouraged to formulate their own opinion, answers and reactions to relevant subject. Their answer is not strictly limited by time and space. There are issues which are so complex, multidimensional or unique, that standardized scales are inappropriate to use.

Open-ended questions represent the majority of the surveyed items in our questionnaire. Due to the limited sample of interviewees, we can focus on individual perception of those issues. This method enables to concentrate on unique, specific and peculiar features of the investigated cities.

Question 8a:

From your point of view, which projects or activities do you consider to be important for future metropolitan development?

Question 15:

Finally, we would like to hear your opinion on the future development of the city and ways to steer this development. What are your strategic recommendations for achieving a territorially-inclusive metropolitan development in selected city?

Assets:

- opportunity to gain more personal feedback based on the feelings, attitudes, personal experience and understanding of the respective topic.
- this type of question enables to provide more information, especially concerning the particular specificities and peculiarities of the examined city. Answers given to open-ended question might sometimes reveal the issues that have previously not been taken into consideration at all.
- higher motivation of respondents to express something individual, with higher added value,
- respondents are not likely to forget the answers they have to choose from if they are given the chance to respond freely, and open-ended questions simply do not allow respondents to disregard reading the questions and just "fill in" the boxes with some superficial evaluation

- it is highly unlikely that the given answers of several respondents will be too similar or same in the nature
- open questions are frequently used as a secondary analysis, revealing the context (e.g. if respondents are other researchers or insiders within examined field) and providing the multiplicated knowledge.

Possible drawbacks:

- the evaluation might be difficult and time-consuming
- it may be difficult to make clear-cut comparison between the particular answers as well as between examined cities
- respondents with higher motivation may make more comments and entries that respondents with more indifferent attitude but relevant and valid observations
- too general or too specific answers
- less articulate respondents may have difficulties to provide plausible answers

5.2.1.2 Selection of respondents

Appropriate selection of respondents is fundamental precondition of the validity and reliability of every survey. Due to the limited number of respondents, we could not take into the consideration the usual demographic and social criteria (age, sex, education etc.). First we tried to set up the basic common criteria. We agreed that selected respondents:

- should be competent to assess the question/issues. Although there are supposed different opinions and points of view (even controversial), the respondents should be able to underline their opinions with certain knowledge and experience within the examined field.
- should be from different background (academic, commercial, municipal). This variety is essential, because each sector will be represented by limited amount of respondents. The domination of certain sectors might significantly distort or bias the results.
- should be motivated to participate. This is essential especially in open-ended questions, high motivation is a basic precondition of thorough and profound answers related to those questions. Even in close-ended questions, higher motivation will reduce risk of superficial answers to questions which were not properly understood etc.
- should be instructed that the principal tool is questionnaire (not interview). Additional communication (interview) should serve as a tool of precision of the given answers, not as the further investigative tool (in order to secure validity and reliability of the research).

The profile of the sample of the respondents in particular cities should be mutually comparable according to several indicators (background, amount, motivation). More on this issue see below.

After open discussion and brainstorming session we decide to use the following sample of participating respondents:

Field of activity

1. politician

2. planner from capital city (public)
3. chamber of commerce
4. media (daily newspaper)
5. economic developing agency
6. academic (reg. planning)
7. project manager (city council)
8. representative international enterprise (private)
9. representative international organization (public, semi-public)
10. cultural (event organization)
11. tourist agency
12. representative / city in Metropolitan region
13. representative / city in Metropolitan region
14. NGO
15. private planner

The interviewees will be the leading personalities and opinion-makers related to the particular city (stakeholders). The main thematic issues covered in the interviews will revolve around potentials, assets, challenges, strengths and weaknesses of the five cities. These dimensions will help to reveal the unique added value of each examined city and its USP (unique selling proposition) on the international marketplace.

5.2.1.3 Content

The content of the questionnaire might be divided onto three thematic scopes:

Part 1

The first part deals with the recent development of particular city in economic, social, environmental and infrastructural terms, as well as with the overall profile of the city (performance of city, image, social climate, past achievements and failures). It integrates both the items which are perceived more subjectively and even emotionally (image of the city, social environment) and the items assessed more rationally (overall development and performance of the city in the delimited dimensions). First 5 questions delimit the framework for general subjective evaluation of city particular achievements and setbacks, with the opportunity to describe its individual subjective connotations creating unique identity. This part of questionnaire is rather descriptive and empirical. We tried to involve respondents into the topics the questionnaire is mapping out and give them proper opportunity to express their subjective and individual opinions.

Part 2

The second part deals with the future perspectives of the particular city. The future potential will be revealed on the background of the existing strengths and weaknesses. There was no particular specification of the fields where the strengths and weaknesses should be assessed, but the emphasis is placed on the issues that might be actively shaped and influenced by the city itself. This part of questionnaire is rather analytical and more in-depth oriented. Questions used in this part require certain degree of knowledge and expert orientation in the field of urban and regional development of the particular city and its metropolitan region. We strived to gain certain balance, asking for most significant strengths and weaknesses, and for the most important and most challenging/controversial actions within city´s territory. Implication of those events/projects on the positioning of the city is the last item of this part of questionnaire. Deeper and rather complex evaluation of the past and running activities is revealing indirectly the attitudes of the respondents

(whether they tend to prefer more social oriented, environmental friendly solutions or they appraise rather neoliberal, progressive, business driven actions etc.).

Part 3

The third part of the questionnaire deals with the cooperative initiatives and factors that are important for an inclusive metropolitan development (factors important for cooperative effort, fields of cooperation, partnerships, strategic recommendations etc.). This section of the questionnaire is focused on measuring the attitudes (what are the preconditions for effective cooperation) and the reflection of satisfaction with the current state of art within this field (degree of satisfaction related to factors conditioning the effective cooperation in respective city). Further questions are investigating the importance of particular fields of metropolitan development with regard to cooperation, attractiveness of the city as a partner, potential future partners for cooperation and strategic recommendations for the future. Last item of the questionnaire is set up as an open question, giving opportunity to include previously forgotten issues and making respondents more involved into the research. We expect that this last question might shed some inspirative light on the important fields of future development, strategic direction, visions etc. These impulses might be further discussed and evaluated on the local conferences in each respective city.

5.2.1.4 Evaluation

Interpretation of the data and statements from questionnaire/interview will combine statistical analysis and content analysis. The essential guide how to proceed with the evaluations should take into the consideration following steps and recommendations:

a) recent urban development trends and city profile

Profile of the city (Question 1)

Q1: overall frequencies of selected adjectives, distribution of opinions, coherence of opinions…). It is an introductory question indicating how is city perceived in general.

Profile / Social environment (Question 3 + 4)

Q3: city image – the overall bipolar profile, preferred adjectives, coherence of opinions, controversially perceived adjectives…In which items the respondents are split apart in their opinions?

Q4: social climate – frequencies, the 3-4 most frequently selected adjectives, inner coherence of the most frequently preferred adjectives

Overall development over the last 5 years in different dimensions (Question 2)

Q2: brief description for each dimension (social, economic…), content analysis, which dimension was answered more frequently, which one was left unanswered or less frequently answered?

Negative and positive events / activities (Question 5a and 5b)

Q5: the most frequently selected events, type of argumentation (Why?), the locations (Where?), controversions (are there events/project which are being mentioned both positive and negative examples?...) territory.

b) perspectives for future development

Strengths and weaknesses of the city (Question 6 and 7)

Q6,7: Comparison, in which fields are located the weaknesses and the strengths?, content analysis of given answers.

Most promising / most challenging projects or activities for future development (Question 8a, 8b and 9)

Q8: the most frequently selected projects, style of argumentation (Why?), the locations (Where?), controversions (are there events/projects which are being mentioned as both positive and negative examples?...)

c) realization of inclusive metropolitan development

Preconditions for cooperation –in general and in the examined city (Questions 10 and 11)

Q10,11: frequencies, comparison of profiles of answers in Q10 and Q11, What is considered to be most relevant and lacking in practice? What is considered irrelevant? Which factors were frequently skipped/voided? Are there frequently mentioned any other issues which are not among the proposed alternatives?

Importance of cooperation for positioning of the city (Question 12)

Q12: content analysis of the given answers

Existing cooperation with other cities and potential future partners (Questions 13,14)

Q13, 14: content analysis of the given answers

Strategic recommendations for future metropolitan development (Question 15)

Q15: content analysis of the given answers, Which fields are the given strategic recommendations tackling? Overall level of satisfaction? Are the respondents prone to express their opinions or are rather indifferent? Any other comments/remarks?

Overall impressions of the processing the questionnaires:

What did we learn from the questionnaires about the city?

Which questionnaire results struck us?

Which items/fields were considered to be too diffuse and unintelligible?

What were the prevailing attitudes and motivations of respondents regarding the survey?

What new perspectives for future development of particular city emerged from the results of questionnaires?

5.2.2 Non-interactive tools (desk research)

Additional research based on the synthesis of data about spatial qualities provided from other WPs), in particular WP2.3 and analysis of documents, chronicles, books, mass-media regarding the prevailing planning approaches, recent spatial development models and visions and cooperative initiatives should help to precise information gained by the activities within WP2.4. Main aim of the desk research was to reveal the context of each city´s existence and recent development. The research should be focused on the issues which are not clearly visible or accountable but they formatted the position of each city and determine its future perspective and development. These issues were not developed as an additional questionnaire, but they rather build up the framework of information and some of the research scopes have been outlined within WP2.5.

5.2.3 Local conference

Local conferences with the representatives and stakeholders of the cities shed additional light on the above mentioned aspects and helped to relate the findings to the results obtained in other WPs and in particular through the interviews. The main objective of the workshops is to get feedback from stakeholders on the (perceived) spatial quality of the five cities.

5.2.3.1 Methodology

As part of the assessment of stakeholder perceptions in WP2.4 workshops with local and regional stakeholders were held in the five POLYCE cities. The workshops were organized after the

completion of the analytical WPs2.1, 2.2. and 2.3 and the first round of stakeholder involvement through the survey in WP2.4. Hence, they represented the second round of stakeholder involvement in the course of the project.

5.2.3.2 Main objectives

The conferences had two main objectives. First, they aimed at the discussion and assessment of results obtained from the analytical work packages as well as the stakeholder survey. General idea was to confront the workshop participants with these results and collect the reactions. The second objective of the events was to elaborate ideas for the development of strategic recommendations based on the results of the conducted analysis.

5.2.3.2.1 Structure of workshop

Based on these two main objectives the workshop was divided into four parts.

1. Introduction of basic concepts of POLYCE

   To ensure a common understanding of the two concepts fundamental to POLYCE, i.e. metropolisation and polycentricity, the workshop started with a brief introduction of these concepts. In a first step, a brief individual brainstorming among the participants was conducted. For that, each workshop participant received two cards to write down their own definitions. The cards were collected and pinned on a flipchart. The project group presented the definitions as applied in POLYCE to create a common understanding of the concepts within the workshop group and to receive feedback on necessary refinements of the concepts.

2. Presentation of preliminary results by project partners

   The second part of the workshop consisted of a presentation of preliminary results by the project partners. This presentation was structured as follows: Firstly, the most striking results from a Central European perspective were presented, i.e. results that dealt with the CED zone and the five cities as a whole. Secondly, the city-specific results for the respective city were presented. This structure was chosen in order to ensure that the workshop participants both get an insight into developments in all five cities but can also focus on the developments and challenges in their own particular city. In terms of content, the presentations included on the CED level the most relevant findings about metropolisation and polycentricity (WP2.2. and WP2.1), and on the city level findings about existing planning strategies dealing with polycentricity and metropolisation (WP2.5), metropolitan profiles (WP2.3), polycentric relations (WP2.1) and stakeholder perceptions (WP2.4). After the presentations, a short round of Q+A was held.

3. Discussion of results

   In a third part, the presented results were discussed among the workshop participants. For that, small groups were formed and the group members were given 15 minutes time to discuss. Guiding questions for this task were:

- Which results did you expect? What struck you? What was surprising?
- Which factors crucially influencing urban development that go beyond the presented results come to your mind?
- Which factors do you consider to be important for future urban development?

   After 15 minutes, the groups were asked to briefly present the outcomes of the discussion and notes were taken on a flipchart.

4. Assessment of development potentials

   The workshop was concluded with a discussion and brainstorming about promising future development perspectives for the respective city. For that, ideas and thoughts were collected on flipcharts. In a second step, the question was posed which projects were

necessary to realize these development perspectives. For this, a distinction was made between projects located at the city regional level and such located at the European level.

5.2.3.2.2 Selection of participants

The general approach of the workshops was to invite a selection of local and regional stakeholders concerned with urban development and strategy building in a European perspective. The main aim was to involve all the target groups who might be benefiting from the dissemination of know-how generated in POLYCE and who might contribute to deepen the discussion of relevant issues of polycentric and metropolitan development of particular cities. About 50 to 60 invitations were sent out for each city in order to eventually get about 15 to 20 participants for each workshop. The selection procedure for the participants was as follows: First, the survey participants from WP2.4 were invited. Second, representatives from the city administration were invited. In a final step, a number of additional actors were invited selected in collaboration with the local city stakeholders. It was attempted to sample participants based on the functional criteria used for the stakeholder survey and to maximize the diversity of professional backgrounds of the participants. A detailed list of participants of the five workshops can be found XX.

5.2.3.2.3 Output and use of results

The workshop was documented using a number of tools. Besides the flipcharts produced by the participants in the course of the discussions a photo documentation and a protocol were created. Based on these materials the results of the workshop were integrated into the project in two ways:

- The interpretation of the analytical results was refined, based on the reactions and comments of the participants.
- The named promising future perspectives and projects were incorporated in the discussion on the elaboration of the POLYCE policy agenda in WP2.5. (reference to WP2.5)

5.3 Results and Outcomes

5.3.1 Questionnaires/interviews

5.3.1.1 Results in the 5 examined cities

WP2.4. QUESTIONNAIRE

EVALUATION of the results from the city of BRATISLAVA

Sample

The interpretation of the questionnaire is based upon the answers and data given by 14 respondents. People from the following categories were approached for participating:

1. politician
2. planner from capital city (public)
3. chamber of commerce
4. media (daily newspaper)
5. economic development agency
6. academic (regional planning)

7. project manager (city administration)
8. representative international enterprise (private)
9. representative international organization (public, semi-public)
10. representative of cultural institution (event management)
11. tourist agency
12. politician from city in MR
13. NGO
14. private planner

We did not succeed to include every position from the list (representatives of chamber of commerce and politicians refused to participate), but some other sectors (tourist agency, cities outside of metropolitan regions) were represented by 2 respondents.

Interpretation of the results

1. Recent urban development trends and city profile

Profile of the city (Question 1)

The results of the questionnaire indicate that Bratislava is predominantly considered as **center of research and education (9), dynamic, growing city (9), historical city (7) and center of finance and business (6)**. The adjective „dynamic city" was mentioned by all respondents coming from municipal field (both from Bratislava as well as from Trnava). Adjectives **„city of tourism" (2) and „dormitory city" (3)** were mentioned less frequently. Despite high frequency of perception of Bratislava as center of research and education, the city was **never mentioned as city of innovation**. Similarly, despite an industrial past, the city was never mentioned as industrial city. Among the other adjectives, the following ones appeared: „gateway to West", „Danubian city", „conservative city" and „city of thieves". **The results indicate that the mainstream perception of the city is related to historical heritage and recent economic development (before crisis), tourism is considered as a minor characteristic.** Respondents preferred generally positive connotations. On the other hand, we should bear in mind, that respondents always tend to be rather careful/positive in first questions (social desirability), unleashing their criticism in later stages of questionnaire (e.g. question 4).

City image/Social environment (Question 3 + 4)

According to opinion of our respondents, Bratislava is predominately perceived as an **expensive** and **perspective** city. It is rather questionable, whether this was influenced by media discourse, displaying lately Bratislava as a **promising, high growing, perspective but on the other hand overpriced city**. In the second rank, Bratislava is also perceived as **attractive, friendly, hectic, safe and self-confident city**. Leans toward other adjectives (unique, dirty, progressive, spacious/dense, noisy, rational, and simple) are not significant.

The opinions of respondents **are not extremely polarized**. Only with regard to the items tranquil/hectic, safe/dangerous and self-confident/without self-confidence, the opinions are little bit split apart. While respondents with background in architecture and spatial/urban planning tend to perceive the city as unique and perspective, respondents from other cities (Trnava) tend to perceive Bratislava particularly as hectic and noisy.

Social climate in Bratislava is considered to be **indifferent (9), competitive (8), split apart (8) and snobbish (6)**. Although the social climate was never perceived to be hostile/frightening, this clearly indicates critical and rather negative perception of this field. Especially by the adjective spilt-apart there is a concordance with the critical evaluation by respondents coming from both municipal as well as from commercial milieu. The positive connotations – **supportive (4), tolerant (4), friendly (3) and cooperative (3)** - were mentioned quite less frequently. **Such expressions indicate a lot of**

conflict potentials (attractive place with plethora of contradictory interests...) and low societal cohesion with individualistic and business driven climate. Respondents are heavily polarized in their opinions – they either perceive social climate clearly negative (split apart, indifferent, snobbish) or clearly positive (supportive and friendly). Results are influenced with the fact that respondents with negative perception of social climate opted for more alternatives than respondent with predominantly positive assessment. Put into the context, the word competitive is here deemed rather in negative connotations (competitive without sensitivity to the needs of others).

Overall development over the last 5 years in different dimensions (Question 2)

Economic dimension was easily the best evaluated dimension. Bratislava is considered as **business location with high attractivity and high competitiveness**. This is the consensus of the majority of respondents with the exception of former main architect of the city who perceives this field more critical. The only dimension with lower score is research and innovation. It seems that respondents lean toward the belief that **successful economic development of Bratislava in recent years is not sufficiently backed by research, development, innovations etc. Societal dimension** is perceived more **sceptical**: especially social integration and international orientation/open-mindness are rather mediocre. On the other hand, social mobility is rather high, it seems that respondents took into the consideration considerable share of employers from other Slovak regions employed in Bratislava business environment. **Environmental, infrastructural and institutional dimension were confronted with heavy criticism.** This is the consensus of majority of respondents, led by the representatives of media, NGO, research institutions etc. Almost all surveyed dimensions are assessed below average. Especially sustainability of land use structure, green mobility, quality of public services and e-governance are considered to be weak points of Bratislava. Quality of above mentioned services is considered to be poor. Opinions are heavily differing when assessing the environmental quality. While **societal, environmental and infrastructural dimensions are evaluated with high polarity of opinions** (environmental dimension was evaluated very negatively by the representative of NGO), there is a consensus that **economic dimension** is the **strongest** part and **institutional dimension** is easily the **weakest** part of Bratislava´s development. Even the representatives of the city of Bratislava do consider institutional dimension to be heavily underdeveloped.

Negative and positive events / activities (Question 5a and 5b)

The positive project/events/activities might be summarized within the following groups of issues:

a) **crossborder cooperation and common activities with neighbors**

   Almost **all activities within the crossborder cooperation were perceived positively**, with the focus on cooperation with Wien and Bundesland Niederösterreich. Intensification of train connection between Bratislava and Wien, preparation activities for building a bridge for cyclists, public transport of Bratislava operating in Hainburg and Wolfstahl as well as regional cooperation with Hungary was mentioned as clearly positive examples of recent activities on the territory of Bratislava metropolitan region. Cross-border cooperation and international relations have been entirely appreciated by the representatives of NGO.

b) **transport issues**

   Respondents assessed **positively some building activities improving the connectivity and accessibility of Bratislava**. Especially bridge **Apollo, tunnel Sitina and some highway bypasses** were mentioned as positive examples. However, the transport infrastructure remains one of the critical issues of Bratislava.

c) **project Eurovea and other shopping centers**

   Eurovea is one of the success stories of recent development in Bratislava. **This project has been positively reflected both by the professionals as well as the broad public.** Respondents (mainly representatives of media, city of Bratislava, business, NGO) appreciate especially the sensitive approach toward the river Danube and public spaces. Eurovea offered several choices without compromising the different needs of public: contact with new national theatre, generous public spaces, contact with Danube as well as various retail

shopping opportunities. This place was previously a derelict plot, cut off from the center and was never a part of the collective memory of the city. Current state of art is offering new opportunities to reflect specific urbanity on the contact zone with the river.

d) international events

Various international events, especially **World Icehockey Championship, summit Bush-Putin, NATO conference** have been mentioned as a milestones making Bratislava European metropolis. These issues have been mentioned predominantly by the respondents of foreign nationality, respondents with the Slovak nationality tend to focus on the intra-city development and externalized projects.

The negative projects/events/activities might be summarized within the following groups of issues:

a) River Park and PKO

Project River Park and plans of demolition of cultural center PKO were mentioned several times as a primary example of new arrogant planning culture brought to Bratislava by the new wave of developers after millenium. Entire **River Park** project has been perceived controversially from the beginning; arguably **becoming a symbol of ruthless dominance of international capital over the local genius loci**. The place was a part of collective memory of inhabitants and despite problematic architectural value of the existing buildings from early modernism, it still symbolized cultural values for many generations of citizens in Bratislava. Project River Park, although backed by prominent Dutch architect Eric van Eckeraat and rather heavy public relations campaign, was an example of total failure of communication with public. Its arrogant superposition over the river Danube became symbol of ignorance and arrogance.

Negative evaluation is common for almost all respondents, having been expressed especially by the representatives of media. Even the respondents outside from Bratislava as well as respondents from the city of Bratislava are highly critical concerning this issue.

b) Public spaces

Public spaces in general are perceived to be **neglected, not systematically included in the spatial development of the city and to be permanently threatened** by new building activities. It has to be taken into consideration that with regard to positioning of Bratislava, public spaces are compared with other European metropolises and this comparison is not always favorable for Bratislava.

c) new flagship building projects after millenium

Many new building projects were reflected with criticism. Except of River Park, the most reluctant attitude of respondent are bound to the projects of **new National Theatre, Aupark Tower, new Ice-hockey stadium, hotel Kempinsky, Kollárovo square rebuilding** etc. These solitaire projects do symbolize for respondents (and probably also for broad public) new individualistic, ruthless and aesthetically problematic planning culture, which left ineffable traces on the face of Bratislava.

d) other

Among other issues negatively perceived, the following ones appeared: delay of new masterplan, airport Bratislava and its diffuse position on international market and poor services, high density in suburbs, evaporation of vineyards, atrocious condition of the main train station, dissolution of the historically precious architectural shapes of early modernism...

There is relatively **high degree of concordance** among the opinions of respondents regarding positive/negative projects/events/activities in Bratislava. That means that there only few exceptional issues which were being perceived both negatively as positively (e.g. new masterplan).

2. Perspectives for future development

Strengths and weaknesses of the city (Question 6 and 7)

Strengths: geographical position, international connection (Wien, Budapest and Praha), culture and history, old city center, qualified human resources and workforce, low unemployment rate...

Weaknesses: marketing, services, greenery, corruption, bureaucracy, passivity, lacking conception, lack of multiculturality...

Respondents from the academic and business background did see the most relevant strength in the factors related to position of Bratislava, respondents from the architecture/culture/art background underlined some soft intangible factors („human scale", „intimacy of the city", „almost Mediterranean flair").

However, strengths are related more to **given characteristics, weaknesses** are related to **management of the city** (infrastructures, services) and decision making (bad decisions). There is strong feeling that extraordinary **potential of Bratislava is continuously wasted and mismanaged**...

Most promising / most challenging projects or activities for future development (Question 8a, 8b and 9)

Promising/important projects: highway bypass, Eurovea, transit of transport, airport reconstruction (new terminal), new sporting facilities, train corridor TENT, tramway to Petržalka, 4th quadrant and renewal of Danube delta, reconstruction of Hurban´ s garrison, reconstruction of heating plant on Čulenová street, Bratislava festivals and cultural events, coordination of spatial development with neighbors (Austria, Hungary)

Controversial: River Park, oil pipeline (Žitný ostrov), new administrative developments in general, icehockey stadium, hospital Rázsochy, Dell building, suburb Dlhé diely, suburb Bory, running building activities within the slopes of Carpathian mountains, reconstruction of main train station.

There is **high degree of heterogeneity** within the sample of answers. Respondent do see promising perspectives mainly in some transport and infrastructure projects. It is obvious, that attention is paid also for restoring architectural heritage and some cultural events. On the other hand, some building activities are considered controversial. This question was frequently omitted, maybe because of some similarity with question 6.

3. Realization of inclusive metropolitan development

Preconditions for cooperation – in general and in the examined city (Questions 10 and 11)

Legal stability and **transparency in decision making** are the **most relevant preconditions** for cooperation in general. **Political stability** and **legitimacy of political administrative system** are considered to be important in second rank. Neither **social security** nor **environmental awareness** are the priorities with this regard.

If we analyze the importance of the selected fields with regard to situation in Bratislava, there is **slight decline in importance** practically in **all items**. The **most important** are considered **legal stability, political stability, transparency in decision making, proactive behavior of citizens and open-mindness of society**. **Social security** and participation **tradition** were left behind.

Differences between the general importance and particular importance in Bratislava are **not significant**. We recorded considerable **inflation of rankings** (some respondents tend to consider important everything) inflicted probably by the phenomena of social desirability (tendency to answer in concordance with the supposed expectations of examiner). Maybe some of terms would require precise definition.

Importance of cooperation for positioning of the city (Question 12)

Cooperation on the level of metropolitan region should concentrate on the following groups of issues:

a) coordination of spatial development

Several responses tackled the need of more coordinated approach toward spatial development and development of settlement structures. This is reflected in the need for more intensive communication concerning the masterplans and various other planning documents.

This has been expressed mainly by respondents coming from architectural/spatial planning background as well as by the respondents employed by the city of Bratislava.

b) improving the infrastructure, especially transport

Infrastructural issues (TEN-T corridor, integrative metropolitan public transport, and highway bypasses etc.) were also in the spotlight. This has been accented by the respondent from academic field, NGO, media, tourist agency etc.

c) tourism and services

Bratislava should more cooperate with its metropolitan region with regards to services and tourism activities.

d) other issues

Among other issues social security, research and development, human resources and education, environmental issues seem to be most essential. Especially representative of the academic sphere emphasized these issues.

Cooperation with other cities should be focused on transport issues and connectivity, social issues, tourism and environmental problems. The most important partners were mentioned Praha, Wien and Budapest. Occasionally some distant cities were mentioned (Chinese cities) by the travel agency respondent.

Existing cooperation with other cities and potential future partners (Questions 13,14)

There were few (almost none) answers regarding the cooperation initiatives within the metropolitan region. Eurocities, Euroregion of 2nd Category Wien-Bratislava-Gyor-Brno, Danubian strategy and projects CUPA and Donauregionen were mentioned several times when mapping out the cooperation with other cities (including POLYCE cities).

Bratislava is clearly considered to be attractive partner for cooperation. The following arguments we found to be essential:

- Bratislava has good geographical position, attractive natural surrounding (river, mountains)
- Bratislava has good potential to interlink its settlement structure with the settlement structures of neighboring countries (Hungary, Austria).
- Bratislava has considerable economic strength and pursue power – this may help to find prosperity for smaller cities in the metropolitan region
- Bratislava is one of the few former „Ost-block“ cities which is performing better than many of „Western“ cities.
- Bratislava is a gateway to Slovakia and Eastern Europe
- Bratislava is really „little big city“ offering pleasant moderate scale

The only answer „No“ was arguing with poor quality of services and was expressed by the respondent of tourist agency.

Potential future partners within metropolitan region were the cities of Malacky, Pezinok, Senec, Trnava, and Nitra. Among the other cities (almost all abroad) Wien was mentioned almost by every respondent. The other potential partners are Budapest, Brno, Praha, Salzburg, Žilina, all EU capitals, all Danubian cities and even some exotic cities (Beijing, Saigon).

Strategic recommendations for future metropolitan development (Question 15)

Many recommendations of the respondents might be summarized within the following essential scopes:

- More public investments (sport, greenery, leisure time..) (respondent with architectural/urban planning background, respondent from the research institution, tourist agency)
- Better spatial planning and knowledge based management (respondents from the city of Bratislava and from the academic background, respondents from tourist agency, respondent from NGO)
- Services and culture (respondent from tourist agency)
- Transport issues (respondent from academic background and respondents from neighboring city of Trnava)
- Greenery and public spaces (respondents with architectural/urban planning background)
- Sustainability and knowledge based city (respondent from academic background)
- Precision of positioning and improving the city image (respondent from the city of Bratislava)

Concluding remarks:

- the city of Bratislava is predominantly considered as center of research and education, dynamic, growing city, historical city and center of finance and business and is predominately perceived as an expensive and perspective city. Regarding overall development over the last 5 years, Bratislava is predominantly considered as business location with high attractivity and high competitiveness. Environmental, infrastructural and institutional dimensions were confronted with considerable criticism.
- strengths of the city of Bratislava lie in the field of geographical position, international connections (Wien, Budapest, and Praha), culture and history, qualified human resources and workforce and low unemployment rate. On the other hand, city marketing, city services, greenery, corruption, bureaucracy, passivity and lack of strategic conception and multiculturality are considered to be weak points.
- Bratislava is clearly considered to be attractive partner for cooperation, especially because of favorable geographic position, considerable economic strength and pursue power and chances to serve as a gateway to Slovakia and Eastern Europe. There is a lot of potential both for cooperation as well as for international competition. Though, this potential is sometimes wasted and mismanaged.

WP2.4. QUESTIONNAIRE

EVALUATION of the results from the city of BUDAPEST

Sampling

The interpretation of the questionnaire is based upon the answers and data given by 15 respondents. People from the following categories were approached for participating:

- academics
- chamber of commerce
- cultural institution
- economic development agency
- media
- NGOs
- politicians (of the core city and cities in the metropolitan region)
- planners (in the public administration of the core city and in a private planning bureau)

- real estate developer
- representatives of international enterprises
- tourism agency representatives

There is no respondent included from the chamber of commerce, despite of numerous requests for participating in the survey.

Interpretation of the results

1. Recent urban development trends and city profile

Profile of the city (Question 1)

According to the experts Budapest is considered predominantly as a historical city (11), center of research and education (10), center of tourism (9), and center of finance and businesses (9). Labels of „dormitory city" (2) and „dynamic, growing city" (4) were less frequently mentioned (only by a municipal planner/head official, by an expert of a commercial real estate adviser company, by the representative of an international organization/ French Institute and by a real estate developer). Five respondents considered the city as a center of innovation – at the same time all of them mentioned Budapest as a center of research and education. On the other hand, nobody described the city as an industrial center. Among the other adjectives the following ones appeared: „administrative center" (2), center of the FDI flows", „the city of chances", city of baths and spas", „retail center", transportation hub". Those who considered the city growing and dynamic usually marked at least five options – therefore, only the most optimistic respondents perceived Budapest as a dynamic city. According to the results the perception of Budapest is mostly related to its historical heritage and post-industrial (e.g. finance, research, education, tourism) economic profile.

Overall development over the last 5 years in different dimensions (Question 2)

None of the dimensions was very positively evaluated but there was not any extremely weak dimension either. **Economy** seems to be the strongest dimension with a rather high score, followed by a **solid research and innovation base**. Competitiveness reached medium score according to the responses. Societal dimension is characterized by high value of „International orientation / open-mindedness"– but it must be noted that **three respondents separated the two aspects of this question** (local politician, top executive at the international tourism office, academic), giving marks for open-mindedness separately, meanwhile the municipal planner/head official refused to answer the question. (All of them rated it lower than international orientation). **Social integration and social mobility was criticized** in some of the interviews. The environmental dimension was rated as average, too. Infrastructure got rather high scores with international connectivity rated as the best of all aspects in Question 2. In the institutional dimension the evaluation of **e-governance was the highest**. At the same time modernization of administration got some critics, which is connected with the two tier administrative system. The level of consensus was the highest in the case of **economic dimension** while the **societal dimension seems to be a more controversial and debated issue**.

City image/Social environment (Questions 3 + 4)

None of the dimensions had "extreme" values, as there are no averages below 2 and above 4. According to the results, Budapest is perceived as an **attractive, unique, emotional, sophisticated city** which is also quite **hectic and dirty**. The assessment of the **self-confidence** of the city turned out to be a bit polarized (e.g. representative of the (public) development sector considered this aspect crucial, but weak in performance, meanwhile respondents from culture, media and tourism assessed this point more positively however, they also thought that this aspect was less important) – it was one of the two aspects which had a significant variance of answers. The other one was the spacious/dense dimension. In this case respondents of planning background consider Budapest rather dense, meanwhile other interviewees described the city as quite spacious or find the dimension neutral According to the respondents Budapest is safe and prospective rather than dangerous and without prospective. **Respondents from other cities (Budaörs, Érd) tend to perceive Budapest as an expensive, dense and noisy city.** The assessment of progressive/old-fashioned dimension was neutral.

The social climate of Budapest is described as **split apart (12), competitive (6)**, and **indifferent (4)**. The latter adjective was used mainly in negative connotations (i.e. competitive at the expense of others). The positive connotations – **supportive (2), inspiring (4), friendly (3), cooperative (2), tolerant (2)** - were mentioned with less frequency. The **respondents see a polarized society with a lot of potential conflicts and lack of trust**. Those **who had more positive perception of social climate opted for more alternatives** than respondents with predominantly negative assessment. At the same time, **respondents with negative assessment tended to use the "other" option** describing the society as **"conservative"** (head official for public development projects), **"clueless", "indecisive" (academics), "immature to establish a network society"** (representative of a local NGO) or "pessimistic" and "distrustful" (head official of the regional development agency) .

Negative and positive events / activities (Question 5a and 5b)

Positive events/activities can be summarized around the following groups of issues:

- **Transport:** projects related to transportation were mentioned very positively by almost all of the respondents. They highlighted the importance of some recent transport infrastructure developments, such as the **M0 ring motorway** ("giving breath" to Budapest), the M6 motorway and other highway developments. The above mentioned roads enhance the international connectivity of Budapest and raise the quality of life and the transport opportunities as well. The new roads also made the surrounding areas attractive for investment. They also strengthen the position of city logistics (representatives of metropolitan towns). Integrated suburban traffic was also mentioned as an exemplary issue. Developments of tram network (e.g. line 4-6) (mentioned predominantly by representatives of cultural life and tourism), and the expansion of Budapest Airport (emphasized by the regional real estate developer and by the head official of the national tourism office) were also mentioned.
- **Other infrastructure:** the establishment the **Central Sewage Plant** was the second most frequently mentioned issue. It is „improving the water quality and the quality of the embankment zone's ecosystem".
- **Cultural life:** respondents **highly esteemed the cultural life of the city**, emphasizing the importance of some of the most recent developments, (e.g. MÜPA (Palace of Arts), National Theatre, CET Cultural Center), the festivals which „give a unique image to Budapest that differentiates the city at the European cultural market". The "**youthful ardour**" ("Berlin in the South) and the role of foreign students attracted to Budapest were also positively mentioned (emphasized by the manager of a private culture provider of international importance and by the official of the French Institute).
- **Urban renewal/development programmes: in general, further extension of the downtown towards the former brownfield in the south** has been mentioned amongst the most promising ongoing development programmes ongoing. As part of that process, the Millennium City Center project was considered a high quality urban development project with potential city branding values. The **Heart of Budapest Programme** was described as a project which contributes to establish a downtown promenade and a metropolitan milieu in the city center.
- **Research and education: the Science Park** and the adjoining **new campus of Budapest University of Eötvös Loránd** were perceived positively by widening the spatial and functional spectrum for further investments and contributing to metropolitan competitiveness of Budapest, as well as widening the spectrum of urban/metropolitan functions in the FUA. The brand-new **private university of "Aquincum University of Technology**" was also assessed as a world class higher education institution of the future.

Negative aspects/events/activities might be summarized around the following groups of issues:

- **Transport:** the **Metro4 project was the most negatively assessed development**, due to its huge delay and financial burden. It also discourages the Municipality of Budapest for further large-scale public investment (head official for public development projects). It also takes away capital from other – metropolitan scale – projects that might concern a much wider

spectrum of inhabitants (representative of the metropolitan town of Érd). Because of the growing importance of individual transportation (i.e. cars) the use of public transport is falling which leads to **decreasing quality of public transport services**.

- **Administration:** the **two tier administrative system of Budapest** was very much criticized making the decision making processes difficult, slow and ineffective. Fragmented decision making resulted in a lack of "any meaningful cooperation amongst municipalities of the core city and the FUA" that "delays structural change in the urban fabric" (municipal planner/head official. The **inadequate political environment** was also mentioned as the stakeholders limit each other instead of „recognizing mechanisms of mutually interdependent interests of the players" (manager of a private culture provider of international importance).
- **Transformation of the retail sector:** although one of the respondents mentioned that the construction of downtown shopping malls (by facilitating a 'city that never stops' where services could be consumed in 24 hours a day, as it was expressed by the official of the French Institute) was a positive issue, most of the respondents claimed exactly the opposite. They claimed that **the malls devastate downtown retailers** and destroy social values (expressly for youths) and there are too much malls in the downtown. The promotion of "American style" shopping and entertainment centers in the FUA favors urban sprawl as well (pointed out by the municipal politician).
- **Financial problems**: because of the macro-economic conditions large scale real estate projects were halted in Budapest. The economic situation of families and enterprises was also badly affected causing declining market demand. A decrease of the local authorities' financial resources was also highlighted in the interviews.
- Developmental problems: the rapid privatization of the built environment makes planning impossible. A controversial point is assessing recent developments, e.g., **Millenium City Center, that is admitted as required enlargement of the downtown but that is – functionally and aesthetically - not progressive at all** hence they do not help Budapest to become a modern metropolis (head official for public development projects). Amongst the inner and outer residential zone of the core city the quality of housing is not sufficient and recent developments are under suspicion of corruption. Delay in riverside developments along the Danube; bad quality of the international passenger terminal at the Danube was perceived negatively. **The river – as one of the most important endowment of the city – has not yet been integrated into urban development.**

2. Perspectives for future development

Strengths and weaknesses of the city (Question 6 and 7)

Strengths: the strategic location (bridge between Western and Eastern Europe), good infrastructure for all the four transport model, extended network and good accessibility of public transport, Danube and its potentials, rich natural environment (thermal water, green spaces near the city), rich cultural life and huge demand for culture, land/site reserves as potentials for further development within the city (i.e. brownfield sites), economic and a knowledge center, touristic-historic city, high quality of education.

Weaknesses: corruption, high level of bureaucracy, competitions among municipalities, lack of cooperation in the field of planning, lack of long-term thinking, fragmented public administration, decreasing quality of public transportation services, congestion, decreasing environmental quality, non-honored sectors like education and health care, increasing social inequalities.

While the strengths of Budapest are related more to its location, natural characteristics and cultural richness, its **weaknesses** are related to the unclear roles in the **management of the city** ("still needs to be clarified who has the responsibility to manage and develop Budapest", head official of the national tourism office), the lack of cooperation among stakeholders ("unexploited business potentials in metropolitan cooperation", representative of the metropolitan town Érd), lack of strategic coordination (representative of the metropolitan town Budaörs) and the severe inequalities within the society.

Most promising/challenging projects or activities for future development (Questions 8a, 8b and 9)

Promising/important projects: Budapest Airport, developing public transportation services and improving urban linkages (including the completion of Metro4), developing public utilities (especially sewage treatment), completion of the M0 ring road, developing intermodal transportation hubs, integrated transport development in the metropolitan region, improving P+R systems, renewal of public spaces, cultural centers like (MÜPA, CET, RAM), new recreation facilities and services, improving conditions of health-care and medical tourism, potentials in Danube-related projects, and the Sziget Festival.

Controversial: tackling with heritage of extensive and uncontrolled land use in the past (e.g. greenfield development for shopping malls), UNESCO world heritage site in Pest downtown (due to megalomaniac real estate developments the title might be at risk), Metro4/high-scale municipal investments (debate focusing on political power struggle rather than on professional considerations of feasibility issues, lacking planning and management protocols), completing the M0 ring road (delay and tension in land ownership – representative of the metropolitan town Érd and Budaörs), fixed-track public transportation to the Airport (as an "issue of reputation and image" as formulated by a regional real estate developer), sewage treatment (a tension of business interests as the Budapest Sewage Works has been privatized), the renewal of the brownfield sites, "Gateway city" projects at the borders of the core city and the FUA, (due to their high-scale and due to their overuse lands and provide much wider selection of urban functions that are needed by the market - head official of municipal public investment projects), majority of the EU funds has been spent for maintenance works instead of manufacturing investments (head official of the regional development agency).

3. Realization of inclusive metropolitan development

Preconditions for cooperation – in general and in the examined city (Questions 10 and 11)

Leadership and decision-making qualities and transparency in decision making are the most relevant preconditions for cooperation in general. Legal stability, political stability and pro-active behavior of citizens are considered to be important in second rank. Neither environmental awareness nor tradition of participation, social security, legitimacy of political administrative system are furthermore of high priority. The former experiences with cooperation and the open mindedness of society seemed to be less important.

If we analyze the importance of the selected fields with regard to the situation in Budapest, there is a **slight decline in importance** practically in **all items**. The **most important** are considered **transparency in decision-making, leadership and decision-making qualities** and **legitimacy of political-administrative system**. **Environmental awareness** and **pro-active behavior of citizens** and **open-mindedness of society** are regarded to be slightly less important. Former experiences with cooperation, tradition of participation, social security, legal stability and political stability were the least important.

Importance of cooperation for positioning of the city (Question 12)

Cooperation at the level of the metropolitan region should concentrate on the following groups of issues:

a) **defining (and coordinating) spatial and regional development policies** - integrated spatial and regional policies, defining functional zones for priority developments in the metropolitan region, administrative reform, improving cooperation (between districts and municipalities, professional organizations, citizens and civic organizations, international institutions).

b) **development of transportation both in the city and in the FUA** - finishing Metro4, developing suburban public transportation services, modernizing public transportation access to Budapest Airport, developing Danube embankments, improving parking opportunities.

c) **Other issues** - clarify long-term environmental issues. A decent strategy is needed to tackle environmental issues on a metropolitan scale: waste treatment, disposal, recycling or burning.

Cooperation with other cities

joint destination package for Central European cities for overseas markets (continuing V4 cooperation), modernizing river cruise fleet in order to establish a good quality of passenger traffic to Bratislava and Wien, with cities of surrounding countries – joint infrastructure (e.g. high-speed rail), joint lobby in order to gain internationals tenders (e.g. huge sport events), joint cultural festivals amongst national capitals (e.g. POLYCE cities), strategic partnerships with Chinese, Russian, Serbian, Romanian, Ukrainian, Slovakian, Check and Polish cities

Existing cooperation with other cities and potential future partners (Questions 13,14)

Very few **existing cooperation's** were mentioned:

- in Hungary: Budapest Sewage Works Ltd. – owned party by the Municipality of Budapest – operates also at the agglomeration settlements, providing waste water treatment
- at international level: Visegrad group initiative in the field of tourism, Quadra Lateranum, Danube Main Street, Metropoly, DunaLog, Romanet, EUROCITIES, METREX

Cities as potential partners:

- in Hungary: the middle sized cities of the wider metropolitan area (in a radius of 60-100 km); regional centers of Hungary (Debrecen, Szeged, Pécs, Győr) to decentralize administrative functions; the cities located along the M0 ring road (Budaörs, Budakeszi, Biatorbágy, Törökbálint, Szentendre, Gödöllő, Vác) and the area embraced by them in the fields of transportation, urban planning, development policy, education and professional training, health care; smaller towns with strong identity and profile (like Esztergom, Szentendre, Vác) to decentralize the national administrative/education/research institutions.
- at international level: Stockholm, Wien, Amsterdam and other Dutch cities as model cities for integrated and sustainable urban development and urban management; Wien – culture; all the cities next to the Danube; former Monarchy-cities (Ljubljana, Zagreb, Kosice, Oradea, etc) - international economic and business cooperation; cities of the V4; Central-European cities – joint cultural and tourism projects, joint destination marketing, joint infrastructure projects, integration of the Roma population into the urban society; all EU capitals; the Balkan cities (the Croatian and Serbian cities) - tourism cooperation projects; Chinese, Russian, Serbian, Romanian, Ukrainian, Slovakian, Check and Polish cities - strategic economic partners

By the majority of the interviewees (nearly 2/3 of them) regarded Budapest to be an **attractive partner for cooperation, as the city**: (1) is open-minded and offers a high variety of possibilities; (2) is a business location, (3) is accessible and well equipped for any kind of economic activity, (4) is a true Eastern European metropolis, (5) has a good European image, (6) provides high quality services and in most cases it is reliable.

Two experts (regional real estate developer, head official of municipal public investment projects) could not decide and 2 other respondents (municipal politician, manager of a cultural service provider of international importance) said that Budapest is not an attractive place for cooperation. According to them Budapest is bureaucratic, badly organized, non-transparent, unaccountable, slow, inflexible and unreliable and it has to redefine itself.

Strategic recommendations for future metropolitan development (Question 15)

All the respondents had a great number of recommendations for the future metropolitan development of Budapest. These are the following:

a) **Marketing/branding:** joint marketing in the metropolitan region (tourism and businesses), elaboration of a (new) Budapest brand, positioning Budapest at the European business market.

b) **Transportation:** further developments in integrated metropolitan transportation, tackling traffic crisis in the metropolitan region.

c) **More clear roles in management and clear-cut coherent planning**: in order to reach this goal a public administration reform is needed, to decrease the power of district governments, in addition a novel urban strategy for Budapest is required with new development regulation (zoning), and intensifying functional division of urban activities in the FUA.

d) **Maintenance of public spaces:** coordinated maintenance of public spaces is essential, the quality urban architecture should be preserved, the degree of build-up areas should be decreased (renewal of zoning regulation), and strategic management of public real estate assets is to be achieved.

e) **Development of new relationships with other countries/regions/cities:** strengthening inter-municipal cooperation in the metropolitan region, cooperation with Eastern and Central-European cities, strengthening partnership with the Balkan capitals; inspiring Russian and Chinese investments.

f) **Other:** establishing knowledge centers (innovation parks based on higher education, technology parks), improvement of the conditions for knowledge society in order to stop and turn back brain drain, development of public utilities (e.g. sewage treatment) to accommodate more manufacturing in the area.

Concluding remarks:

- on average the urban development trends and future potentials of Budapest was perceived positively by the interviewed experts, however, there are several threats (increasing social inequalities, bureaucracy, corruption) that hamper the development prospects;
- while the strengths of Budapest are related more to its location and natural characteristics, historical as well as cultural richness, its weaknesses are related to the unclear roles in the management of the city (i.e. mismanagement), lack of strategic coordination in development and public management issues amongst the municipalities, lack of cooperation and the severe inequalities in the society,
- the majority of the interviewees regarded Budapest as an attractive partner for international cooperation, as the city is open-minded, well equipped for any kind of economic activity and provides high quality services.

WP2.4. QUESTIONNAIRE

EVALUATION of the results from the city of LJUBLJANA

Sampling

The interpretation of the questionnaire is based upon the answers given by 12 respondents. People from the following categories were approached for participating:

- academics
- chamber of commerce representatives
- cultural institution
- economic development agency representatives
- media representatives
- NGOs

- politicians (of the core city and two cities in the metropolitan region)
- planners (in the public administration of the core city and in a private planning bureau)
- real estate developer
- representatives of international enterprises
- tourism agency representatives

Representatives of chamber of commerce, politicians, tourism agency and NGOs refused to participate, but several cities outside of metropolitan region(s) of Ljubljana were represented.

Interpretation of the results

1. Recent urban development trends and city profile

Profile of the city (Question 1)

The results of the questionnaire indicate that Ljubljana is predominantly considered as historical city (9), center of research and education (8), and city of tourism (7). Additionally, Ljubljana is considered as financial and business (5) and dynamic, growing city (4). Industrial city (1) was mentioned only once. Despite a frequent perception of Ljubljana as center of research and education, the city was never mentioned as city of innovation neither as dormitory city. Apart from that, the city was described as: the capital city of Slovenia, administrative center and city of transition. The results indicate that the mainstream perception of the city is related to historical heritage and recent economic development, as well as tourism.

Overall development over the last 5 years in different dimensions (Question 2)

Ljubljana is considered a business location with high attractiveness for businesses. Research and innovation were less well evaluated. It seems that the respondents from different backgrounds believe that while overall Ljubljana developed positively in economic terms some elements of economic development lag behind (e.g. competitiveness, research and innovations).

The societal development is evaluated more critically and social integration, open-mindedness and social mobility seem to have not been able to keep pace with the positive economic development.

Environmental, infrastructural and institutional dimension were confronted with the same evaluation, which can be considered as criticism. Especially environmental quality, sustainability of land use structure, green mobility, international connectivity, modernization of administration and public participation are considered to be weak elements of Ljubljana. Only the quality of public services and e-governance were assessed rather high. Most respondents had very similar opinions which points to a general agreement about the overall development of Ljubljana over the last five years.

City image/Social environment (Question 3 + 4)

According to the majority of respondents, Ljubljana is an expensive and attractive city (10 answers). Furthermore, the city is also perceived to be safe. While there is a general agreement on this image of the city the respondents are polarized whether or not Ljubljana is a safe place. This opinion depends on the background of the respondent and it is not the general view of the spatial and regional planning experts.

Social climate in Ljubljana is considered to be competitive (6), split apart (5) indifferent (4), and tolerant (4). Although the social climate was never perceived to be hostile / frightening, this clearly indicates a critical and rather negative perception of this field. Also the negative connotation – as being “snobbish” received 3 answers. The positive connotations – supportive (3), inspiring (2), friendly (1) and cooperative (1) were mentioned quite less frequently. Such expressions indicate a lot of conflict potentials and low societal cohesion.

Thus, respondents generally agree on their assessment of the image and social climate of Ljubljana. The negative assessment of these two dimensions seems to prevail over positive assessments which also depend on the respondents’ field of interests.

Negative and positive events / activities (Question 5a and 5b)

The positive project/events/activities might be summarized within the following groups of issues:

- Sports park Stožice which is of national importance
- CIVITAS project for traffic management as a whole (traffic arrangement, parking places, public transport, self-service rent-a-bike system, etc.)
- Expected renovation of bus and railway station in Ljubljana
- Technological park development project
- Renewal programs for brownfield areas (e.g. Metelkova mesto, Partnerstvo Šmartinska, Rog factory, etc.)
- Natural and landscape park Barje
- Regional waste collection and management site (RECERO)
- Adoption of the new spatial plan for the Ljubljana municipality (new housing and business zones, arrangement of existing and providing new public spaces, etc.)

The negative projects/events/activities might be summarized within the following groups of issues:

- The improvement of the public transport in too slow
- New shopping centers development (too many of them)
- New housing areas are not planned in accordance with existing settlement system
- Inadequate project for the Plečnik's stadium (national cultural heritage) renovation
- Hydro power plant on Sava river
- Sports park Stožice

There is a relatively high degree of concordance among the respondents regarding positive/negative projects/events/activities in Ljubljana. That means that there are only few exceptional issues which were being perceived both negatively and positively (e.g. Sports park Stožice).

2. Perspectives for future development

Strengths and weaknesses of the city (Question 6 and 7)

Strengths: good geographical position, culture and history, knowledge, administrative and economic center of Slovenia, residence and visitors friendly and attractive city, significant business, congress and market center, small city with four pointed star spatial organization, good connectivity with the public transport, highway ring/bypass around Ljubljana, sports park near the highway ring/bypass, good potential to developing a public transport, high quality living conditions, closeness of the green areas (parks, forest, landscape parks, etc.), high quality educational and research institutions, city of students, a lot of good quality agricultural land for self-sufficient food production, low housing density, etc.

Weaknesses: Ljubljana is not well recognized city in the world and even in Europe, public transport in the city (bus and railway) need to be improved, poor accessibility to the Ljubljana (Jože Pučnik) international airport, the obsolete main bus and railway station, roads and parking places are in bad conditions, university, administration and medical buildings in the city center, old and unrenewed houses, ineffective use of land and natural resources, bureaucracy, demographic ageing, weak business culture (to many people are employed in public sector), etc.

Both the strengths and weakness are related to given characteristics and to city management city (infrastructures, services) and decision making. The respondents are however strongly polarized in their opinions which came out from their backgrounds: the same answers are found as strengths and weakness (e.g. public transport, living conditions in the city).

Most promising / most challenging projects or activities for future development (Question 8a, 8b and 9)

Promising/important projects: CIVITAS project which includes introduction of self-service rent-a-bike system in Ljubljana and overall traffic management, improvement of public transport (bus and

railway) in whole metropolitan region, accessibility improvement to the Ljubljana (Jože Pučnik) airport, more inclusive spatial planning, new bus and railway station in Ljubljana, P+R system, landscape park Ljubljansko Barje, developing of the business zones in the wider metropolitan region, sport park Stožice project, environmental protection and renewal of brownfields activity (e.g. Rog factory, Partnerstvo Šmartinska),

Controversial: unsuitable construction of underground parking garages and office buildings in the city center, lack of public transport in some (new) residential areas in the core city and in less accessible areas in the metropolitan region, new shopping centers developments.

There is a high degree of heterogeneity within the sample of answers. Respondent do see promising perspectives mainly in some transport and infrastructure projects, especially in improvement of public transport. Some attention is paid also for restoring old buildings and renewal of brownfields areas.

3. Realization of inclusive metropolitan development

Preconditions for cooperation – in general and in the examined city (Questions 10 and 11)

Irrespective of the situation in Ljubljana - legal stability, transparency in decision making, leadership and decision-making qualities, pro-active behavior of citizens, social security and open mindedness of society are the most relevant preconditions for cooperation in general. Former experiences with cooperation, tradition of participation, legitimacy of political administrative system and environmental awareness are considered to be important in second rank. Only the political stability is seen very heterogeneously.

If we analyze the importance of the selected fields with regard to the situation in Ljubljana, the most important are considered legal stability, political stability, leadership and decision-making qualities transparency in decision making, proactive behavior of citizens and legitimacy of political administrative system. Also environmental awareness is very high ranked, but the open mindedness of society is placed lower than in question 10. In this question only social security caused disagreement among the respondents.

Differences between the general importance and particular importance in Ljubljana are significant, especially for the factors of political stability and legitimacy of political administrative system.

Importance of cooperation for positioning of the city (Question 12)

Cooperation on the level of metropolitan region should concentrate on:

- improving the infrastructure, especially improvement of public transport and cycling network
- tourism and services (included public services)
- improvement business environment and ensuring more working places
- R&D
- waste management
- spatial planning (especially for housing and business zone development)
- management of natural resources (e.g. energy supply) and cultural heritage
- natural disaster protection

Cooperation with other cities should focus on transport issues and connectivity, social issues, Erasmus program for students' exchange, cooperation in the field of cultural heritage, tourism, environmental problems and good practice exchanges. Institutional cooperation is frequently mentioned. No special cities as the important partners were mentioned.

Existing cooperation with other cities and potential future partners (Questions 13,14)

There were few (almost no) answers regarding the cooperation initiatives within the metropolitan region. UCUE, EUROCITIES, CIVITAS, INTERREG, URBACT, ESPON are the mentioned cooperation programs.

Ljubljana is clearly considered to be an attractive partner for cooperation. The following arguments we found to be essential:

- Ljubljana has good geographical position, attractive natural surrounding (river, mountains)
- Ljubljana has good potential to interlink with neighboring (Balkan) countries.

The responded gave also some negative answers from the following categories:

- Ljubljana has high national taxes,
- Ljubljana is very bureaucratic
- Ljubljana has very closed business environment

Potential future partners within metropolitan region were the cities which are participating in the Ljubljana metropolitan region development program (Kranj, Domžale, Kamnik,Bled, Radovljica, Jesenice, Trbovlje, Zagorje and Hrastnik) as well as cities in the coastal region (Koper, Izola and Piran).

Among the other cities Wien and Bratislava were mentioned most frequently. Other potential partners are all other capital cities and medium sized cities in Europe as well as British and Scandinavian (north European) cities. The respondent specifically named the following cities: Rome, Trieste, Venice, Pasaro and Parma (Italy), Chemnitz, Wiesbaden and Leverkusen (Germany), Zagreb, Reka (Croatia), Klagenfurt, Graz (Austria), Sarajevo (Bosnia and Herzegovina) and Belgrade (Serbia).

Strategic recommendations for future metropolitan development (Question 15)

Most recommendations might be summarized within the following categories:

- improving strategic planning for the future development of Ljubljana metropolitan region according to the EU 2020 strategy of smart, inclusive and competitive cities
- Transport issues (public transport)
- Services, culture and tourism
- Improvement of international connectivity
- Improving positioning and city image

Concluding remarks:

- Ljubljana is regarded as historical city and tourism destination that has recently experienced solid economic development. The city and urban region performed well economically, particularly as highly attractive business location but conversely struggles with low levels of social integration and social mobility.
- Strengths of Ljubljana are to be found in its geographical location, its cultural and historical heritage and the related high attractiveness for tourism and economic activities, while still not sufficiently organized public transport and less efficient use of land represent the city's greatest weaknesses.
- Ljubljana is seen as attractive partner for cooperation that has a great deal of potential, which is however sometimes threatened by administrative mismanagement.

WP2.4. QUESTIONNAIRE

EVALUATION of the results from the city of PRAHA

Sample

The interpretation of the questionnaire is based upon the answers and data given by 11 respondents. People from the following categories were approached for participating:

no	category	response
1	politician	no response
2	planner from capital city (public)	responded
3	chamber of commerce	no response
4	media (daily newspaper)	responded
5	economic development agency	responded
6	academic (reg. planning) no.1	responded
7	academic (reg. Planning) no.2	responded
8	project manager (city council)	responded
9	representative international enterprise (private)	responded
10	representative international organization (public, semi-public)	no response
11	cultural (event organization) no.1	responded
12	cultural (event organization) no.2	no response
13	tourist agency	responded
14	representative / city in MR no.1	responded
15	representative / city in MR no.2	no response
16	NGO	responded

Representatives of chamber of commerce, international organization and politicians refused to participate, but the academic sector and the cultural institution were represented by 2 respondents.

Interpretation of the results

1. Recent urban development trends and city profile

Profile of the city (Question 1)

The results of the questionnaire indicate that Praha is predominantly considered as historical city (10), center of tourism (9) and center of finance and business (8). Adjectives dynamic, growing city (3) and center of research and education (2) were mentioned less frequently. The only additionally added adjective was “center of state administration”, which indicates that Praha is also strongly perceived as the national capital. The answers suggest that the perception of the city is related to its historical heritage, tourism and economic performance. At the same time Praha is not considered to be very dynamic or innovative.

Overall development over the last 5 years in different dimensions (Question 2)

The economic dimension was clearly the best evaluated dimension. **Praha is** considered as **business location with high competitiveness and attractiveness**. However, research and innovation received a low score. The representative of the private enterprise was by far the most critical. We can conclude that the respondents believe that the **successful economic development of Praha is rather a result of external influences and trends and is not supported and further fostered by research and innovation**.

Societal and infrastructural dimensions are perceived more **ambivalent**: while social integration is considered rather weak and international orientation/open-mindedness rather strong, social mobility is regarded mediocre. All the answers in this dimension oscillate around the middle quite

steadily. Here, the media had the most critical assessment. In the infrastructural dimension green mobility is considered rather weak. It comes out from the following answers however, that the question is not well set for Praha. **While the public transport system is perceived as very developed and useful, the cycling facilities and environment are subject to heavy criticism**. This question is therefore influenced by the respondents preferred mode of "green" transportation. Quality of public services is perceived mediocre and International connectivity rather good. Again the private enterprise representative is the most critical one.

Environmental and mainly institutional dimension were criticized greatly. All surveyed dimensions are assessed below average. Especially participation of citizens, modernization of administration and e-governance are considered to be weak points of Praha. **The environmental dimension is not considered as poor but still not good.** Environmental quality scores low, yet some respondents consider it rather high. Quality of open space had almost equally positive and negative assessment. Sustainability of land use structure was a category that was not clear to some respondents (so they omitted it in the end).

It is obvious that institutional dimension is the weakest part of Praha´s development. All the other economic, societal, environmental and infrastructural dimensions are evaluated with high polarity of opinions, even though economic dimension is clearly the strongest link. If we look at opinions that don't fit the average, there is a clear tendency to criticism at the side of media and even more so from the representative of international enterprise. On the other side the city planner tends to be more positive than average.

City image/Social environment (Question 3 + 4)

According to opinion of our respondents, Praha is predominantly perceived as an **expensive (12), attractive (11), unique (11) and prospective (9)** city. Significantly less strongly is Praha perceived as **safe (6), dense (6) and old fashioned (5)**. Less respondents consider the city to be friendly, hectic, clean, noisy, emotional, simple or self-confident.

The answers are generally quite consistent. In most cases they clearly tend towards one pole. Only with regard to the items tranquil/hectic and attractive/unattractive the responses are spread throughout the whole scale (surprisingly media was the most critical). It is also rather surprising, that the city is perceived as old fashioned.

Social environment in Praha is by multiple respondents considered to be **indifferent (7), split apart (6) and competitive (5)**. The second rank of answers includes **friendly (3), snobbish (3) and inspiring (2)**. It is notable that the positive connotations supportive, tolerant and cooperative are mentioned very scarcely or not at all. Yet, at the same time, the social environment was never perceived to be hostile/frightening (in accordance with results of Question 3). The results may indicate that our respondents perceive Praha as **very individualistic, non-cooperating city**. In general, the vision of Praha is ambivalent. However very often negative answers tend to dominate and there is only one clearly positive opinion (from the media).

Negative and positive events / activities (Question 5a and 5b)

The positive project/events/activities might be summarized within the following groups of issues:

- **Transportation projects:** New extensions of metro lines and new part of Praha's outer ring road are by far the most common answers of all the positive projects. Among other transportation projects the airport, integrated transportation system and introduction of resident parking zones was also mentioned.
- **New building projects and reconstructions:** Development of new city centers, flood protection, building of the multifunctional O2 arena, reconstruction of the main train station and Holešovice brewery are all considered successful and/or important.
- **Cultural and social events:** Events like farmers' markets or Praha - European Capital of Culture 2000 that contributed to better cultural and social environment were also mentioned.

The negative projects/events/activities might be summarized within the following groups of issues:

- **Transportation projects:** As well as getting the highest ranks among the positive answers, transportation also comes to be the most negative topic. The Praha inner ring road, insufficient development of the airport, underground parking and ineffective development of the metro lines were pointed out by the respondents as negative examples.
- **Building and development policies:** The city's housing policy, urban sprawl, conversion of several train stations for commercial purposes, new shopping centers at inconvenient localities are all considered failures.
- **PR and marketing of the city**: Cancelling the new building of National Library by Jan Kaplicky was strongly criticized. The project was considered controversial from the very beginning, yet the respondents tend to emphasize mainly its flagship qualities. On the other hand Praha's candidacy for 2016 Summer Olympics was reflected as inappropriately ambitious. Also an absence of city's PR conception is believed to result in Praha losing its position as a Central European metropolis.

The opinions of the respondents were fairly uniform, with the exception of transportation issues. The projects of airport development, main train station reconstruction and surprisingly also metro development were perceived controversial (although the positive opinions dominate slightly). In the group of construction activities, mainly individual projects were assessed positive, while strategies, concepts and policies were given a negative rank.

2. Perspectives for future development

Strengths and weaknesses of the city (Question 6 and 7)

Strengths again can be sorted into several categories: **appearance and spatial qualities** (old city center, greenery inside the city, geographical position, quality of life and city scale, enough development areas), **economic performance** (qualified human resources and workforce, low unemployment rate, good R&D potential, business center, good economic performance and competitiveness), **transportation** (public transport, individual transport network, transport connection), **social environment** (social stability, social diversity, public services, strong connection between the city and its citizens).

Weaknesses are dividable into: **public administration and politics** (municipal politics not acting for the benefit of the city, corruption, lack of conception in building, housing and transportation policy, poor coordination with the metropolitan region, exaggerated heritage protection, low subsidies for culture, ineffective democratic policies, poor urban development strategy, absence of a unifying vision), **quality of space and infrastructure** (noise and pollution, neglected use of the river, obsolete infrastructure, lack of parking places, quality of services), **social environment** (level of civil society and citizen participation, decreasing quality of education, xenophobia, ageing society).

Strengths are related more to **current state and potentials, weaknesses** are related mainly to **management of the city** (politics, strategies).

Most promising / most challenging projects or activities for future development (Question 8a, 8b and 9)

Promising/important projects: regional rail network, outer ring road, better connection to airport, green mobility, wastewater treatment plant, reducing traffic in the center, new parking lots in the center, strategic and land use plans at the regional, municipal and borough scale, museums, libraries and other cultural projects and events, use of the R&D potential, building new university campus.

Challenging: inner ring road, transportation engineering in general, wastewater treatment plant, D-line of metro, conversion of train stations, urban development on greenfield and without conception, feasibility of bigger building projects, increasing prices in public transport, high-rise buildings, keeping citizens informed.

Answers in this topic more or less repeat what we could learn from questions 5 to 7. There is again a strong emphasis on the transportation and public administration issues. This includes the

controversy between opinions (NGOs vs. tourism agencies) on the use of the city center, especially the amount of traffic allowed. Several projects were mentioned in both categories by the same respondent, which means they are seen as important but hard to carry through at the same time. Also it is sometimes unclear whether "challenging" (question 8B) is taken in positive or negative meaning. Question 9 was omitted by half of the respondents, probably because the answers to 8A and B were already considered the most important.

3. Realization of inclusive metropolitan development

Preconditions for cooperation – in general and in the examined city (Questions 10 and 11)

Transparency in decision making is considered the **most relevant precondition** for cooperation in general. **Legal stability, political stability** and **proactive behavior of citizens** are considered to be important in second rank. The lowest priority was given to **former experience with cooperation** and **social security**.

The importance of the selected fields with regard to situation in Praha was assessed similarly. **Transparency in decision making** still leads the ranking, **legal stability and political stability** follow (with slight increase on the political stability, otherwise but **former experience with cooperation** and **social security** get the lowest rank.

Generally the difference between the general importance and particular importance in Praha is not significant. However, there is a notable rise in leadership and decision-making qualities and decrease in former experience with cooperation and namely in social security. This can be explained by Praha's specific conditions, where social security is high and therefore no issue, whereas leadership is considered weak link and therefore important. The change of ranking of experience with cooperation has no obvious reason.

Importance of cooperation for positioning of the city (Question 12)

Cooperation on the level of metropolitan region should concentrate on the following groups of issues:

a) infrastructure, especially transport and energy security

Further integration and development of the public transport and transportation issues in general is thought to be the field for cooperation. Also issues of energy security (handling heating and electricity) and other infrastructure (water, waste, and wastewater) were considered important

b) coordination of spatial development

Coordinated approach towards regulation and planning of spatial development, specifically of urban sprawl and suburbanization, location of functions was introduced. Environmental protection, conception of green areas and green belt was also mentioned.

c) tourism, security and other issues

Coordination and joint promotion of tourism throughout the Metropolitan Region was mentioned. Among other issues citizen security, flood protection, EU grants, labor market and education seem to be most essential.

Cooperation with other cities should be focused on know-how transfer in various areas such as promotion of cycling, citizen participation, legislation modifications, tourism and transport connectivity.

Existing cooperation with other cities and potential future partners (Questions 13,14)

There is no general knowledge about cooperation of Praha and other cities (at all levels) with the exception of the city planner respondent. The assumptions are that cooperation with Praha is scarce, if any. The Central Bohemia Region as a whole was mentioned as a potential partner for Praha, as well as individual towns for specific ongoing issues.

The only informed respondent mentioned exchange of experience and information and participation in joint projects with Wien and Budapest (for the POLYCE cities) and Brno and Pilsen (for the other cities).

Praha is generally considered to be attractive partner for cooperation, but with many reservations.

The arguments pro were:

a) Praha is strong and attractive within Central Europe

b) Praha has economic power, large institutional capacity and therefore potential to show the right path

c) Praha is located in an ideal geographical position between East and West Europe

d) easily accessible by road and air

e) Praha is an ancient and globally acclaimed cultural center of Central Europe

f) Praha is an attractive tourist destination and a thriving city of interest to entrepreneurs and immigrants

g) Praha has strong background and name

h) Praha can build on the former joint Czech-German-Jewish cultural environment

The arguments contra were:

a) Praha focuses on the superficial commercial business activities

b) Praha leaves no room for their citizens' initiative

c) Praha doesn't invest in non-profit events or structures related to culture and art.

d) Praha has a reputation of total lack of interest in real cooperation

e) Praha is politically illegible and the nation is seen as uncooperative and Eurosceptical

To summarize the previous answers, if Praha “wants, it certainly has something to offer”. There are doubts, however, about its genuine interest to cooperate.

Potential future partners within the metropolitan region were the towns of Kladno, Beroun, Benešov, Brandýs nad Labem-Stará Boleslav, Kralupy nad Vltavou, Český Brod. Also all municipalities and cities within 10 to 15 km from the border of Praha, ideally unions of these municipalities as well as the whole Central Bohemia Region were proposed as partners.

As the other potential partners (almost all abroad) were mentioned Brno, Pilsen, Wien, Salzburg, Budapest, Györ, Bratislava, Krakow, Wroclaw, Warsaw, Berlin, Hamburg, Freiburg im Breisgau, Munich, Nuremberg, Dresden, Leipzig, Passau, Regensburg, Lyon, Copenhagen, Amsterdam, Helsinki.

Strategic recommendations for future metropolitan development (Question 15)

The most crucial recommendations of the respondents might be summarized as follows:

a) urban-planning **vision** of the city, clear **development strategy** and high-quality **masterplan**

b) **participation of citizens** in planning and implementation of sustainable development

c) real cooperation with the Central Bohemia Region

d) maintain and develop the social cohesion of citizens

e) promote research and innovation

f) preference of the **public transport**

g) maintain high proportion of **green areas**

h) active role of the **public sector**

i) increase quality and competency of both political and administrative decisions

j) promote diversity, polycentricity and cohesion of the region

Concluding remarks:

a) Praha is seen as a city of tourism with a rich historical heritage and a flourishing urban economy, which is attractive and unique but also expensive. Praha performs well economically, environmentally, socially, and in terms of infrastructure provision but struggles with institutional aspects.

b) Strengths of the city lie in its geographical position, its economic performance, its social climate and the organization of transport. In contrast, public administration and unsustainable land use are the city's greatest weaknesses.

c) Praha is considered to be an attractive partner but there is doubt about the city's will to cooperate with other cities.

WP2.4. QUESTIONNAIRE

EVALUATION of the results from the city of WIEN

Sampling

The evaluation is based on a sample of 12 questionnaires completed by selected stakeholders. Stakeholders from the following groups were targeted with the questionnaire (in alphabetical order):

- academics
- chamber of commerce representatives
- cultural institution
- economic development agency representatives
- media representatives
- NGOs
- politicians (of the core city and two cities in the metropolitan region)
- planners (in the public administration of the core city and in a private planning bureau)
- real estate developer
- representatives of international enterprise
- tourism agency representatives

We did not receive back the questionnaire from stakeholders from the following groups:

- cultural institution
- real estate developer

1. Recent urban development trends and city profile

Profile of the city (Question 1)

In the perception of the stakeholders Wien is seen, not surprisingly, as a "historical city" and a "center of tourism". In contrast, "center of research and education", "dynamic, growing city", "center of finance and business" or "center of innovation" appears to be a less adequate description of the city for the surveyed stakeholders, indicating that in their view the city's profile is mainly related to its historical heritage and its role as a tourist destination, rather than to the presence of a strong service sector and innovative businesses. However, some respondents see this profile of the city changing, describing Wien as a "city in transition", a "gateway city", a "2nd tier service center", and a "center for international organizations".

Overall development over the last 5 years in different dimensions (Question 2)

Comparing the dimensions of economy, environment, infrastructure and institutions, Wien performs best in the provision of infrastructure, according to the respondents. In particular the quality of public services (education, health care, etc.) was ranked high. Also well evaluated were the economic dimension, especially with regard to the attractiveness of the city as business location, and the environmental dimension, with particular regard to the environmental quality (air, soil). A slightly worse evaluation was given to the institutional dimension, mainly due to a low score on citizen participation. The worst performance was reached in the societal dimension. However, opinions of the respondents also diverge most on this point, with particular disagreement on the aspect of social integration and international-orientation / open-mindedness of the Viennese society. As regards social integration, the politician from the metropolitan region and the representative of the international enterprise consider Wien to perform very weak on this point, while the politician from the core city, another politician from the metropolitan region, the two planners and the representative of the economic development agency accord Wien an average performance on this point. Concerning open-mindedness and international orientation, the representative from the academic sphere grants Wien a very weak performance while one politician from the metropolitan region sees Wien to perform very well on this point. Further disagreement is evident with respect to the level of green mobility and the quality of e-governance.

City image and social climate (Question 3 + 4)

In the view of the respondents, Wien is considered an attractive, unique and safe place. The city is furthermore regarded rather friendly, clean, silent and prospective. The interviewees show clear disagreement on whether Wien is affordable or expensive and whether it is a place with or without self-confidence. As regards affordability, one politician from the metropolitan region, the representatives from the planning sphere (private and public) and the media representative regard Wien as affordable, while another politician from the metropolitan region, the representative of the chamber of commerce, the representative of the international enterprise and the academic consider Wien to be expensive. Concerning the self-confidence of the city, the representative of the chamber of commerce sees Wien to be completely without self-confidence, while the private planner, the representative of the international enterprise and the representative of the economic development agency regard Wien to be very self-confident.

The general social climate in the city is considered to be supportive, friendly, and cooperative. Less respondents see Wien to have a competitive, tolerant, inspiring, split apart or hostile / frightening climate. A certain polarization in the answers is evident, however, with academics and representatives from NGOs leaning towards the selection of answers with rather negative connotations (split apart, hostile / frightening), while representatives from the economic sector and tourism show a tendency towards choosing rather positively connoted adjectives (inspiring, friendly, supportive).

Positive and negative events and activities within the last 10 years (Question 5)

Positive events and activities mentioned can be grouped in 7 categories:

1. **Extension of public transport, bike and road infrastructure** to improve connectivity and to increase the level of green mobility
2. **Preparation and start of Main Station Project** to improve local / regional and international connectivity, to modernize rail infrastructure, and to give impulse for urban development in surrounding districts
3. **Start of "Seestadt Aspern"** project to secure living space for growing city population
4. **Housing policy** to secure affordable and high-quality housing and avoid social and economic segregation
5. **Expansion of service sector** in general and R & D activities in particular through subsidies for innovation in service sector, start of BioCenter and IST Austria
6. **Cooperation** with surrounding municipalities and cities, e.g. through CENTROPE

Negative events and activities can be classified in 4 categories:

1. Failure to create high-quality **public space** and loss of existing spaces in the course of urban development projects
2. Failure of **large urban development projects** and low cost-benefit ratio of publicly financed projects (Rothneusiedl, Wienerberg City, Prater)
3. Lack of projects to **avoid spatial fragmentation** (reference made to growing segregation in social housing areas as well as in kindergartens and schools)
4. **Other:** dispersed center development, failure to cooperate with surrounding municipalities, growing xenophobic climate, lack of coordination between hospitals

Generally, the respondents showed a high level of agreement concerning positive and negative events and activities. However, cooperation with the surrounding municipalities as well as aspects of the local housing policy appear to be controversial, with some respondents stressing the positive developments in these two fields while others refer to negative influences on the city's development in recent years.

2. Perspectives for future development

Strengths and weaknesses of the city (Question 6 and 7),

The mentioned **strengths** of Wien can largely be grouped in two categories:

- **Quality of life:** public transport, affordable housing, cultural amenities, security, green space, historical heritage
- **Economic development:** location in central Europe and hub function to Eastern Europe, highly-skilled workforce, high productivity, diversified economy, location of international headquarters and congress center

Weaknesses of the city are related to the following categories:

- **Integration:** lack of integration, growing social segregation, lack of open-mindedness and growing xenophobia
- **Economic development:** lack of innovation, low attractiveness for R&D activities, lack of highly skilled workforce
- **Environment and transport:** unsustainable resource consumption level, car traffic, lack of parking space
- **Other:** insufficient child care facilities, lack of cooperation with neighboring municipalities, corruption

Remarkably, the lack of integration and growing problems related to the increasing diversity of the city is perceived as a weakness by many respondents. Controversial are the opinions on economic factors, particularly regarding the availability of skilled labor, with the respondent from the chamber of commerce seeing it as strength of the city and the representative from the academic sphere stressing the lack of highly-skilled labor.

Most promising and most challenging projects or activities for future development (Question 8 and 9)

By far mentioned most frequently as **promising project** were the Main Station project and Aspern Seestadt. Furthermore named were the following projects: Nordbahnhof, University of Economics Campus, MediaQuarter Marx, Wien BioCenter, expansion of public transport network, fostering integration policies, improving education and research, upgrading city as site of knowledge-intensive services, increasing energy-efficiency and strengthening cooperation, in particular the axis Wien-Bratislava.

The Main Station project, Seestadt Aspern and the integration of migrants were raised most often as **challenging projects**. Besides, the following projects appeared: Airport Skylink, Biosphärenpark, quality of education system.

Most promising for the positioning of the city are again the Main Station Project, Aspern, integration as well as the cooperation with CEE regions and Bratislava in particular.

Clearly, large urban development projects (Main Station, Aspern), integration and cooperation with surrounding regions are considered to exert most influence on the development of Wien in the coming years in the interviewees' view. However, the respondents acknowledge both possible positive effects as well as potential challenges related to the realization of these projects and consider them to be promising but also most controversial.

3. Realization of inclusive metropolitan development

Preconditions for cooperation – in general and in Wien in particular (Question 10 and 11)

Legal and political stability, social security and the legitimacy of the PAS are seen as most important preconditions for cooperation by the respondents. Former experiences with cooperation, tradition of participation, and pro-active behavior of citizens are regarded less important. Respondents disagree on the importance of leadership and decision-making qualities, transparency in decision-making, open-mindedness of society and environmental awareness, with certain respondents considering these aspects much more important than others.

With regard to the particular situation in Wien, also legal and political stability are considered to be important. Furthermore, leadership and decision-making qualities, as well as open-mindedness of society received a high rank. Of lower importance are former experiences with cooperation and pro-active behavior of citizens.

In contrast to the preconditions for cooperation in general, there is more disagreement to what extent the pro-active behavior of citizens and social security are important preconditions for cooperation. Generally, however, there are no significant differences in the general assessment and the assessment for Wien in particular.

Importance of cooperation for positioning of the city (Question 12)

The following fields were raised as important fields for cooperation of Wien with cities in the metropolitan region:

- **Infrastructure development and transport:** major infrastructure projects as well as car traffic and public transport connections were frequently mentioned
- **Settlement structures and coordination of spatial development:** references was made to land use policies and housing provision, especially in the south of Wien
- **Economic development:** labor market and locational policy with regard to industry and cluster networks were mentioned here
- **Environmental issues:** waste management and recycling, recreation and nature as well as energy production are considered important fields of cooperation
- **Others:** furthermore mentioned were food production, health care, higher education, R&D and cultural activities

Outside of the metropolitan region, coordination is considered necessary in the fields of R&D, energy, knowledge transfer, cluster networks, transport and infrastructure, locational policy, tourism and climate protection

Existing cooperation with other cities and potential future partners (Question 13 and 14)

Regarding **existing cooperative initiatives within the metropolitan region** the following projects were mentioned: Centrope, PGO, VOR, SUM, WIEN REGION, TWIN CITIES and the cooperation of Tulln with the University of Natural Resources and Life Sciences Wien. Centrope and the PGO were thereby mentioned most frequently, followed by the VOR and the Wien Region.

With regard to **cooperative initiatives with other POLYCE cities** again CENTROPE appeared most often, next to the TWIN CITY PROJECT BRATISLAVA. Other mentioned projects included CENTRAL DANUBE AND CREATING THE FUTURE / AT-SK. Remarkably, there were no explicit initiatives mentioned with Praha, Budapest or Ljubljana.

Finally, regarding cooperative initiatives with other, non-POLYCE cities, EUROCITIES, METREX, OPENCITIES, UN-Habitat Best Practice Hub and INTERREG were named.

The City of Wien is generally regarded as **a very attractive partner**, mainly due to existing experience with cooperation, the geopolitical location, the well-functioning administration, the reputation in international networks and the high quality of life. Only one respondent saw Wien as a rather unattractive partner, referring to the lack of clearly defined common goals

Potential future partner cities within the metropolitan region in the respondents' view are Bratislava, Wr. Neustadt, Mödling, Vösendorf, Schwechat, Mödling, Vösendorf, Gerasdorf, Gänserndorf, Klosterneuburg, Korneuburg, Krems, Tulln, Linz, Graz, Brno, Sopron, Györ, and Lower Austria generally.

Additionally, outside the MR, the following cities were mentioned: Praha, Budapest, Ljubljana, Berlin, Munich, Hamburg, Zurich, Milan, Barcelona, Paris, cities in the EUROCITIES group, cities in the Danube Region and European cities generally.

Strategic recommendations for future metropolitan development (Question 15)

The strategic recommendations for future development of Wien given by the respondents can be summarized as follows:

- Foster strategic partnerships to weather increasing interurban competition
- Develop long-term vision
- Further improve life quality
- Improve energy efficiency and develop green technologies
- Strengthen existing strengths (life sciences, creative industries, tourism)
- Launch active education and integration initiatives
- Focus on knowledge and skill-intensive economic activities to foster growth
- Develop opportunities for local value creation

Concluding remarks

- Stakeholders from multiple backgrounds consider Wien to be an attractive, unique and safe place that benefits from its historical heritage and its related role as a tourist destination. It is performing well in terms of infrastructural provision, economic development and environmental quality. This positive performance is however threatened by problems related to social integration in the view of the respondents.
- As stakeholders from multiple perspectives think, the strengths of the city are the high quality of life and the performance of the local economy. Conversely, weaknesses are the lack of integration, the low energy and resource efficiency as well as the lack of innovative economic activities.
- There is generally a high awareness of cooperative initiatives of Wien with other cities among the stakeholders surveyed. Furthermore, the city is considered to be a very attractive partner for cooperation, mainly due to existing experience with cooperation, the geopolitical location and the well-functioning administration. Potential future partner cities are located in the city's metropolitan area but also in Germany, Hungary, the Czech Republic, Slovakia, Slovenia, Switzerland, Spain, Italy and France.

5.3.1.2 Comparison and general conclusions from 5 examined cities

There have been some similarities in the results of the questionnaires performed in examined cities. The following ones we consider to be most significant:

1. **Bratislava, Ljubljana, Budapest are considered to be perspective metropolises displaying great potential in the future**. This potential lies in geographical position, existing links for cooperation as well as in recent achievements in terms of transformation during last 20 years. However, this **potential is somehow underused and mismanaged** – all three mentioned cities had got outstanding preconditions, which were not fully utilized. There has

been criticism on the role of the management of the cities – having failed to establish unique and strong positioning and identity (Ljubljana), being passive in the process of spatial development (Bratislava) or maintaining the old-fashioned, slow and bureaucratic decision and management culture (Budapest). Necessity to build strong and distinctive brands of the above mentioned cities were particularly highlighted also in the discussions held during local conferences, especially in Budapest and Bratislava.

2. **Praha** is perceived to be **rather individualistic city** with restricted will to cooperate („Praha is not actively fostering cooperation"). Specific position of the city of Praha, enjoying unique position within the Central European Context (tourism, culture, and history), maybe also geographical position (placed far away from the national borders) might lead to **somehow specific position, characteristic by rather hesitant attitude to cooperate and rather solitaire approach toward the spatial development**. However, the direct feedback from the representatives of the city of Praha did not confirm this position – they are not identified with the image of the Praha as rather individualistic and non-cooperative city. On the other hand, some lack of strategic element in the spatial planning of the Praha has been the subject of general consensus.

3. **Wien is considered to be city with high standard of services and infrastructure**, with some specific problems regarding social inclusion. Wien is predominantly perceived as "historical city" and "center of tourism". At the same time, the city is hardly seen as a "center of finance and business" or "center of innovation". Furthermore, Wien is considered to be an attractive, unique and safe place with a supportive, friendly and cooperative social climate. There is strong disagreement however whether the city is affordable or expensive. The outstanding qualities of the public services of the city are obvious. Generally, the city is considered to be a **very attractive partner, mainly due to existing experience with cooperation**, the geopolitical location and the well-functioning administration. More active approach reflected in various policies has been emphasized on the local conference in Wien. Position of Wien is somehow special and this city might act as a leader of Central European cooperative networks. This has been confirmed also during local conference in Wien.

4. **Ljubljana** offers quality in almost all aspects but is **little bit struggling to find clearly profiled strategic positioning**. This is particularly valid also for the city of **Bratislava. Both cities are lagging behind in terms of precise identity, positioning and branding**, compared to 3 other metropolises. Ljubljana and Bratislava seem to struggle to offer clearly defined scope of their identity and image. It seems that in some aspects those 2 cities are "playing the same league" as Budapest, Wien, Praha, but in some other fields not. This is an open question for the future and sensitivity of this issue has been confirmed during the local workshop in Bratislava. Local workshop in Ljubljana highlighted the need of the city to cooperate with cities in the region in Western Balkan.

5. **Social climate** in all 5 cities has been assessed **quite critical and negative - social climate** is considered to be **split apart, indifferent, competitive** in negative connotation etc. This issue was the main target of the critical evaluation, reflecting maybe the overall sepsis and crisis related sentiments of many respondents. Societal development, inequalities in social integration, social cohesion etc. are sensitively perceived in Wien and Ljubljana, partly in Budapest, but are not the most prominent problems in Praha and Bratislava (subjectively perceived).

6. **People appreciate clearly visible projects with benefits for broader public** (highway bypasses, public transport innovations etc.) – mainly in Budapest, Bratislava, and Ljubljana. Bratislava is predominantly considered as business location with high attractivity and high competitiveness. Among the most positive events/activities, the crossborder cooperation and common activities with neighbors, various transport infrastructure projects and project Eurovea are most significant ones. The negative projects/events/activities are represented mainly by River Park project, various non-favorable activities within public spaces and

several new flagship building projects externalized after millenium. Praha is perceived to capitalize its economic and geographic position, but not to be innovative and dynamic per se.

7. Respondents participating in interview/questionnaires have shown **more focus on the local problems than on patterns of cooperation, broader polycentric relations and conceptual issues**, This clearly indicates that even the professionals are more concentrating on the processes running directly within the examined cities than processes running between them. This indicates the traces of light underestimating of strategic processes, which has been partly confirmed during the local conference in Bratislava. The leading role of the management of the cities in this process is not fully utilized and visible till now.

8. **Overall** the respondents' **feedback** on the survey was relatively **positive**. Distinguishing their professional and sectoral background, representatives from only 2 sectors – politicians and representatives of chamber of commerce - refused to participate. The main topic was to find to be interesting and important - respondents have shown more enthusiasm and engagement when dealing with problems/weaknesses/strengths/potentials of the core city than when assessing cooperation interlinkages, situation in metropolitan region etc. On the other hand, the extension of the questionnaire was maybe slightly too exhausting and oversized – respondents seemed tired especially at questions 13 and 14.

5.3.2 Local conferences

Local conferences in 5 examined cities generated the following results:

Wien

A number of 26 stakeholders participated at the Local City Conference in Wien, which took place on November 4th, 2011 at Wien University of Technology. The workshop started with a brainstorming on key concepts used in POLYCE. For that, the participants received two cards with the following questions on it: "What do you know about polycentricity?" and "What do you know about metropolisation?".The most frequently mentioned terms regarding polycentricity were: "multiple centers", "diversity", "cooperation", "working together" "functional interdependencies". Concerning metropolisation the terms "concentration", "growth", "metropolitan regions" and "internationality" were mentioned most often. The answers overall broadly corresponded to the definitions applied in POLYCE.

After a short presentation of key analytical results of the project the stakeholders gathered in small groups for discussions of the results. Four groups were formed: "strengths and weaknesses of Wien", "metropolisation in Wien", "polycentricity in Wien" and "existing planning strategies regarding polycentricity and metropolisation". The "strengths and weaknesses" group came to the conclusion that "integration" and "sustainability" pose the two biggest challenges for Wien in the coming years. Integration was thereby not only discussed as ethnic but also as social integration of different groups in the city. Sustainability, in ecological but also economic and social terms is seen as the second big challenge that the city will face. The "metropolisation" group uttered surprise about the relatively low competitiveness of Wien in comparison to other European cities that was revealed by the empirical analysis. Regarding Wien's role as metropolis the stakeholders agreed that metropolisation is a process which the city is continuously confronted with. However, in many ways policies could more actively take up the process and try to build strategies on it. In the "polycentricity" group, participants agreed that from a policy perspective a polycentric structure is a desirable goal. Moreover, the term "polycentricity" is considered quite useful for lobbying and for attracting funding. A challenge however is that there is a multitude of definitions of polycentricity available, which are often incomparable, making a policy use more difficult. Furthermore, a practical strengthening of the polycentric system of Wien will require closer collaboration of the city with its surrounding municipalities. The fourth group dealing with "existing planning strategies regarding polycentricity and metropolisation" concluded that while a number of strategies are already available in reality the concrete implementation of them is often lacking. The stakeholders agreed

that future strategies have to address Wien's position in a European context on one side, and the strengthening of the polycentric structure on the city regional level on the other.

In the third part of the workshop the participants were asked to collect ideas about promising future development perspectives for Wien and possible projects to realize these perspectives. The workshop ended with a short round of reflection. For the development of future strategies this brought about that Wien will face the challenge to position itself in the European urban structure without losing sight of its regional and historical identity. Cooperation on different levels of scale is considered as a key strategy to achieve this.

Bratislava

Local conference in Bratislava has been attended by participants, coming mainly from the City of Bratislava, academic and research milieu and planning and corporate business. After short introduction of the POLYCE project and its mission, the conference continued with the brainstorming devoted to the understanding of the crucial terms polycentricity and metropolisation. Polycentricity was often understood as a process of building of a network of decentralized mutually cooperating centers, generating a synergy effect in spatial development. The prevailing approach to metropolisation highlighted the rising quality of the metropolises in various fields. Some answers tackled the importance of metropolitan cooperation („metropolises must use their potential in mutual cooperation"). Most of the statements were in concordance with our understanding of polycentricity and metropolisation within the POLYCE project.

After brainstorming, the discussion proceeded with the questions of approach to planning in Bratislava. Has Bratislava any kind of approach to its planning? It was said that Bratislava is planning schizophrenic and foremost there is missing the definition of key values in the creation of land development. The next topic of discussion was problem in babbittry in strategy and vision, whereby suffers Bratislava. And one guest confirmed it with the pinch of irony by slogan of Bratislava: "Little Big City". The need of strategic planning documents for sustainable development was discussed and also the absence of function of polycentricity and its definition in the Strategic plan of Bratislava. The audience talked about non-traditional methods of analysis, which should be used for collecting an input data for the planning process. Among these non-traditional analyses was mentioned for example Google analytics like a tool linked to area of Bratislava for monitoring preferred keywords search on the internet by the citizens relative to other cities. The impact of location of Bratislava to its development was very long discussed. Its location was evaluated primarily as a negative, especially in terms of transportation and administrative connection to the rest of our country, where these links markedly absent and Bratislava alienates. Then civic activist spoke about the social and cultural environment in Bratislava and its structure, which isn`t developed sufficiently and break creativity of citizen and interested people, whose need to realize their ideas. Due to the absence of this component is Bratislava less creative in their development. For example the creation of "Hackerspaces" in ex-barracks could facilitate this problem, said the civic activist. She mentioned ignorance to the alternative transportation structures in planning of Bratislava, like cyclo-ways are. Consequently, the discussion focused on the center of Bratislava, where is missing a connection to major transport corridors like in other metropolitan cities is resolved by railway station in the center. For the center of Bratislava it is also very important the river Danube, which potential isn`t absolutely utilized by center of Bratislava. Then the discussion continued by problem of environmentally unsafe industries in the territory of Bratislava like MOL refinery or Istrochem and by the problem of recovery of spatial capital by improvement of public spaces. Discussion returned to the transport structure and was mentioned the project TEN-T, which any citizen does know and also they don`t know its real contribution. At the end, the audience discussed about the need of transparency in management of the city and in its development, for example by the concept of digital participation like GIS systems surely are. The debate was concluded by an assessment that transfer know-how among the cities of POLYCE is necessary for the further successful continuation of the cooperative development.

Ljubljana

The POLYCE Local Conference (LC) in Ljubljana took place on Tuesday 22nd November 2011 (13-17h) at the City Hall of the City Municipality of Ljubljana. The POLYCE project results were presented by Ljubljana research team (Alma Zavodnik Lamovšek, Nataša Pichler-Milanović, Samo Drobne) and Ljubljana stakeholders - Mr Miran Gajšek (LC Chairperson) and Ivan Stanič (LC moderator). The POLYCE LC in Ljubljana attended approx. 20 people from different institutions (invitations were sent to cc 60 different e-mail addresses). The LC attendance list is available with the names of participants and their institutions. The LC took place according to the pre-defined schedule and timing. Presentation (cc 70 ppts) was printed and distributed to the participants attending the LC (i.e. invitation and ppts can be put on the POLYCE web site if needed). Ljubljana team presented the results of WP2.1-2.4 with the special emphasis on Ljubljana CC, FMA, MR - the city, urban region and metropolitan area.

The overview of spatial planning, regional and city policies in Ljubljana and Slovenia vis-à-vis polycentricity and metropolisation - including the key development projects of (inter)national, regional and city importance - were presented by Mr Ivan Stanič, POLYCE stakeholder, urban planner and architect from the Department of Urban Development, City Municipality of Ljubljana. Mr Ivan Stanič was also moderating the final LC discussion over the need for future policies and projects in Ljubljana. The LC participants in Ljubljana were actively involved in discussions during the presentation of POLYCE results with questions and comments, as well as in the final discussion over the need for future policy and projects recommendations. The perception of LC participants over the meaning of polycentricity and metropolisation were very different - taking in consideration all aspects of - political, economic, accessibility, functional, governance, links, networks and cooperation between different (urban) centers both at the intra-urban and inter-urban levels). Their perceptions are included in the POLYCE City Profile Report of Ljubljana.

The final conclusion of LC Ljubljana participants is that the new development projects are not needed - just their implementation in future - taking in consideration current lack of financial resources and economic austerity in Slovenia from year 2009 onwards. The other conclusion of LC Ljubljana participants is the importance of public participation and "soft" policies for project implementation. The LC Ljubljana participants were also of opinion that the Ljubljana needs to enhance cooperation links and networks with other Central European metropolises (not only Wien), as well as with other close-by city regions in the Alps-Adriatic cross-border region and Western Balkans (ex-Yugoslavia) - especially through the research and education, cultural, economic links and networks, and improvement of railway infrastructure between Ljubljana and other cities in Central and South-East Europe.

Budapest

The Budapest POLYCE local conference was held on the 4th of November 2011 between 9.00-14.00 at the central headquarter of the Hungarian Society for Urban Planning. The number of participants was 32. All participants gave written definitions to ‚polycentricity' and all but two attendees answered the question on 'what is metropolisation?'. Polycentricity was conceived as plurality of urban nodes in order to counterbalance the overweight of the core city. Polycentricity can be applied in public policies in creating and improving relations among central places. To reach a good-level of well-structured and non-hierarchical centralities a realistic division of functions is needed that is anchored to local endowments and capacities. Lack of subordination among urban nodes may create a relative neutral arena of power that features rather figures of flows and mobility than of stock of locally accessible goods. According to the participants an important precondition to reach a polycentric structure is to equalize accessibility among urban nodes. ‚Metropolisation' on the other hand was defined as assimilation of urban core and its catchment area that is an outcome of global concentration of economic activities into larger urban areas. Increasing concentration and complexity of urban functions results in the expansion of highly urbanized spaces which in turn leads

to an advanced cooperation among the urban core, suburban and rural areas. Metropolitan regions are pressed to get specialization among the competing business locations. Another approach is applied when metropolisation is conceived as a government scheme that has been evolved to manage externalities of large urban areas in an institutionalized form of governance.

Participants of the local conference came from diverse professional background, including public administration, business, planning as well as science. On behalf of the local authorities (both in and outside of Budapest) politicians, government officials and professional planners took part. Leading experts represented the regional development agency, the national planning office as well as the agglomeration development council. The local and metropolitan transport sector was represented by experts of the Budapest Transportation Center. Some private companies dealing with regional and urban development and research fellows of the Hungarian Academy of Science were also present. Businesses have been represented by the chief executive of a business and logistic park close to Budapest Airport.

A consensual finding of the conference was to acknowledge that rivalry weakens the position of Budapest and the whole metropolitan region. Therefore, an active cooperation among metropolitan centers is required for better utilization of cooperation synergies. On the one hand, micro-scale polycentric development is a relative advantage of the Budapest urban region as there are plenty of dynamic economic, cultural and tourism sub-centers around Budapest. According to stakeholders the polycentricity with these small- and medium-size cities (like Gödöllő, Budaörs, Szentendre, Vác) could be fostered by developing metropolitan transportation including services like P+R parking, diminishing tariff system and by stimulating transversal flows. Metropolitan partnership should be also strengthened in the frame of a novel metropolitan-scale planning and development institution. On the other hand, while improving the polycentricity at the meso-level Budapest should differentiate its relationships with cities in the wider metropolitan catchment area (medium- and large cities in a distance of 80-100 km away from the core city like Tatabánya, Székesfehérvár, Dunaújváros, Kecskemét) and with capitals of the neighboring countries like Bratislava, Wien, and also Zagreb and Belgrade. In relations with Central European capitals Budapest should emphasize its uniqueness (e.g. the peculiarities of Hungarian culture, the spa culture of Budapest and the wide spectrum of medical and recreation services that emerged from it, the art and music life) and that should also be part of the official city marketing and branding.

Praha

The Czech national POLYCE conference was held in Praha on 3rd November 2011. It was attended by 30 participants out of the 73 invited. The participants were made acquainted with the results of the preceding inquiry and they were also asked to define what polycentricity and metropolisation means for them.

The participants of the conference commented on the focus on transportation infrastructure among the projects that prevailed in the responses. They would put more emphasis on social issues and soft factors for economy. Competent and qualified city management as well as urban and regional policy dominate among the major issues that will influence future development and prosperity of Praha. Existing strategies and policies are non-transparent for citizens, and weak vis-à-vis pressures of developers. In the result, the Land-use plan of Praha has become a “tear-off calendar”, being rather driven by demands of individual investors. The theme of spatial management should move upwards on the agenda of politicians. The city and region should be active players in planning and allocation of important investments as development impulses. The decisions of administration should be transparent and consistent with the strategy and policies. Besides, a new perspective of public space as a friendly place for interpersonal communication as well as focus on better use of knowledge potential received most support as decisive factors for future.

There were discussed the following potentials for future development:

- City level. – Apart from the important factors mentioned above, the participants of the conference recommended to specify / concretize the meaning of polycentricity for Praha

and make it conform to urban form of compact city. Culture should become groundwork for ingoing creative industries. In general the shift from “hardware” investments towards city “software” investments is desirable.

- Metropolitan region level. – The central issue is coordination between Praha and Central Bohemian Region in various themes: infrastructures, transport service, suburbanization, research facilities, environmental policy. Forms of coordination may vary – single regional planning office, common regional plan (“Principals for Territorial Development”), common task groups with participation of Praha and surrounding municipalities, motivation of local self-governments to collaborate with each other.
- Central European level. – The functional Central European macro-region extends from the POLYCE to Munich, Nuremberg, Dresden and possibly also Warsaw. Praha should identify and clarify own interests within the Central European Region and seek for shared interests with other regional partners for lobbying on the EU level – e.g. revitalization of housing estates, Roma integration, migration policy, environmental policy, anti-brain drain policy. Obviously, the common interests of the POLYCE city partners may be improved transportation linkage, further removal of barriers (institutional, cultural, language). The common cultural heritage of the POLYCE may become an important stimulus for common tourist policy as well as promoting the central European identity as a motivation for students to migrate during their studies between the POLYCE cities.

Overall conclusions from local conferences:

The local conferences met the main goal: to inform about activities within the POLYCE project and to gather valuable feedback toward processes of polycentricity and metropolisation of relevant 5 cities. Direct inputs from participants mostly confirmed the principal outcomes from the survey. The understanding of the key terms „polycentricity“ and „metropolisation“ is close to the understanding and approaches within the POLYCE project. Discussion brought valuable impulses especially in the field of metropolitan cooperation and the need for building a strong, distinctive and highly profiled city identity of all 5 examined metropolises.

5.4 Needs for future research from the point of view

WP2.4 was focused on the perceived spatial characteristics of the five cities with regard to environmental, economic, social and psychosocial aspects. We performed qualitative evaluation of the strengths, weaknesses, potentials, assets and challenges of the examined core cities and their metropolitan regions. Main objectives of WP2.4 were the identification of most relevant potentials, factors and assets of the five cities on the meso and macro level, widening the perception of important assets and potentials among the stakeholders and assessment of assets for future positioning of the five cities as metropolises on the macro level.

For the future research the following priorities seem to be most important:

- **Enrichment** of the used **methodological framework** (questionnaires, desk research and workshops) with more **interactive and feedback-oriented methods**. Tools like mental mapping, scenario-building, interactive playing might deepen the imagery of the participants and generate even more precise and inspirative outputs. Desk research might be enriched of the research of complex non/visible factors contributing the polycentricity and metropolisation potentials of the examined cities (planning culture, creative milieu, social climate in different social groups…).
- Additionally, we recommend to divide questionnaire/interview onto separate tools (questionnaire dedicated to scales and interview to open questions). Separate research might be devoted to the city image and perception of the each examined city among the respondents from other 4 cities.

- **Validisation, enhancement and better benchmarking** tools for participative assessment of perceived strengths, weaknesses, potentials, assets and challenges for each city. Regular survey (maybe each 5 years) repeating the several topics and items of questionnaire might help to map out longitudinal progress of each city and to compare this progress with other participating cities as well.
- Better feedback of the results of WP2.4. from the **representatives of the other different cities** (outside the group of our 5 examined cities) of similar size and position within the Europe. The future research should integrate our results with the results of other project in order to create a database of the cities and their examined indicators.
- **Particular bilateral relations** between the examined cities might be the next scope of the research. There are some specific relations (Wien-Bratislava, Wien-Budapest) requiring special research depicting not the cities itself, but their specific particular relation, based on the analysis of complementary competition/collaboration patterns.
- **Detection of relevant synergy effects of the five examined cities and their cooperative efforts** in various contexts – both regarding the scale (local, regional, national, Central European, European) as well as the thematic sectors/scopes (trade, tourism, environment). Identification of factors which must be implemented in mutual coordination in all examined cities.
- Finding the **leaders and personalities** who may symbolize the cooperative effort in all 5 examined cities. These personalities should be guarantors of the implemented strategies (people always follow the leaders…). Future cross-disciplinary research (planning, sociology, cultural anthropology, psychology) might target this question with utmost efficiency. This research might be focused on the issues of urban sociology and psychology (behavioral models, leadership characteristics), regional development (successful leaders bound to flagship projects and initiatives) as well as planning (planning cultures generating leaders, democratic versus autocratic planning cultures…).

6 Agenda for Central European Metropolises & CED-Zone

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6.1 Introduction

6.1.1 Objectives

The strategic recommendation aims at deeper insight in the perception as well as an objective state-of-the-art of the spatial changes that are commonly classified as polycentricity and metropolisation. It provides background information for the development of new strategies that should be better prepared to cope with the massive changing conditions affecting metropolitan regions of the Central European capitals – from suburbanization to demographic and social changes, and the changes resulting from the integration process of new EU members. It also explores applicability of the concept of governance in the Central European context with its different political and administrative culture but with shared cultural tradition of the Central European region.

6.1.2 Methodology

The proposals for strategic recommendations stem from the identified factors influencing metropolitan development and providing future development opportunities. They derive from the evidences and findings from previous analyses and stakeholders´ perceptions and opinions on characteristics, potentials and assets developed in the preceding stages of the project.

The process of elaboration of strategic advice combined top-down and bottom-up approaches in the collection of information and receiving feedback from stakeholders. As such, it consisted of several incremental steps:

- Collection of existing background “top-down” information: analysis of planning documents of the 5 POLYCE cities
- Collection of existing background “bottom-up” information: analysis of outcomes from questionnaires
- Elaboration of strategic advice to be discussed at the local city conferences
- Synthesis of the 5 strategies as a basis for identifying shared features for a CED-zone-perspective
- Elaboration of final strategic advice for 5 POLYCE metropolises and CED-zone

These proposals of perspectives and strategies for the metropolitan regions of capital cities were elaborated by each national group and national stakeholders. On the background of these particular metropolitan regional proposals and on the background of the stakeholders´ perceptions and opinions a common proposal was developed for a Central European / Danube zone perspective.

The elaboration of the strategic recommendations distinguishes the territorial coverage of the strategies and policies - from core city / metropolitan region to the Central European region level. The existence or absence of a strategy or a territorial dimension will give significant impulses for further discussion.

As the Central European Region is part of EU Danube macro-region, the strategies and projects are connected to certain priorities indicated in the European Union Strategy for the Danube Region related to metropolitan areas, namely:

- to improve mobility and intermodality
- to encourage more sustainable energy

- to promote culture and tourism, people to people contacts
- to develop the knowledge society: research, education and ICT
- to invest in people and skills
- to step up institutional capacity and cooperation

The evidence of existing / pending strategies and projects as well as the new proposals for actions distinguished two territorial levels – (A) the metropolitan region of each capital city; and (B) the Central European / Danube macro-regional zone.

6.1.3 Outcomes

The strategy for strengthening polycentricity is based on the following pillars:

- Metropolitan growth management regarding the allocation of new metropolitan functions under consideration of land recycling and combating suburban sprawl
- Metropolitan positioning through the strengthening and enhancement of relevant driving forces
- Efficient and sustainable macro-transportation within and between respective metropolitan regions as well as in the entire CED-zone including linkages to wider Europea
- Cooperative and integrated territorial governance on the level of metropolitan regions strengthening the mutual relation between metropolitan development of cities and polycentric development within the CED-zone
- Development of cooperative structures between metropolitan regions in order to enhance polycentric development (focus on planning and transport policies)

The strategic recommendations are presented on two levels:

- for the metropolitan system of the Central Europe – recommendations for areas of co-operation and shared activities of the POLYCE metropolises and metropolitan regions as parts of the Central European zone designed in cooperation with the involved stakeholders and related to the Danube region strategy as well as other existing initiatives
- for each metropolis and its metropolitan territory – recommendations for activities regarding each POLYCE metropolis and metropolitan region in the Central European polycentric metropolitan system

The activity proposals were assigned to the following fields of action that refer to polycentricity and metropolisation:

- spatial structure
- infrastructure
- economy and knowledge
- environment and energy
- living and culture
- image, identity, marketing
- governance

6.2 Metropolitan Agendas

6.2.1 Bratislava

Most of the activities named in Bratislava refer to infrastructure, environment or governance, while there were only a few ideas on spatial structure, economy, living or image. The most prominent field of action is infrastructure, in which an adequate connection of centers to high-ranked infrastructure is postulated. Furthermore multimodal regional transport networks need to be provided. Referring to environmental matters, the awareness and efficiency of energy use in urban development needs

to be enhanced. Furthermore, the quality of local recreational areas needs to be strengthened and protected by adequate measures.

In order to improve institutional conditions for future politics, new forms of governance have to be established in the whole metropolitan region. Here a special emphasis lies on a concerted development strategy for cross-border spatial development and proper platforms (e.g. common databases, internet forums, regular meetings) for permanent information exchange of the actors involved.

With regard to spatial structure the distribution of metropolitan functions on different municipalities within the Metropolitan Area has to be considered against the background of changing economic and social conditions, which will require a clear positioning and specialization of the existing (sub-) centers in their functional and economic orientation. In order to come up with the requirements of knowledge economy this specialization should be directed at establishing knowledge-intensive services and R&D-clusters. All these measures and strategies aim at sharpening the identity and image of Bratislava, fostering its unique profile and competitiveness. The clearer the image of the metropolis is defined and communicated, the better the perspective of Bratislava regarding its economic development. The citizens of Bratislava and its metropolitan region should be involved to participate in this process.

While some infrastructural and institutional measures have a tendency towards being inclusive, those activities related to economic specialization and image strategies are only very strongly fostering the metropolitan competitiveness. What is interesting though, is the fact that only infrastructure provision measures can only be interpreted as being of an inclusive character, while most environmental and governance measures must be understood as having an inclusive tendency only in the first run, with the ability of improving the competitive behavior of the Bratislava.

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-	Incl.	
STRUC	Effective distribution of metropolitan functions by clear positioning and specialization of (sub-) centers	Core city and regional municipal administrations, Regional planning bodies		X			
INFRA	Connect new and existing centers to high-ranked infrastructure (e.g. new Central Bus station)	Core city and regional municipal administrations, Regional planning bodies, national ministries, infrastructure provision bodies		X		X	
	Provide multimodal regional transport network	Core city and regional municipal administrations, Regional planning bodies, Public transport providers, infrastructure provision bodies				X	
	Expand road infrastructure in the South to strengthen polycentric structure	Core city and regional municipal administrations, Regional planning bodies, national ministries				X	
ECONO	Foster economic specialization by establishing knowledge-intensive services and R&D-clusters	Core city and regional municipal administrations, research institutes, Universities, R&D-businesses	X				
ENVIR	Improve energy-awareness and –efficiency in urban development (e.g. 'green' transport systems)	Core city and regional municipal administrations, Regional planning bodies, green technology businesses, research institutes		X		X	
	Strengthen and protect quality of local recreational areas (e.g. vineyards, bike lane network)	Core city and regional municipal administrations, regional planning bodies		X		X	

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-	Incl.	
LIVIN	Improve the quality of living conditions	Core city and regional municipal administrations					
IMAGE	Sharpen metropolitan identity and image with participatory methods	Core city and regional municipal administrations, regional planning bodies, marketing agencies, Universities, research institutions	X			X	
GOVER	Joint cross-border spatial development strategy for Bratislava region	Core city and regional municipal administrations, Regional planning bodies, national ministries, marketing strategy, research institutions, planning bureaus		X			X
	Develop information- and knowledge-exchange-platform	Core city and regional municipal administrations, Regional planning bodies, private planning bureaus		X		X	

Figure 52: Metropolitan Agenda Bratislava: Activities, Actors, Implications

6.2.2 Budapest

In the stakeholders' mentions, Budapest's most important field of activity has to be the metropolitan infrastructure. Besides some specific local measures, activities should tackle the metropolitan character of Budapest by improving the regional high-ranked infrastructure. Relatedly, institutional activities concerning the coordination in questions on mobility and transport are claimed. Further coordination must be undertaken in the city concerning its development strategies and planning approaches of the Budapest districts.

Economic activities should foster the development of metropolitan regional centers in research and development, while numerous commercial, business and logistics centers near the airport are claimed a potential for the future.

Interestingly, in Budapest's metropolitan agenda an emphasis lies on the Danube and related projects. While environmental measures have to tackle poor water and environmental quality, the river should play an important role in touristic and marketing activities of the city. This might be of vital importance to some actors in the Budapest metropolitan region, concerning the city's positioning in the Danube Region.

Besides, it is important to have a look at how much the suggested activities support the concepts of competitiveness and inclusion. Generally, governance activities solely seem to have an inclusive character, which stresses the stakeholders' impression of a lack of collaboration in the metropolitan territory of Budapest. While touristic and, more generally, economic activities are aiming at the competitive profile of the city, infrastructural measures draw a more complex picture, with airport and motorway expansions having also an effect on Budapest's competitiveness. What is interesting is the fact, that - as in other cities - economy-oriented measures, as they were named, do not contribute to an inclusive metropolitan development. The same is true for image-related activities. While marketing is targeted, no identity-oriented, inclusive measure can be found in the list. The other way round this is also true for the field of environmental activities, where none of the measures are thematizing metropolitan competitiveness. Therefore Budapest's metropolitan development needs to take these gaps into account - either as part of their profile, or by defining aims and activities that are able to tackle both sides of what makes smart metropolitan development.

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-	Incl.	
STRUC	establish novel city centers in the suburbs and at the metropolitan periphery (KöKi Terminal, Tópark)	core city and regional municipal administrations, private investors, public transport providers		x		x	
INFRA	Expand Budapest Airport capacity (Budapest Airport terminal 2)	Private investors	x				
	Improve suburban railway service	Public transport provider					x
	Improve P+R capacities and intermodal nodes	Public transport providers, core city and regional municipal administrations					x
	Extensive improvement of sewerage in the Southern agglomeration to utilize Central Sewage Plant's maximum capacity	core city and regional municipal administrations			X		
	Expand M0 to western section	core city and regional municipal administrations, national ministries		x		x	
	New Danube bridge (pedestrian/cycle crossing in the downtown, residential and business bridge at Albertfalva)	City administration, private investors				x	
ECONO	Promote R&D clusters (Bio-Info-Medical Innovation Park, Q2 Science Park for chemistry, nanotechnology, Aquincum Institute of Technology, Talentis Business and Technology Park)	City administration, research institutes, universities, private business actors	x				
	Promote investment in, and clustering of economic activities around Budapest Airport and M0 zone (manufacturing, logistic, trade and retail)	Private investors, city administration	x				
ENVIR	Improve Danube's water quality by reaching Central Sewage Plant's maximal capacity	City administration				X	
	Improve environmental quality of the Danube-branch Ráckeve-Soroksár	Central Danube Valley Water Authority				x	
LIVIN	Encourage tourism development at the waterfront Ráckeve-Soroksár Danube -branch (e.g. watersports)	core city and regional municipal administrations, private investors, tourism agency		x			
IMAGE	Market priority area Danube riverside (e.g. Castle Garden Bazar)	core city and regional municipal administrations, Regional Development Agency of the Central Hungarian Region	x				
GOVER	Establish National Transportation Holding by apporting Budapest Transportation Company	National government				x	
	Ongoing reconciliation of local development strategies in Budapest Agglomeration Development Council	core city and regional municipal administrations, Budapest Agglomeration Development Council					x
	Establish alliance of Budapest districts	municipal administrations		x			x

Figure 53: Metropolitan Agenda Budapest: Activities, Actors, Implications

6.2.3 Ljubljana

Stakeholders' recommendations for Ljubljana comprise most fields of action but concentrate particularly on issues of governance. (see Figure 54)

Facing trends of urban sprawl, a predominant aim is the development of a sustainable spatial structure. This includes the construction of new and revitalization of existing centers - not only within, but also in the suburban areas of Ljubljana. These (sub)-urban centers should be connected to the core city through high ranked infrastructure, and especially an improved public transport system. Consequently, these activities touch upon the urban structure and infrastructure at the same time and need to be organized by actors from the city municipality of Ljubljana and other municipalities in the urban region or Central Slovenian statistical NUTS 3 region, but also from the national level and public transport providers.

Economic activities have to target knowledge intensive activities, in particular research and development and teaching services. However, there are no efforts undertaken concerning economic clustering, while Ljubljana's role as a university city is of high importance. Along with these activities the image of Ljubljana should be developed and modified towards a city of innovation and sustainable urban-regional development. Even proposed activities regarding the environmental sector are in line with the expected image change: environmental quality standards and recreational areas should be protected or even improved. Of course, corresponding activities should include actors from economy and politics of different levels (municipalities, national ministries) and must be steered by planning bodies on the urban-regional level.

Cooperation between the core city and other municipalities should be strengthened or even institutionalized, based on a corresponding (statistical) Central Slovenian (functional) region. This might improve information on urban-regional trends. Anyhow, common governance efforts for the metropolitan area of Ljubljana will need a harmonized funding system for joint activities.

While most of the proposed activities seem to have both competitive and inclusive effects at the same time, particularly those activities related to economic functions might strengthen Ljubljana's competitive position. Hence, governance efforts like institutionalized cooperation and harmonized funding are very important for a smart and balanced development as they are supporters of a territorially inclusive development.

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-	Incl.	
STRUC	Develop new and revitalize existing centers and sub-centers	Core city and regional municipal administrations, regional development agencies, private sector		X		X	
INFRA	Connect new and existing centers to high-ranked infrastructure (new railway and bus stations)	Core city and regional municipal administrations, regional development agencies, national ministries, public transport providers, private sector		X			X
	Use infrastructure development to strengthen polycentric structure (links from Ljubljana airport to other urban centers)	Core city and regional municipal administrations, regional development agencies, national ministries, public transport providers		X			X
ECONO	Promote service-sector- and R&D-sector development and clustering	Core city and regional municipal administrations, regional development agencies, private business actors, private sector	X				
	Develop Ljubljana as a University location (e.g. new University library)	Core city and regional municipal administrations, regional development agencies, national ministries, Universities		X			
ENVIR	Strengthen and protect quality of local recreational areas (e.g. bicycle lane networks)	Core city and regional municipal administrations, regional development agencies		X		X	

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-	Incl.	
LIVIN	Preservation of natural and cultural heritage areas and local identity in city-region and promotion of tourism	Core city and regional municipal administrations, regional development agencies, tourism organizations, heritage organizations, private sector					
IMAGE	Promote Ljubljana as smart, innovative, and sustainable city region	Core city and regional municipal administrations, regional development agencies, marketing agency, research institutes, private sector	X			X	
GOVER	Develop information- and knowledge-exchange platform	Core city and regional municipal administrations, regional development agencies, national ministries, private sector		X			X
	Institutionalize cooperation between core city, and other municipalities of the region (i.e. establishment of administrative regions)	Core city and regional municipal administrations, regional development agencies, national ministries		X			X
	Harmonize statistical (administrative) regions	Core city and regional municipal administrations, regional development agencies, national ministries			X		
	Joint project funding between municipalities, state, EU funds	Core city and regional municipal administrations, regional development agencies, national ministries, private sector		X			X

Figure 54: Metropolitan Agenda Ljubljana: Activities, Actors, Implications

6.2.4 Praha

According to the stakeholders questioned, Praha should focus its activities primarily on the fields of governance and infrastructure. In the field of infrastructure, the newly proposed measures focus on public transport, which should compensate for the existing ambitious projects related to the improvement of the road infrastructure network. The governance-related activities that were raised by the stakeholders suggest that coordination should be high up on the city's agenda. Coordination of spatial development on a regional level, but also of public transport and service provision is considered to be an important future activity, for which a more open, comprehensive and coordinated spatial and sectoral planning is needed. Measures that foster information and knowledge exchange among relevant actors could be a first step to achieve such closer collaboration. In the field of economy, a focus should be on research and development activities and knowledge intensive services more generally. A sustainability-related activity that is considered promising is to secure energy supply for the country through increasing the capacity of natural gas storage tanks. Finally, in terms of image creation, the efforts should be focused on enriching Praha's identity by combining it with the identity of the metropolitan region, possibly by making use of the existing local cultural heritage and natural values. Of course most of the proposed new activities will have multiple effects for several fields of action.

For the implementation of these activities a multitude of actors is be needed. They have to span different sectors and spatial scales, including local, regional and in some cases also the national level. In particular the scalar dimension seems to be of importance for the realization of an inclusive and competitive metropolitan region. Most of the proposed activities require not only local but also regional and even national actors. This again points to the necessity of close coordination of actors on a regional level.

Overall, the proposed activities can be expected to contribute both to Praha's competitiveness and inclusiveness. From the perspective of competitiveness, the promotion of R&D activities, as well as image-related activities can be expected to have the greatest effect. On the other hand, it is the coordination of public transport as well as governance-related activities that might foster the inclusiveness of the city.

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-	Incl.	
STRUC	Link the planned intensity of urban use to the capacity of public transportation	Core city and regional municipal administrations, planning bodies, public transport providers		X			X
INFRA	Focus transportation investment on public transport	Core city and regional municipal administrations, public transport providers		x		x	
	Coordinate public transport on regional level (Central Bohemia)	Core city and regional municipal administrations, national ministries		x			X
	Improve quality, capacity, and supply of rail services on regional level	Core city and regional municipal administrations, public transport providers		x		x	
ECONO	Promote R&D and knowledge-intensive activities	City administration, research institutes, universities	X				
ENVIR	Increase energy safety (increased capacity of natural gas storage tanks)	National ministries, energy providers			X		
LIVIN	Provide public services and other improved facilities of everyday use for residents in walking distance	Core city and local municipal administrations, planning offices			X		X
IMAGE	Enrich the cultural identity and image of Praha by identity and image of Central Bohemia	Core city and regional municipal administrations, regional development agency, tourist agencies	x			X	
	Market local cultural heritage (e.g. Czech cuisine)	Regional development agency, tourist agencies, tourist businesses	x			x	
GOVER	Coordinate development of Praha and Central Bohemian Region (especially large suburban development projects and residential development)	Core city and regional municipal administrations		x		x	
	Information and exchange platform for metropolitan region	Core city and regional municipal administrations, local planning bureaus, research institutes		x			X
	Coordinate public service provision to maximize accessibility and supply	Core city and regional municipal administrations, Regional planning bodies					x
	Coordinate public transport development with settlement structure	Core city and regional municipal administrations, public transport providers, regional planning bodies				x	

Figure 55: Metropolitan Agenda Praha: Activities, Actors, Implications

6.2.5 Wien

Obviously, most of the proposed activities for Wien are related to the field of infrastructure. (See Figure 56) Interestingly, there are no activities that are mainly concerned with the spatial structure of the city, albeit infrastructure measures indirectly also constitute interventions in the city's spatial structure.

The proposed infrastructure activities mentioned and discussed during the stakeholder workshop in Wien are fairly diverse and range from a general improvement of accessibility to specific measures to connect the city to particular functions in the metropolitan region. They target both more traditional modes of transportation (e.g. car) and more alternative ones (public transport, bike). In the field of economy the focus is on knowledge creation and exchange. This should comprise not only private

actors but also exchanges between governmental and private actors. Environment-related activities suggest to further focus attention on environmental technologies and governance issues, a field in which Wien already has shown some success in the past but needs further initiatives to meet the challenges of a sustainable resource management and land use development'. Activities in the field of living should aim at changing mobility patterns and diversity strategies. In terms of image, Wien could aim to further position the city on one side as green and sustainable, and as multi-cultural, open and diverse on the other side. Finally, the focus of governance activities is on developing long-term strategies for the future metropolitan development of Wien and on fostering knowledge exchange on a regional level.

It comes as no surprise that for the practical implementation of such activities a variety of actors is needed, including governmental and private actors located both on the local and the regional level. Especially the latter point appears to be crucial, namely that for the realization of a metropolitan, regionally inclusive development the participation of, as well as the cooperation with, regional actors is of high importance. Hence, a specific governance approach incorporating specific interests of actors from different administrative sectors and spatial levels as well as existing initiatives (such as SUM, VOR, PGO dealing with the coordination of urban development on a regional scale) should be implemented. As a next step, evidence based policies should be elaborated and based on relevant information and knowledge about most recent trends and challenges of development within the metropolitan area.

The proposed activities can be expected to contribute predominantly either to the competitiveness or to the inclusiveness of the city of Wien. More concretely, especially measures in the field of the proposed infrastructure provision can be expected to be fairly inclusive in their effects. (See Figure 56) On the other hand, it is the provision of specific infrastructure links (to airport and business parks), the promotion of environmental technologies and specific, image-related activities that can be expected to have a strong effect on the city's competitiveness. Finally, measures in the field of governance can be expected to be fairly inclusive in their effects or at least to balance the respective effects in a smart way.

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-		Incl.
STRUC							
INFRA	Improve intra-regional accessibility	Regional planning bodies, infrastructure provision bodies, public transport providers					X
	Develop regional public transport system	Regional planning bodies, national ministries, public transport providers		X			X
	Expand road infrastructure in North	Core city and regional municipal administrations, national ministries, infrastructure provision bodies, regional planning bodies		X		X	
	Expand and improve bike lane network	Core city and regional municipal administrations, regional planning bodies				X	
	Expand highway links to airport (A4 between Wien and Wien airport)	National ministries, infrastructure provision bodies, regional planning bodies	X				
	Connect business parks with regional public transport network	Regional planning bodies, public transport providers	X			X	
ECONO	Develop new feasibility study- and transport funding models for urban mega-projects	Core city and regional municipal administrations, research institutes, public transport providers, infrastructure provision bodies				X	

Field of action	Activity	Actors	Fostering Competitiveness or Inclusion				
			Comp.		-	Incl.	
	Develop regional information and knowledge exchange platform	Core city and regional municipal administrations, local planning bureaus, research institutes				X	
ENVIR	Foster the implementation of environmental technologies	Core city and regional municipal administrations, national ministries, research institutes, green technology businesses	X				
LIVIN	Change in mobility behavior	Core city and regional municipal administrations, national ministries, regional planning bodies		X		X	
	Define and communicate equal opportunity- and diversity strategies	Core city and regional municipal administrations, national ministries		X			X
IMAGE	Strengthen the position of Wien as green city	Core city and regional municipal administrations, green technology businesses, marketing agencies	X				
	Improve cosmopolitan appear	Core city and regional municipal administrations, national ministries					X
GOVER	Develop concerted metropolitan policy (common urban growth management on metropolitan level; institutional definition of metropolitan agglomeration)	Core city and regional municipal administrations, regional planning bodies, national ministries		X			X
	Develop regional information and knowledge exchange platform	Core city and regional municipal administrations, local planning bureaus, research institutes		X			X

Figure 56: Metropolitan Agenda Wien: Activities, Actors, Implications

6.3 A Central European Development Agenda

6.3.1 The European Context: Embedding POLYCE in European policy

A detailed examination of existing strategies, policies and networks on the European or transnational level indicates that there are many different documents or initiatives, which might provide a framework for the development of common agendas and projects of the 5 Central European metropolises aiming at increasing cohesion of the Central European macro-region and an improved competitiveness in a wider context.

6.3.1.1 EU Cohesion Policy

EU Cohesion Policy is the main instrument for pursuing the EU's economic, social and territorial cohesion objectives. It accounts for the second largest share of the EU budget, encompasses several funds and is aligned with the EU's overarching growth and jobs strategy. The debate on the post-2013 Cohesion Policy mainly deals with:

- focusing the policy on a limited number of EU priorities aligned with Europe 2020, notably research and innovation, low-carbon economy, human capital
- requiring a more visible and effective performance by improving the monitoring and evaluation of the Operational Programmes
- a different alignment of funding instruments
- achieving more strategic coherence between relevant policy areas through (for example) joint strategic planning or programming of all EU funding

- Strengthening the territorial dimension, including territorial cooperation, by defining macro-regions and functional areas as a base for planning/intervention
- Reviewing administrative procedures, with potential differentiation of management and control requirements and other simplification measures (EP, 2011: 17)

A shift from the traditional cohesion policy concept as redistributive mechanism towards the 'allocative' perspective of the place-based policy with developmental mission is the core of the EC Cohesion Policy after 2013. The Fifth Cohesion Report European Commission (EC, 2010) emphasized a functional and flexible approach. Depending on the issue, the appropriate geographical dimension ranges from a macro region, such as the Baltic Sea or the Danube region, to metropolitan and cross-border regions or a group of rural areas and market towns. Such a flexible geography can better capture the positive and negative externalities of concentration, improve connections and facilitate cooperation and so be more effective in furthering territorial cohesion.

6.3.1.2 European Union Strategy for the Danube Region

In 2010, the European Commission adopted the EU Strategy for the Danube Region following a request from the Member States. This is a comprehensive strategy, covering several Community policies and targeting a 'macro-region'. The strategy takes the form of a communication and an action plan which will be reviewed regularly. The Danube region, which covers parts of 8 EU countries (Germany, Austria, Hungary, Czech Republic, Slovak Republic, Slovenia, Bulgaria and Romania) and 6 non-EU countries (Croatia, Serbia, Bosnia and Herzegovina, Montenegro, Ukraine and Moldova) is facing complex challenges, which require better coordination and cooperation in the following priority areas:

- Improve mobility and intermodality
- Encourage more sustainable energy
- Promote culture and tourism, people to people contacts
- Restore and maintain the quality of waters
- Manage environmental risks
- Preserve biodiversity, landscapes and the quality of air and soils
- Develop the knowledge society: research, education and ICT
- Support the competitiveness of enterprises
- Invest in people and skills
- Step up institutional capacity and cooperation
- Work together to tackle security and organized crime

Most priority areas mentioned relate to the POLYCE themes. The strategy comprises the action 'Build Metropolitan Regions in the Danube Region', which should initiate a platform of existing and emerging metropolis regions in order to establish a framework for learning and development of common ideas in all areas relevant to metropolitan development. City networks should promote cooperation and exchange of information and experience among the relevant actors (e.g. administrative experts, municipal and regional parliaments). There is a scope for knowledge exchange of agglomeration development strategies, which will enhance dissemination of good practice and detect promising fields of cooperation among public authorities and businesses.

6.3.1.3 Strategy Europe 2020

The EU's Europe 2020 strategy for smart, sustainable and inclusive growth was launched by the European Commission in March 2010 and approved by the Heads of States and Governments of EU countries in June 2010. The strategy identified four priorities:

- Smart growth – improving performance in education, research and digital society;
- Sustainable growth – building a more competitive low-carbon economy, protecting the environment, green technologies and production methods, efficient smart electricity grids, harnessing EU-scale business networks and improving the business environment;

- Inclusive growth – more and better jobs, investment in skills & training, modernizing labor markets and welfare systems, ensuring the benefits of growth reach all parts of the EU;
- Economic governance – closer EU surveillance of economy, actions to safeguard the stability of the Euro area and to repair the financial sector.

Within the framework of the Europe 2020 strategy, internal market, global competitiveness, cohesion and environmental issues, in particular de-carbonisation of transport, are objectives which will require balanced solutions. In order to monitor how the priorities are being accomplished, the strategy sets five EU-wide common headline targets in the fields of employment, research and development/innovation, energy/climate change, education, and poverty/social exclusion. All member countries translated these targets into individual indicators for their national reform programmes. In that way, the priorities of the Europe 2020 strategy should be reflected in planning strategies and also strategic projects on all territorial levels.

6.3.1.4 EU Territorial Agenda

The original document of the Territorial Agenda of the EU (CEC, 2007) was the first step towards institutionalization of the territorial cohesion that became a shared responsibility among EU and Member States. The amendment of the Territorial Agenda for 2020 identified promoting polycentric and balanced territorial development as "key element of territorial cohesion to foster territorial competitiveness of the EU. Cities should form innovative networks to improve their global competitiveness and promote sustainable development. Polycentric development is necessary at the macro-regional, cross-border and national and regional levels. Polarization between capitals, metropolitan areas and medium sized towns should be avoided and policy should contribute to reducing territorial polarization and regional disparities by addressing bottlenecks to growth in line with Europe 2020 Strategy" (Territorial Agenda for 2020).

6.3.1.5 Visegrád Group

The Visegrád Group, also called the Visegrád Four or V4, was established in 1991, as an alliance of Czech Republic, Hungary, Poland and Slovakia for the purposes of cooperation and furthering their European integration. The 'Common spatial development document', which was prepared for a meeting of ministries in 2010, mainly pursues two goals:

- Delineation of development poles, development axes and transport networks on the territory of V4+2 (Romania and Bulgaria) countries and the detection of their no-continuations
- Proposal for further works on the Common spatial development document – common approach towards the withdrawal of barriers in spatial development of V4+2 countries; further cooperation of V4+2 countries in the field of spatial development

The document is not explicitly related to polycentricity and metropolisation but will presumably contribute to the polycentric development on Central European macro-regional level.

6.3.1.6 Trans-European Networks

The idea of Trans-European Networks (TEN) emerged by the end of the 1980s in conjunction with the proposed Single Market. The construction of Trans-European Networks is considered as a key element of the Internal Market, of economic growth and employment and of economic and social Cohesion. According to these objectives, the Community develops guidelines covering the objectives, priorities and projects of common interest for transport (TEN-T) and energy (TEN-E). The third sector of telecommunications (eTEN) was finished in 2006 and it is followed by the ICT policy Support Programme. Many projects of common interest have benefited from financial support through the TEN-budget and the Structural Funds or by loans of the European Investment Bank (EIB).

According to the Union guidelines for the development of the trans-European transport network (Decision No 661/2010/EU) all TEN-T projects have to be assessed as for their socio- economic impact and their impact on the environment, including their impact on trade and the free movement of persons and goods between Member States, on territorial cohesion and on sustainable

development. Whereas the effects on polycentric development are not explicitly pronounced, obviously the impact on spatial patterns is expected. The decision identified the following priority links to be started in 2010 that relate to the POLYCE space:

- Railway axis Paris-Strasbourg-Stuttgart-Wien-Bratislava, including the Salzburg-Wien section (2012) and Wien-Bratislava (2010) cross-border section
- Rhine/Meuse-Main-Danube inland waterway axis, including the Wien-Bratislava cross-border section (2015), and the Sap-Mohács section (2014)
- Athens-Sofia-Budapest-Wien-Praha-Nuremberg/Dresden rail link, with the Budapest-Wien cross-border section (2010); railway Břeclav-Praha-Nuremberg (2010), with Nuremberg-Praha as cross-border section; railway axis Praha-Linz (2016)
- Railway axis Gdańsk-Warsaw-Brno/Bratislava-Wien, consisting of the connections Gdańsk-Warsaw-Katowice (2015), Katowice-Břeclav (2010) and Katowice-Žilina-Nové Mesto (2010)
- Motorway axis Gdańsk-Brno/Bratislava-Wien, with the motorways Gdańsk-Katowice (2010), Katowice-Brno/Žilina (2010) and cross-border section of the motorway Brno-Wien (2009).

6.3.1.7 CENTROPE

CENTROPE is a joint initiative of the Austrian Federal Provinces of Wien, Lower Austria and Burgenland, the Czech Region of South Moravia, the Slovak Regions of Bratislava and Trnava, the Hungarian Counties of Győr-Moson-Sopron and Vas as well as the Cities of Bratislava, Brno, Eisenstadt, Győr, Sopron, St. Pölten, Szombathely and Trnava, which was founded in 2003 in order to create a Central European Region, where cross-border cooperation is rooted in all areas of life. To work towards the attainment of this goal, CENTROPE will pursue four specific development goals until 2012: knowledge region; human capital; spatial integration; culture and tourism.

6.3.1.8 Cities for Cohesion

This initiative, which was established to respond to the EU Green Paper on Territorial Cohesion, deals with the urban dimension of cohesion policy insisting that the macro-regional approach should be applied in cohesion policy. The cities and metropolitan regions involved in the network (Wien, Praha and 14 non-POLYCE cities) sought for increased cooperation across regional and national borders through governance, which should be encouraged by EC through the EU Structural Funds. Furthermore the territorial impact of all EU- policies that contribute to territorial cohesion should be given more consideration.

6.3.2 Comparative Analysis of the POLYCE City Agendas

All POLYCE cities have pronounced their spatial policies in strategic plans, making polycentric development a cornerstone of the spatial concept in these strategies. While infrastructure projects are the most common activities to pursue polycentric development, comparatively fewer projects are oriented towards environmental, cultural or quality of living issues. The recommendations for new projects typically extend, update and enrich the existing strategies coping with newly emerging issues and challenges that were also raised by recent EU documents (e.g. Europe 2020). Some projects particularly target new or improved facilities for knowledge economy or aim at enhancing metropolitan governance. Furthermore, some new infrastructure projects complement the existing ones by more environment-friendly modes. The following similarities and differences that are shared among the POLYCE cities can be classified:

- The challenges of suburban sprawl outside the core city need to be tackled. Suburban areas should be better structured and provided with jobs, infrastructures and services (Budapest, Ljubljana, and Praha)
- Infrastructures connecting the city and metropolitan area with facilities of specific functions (e.g. science and business) are important to strengthen the competitive position (all cities)
- Infrastructure improvements should target environment-friendly modes, while the urban and regional highway network should be expanded to improve overall accessibility. The same is true for rail networks and airport connections (Ljubljana, Wien, Praha).

- City and regional development must be coordinated (Bratislava, Ljubljana, Praha).

In all cities, infrastructure strategies consider the whole metropolitan areas, while other issues often neglect the regional dimension. This can be explained by an administrative division between the cities and surrounding regions in the cases of Wien, Praha and Ljubljana, which pushes the coordination between the metropolitan city and its regional hinterland to the supra-regional i.e. national level. Consequently, all metropolitan regions seek for some kind of institutionalized cross-regional coordination. Apparently, the most pronounced and structured approaches of coordination exist in Wien, which has the longest tradition of suburbanization across city limits. The existing strategic projects in all POLYCE cities are rather aimed at increasing the competitiveness of the city/metropolitan region while the projects for improved accessibility within the cities and metropolitan regions should enhance metropolitan integration and cohesion. The results from the POLYCE research suggest that the public awareness of the insufficient coordination within the metropolitan regions is increasing in all metropolises.

6.3.3 Common Activities of the POLYCE Metropolises

The macro-regional dimension of strategies is pronounced in all of the existing strategies for cities/metropolitan regions. The strategies reflect the specific position of a particular metropolis on European development axes and within the wider European space. The dimension of the CED-zone is not explicitly mentioned in the existing strategic documents. The actions recommended by the POLYCE expert panels for the POLYCE cities/metropolitan regions start from the recognition of their specific potentials and challenges. They also reflect inconsistencies between existing strategies:

- The strategic projects for Bratislava and Wien reflect the unique position of the "twin capitals", aiming at strengthening the Wien – Bratislava axis.
- The contributions of Budapest and Ljubljana emphasize the cooperation in the implementation of the overall Danube Strategy, in the case of Ljubljana mostly in education and research collaboration.
- The recommendations given in Praha emphasize a "soft" dimension of collaboration with education, culture and tourism balancing existing strategies and projects for high-ranking transportation infrastructures.

The following table shows recommended aims and examples of activities (major projects, policies, strategies) that are considered to have importance for the polycentric and metropolitan development within Central Europe, namely in the metropolitan regions of the POLYCE capitals.

Field of action	Aim	Activity	Spatial entity	Actors	Fostering Comp. - Incl.				
STRUC	Enhance cross-border polycentric development of spatial structure	'Spatialization' of CENTROPE (Wien-Bratislava-Győr-Budapest axis)	BRA, BUD, WIE, Brno, Győr	**Regional planning bodies,** national gov's, city admin's, planners		X		X	
	Coordinate national spatial planning strategies	Coordinate development axes of national importance (extending V 4+2)	AT, CZ, HU, SK, SI	**National gov's,** regional planning bodies, city admin's, planners		X			
		Implementation of CED-zone development strategy	All POLYCE states and metropolises	**National gov's,** regional planning bodies, city admin's, planners		X			
INFRA	Improve connectivity of capital cities	Develop high-ranked infrastructure between POLYCE metropolises	All POLYCE states and metropolises	**National gov's,** regional planning bodies, transport provision bodies, city admin's		X		X	
		'Interrail' for Central Europe	All POLYCE states	**Public transport providers**		X		X	

Field of action	Aim	Activity	Spatial entity	Actors	Fostering Comp. - Incl.				
		Improve (rail) access to metropolitan airports	LJU, PRA, WIE	**Public transport providers**, regional planning bodies, city admin's, planners	X				
		Improve public transport network	BRA, LJU (implicitly also other metropolises)	**City and regional admin's,** planners, regional planning bodies					X
ECONO	Facilitate information flows for knowledge economy	Contact points for knowledge-economy infrastructure and business sector	All POLYCE metropolises	**City admin's,** education and research facilities, business sector	X				
	Implement media cooperation of the five POLYCE cities	Common magazine '5' for the five POLYCE cities	All POLYCE metropolises	City admin's, **publisher,** planners, cultural institutions		X		X	
		Common TV-platform for Eastern Europe ('ARTE East')	All POLYCE states and metropolises	**Media company,** regional administrations		X		X	
	Foster higher education and R&D-capacity	CEEPUS - exchange programme for university students in Central Europe and Balkans	All POLYCE states and metropolises	**Higher education facilities,** CEEPUS administration		X		X	
ENVIR	Strengthen transnational bio-corridors	Alps-Carpathian Bio-corridor, Danube Bio-corridor	AT, HU, SK, SI	**National gov's, regional planning bodies,** city and regional admin's, planners			X		
	Increase energy safety and substitutability of energy carriers	Implement joint energy supply strategies	All POLYCE states (linked to EUSDR Priorities and V4 activities)	**Energy suppliers,** planners, city and regional admin's	X				
LIVIN	Promote culture as driving force of prosperity	POLYCE city cultural exchange	All POLYCE metropolises	**Cultural institutions,** city admin's		X			
IMAGE	Implement joint tourism and marketing strategies	Market CE cities as joint and interconnected tourist destination	All POLYCE metropolises	**Regional development agencies,** tourist agencies, city admin's		X			
		Establish informal city-network (EUROCITIES, Metrex, Opencities, …)	All POLYCE metropolises	**Chambers of commerce,** city admin's		X		X	
GOVER	Implement a common platform of the POLYCE cities	Further identify potentials for specialization and cooperation	All POLYCE metropolises	**City and regional admin's,** chambers of commerce		X		X	
		Common representation of Central European topics on EU level	All POLYCE metropolises	**City and regional admin's,** chambers of commerce	X				
	Coordinate spatial planning	POLYCE planning network	All POLYCE metropolises	**Regional planning bodies,** planners, city and regional admin's		X		X	
	Encourage PPPs on Central European level	Support CED-zone companies to participate in PPPs	All POLYCE metropolises	**City and regional admin's,** chambers of commerce, business sector		X			

Figure 57: Central European agenda: aims, activities, actors, implications

N.B.: Key actors or potential initiators of an activity are printed in bold

The shared strategies and projects proposed mostly derive from existing programmes and initiatives, namely the EU Strategy for the Danube Region, CENTROPE and the V2+4 Initiative. As such some of them may not involve all the POLYCE cities and metropolitan regions (e.g. the CENTROPE initiative, supra-regional bio-corridors spanning from the Alps to Carpathian Mountains or along the Danube, other initiatives may reach beyond Central Europe (e.g. CEEPUS higher education exchange platform). This makes the recommendation of shared POLYCE activities quite open and flexible to actual circumstances. The activities proposed in the five cities cover all fields of action. In certain fields, some of the actions expand beyond the scope of power and responsibility of the POLYCE partners: activities dealing with (macro-regional) spatial structures, infrastructures, environment and energy have to be tackled by national governments/ministries or even the EU.

The actions that can be effectively undertaken by actors on city and/or regional level deal with rather "soft" development factors: knowledge, living and culture, image and identity, governance. Unlike the "hard" investments in physical structures and infrastructures that are often already involved in the existing strategies and plans, the "soft" investments in human capital, knowledge and identity should be the focus of activities in a potential POLYCE network. The "soft" investments typically require involvement of both public and private actors requiring the cooperation of various institutions. The key role for certain activities in the field of spatial structure is assigned to the national governments (in the case of Wien to the Bundesländer), which are responsible for the management and coordination of spatial change. Existing varieties in administration patterns and responsibilities will require further capacities to overcome formal discontinuities.

6.3.4 A Central European Development Agenda: Recommended Shared Activities

The potentials for cooperation among the POLYCE metropolises were found particularly in the fields of knowledge economy, management of transportation and metropolitan governance. Cooperation and institutional capacity of administration and spatial planning are prerequisites for the recommended activities, which makes all issues referring to governance of prime importance. In that field two essential aims were identified that lie within the responsibility of administrations of the cities and their metropolitan regions:

- Incorporating a common POLYCE platform – inspired by the G4 network of the Dutch metropolitan cities of Amsterdam, Hen Haag, Rotterdam and Utrecht. The first task of the platform, which should include the cities, regional administrations and development agencies, will be to clarify potentials for specialization and cooperation and, consequently, to set the agenda for shared strategies of the POLYCE cities. The platform shall represent the shared interest of the POLYCE network towards EC institutions and join relevant European initiative (e.g. Cities for Cohesion), similarly as the G4 network has done it. In the process of establishing the POLYCE platform the experiences of the CENTROPE initiative should be considered, keeping in mind that it refers to a different model of polycentricity and spatial scale.
- Coordinating spatial planning of the metropolitan regions – both within the regions and among them. Since the conditions in the five metropolitan areas are highly different, the experience on the coordinated planning should be transferred from Wien and Bratislava to the other partners in the initial stage. The organizational pattern for particular metropolitan regions should be adjusted to specific local conditions. Inter-metropolitan cooperation should start from informal networks (e.g. organizing regular meetings of stakeholders) and develop to a more robust structure. On the national level, the network should be linked to the Visegrád group and extended to Austria and Germany within the framework of the Danube Region.

The POLYCE metropolises should also act as facilitators for information exchange and business contacts within the POLYCE network. As shown in the table above, many of these activities cannot be realized by public institutions, but need participation of the private sector. Still, public actors can incite or foster projects by providing financial or organizational support. The collaboration of administrative units and private businesses in public-private partnerships seems to be a possible way

to integrate a variety of relevant actors and to pool all available resources. This approach seems to be of high importance in the fields of knowledge economy, sustainable energy, living and culture, image-making and marketing. The recommendations mentioned above mainly include “soft” activities to create shared identity and consciousness by means of information, media, culture and education. The effects of these efforts, however, are expected as externalities for economy, especially in the fields of tourism, energetic safety and environmental quality. The table above suggests some examples but it is by no means exhaustive.

The “hard” infrastructure activities affecting accessibility of the Central European metropolitan zone have to be planned and implemented on the supra-regional level by the coordination of national spatial planning strategies and (in the case of Wien & Bratislava) cross-border polycentric development. The designated activities will have multiple effects on various themes and fields of action. They will contribute both to the internal cohesion and integration of the five metropolitan regions and to the competitiveness of the Central European zone. Besides, the networking process itself will strengthen the links among the POLYCE metropolises by inducing collective learning, the exchange of experiences and the identification of best practices.

7 Conclusions

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The basic objectives of POLYCE are defined in the introduction to this report (chapter 1). Two main goals were pursued with this research:

- Identify the importance of the mutual links between the processes of metropolisation and polycentric development
- Elaborate the challenges and perspectives of future urban development

7.1 Options for Policy Development

Based on its specific methodology through the combination of quantitative and qualitative methods POLYCE research provides the following conclusion on the base of the empirical research:

Metropolitan size and its preconditions

- In a non-traditional explanation of urban growth based on a micro-economic analysis of influencing factors there is clear evidence that (1) a small group of factors are determining costs and benefits of metropolitan size and that (2) metropolitan power functions as well as polycentricity do have a positive impact on metropolitan size. Polycentricity is identified to be relevant both within the metropolitan regions and between them. In other words, metropolitan functions and polycentricity have a decisive positive impact on demographic growth of metropolitan areas and not just of the core cities, whereas trends of sprawl are identified to have a negative impact.
- There is clear evidence that metropolitan growth affects the process of urbanization and accelerates both economic and demographic transition processes according to the specific profiles of the metropolises and the actual activities of relevant stakeholders.

Polycentricity – its understanding and meaning for metropolitan development

- The concept of polycentricity covers different aspects at different spatial levels. The empirical analysis shows clear differences in morphological and relational polycentricity and a specific pattern of functional relations in terms of research and firm networks, which underlines the distinctive characters of the five metropolitan regions and the unequal intensity of interaction and co-operation with each other.
- Empirical findings identifying less polycentric structures in the metropolitan regions of Budapest, Praha and Wien go along with findings on urban sprawl as a risk and potential cost factor. Hence, a lack of polycentric development will negatively influence further demographic or economic growth. However, it is not evident that this risk can also be regarded as a barrier for the establishment of further metropolitan functions.

Metropolitan profiles indicating challenges of smart metropolitan development

- Metropolitan profiles were elaborated to show the differences and commonalities between the metropolises. The approach allows for a comparison of one metropolis against specific others, and the comparison with the 'average metropolis'. Metropolitan profiles are elaborated on the aggregate-level of five development characteristics with underlying factors that are again defined by groups of indicators.
- Differences between metropolitan profiles are easily to observe – even in comparison of the five POLYCE metropolises. They indicate (1) that processes of urbanization, economic restructuring, socio-demographic change and metropolisation are having different impacts on the metropolitan level and that (2) a high quality of living characterizes more or less all of them. At the same time there is a clear specialization in other fields of metropolitan development, indicating specific assets for positioning and future strategic endeavors.

Underlying factor values show convincingly that metropolises differ in their competitive and socially inclusive features. Hence, smart metropolitan development has to be challenged.

- Strengths and weaknesses in the various fields of urban development (outlined as characteristics and factors) need to be discussed with stakeholders to support common sense in future perspectives regarding a smart development.

Strategic endeavors supporting smart metropolitan positioning

- Based on the analysis of planning documents and corresponding strategic projects the local governance approaches for the five metropolises are described regarding their strategic endeavors steering the process of metropolisation and polycentric development in the metropolitan region.
- Not surprisingly, results show that the strategic discussions and recent approaches are rather different in comparison of five metropolises – expressing specific conditions of metropolitan development in its respective administrative-political system and its experiences in an increasingly competitive environment. Hence, Vienna - as the most experienced city with changing conditions through the integration process and through its strong administrative-political position as an own federal state – initiated multifaceted traditional planning as well as strategic initiatives aiming to steer metropolitan development or to position itself in a European context. At the same time, all other stakeholder metropolises show – besides traditional planning approaches - a more or less clear strategic effort to discuss and implement polycentric development in the metropolitan region which is not as dominant in the Vienna case.
- Different strategic efforts were the outcome of the discussion with respective stakeholders indicating that there is no clear vision up-to-know to be identified and elaborated. Hence, the need for an intensified strategic endeavor regarding smart metropolitan development balancing competitiveness and social inclusion within every metropolitan region is very obvious.
- With regard to relational polycentricity on the micro (intra-regional) level, the development of networks between the core cities and their surrounding areas can be financially supported by existing “Convergence” or “Regional Competitiveness and Employment” objective programmes. In some cases, however, the programme area does not correspond to the Functional Metropolitan Area or even the Metropolitan Region, which might be a serious obstacle for many integrative initiatives. In recognizing this fact, the cities should reconsider the spatial delimitations of the programme areas in the forthcoming financing period, considering functional relations more than administrative borders.

Strategic endeavors for polycentric development in the CED-zone as part of the Danube Region

- Empirical results showed that functional and strategic polycentricity (as supporters of territorial cohesion in the CED-zone) are not yet on top of the agenda of stakeholders.
- Discussions even showed that different foci and strategic activities are regarded as being of high importance. All metropolises regard themselves as important centers or hubs in their own geographical context towards outside neighboring regions and countries. Obviously, a territorially cohesive development within the CED-zone needs new and more strategic endeavors than activities improving accessibility through infrastructure investments.
- Strategic efforts should concentrate on a more specialized cooperative approach between Bratislava and Wien because of their geographical situation which already lead to manifold relations but only few common strategic activities in the frame of or in addition to the CENTROPE-initiative. Other strategic activities are mentioned which not necessarily will include all five metropolises but only bi-lateral collaboration.
- Very obviously, some specific proposals are less related to concrete multilateral activities implementing functional relations in the economic sphere but emphasize the necessity of the improvement of relational capital (language, new administrative or strategic capacity) between actors from the five stakeholder metropolises: This includes (1) improving of contacts and accessibility to information, (2) transforming information into valuable

knowledge about partner cities as output of continuous and systematic contact facilities, (3) producing a broader basis of truth and relational capital and (4) improving the common lobbying for interests of CED-zone partners within the EU.

- The tight historical, social and economic ties of the five metropolises could be a proper base for further cooperation between public institutions, society and private businesses. These relations can be extended and deepened by different cross-border networking projects, which can well be subsidized within existing EU-Regional Policy Programmes: in the current period (2007-2013) the Programmes under the objective 'European Territorial Cooperation' (ETC) can still be exploited for reasonable cooperative initiatives. Since the majority of existing cross-border cooperation programmes do not cover the capital regions, the development of bilateral relations can rather be supported by the interregional co-operation programme, which aims at fostering all kinds of city networks. In that context the URBACT II-programme, which is especially directed at information exchange of cities, should be considered. Furthermore, the transnational co-operation programme 'Central-Europe', which covers not only the five cities but also their hinterlands could be a suitable platform for cooperation projects in all relevant issues. Since the programme area also includes Poland, Eastern and Southern parts of Germany and the North of Italy, this programme places the POLYCE cities in a wider spatial context, connecting them to cities as Berlin, Warsaw, Munich and Milano, which are highly relevant partners for the POLYCE region. Therefore the five cities and their national governments should seriously aim at maintaining and strengthening this 'Central-Europe' co-operation programme in the forthcoming financing period, trying to act as the core of this dynamic region.
- Activities in strategic form should be based on the EUSDR (European Strategy for the Danube Region), starting from the five metropolises as part of the Danube Region. Obviously a promising and stimulating attitude of the five to act as important drivers and initiators of specific issues of development already exists. However, the five stakeholder cities obviously see their responsibility in a wider European Danube region context.

7.2 Options for further research

7.2.1 Data limitations

The results presented above and in the scientific report indicate that empirical research in specific fields of metropolisation and polycentricity is constrained by the lack of relevant data. These data limitations are an obstacle for tackling some of the questions of this project empirically.

- **Availability of cross-border relational data**: availability is rather poor as the basis for empirically analyzing relational polycentricity. There is no sufficient information source on capital flows (e.g. Foreign Direct Investments), migration (on the regional level) or the transport of goods. The data used in this field of research (GaWC, CORDIS, Google) can be considered as ambitious efforts to define proxies, but are far from giving a comprehensive picture on inter-urban relations and do not seriously allow to make significant statements on changes over time.
- However, future work may include a measure of the first and second types of polycentricity (micro level: presence of multiple job centers; meso level: ratio of wealth production within the FUA with regard to lower rank areas outside the FUA), provided a cross-sectional data set with data on both the first and the second kind of polycentricity is made available.
- **Intra-metropolitan scale of metropolisation and polycentricity**: availability of reliable data is much better due to national data sources. Therefore, a lot of relevant indicators describing the regional conditions can be defined on the micro level. The problem, however, lies in the different survey methods of these data, which partly limits their comparability.
- **Lack of data on the process of metropolisation**: Most of the data are covering the time period 1998-2008 - as the most prosperous years for European cities - before the period of recent economic crisis. Hence, data should be from recent years. Selected indicators are

showing more competitive nature of metropolitan development, some of them are showing inclusive development - some are the indicators of both: Data has to be enhanced according to recent topics of research and policy. For instance the process of metropolisation could not be described across several years with valid and comprehensive information.

Hence for any further (and complex) comparative analysis of European city regions and metropolises - the most desired situation will be to have an access to data covering not only NUTS 2 regions but also NUTS 3 regions (corresponding to LUZ level) as well as LAU 2 / LAU 1 levels as building blocks for FUA/MEGA spatial level. This is also one of the recommendations from the POLYCE TPG to - ESPON, URBAN AUDIT, EUROSTAT – in order to inter-link their data – and improve, establish and maintain comparable database that can be used not only by urban researchers, but also by stakeholders in European metropolises to formulate and implement their urban policies, spatial planning initiatives and strategic projects, using benchmarking approach as an instrument of efficient urban and regional management and territorial governance. (see chapter 4.10)

- **Harmonization of databases**: a fundamental step to harmonize metropolitan data from different sources has already been done by Eurostat in launching the Urban Audit database and in organizing data in the ESPON database. These efforts should be continued by defining general guidelines for data collection, preparation and presentation, which should be applied by all further activities on data production and collection.
- **Harmonizing territorial concepts**: harmonizing the existing territorial concepts used by Urban Audit and in different ESPON projects is urgent to make data comparable. The goal of these efforts should not only consist in improving data availability for further research, but especially in preparing a suitable source of information, which can easily be accessed by stakeholders, decision-makers, investors or other relevant actors. The HyperAtlas, which is based on the multi-scalar territorial analysis concept, can be seen as a promising example of such an analytical tool allowing metropolitan actors to get comparable information on their city/region on different spatial scales.

7.2.2 Issues of further research

Due to the abovementioned data limitations and the limited timeframe of the targeted analysis many questions could only be tackled on a superficial level, which means there are still a lot of potential activities for future research.

First the process of metropolisation has to be analyzed in more detail. This process, both morphological as well as functional, is in fact a way to describe the spatial organization being increasingly centered around large cities (Elissalde, 2004; Leroy, 2000). Here we focus only on the second definition of metropolisation, which is strongly connected with the work described in Sassen (2002). (see chapter 3.2.2)

Another element here taken into account related with the positive effects of pure density because agglomerative forces are assumed to imply more indirect effects. Hence, a relatively recent wave of quantitative assessments found that pure density may offer a consistent explanation of the variation of productivity levels across space (Ciccone and Hall, 1996). (see chapter 3.2.2)

As a second aspect the issue of relational polycentricity on all spatial scales needs further investigation. The description and analysis of all kinds of flows, co-operations and networks both between the five POLYCE cities and with other European or global cities can definitely be extended and deepened in order to explore existing social and economic ties and to get evidence on driving forces and mutual interrelations. In this context the question of the relative importance of the POLYCE network in comparison to other networks has to be approached in more detail: as long as the relations to the other POLYCE cities play a rather negligible role, the idea of fostering an integrated region has to be questioned basically.

As was found during the implementation of the project, medium-sized cities seem to be an important connecting element of the Central European metropolises analyzed within this research. The assumption is that they might play an important role concerning territorial cohesion, particularly

when related to concepts of polycentricity. Therefore, an in-depth research of the role of medium-sized cities as supporters or even foundation of polycentric European urban networks is suggested.

Regarding the delimitation of metropolitan areas, more sophisticated methods could be applied for measuring the morphological structure and functional relations within the metropolitan regions: the spatial distribution of population and employment on the one hand and the analysis of commuter flows on the other could presumably be extended to other factors in order to get a more stable picture of functionally integrated metropolitan areas and regions. Additionally, the indicators used in the metropolitan profiles should be more oriented towards 'soft' location factors (e.g. cooperative networks, governance approaches, relational capital), which go far beyond classical economic or demographic conditions.

The role of the city administrations as project partners should be defined more clearly from the beginning, as it has not always been clear to what degree they are obliged to provide the research group with institutional information, organizational support, or empirical data. Furthermore the participation of non-governmental organizations or institutions should be intensified in order to consider a broader range of opinions, goals and interests in the whole process. In this context a trade-off between the scope and depth of research could be discussed: although the extension of participating cities would reduce the accuracy of the results, it would improve the comparative aspect of the research.

Time pressure was a general problematic factor in conducting this research. This point is even weightier, when processes integrating a variety of local stakeholders are a methodological precondition. As is widely acknowledged, implementing such governance approaches is a long-lasting and therefore time-consuming task. In that sense targeted analyses would need far more time, if integrative approaches shall not always fail to go into sufficient depth.

8 Figures

9 Bibliography

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10 Annexes to the Scientific report

10.1 Annex I: Publications of the TPG members resulting from the implementation of the Targeted Analysis

Camagni, A., Capello, R., and Caragliu, A. (2012): "Equilibrium vs. optimal city size: theoretical reflections and an empirical investigation", paper presented at the 51st Congress of the European Regional Association, Barcelona, Aug. 30-Sep 3, 2011.

Giffinger, R. (2010): "Metropolitan development in a cross border region: Challenges of strategic efforts in CENTROPE"; Presentation at 2010 Annual Meeting of AAG (Association of American Geographers), Washington DC; 14th April, 2010 – 18th April, 2010.

Giffinger, R. (2010): "Challenges of polycentric development in the Danube Region: A plea for a regionally differentiated multilevel approach"; Keynote: Symposium BOKU - Danube Region Strategy - Basic Conditions, Wien; 2nd December, 2010.

Giffinger, R. (2011): "Polycentric development in CEE; Presentation at 10th Meeting of the Partnership for improvement of Danube Infrastructure and Navigation (10th PIDIN Meeting), Wien; 1st April, 2011.

Giffinger, R. (2011): "European Smart Cities: the need for a place related Understanding"; Keynote: Creating Smart Cities, Edinburgh Napier University; 30th June, 2011 – 1st July, 2011.

Giffinger, R. (2011): "Smart Cities in a Territorial Understanding"; Presentation at Conference "Smart Planning for Europe's Gateway Cities", IX Biennial of European Towns and Town Planners, Genova, Italy; 14th September, 2011 – 14. September, 2011.

Giffinger, R. (2011): "Metropolisation of Vienna: Challenges of cooperative strategic efforts in CENTROPE"; Workshop "Comparative metropolitan development: Copenhagen - Vienna", Copenhagen, Denmark; 21st September, 2011.

Giffinger, R. (2011): "Balance zwischen Innovationsdruck, Wettbewerbsfähigkeit und sozialräumlicher Kohäsion."; Keynote: "twenty.twenty: The City - Networking with Things, organized by A1 and The Gap, Wien; 19th October, 2011.

Kramar, H. and Kadi, J. (2012): "Implementing the Concept of Relational Polycentricity: Firm and Research Networks in CEE Capital Cities." In: Studia Regionalia, Warsaw: Polish Acedemy of Science (to be published)

Pichler-Milanovic, N. and Zavodnik-Lamousek, A. (2011): "ESPON 2013 POLYCE Metropolisation and Polycentric Development in Central Europe"; Presentation: Is there space for smart, sustainable and inclusive growth? ESPON and ESPON – INTERSTRAT national event, organized by the Ministry of Environment and Spatial Planning of RS (MOP) and ESPON National Contact Point , Ljubljana, Slovenia, 4th October, 2011.

Maier, K. and Sykora, L., Mulicek, O. (2011): "ESPON 2013 POLYCE Metropolisation and Polycentric Development in Central Europe"; Presentation at National Info Day on ESPON organized by the Ministry of Regional Development, Praha, Czech Republic, 21st February, 2011.

Maier, K. and Sykora, L., **Mulicek, O.** (2011): "ESPON 2013 POLYCE Metropolisation and Polycentric Development in Central Europe"; Presentation: organized by the Ministry of Regional Development, Praha, Czech Republic (invited), 20th September, 2011.

10.2 Annex II: Conceptual Review of "Inclusive Growth"

Authors: Christophe Sohn, Sabine Dörry

SUMMARY

Inclusive growth appears in the "First ESPON 2013 Synthesis Report: New Evidence on Smart, Sustainable and Inclusive Territories" (2010) as one of the very central buzz words and could therefore be assumed an innovative concept.

The concept of inclusive growth arose from the debate on the Millennium Development Goals (MDGs) (United Nations 2000, 2005) where academic scholars and policy researchers defined inclusive growth as an essential condition for poverty reduction. It directly links the macro (national structural transformation) with the micro (economic diversification and competition) determinants of economic growth (Ianchovichina and Lundstrom 2009). Important key phrases are equity (participation in & benefit-sharing of growth by all segments of society), equal access (to the opportunities for all segments of society), and protection (in market and employment transitions). Overall, inclusive growth is both an outcome and a process (UNDP website; Ali and Hwa Son 2007, p. 12).

The authors of the First ESPON 2013 Synthesis Report followed a central request of the ESPON programme when they prominently included the term 'inclusive growth' in their report. They were asked to connect or embed wherever possible and meaningful the results of the so far conducted ESPON projects (in)to the EU's political vision expressed in the EUROPE 2020 strategy (European Commission 2010). Hence, in the case at hand, inclusive growth formulates a (political) vision of the EU.

CONCEPTUAL FOUNDATIONS

Within the MDGs, the concept of inclusive growth depicts a new, enlarged perspective on development strategies in order to reduce poverty throughout the world. In their documents, analyses, and strategy formulations, a large number of aid agencies, internationally operating non-government organizations and other development partners but also academic and policy researchers have been sharing and contributing to the enhancement/advancement of the concept of poverty reduction towards a concept of inclusive growth (The Central Committee of the Communist Party of Viet Nam 2001; Asian Development Bank 2007; Planning Commission of India 2006; Roemer 2006; State Council of China 2006; UNDP 2007).

The literature on inclusive growth suggests a key interest in channeling policy resources to the deprived, poor people in a comprehensive effort to reduce poverty (Ali and Hwa Son 2007; Ali and Zhuang 2007). The most ample definition of inclusive growth we have found provide Ali and Zhuang (2007, pp. 10-11, see Text box 1). According to them, inclusive growth…

> "...means growth with equal opportunities. Inclusive growth therefore focuses on both creating opportunities and making the opportunities accessible to all. Growth is inclusive when it allows all members of a society to participate in and contribute to the growth process on an equal basis regardless of their individual circumstances.
>
> The importance of equal opportunities for all lies in its intrinsic value as well as instrumental role. The intrinsic value is based on the belief that equal opportunity is a basic right of a human being and that it is unethical and immoral to treat individuals differently in access to opportunities. The instrumental role comes from the recognition that equal access to opportunities increases growth potential, while inequality in opportunities diminishes it and makes growth unsustainable, because it leads to inefficient utilization of human and physical resources, lowers the quality of institutions and policies, erodes social cohesion, and increases social conflict. [...]
>
> In sum, an inclusive growth strategy encompasses the key elements of an effective poverty reduction strategy and, more importantly, expands the development agenda. A poverty reduction strategy based on a single and absolute income criterion ignores the issue of inequalities and the risks

associated with them. In contrast, an inclusive growth strategy addresses circumstance-related inequalities and their attendant risks. Inclusive growth is not based on a redistributive approach to addressing inequality. Rather, it focuses on creating opportunities and ensuring equal access to them. Equality of access to opportunities will hinge on larger investments in augmenting human capacities including those of the poor, whose main asset, labor, would then be productively employed."

Ali and Zhuang, 2007, pp. 10-11, emphasis by Dörry/Sohn

Text box 1: definition of inclusive growth according to the global developmental policy discourse

Ali and Hwa Son (2007) go one step further and operationalise the definition of inclusive growth. They provide a statistical tool – the social opportunity function – to actually measure inclusive growth as an outcome of a national economy. Using the example of the Philippines, they claim 1) to have developed a dynamic tool, 2) to being able to influence the inclusiveness of growth for a country by adjusting different statistical parameters, and 3) hence to being able to advice national development strategies.

MEANING OF INCLUSIVE GROWTH ACCORDING TO 'EUROPE 2020'

Very similar to the understanding of inclusive growth in the context of developing countries, the EU formulated its vision of Europe's social market economy in the aftermath of the global economic crisis. Besides smart and sustainable growth this vision is based on inclusive growth, too. The identified three specific priority strategies – smart, sustainable, and inclusive growth – ought to support and guide the EU's society towards a sustainable future.

Besides tackling the issues of the population's ageing and gender equality, inclusive growth in the EUROPE 2020 vision also addresses (European Commission 2010, p. 16) a particular spatial perspective (see Text box 2):

"Inclusive growth means empowering people through high levels of employment, investing in skills, fighting poverty and modernizing labor markets, training and social protection systems so as to help people anticipate and manage change, and build a cohesive society. It is also essential that the benefits of economic growth spread to all parts of the Union, including its outermost regions, thus strengthening territorial cohesion. It is about access and opportunities for all throughout the lifecycle."

European Commission 2010, p. 16, emphasis by Dörry/Sohn

Text box 2: definition of inclusive growth according to EUROPE 2020

The overall goal of inclusive growth in the EUROPE 2020 vision is complemented by a number of so called flagship action programmes, comprising concrete projects which basically translate the goals on the EU level into tangible outcomes on a national level and bring them to life.

THE TERM INCLUSIVE GROWTH IN THE 'FIRST ESPON 2013 SYNTHESIS REPORT'

- ESPON had requested the authors of the study to answer the question: To what extend are the ESPON project results able to contribute to the term 'inclusive growth' highlighted in the programmatic strategy/vision of EUROPE 2020?
- Thereupon, the report's authors geared to the core statements of 'inclusive growth' used in the EUROPE 2020 strategy and tried to conjoin its dimensions with the so far available ESPON project data, conclusions, and insights. With regard to the Synthesis Report this is why 'inclusive growth' is that strongly amalgamated with the various fields of social, political, energy, and spatial 'cohesion challenges'.
- Inclusive growth as it is applied in the report at hand is not primarily a scientific-based concept. Rather, it is vaguely defined and in fact understood as a political agenda/vision for

the next – challenging – decade(s). Hence, inclusive growth is used to connect key socio-economic expectations on the EU level with empirically defined spatial/territorial findings of a number of past ESPON projects.

Referring to the EUROPE 2020 vision, the ESPON report's introduction states that 'cohesion' and 'inclusion' are key territorial aims. The report highlights that in order...

> "...to strengthen the competitiveness of Europe, the development potential of all regions needs to be utilized. It is not sufficient to rely on the strength of cities and regions that are successful already. … Consequently, development strategies for Europe need to be inclusive."
>
> ESPON 2010, p. 55, emphasis by Dörry/Sohn

Knitting the inclusive growth aspect of EUROPE 2020 and key results from ESPON projects together, the specific ESPON projects referred to in the report are the ones on territorial diversity (TEDI), demography (DEMIFER), cross-border regions (METROBORDER), energy (RE-RISK), agglomeration economies (CAEE), convergence regions (SURE), islands (EUROISLANDS), and rural areas (EDORA) (ESPON 2010, p. 81).

10.3 Annex III: The Polycentric System of Central Europe

Ludek Sykora, Ondrej Mulicek, Petr Kucera, Branislav Machala

10.3.1 Zipf Regression Function

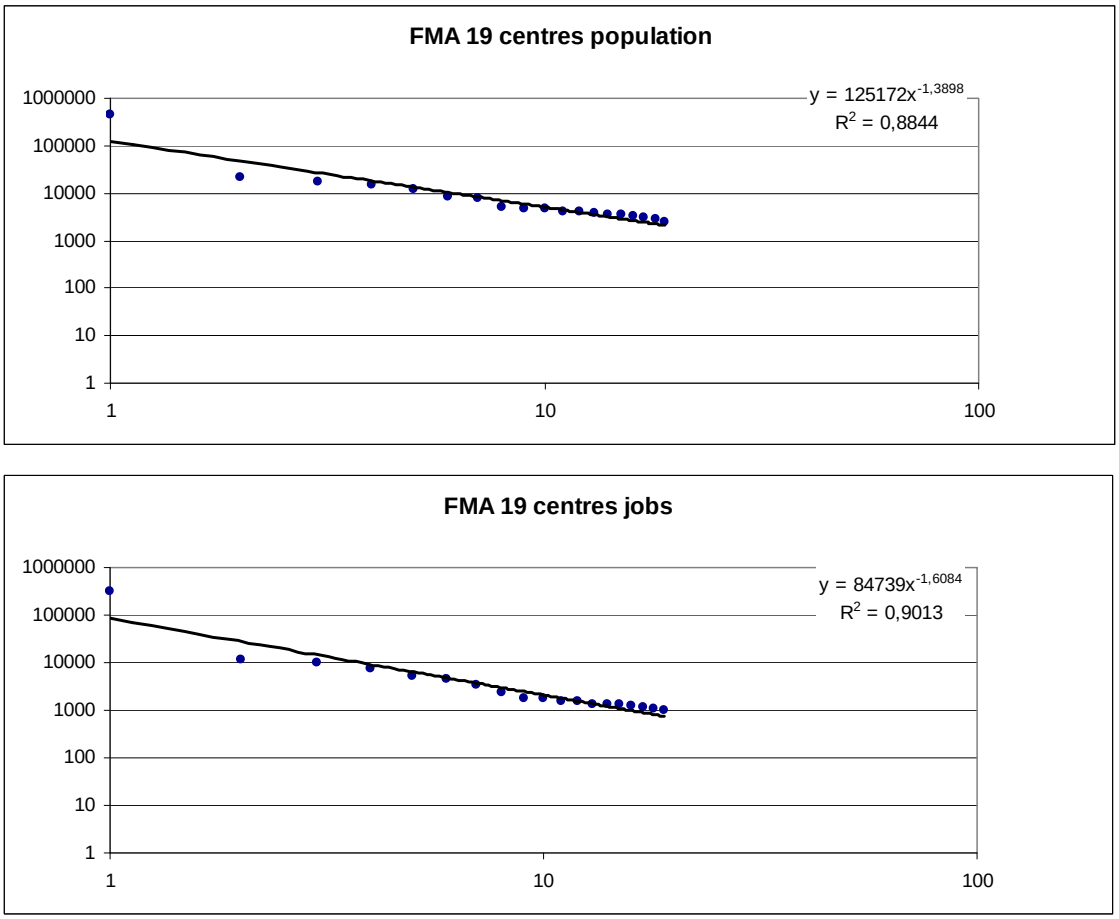
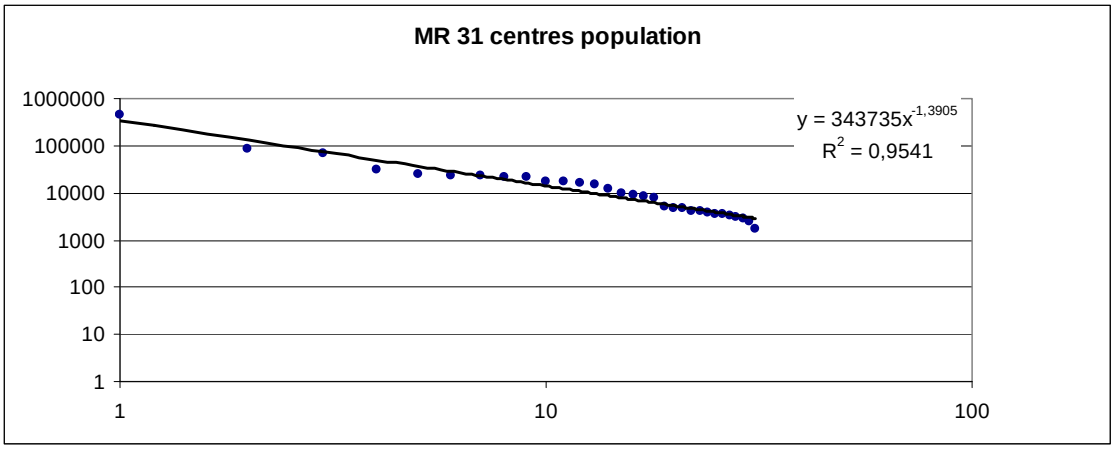


Figure 1: Bratislava Functional Metropolitan Area: Zipf regression function



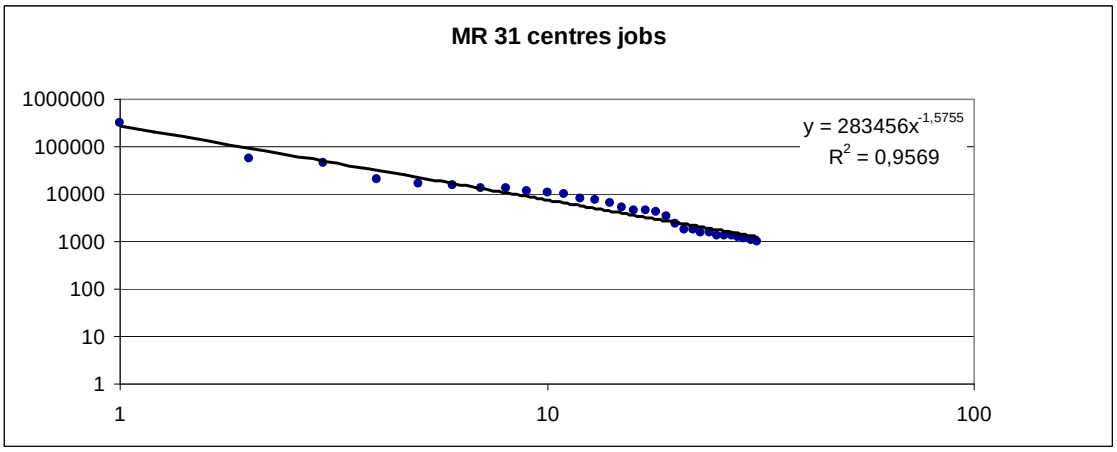
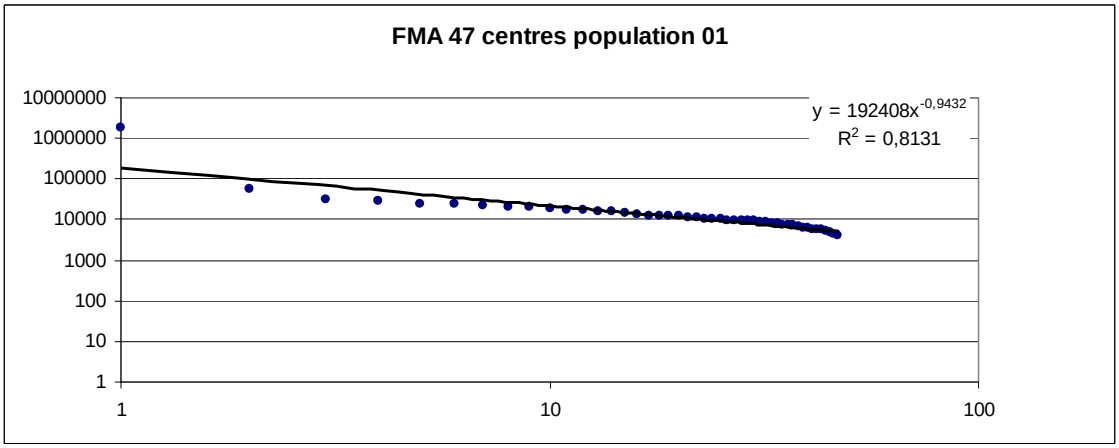


Figure 2: Bratislava Metropolitan Region: Zipf regression function



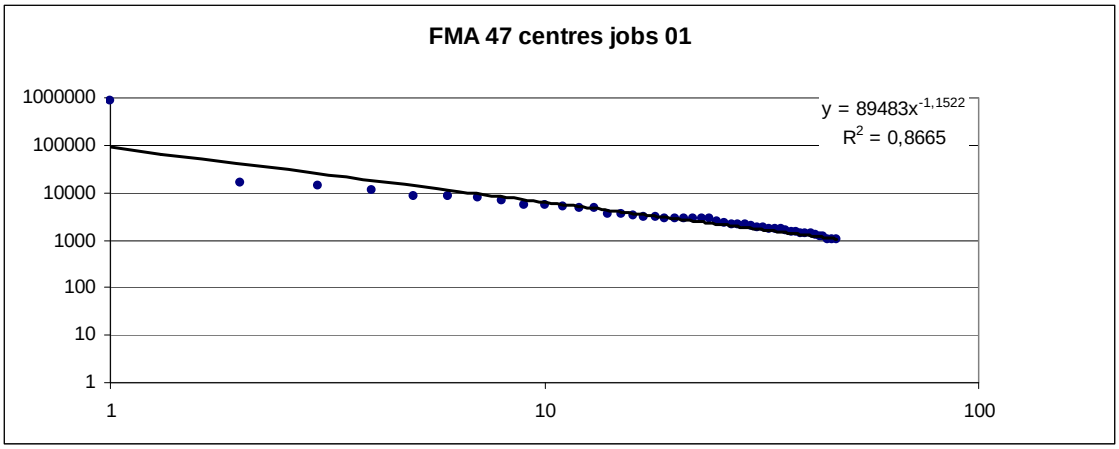
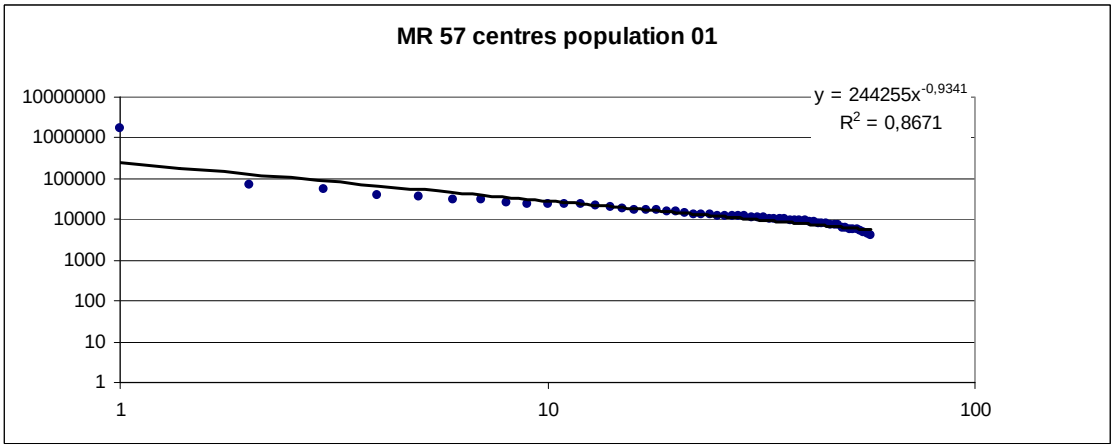


Figure 3: Budapest Functional Metropolitan Area: Zipf regression function



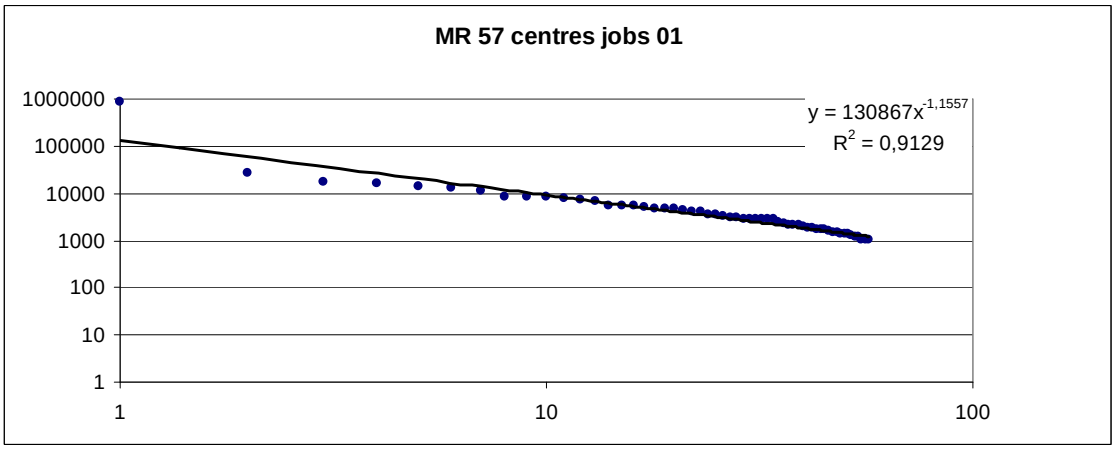
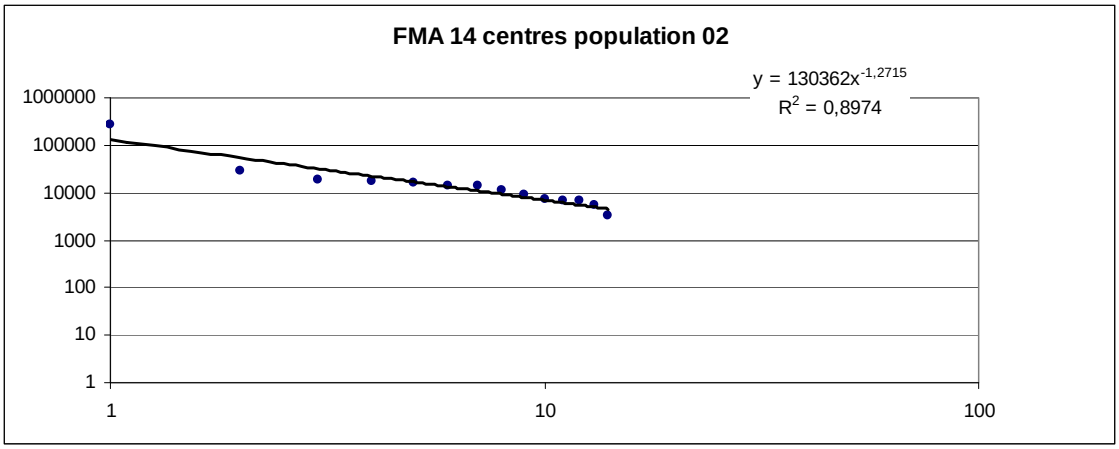


Figure 4: Budapest Metropolitan Region: Zipf regression function



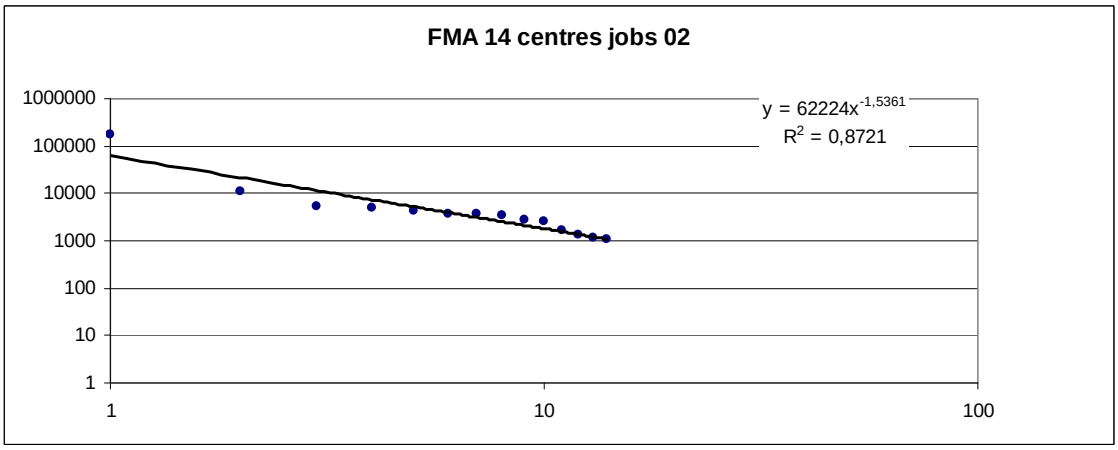
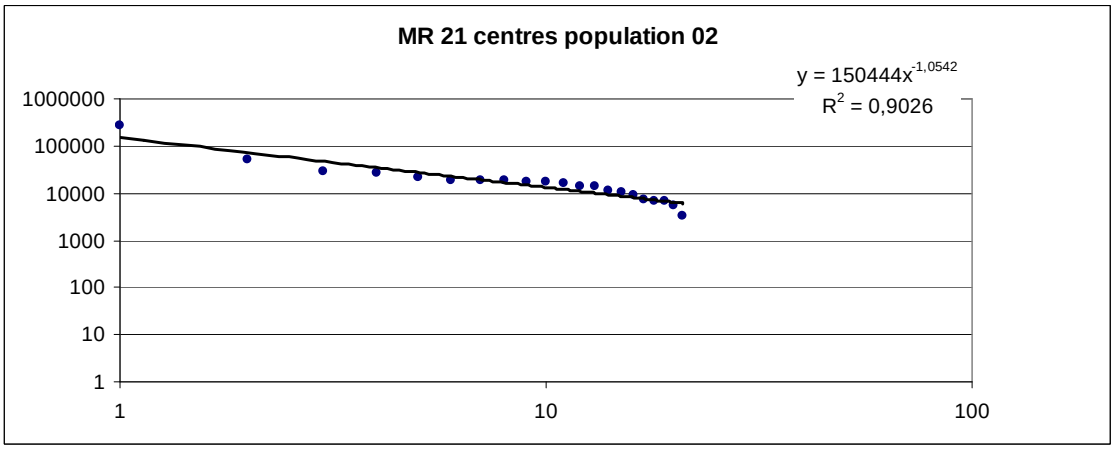


Figure 5: Ljubljana Functional Metropolitan Area: Zipf regression function



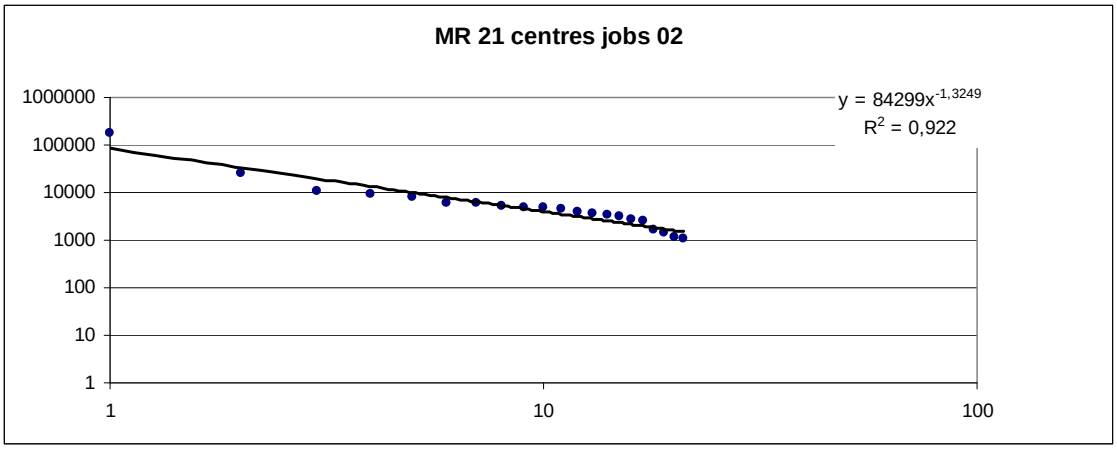
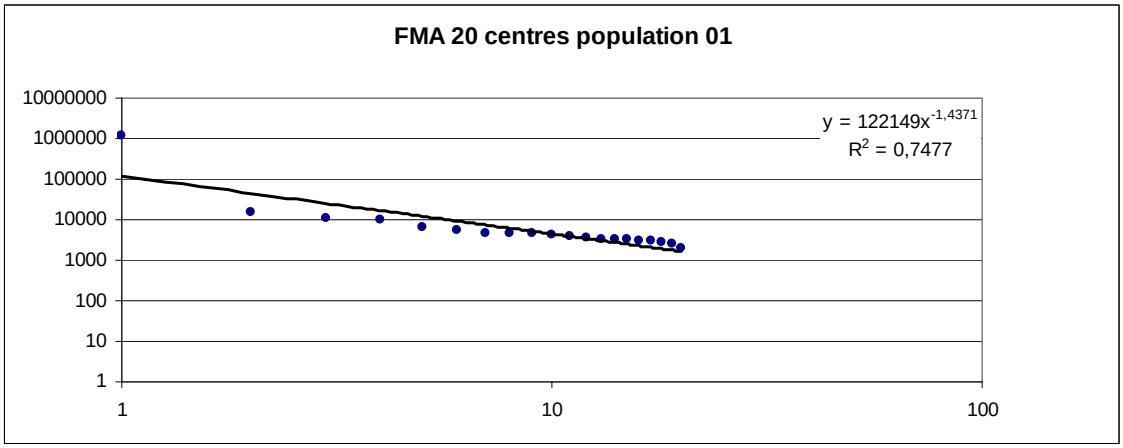


Figure 6: Ljubljana Metropolitan Region: Zipf regression function



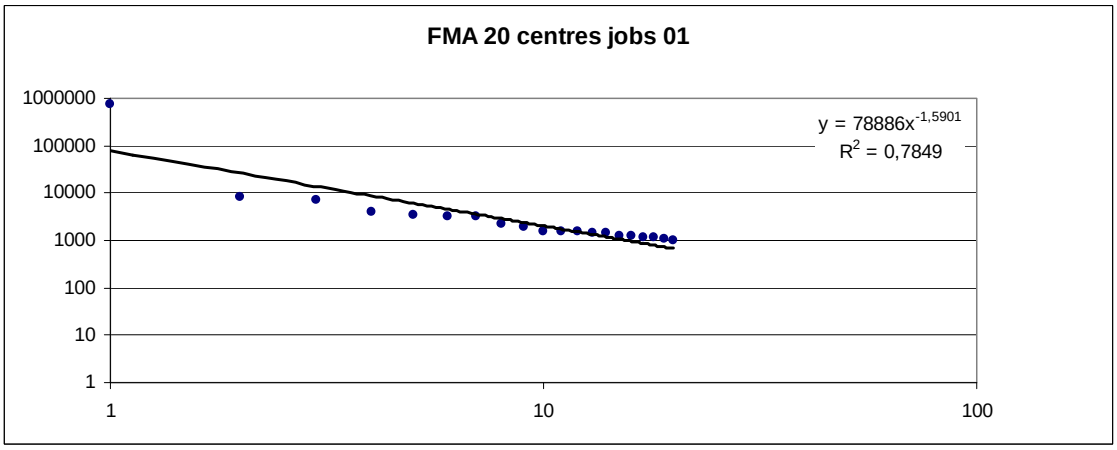
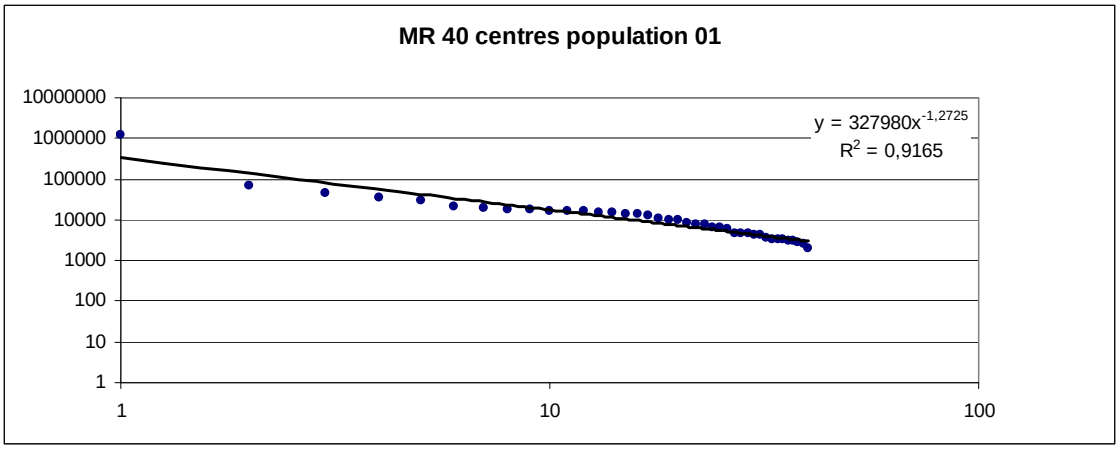


Figure 7: Praha Functional Metropolitan Area: Zipf regression function



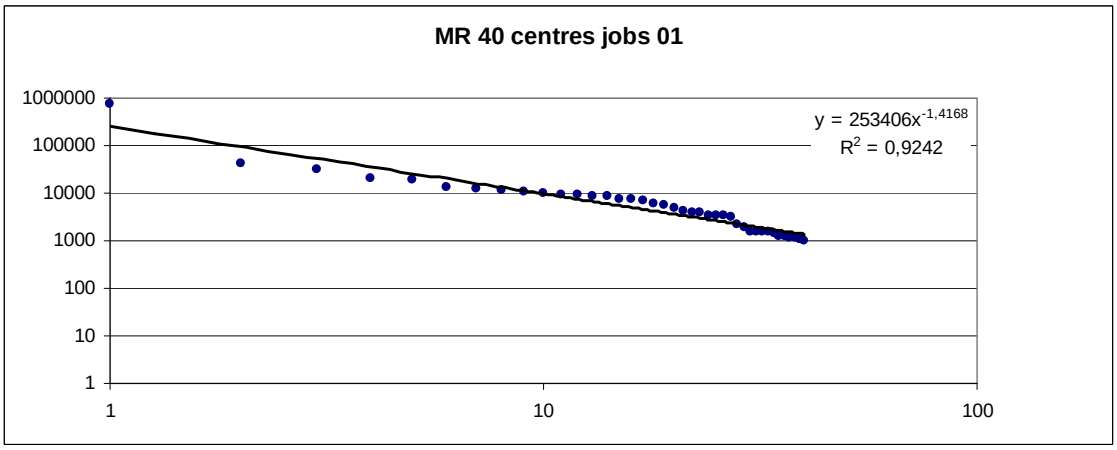
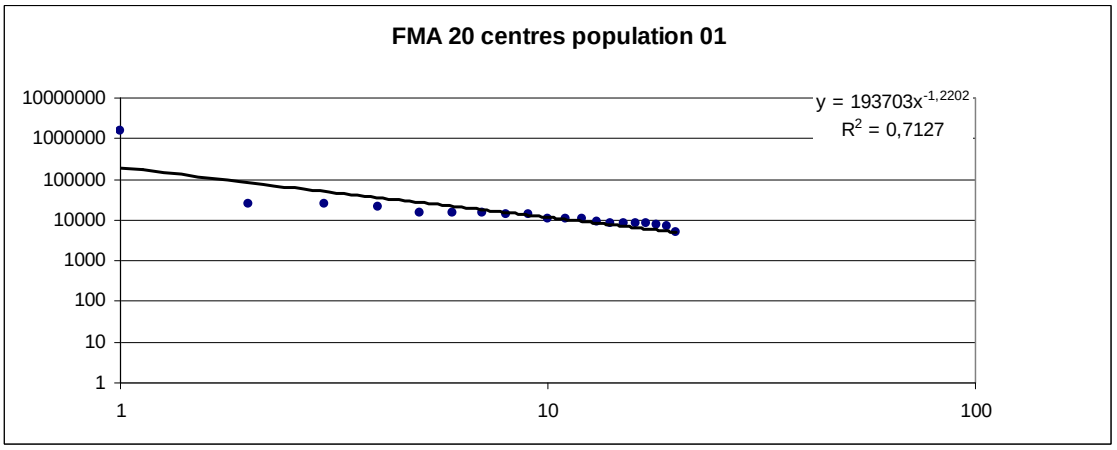


Figure 8: Praha Metropolitan Region: Zipf regression function



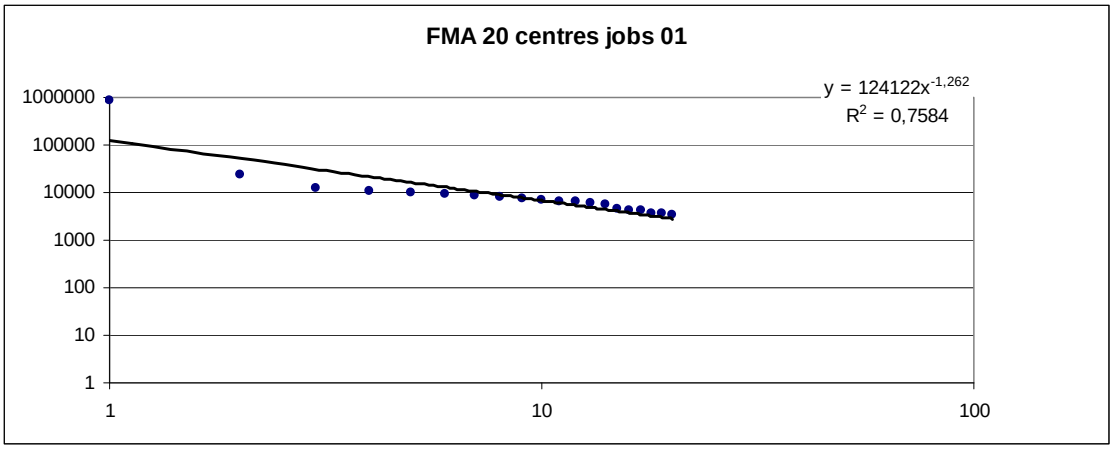
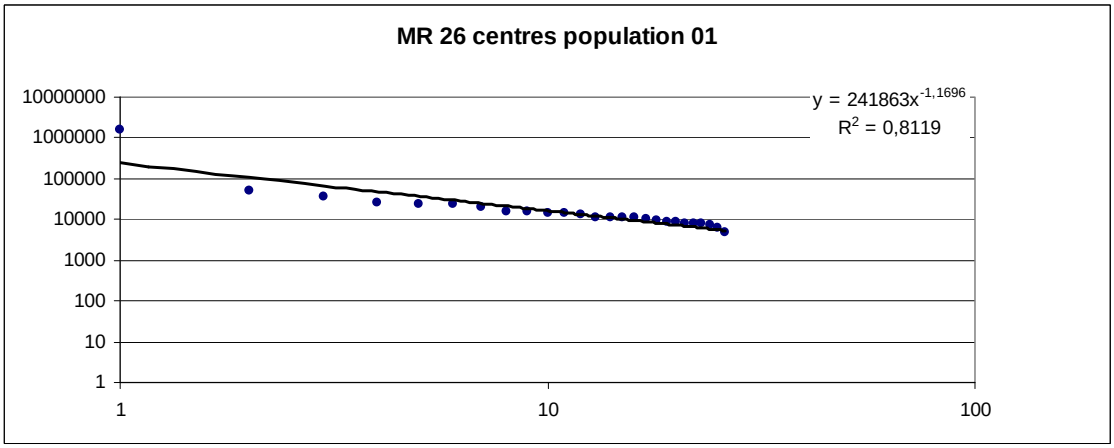


Figure 9: Wien Functional Metropolitan Area: Zipf regression function



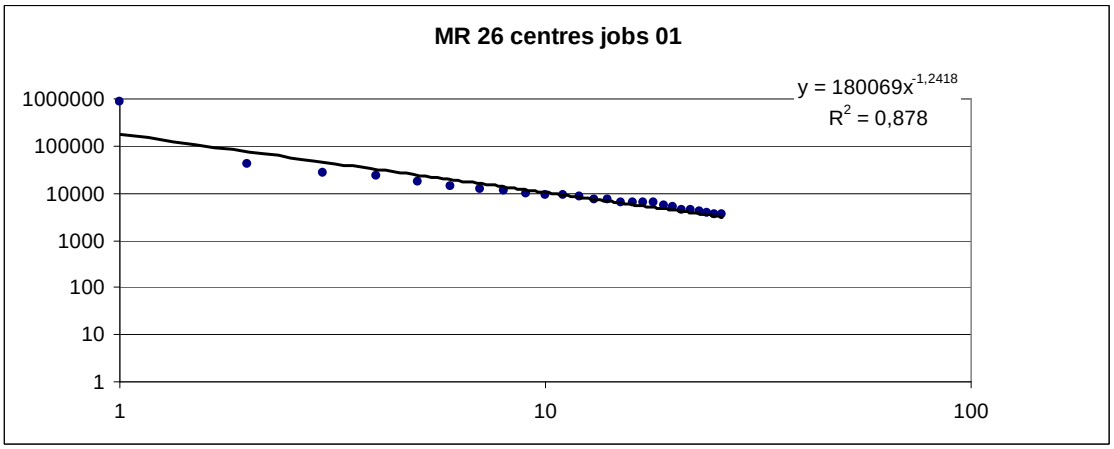


Figure 10: Wien Metropolitan Region: Zipf regression function

10.3.2 Hierarchical and Reciprocal Commuting Relations

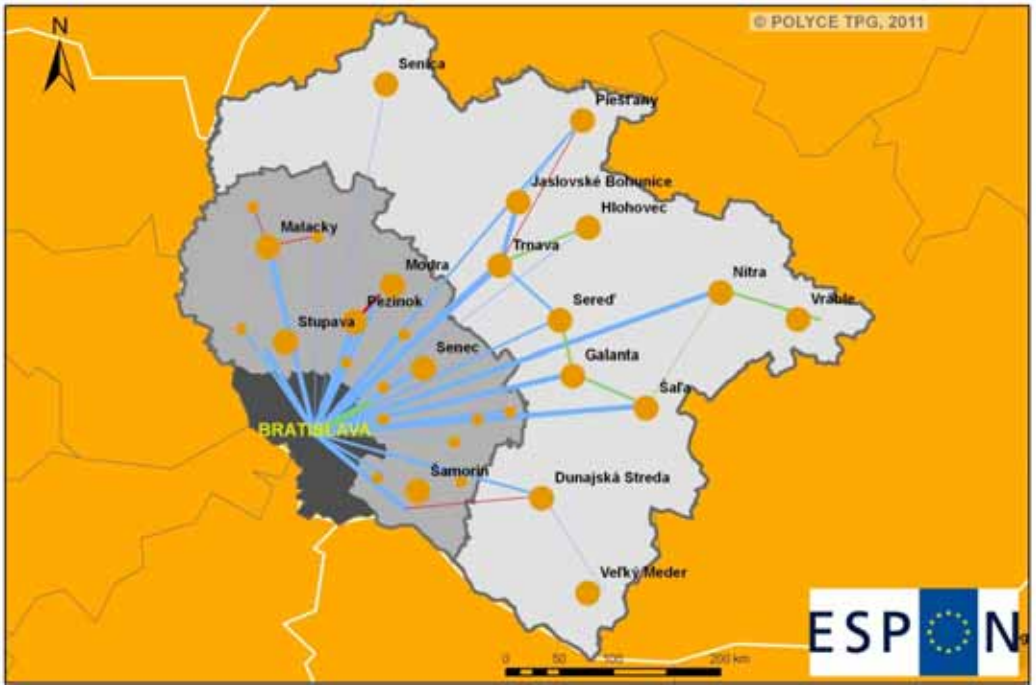


Figure 11: Bratislava: Hierarchical and Reciprocal Commuting Relations in Functional Metropolitan Area and Metropolitan Region

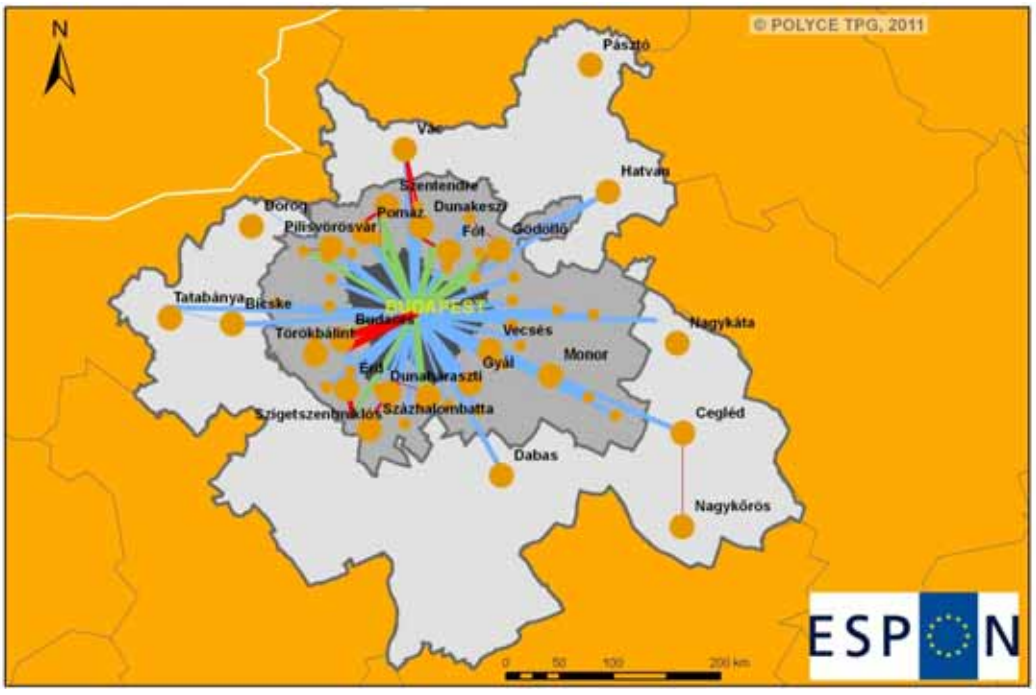


Figure 12: Budapest: Hierarchical and Reciprocal Commuting Relations in Functional Metropolitan Area and Metropolitan Region

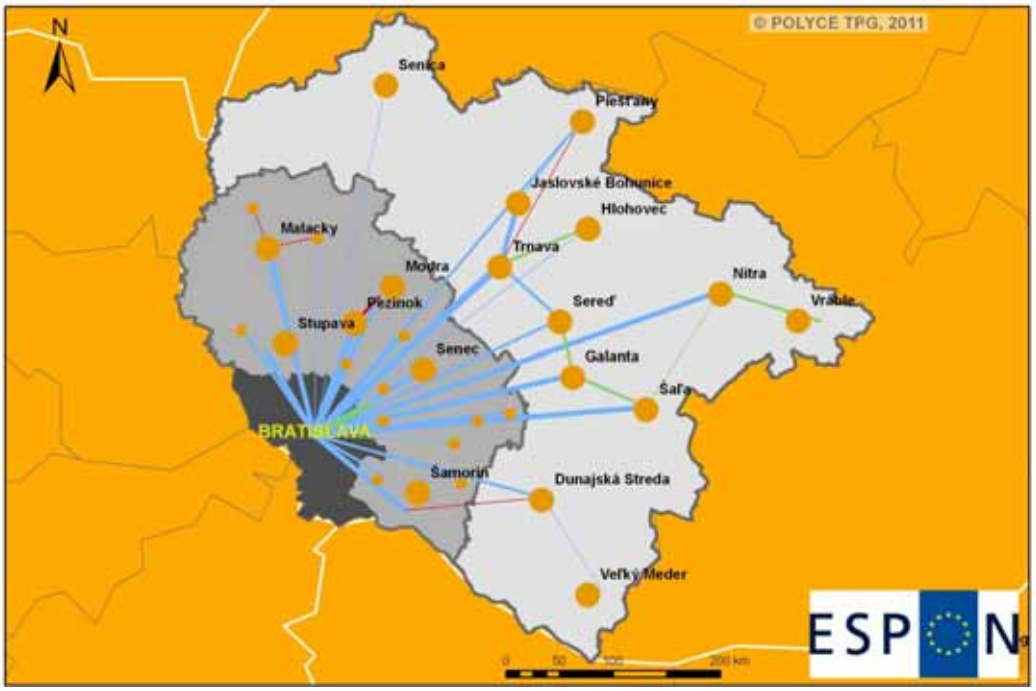


Figure 13: Ljubljana: Hierarchical and Reciprocal Commuting Relations in Functional Metropolitan Area and Metropolitan Region

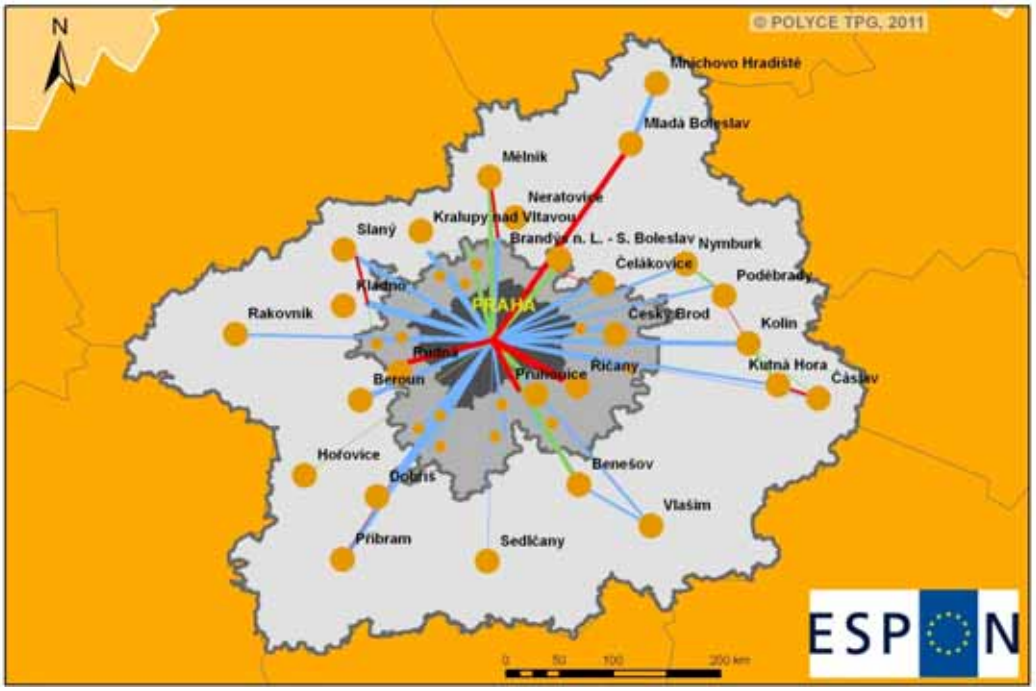


Figure 14: Praha: Hierarchical and Reciprocal Commuting Relations in Functional Metropolitan Area and Metropolitan Region

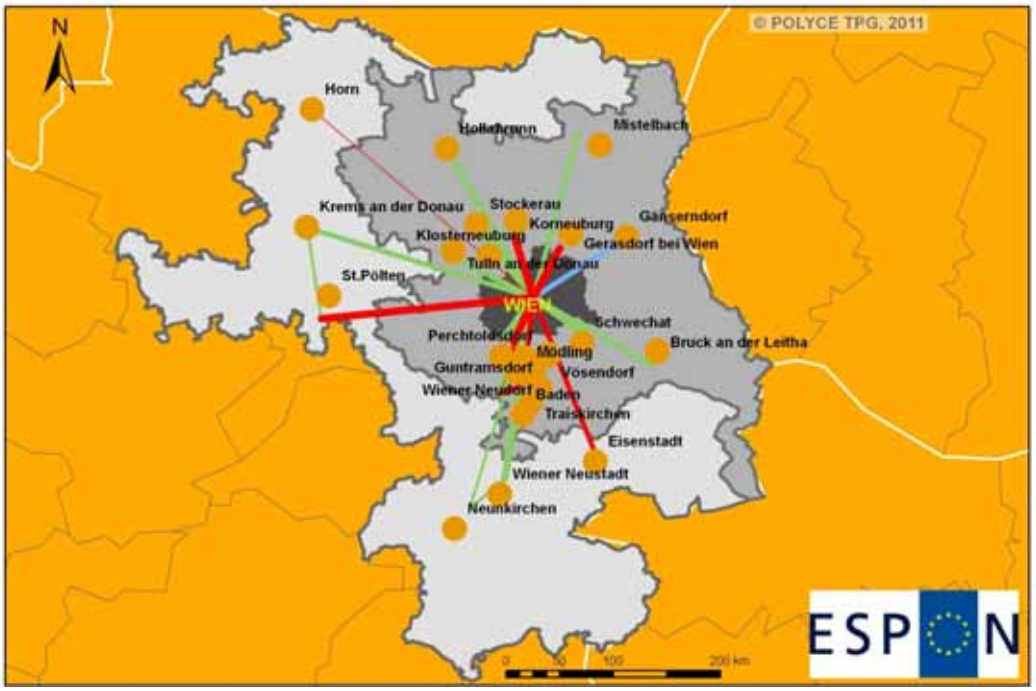


Figure 15: Wien: Hierarchical and Reciprocal Commuting Relations in Functional Metropolitan Area and Metropolitan Region

10.4 Annex IV: Urban Size & Metropolisation

Roberto Camagni, Andrea Caragliu, Ugo Fratesi

10.4.1 Land rent and city size

Traditional view on the notion of land rent from a macro perspective (i.e., abstracting from classical monocentric models à la Von Thunen and Alonso) foresee that rent and city size go hand in hand. This view is in particular true for simple urban growth models based on spatial equilibrium (see Rosen, 1979 and Roback, 1982 as the seminal contributions and, for a comprehensive review, Glaeser, 2008). And indeed, apparently our data confirm this prediction (Figure 40), with a slope equal to 0.70, significant at all conventional levels (model 1 in Figure 41).

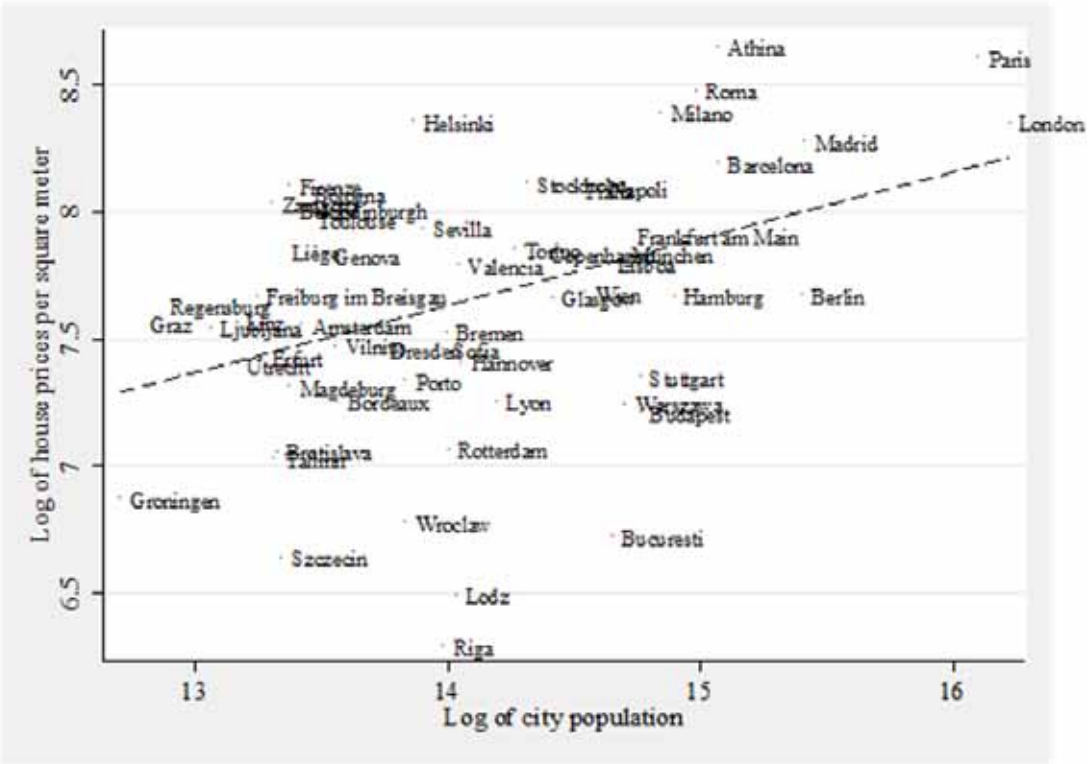


Figure 16: Log city population and log prices of apartments per square meter

However, this prediction dramatically changes as the model is made more complex as to encompass determinants of urban costs (model 2), pure density effects (model 3), traditional urban benefits (model 4), pure density effects and traditional urban benefits *simultaneously* (model 5), and finally metropolisation and relational polycentricity controls (model 6). The value of the estimated parameter is represented in Figure 16.

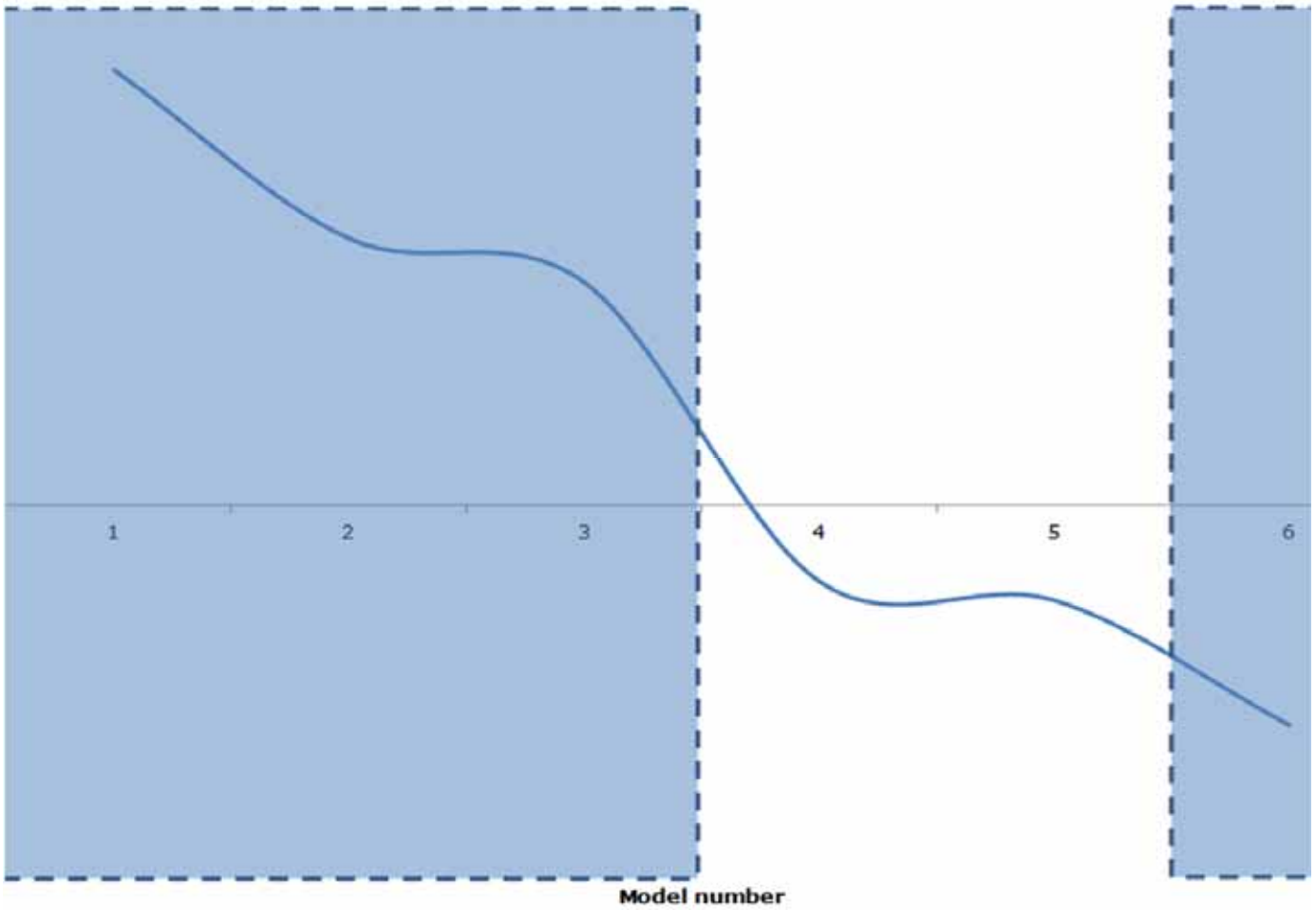


Figure 17. Estimated land rent parameter.

Source: authors' calculation. Shaded areas indicate that the land rent parameter is significant at least at the 5% level.

Once variables determining simultaneously the value of land rent and city population are both taken into account, the estimates associated to the land rent parameter become negative and highly significant, highlighting the cost side of the notion of rent. The relationship between city size and land rent, after taking into account rent and size determinants, becomes therefore negative (Figure 18).

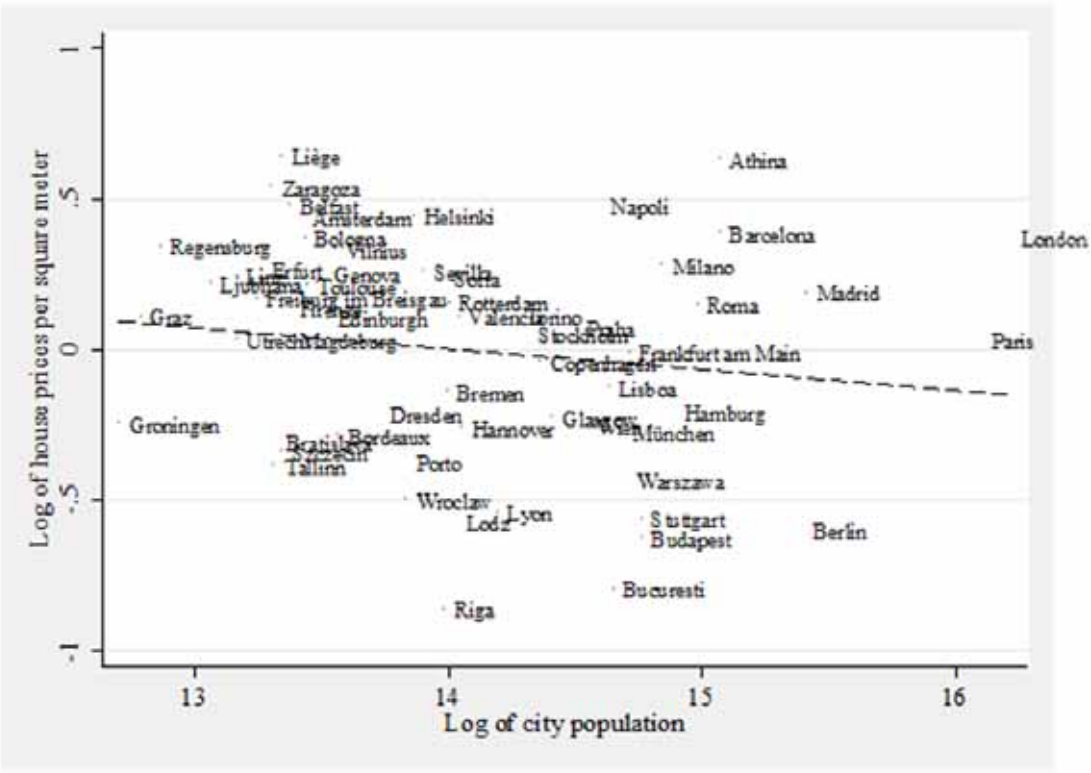


Figure 18: Log city population and log prices of apartments per square meter (predicted value)

10.4.2 Land rent data.

Country	Source of house prices data	Year
Austria	Global Property Guide (www.globalpropertyguide.com)	2006
Belgium	Institut National de Statistique	2006
Bulgaria	National Statistical Institute	2006
Cyprus	Global Property Guide (www.globalpropertyguide.com)	2006
Czech Republic	European Property website (www.europeanproperty.com)	2006
Denmark	Urban Audit 2001-2004 data, inflated by 48% (price increase calculated with GPG data)	2006
Estonia	Urban Audit 2001-2004 data, inflated by 61% (price increase calculated with GPG data)	2006
Finland	Urban Audit 2001 data, inflated by 157% (price increase calculated with GPG data)	2006
France	FNAIM house prices statistics	2006

Germany	Urban Audit 2001-2004 data, inflated by price increase calculated with BulwienGesaAG data)	2006
Greece	Various international real estate agencies (e.g. http://www.mondinion.com/Real_Estate/country/Greece/)	2006
Hungary	Urban Audit 2001-2004 data, inflated by 20'% (price increase calculated with Departement du Logement data)	2006
Ireland	-	2006
Italy	Banca dati delle quotazioni immobiliari - Agenzia del territorio (http://www.agenziaterritorio.it)	2006
Latvia	Central Statistical Bureau of Latvia	2006
Lithuania	Inreal quarterly report	2006
Luxembourg	Urban Audit 2001-2004 data, inflated by 11% (price increase calculated with Departement du Logement data)	2006
Malta	Malta's property price index	2006
Netherlands	Urban Audit 2001 data, inflated by 66% (price increase calculated with GPG data)	2006
Poland	Urban Audit 2001 data, inflated by 66% (price increase calculated with GPG data)	2006
Portugal	http://www.portugalvirtual.pt/real-estate/prices-how-to-finance.php	2006
Romania	Urban Audit 2001-2004 data, inflated by 74% (price increase calculated with GPG data)	2006
Slovakia	Urban Audit 2001-2004 data, inflated by 41% (price increase from the house prices index of Central Bank of Slovakia)	2006
Slovenia	Urban Audit 2001-2004 data, inflated by 57% (price increase from the house prices index of Statistics Slovenia)	2006
Spain	Urban Audit 2001-2004 data, inflated by 35% (price increase calculated with GPG data)	2006
Sweden	Värderings Data SA	2006
United Kingdom	Urban Audit 2001-2004 data, inflated by regional housing price inflators as compiled by Nationwide Ltd.	2006

10.4.3 City sizes predicted by the model.

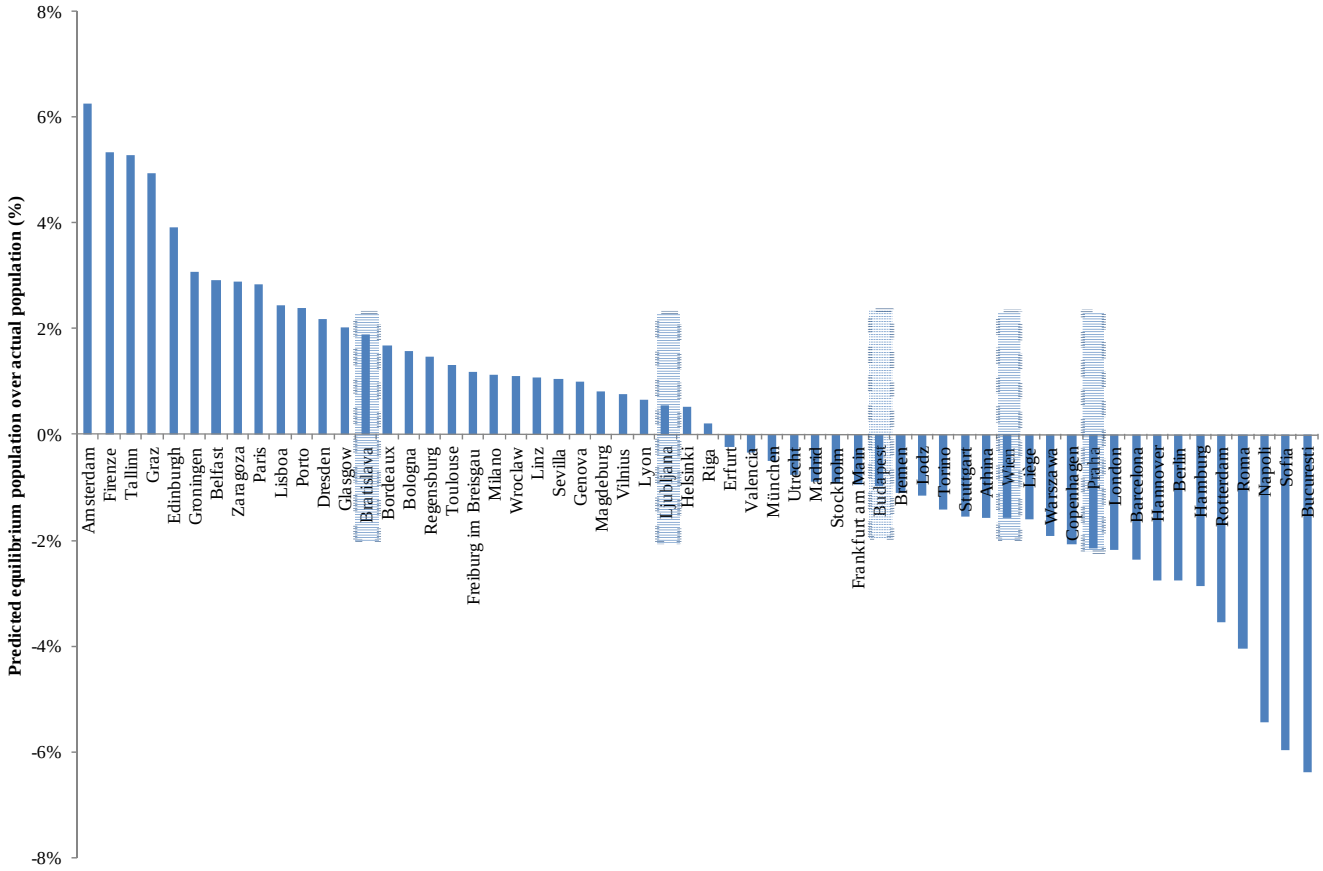


Figure 19: City size as predicted by model 12 vs. real city population.

Note: Shaded areas indicate cities joining the Polyce project.

10.4.4 City sample.

City	Country	City	Country
Wien	Austria	Athina	Greece
Graz	Austria	Budapest	Hungary
Linz	Austria	Roma	Italy
Liège	Belgium	Milano	Italy
Sofia	Bulgaria	Napoli	Italy
Praha	Czech Republic	Torino	Italy
Berlin	Germany	Genova	Italy
Hamburg	Germany	Firenze	Italy
München	Germany	Bologna	Italy
Frankfurt am Main	Germany	Vilnius	Lithuania
Stuttgart	Germany	Riga	Latvia
Dresden	Germany	Amsterdam	Netherlands
Bremen	Germany	Rotterdam	Netherlands
Hannover	Germany	Utrecht	Netherlands
Magdeburg	Germany	Groningen	Netherlands
Freiburg im Breisgau	Germany	Warszawa	Poland
Regensburg	Germany	Lodz	Poland
Erfurt	Germany	Wroclaw	Poland
Copenhagen	Denmark	Szczecin	Poland
Tallinn	Estonia	Lisboa	Portugal
Madrid	Spain	Porto	Portugal
Barcelona	Spain	Bucuresti	Romania
Valencia	Spain	Stockholm	Sweden
Sevilla	Spain	Ljubljana	Slovenia
Zaragoza	Spain	Bratislava	Slovakia
Helsinki	Finland	London	UK
Paris	France	Glasgow	UK
Lyon	France	Edinburgh	UK
Toulouse	France	Belfast	UK
Bordeaux	France		

10.4.5 City sample for WP2.2.

This work package is based on a set of 59 major metropolitan areas in Europe. Figure 20 shows the city sample drafted for this work package, showing a wide coverage of several aspects of economic activity in Europe:

- 22% of cities lie in NMS;
- 37% of total city sample is a capital city;
- Capital cities from the EU27 included are 22, with Brussels, Dublin, Valletta, Nicosia, and Luxembourg excluded because of missing values;
- As of 2010, our sample covers:

o 26% of total EU27 population;
o 36% of total EU27 urban population;
o 33% of total GDP produced in the European Union;
o 29% of total labor force;
o 32% of total labor force employed in tertiary and advanced industries.

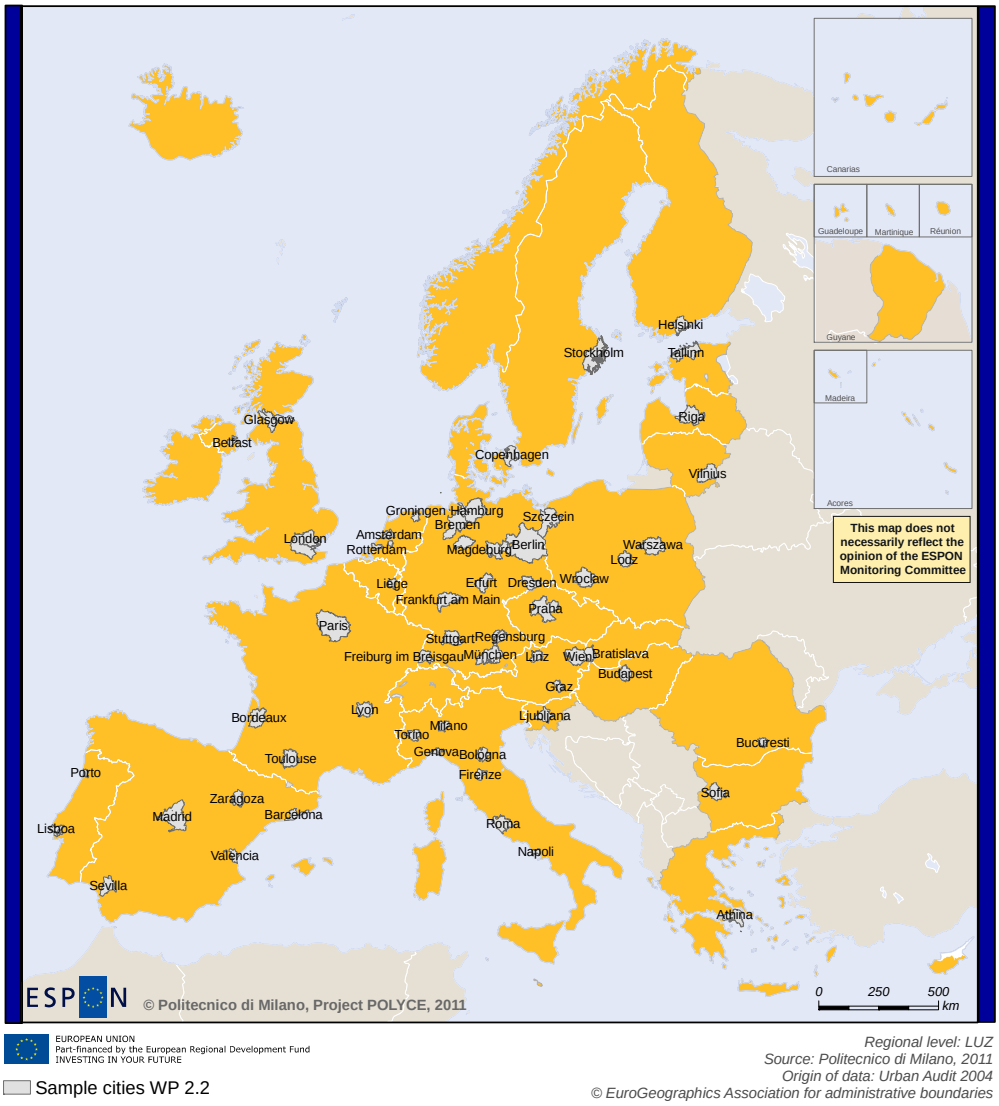


Figure 20: City sample.

10.5 Annex V: Metropolitan Profiles

Natasa Pichler-Milanovic, Alma Zavodnik-Lamousek, Samo Drobne, Miha Konjar

10.5.1 Metropolitan Profiles (Summary)

METROPOLITAN KEY DEVELOPMENT / POLICY AREA	RESULTS	SIMILARITIES BETWEEN 5 POLYCE METROPOLISES:
ECONOMY	The key development (policy) area ECONOMY -.Wien and Praha show the overall above average values, Bratislava shows the average value, while Budapest and Ljubljana are bellow the average among 50 MEGA. Stockholm shows the highest value in ECONOMY area among 50 MEGA. The overall value of ECONOMY is lower than the total scores of POLYCE metropolises in Wien, Praha and Ljubljana while the overall average values of ECONOMY are higher than total scores in Budapest and Bratislava.	ECONOMY – 5 POLYCE SIMILARITIES: • Wien, Praha (++) • Bratislava (0) • Ljubljana, Budapest (-)
PEOPLE	The key development (policy) area PEOPLE shows the overall above average values in Bratislava and Ljubljana, while bellow the overall average values in Budapest, Wien and Praha. Madrid and Luxembourg show the highest overall average value in PEOPLE area among 50 MEGA.The overall average value of PEOPLE is lower than the total scores for POLYCE metropolises in Wien and Praha while overall average values are higher than the total scores in Ljubljana, Budapest and Bratislava.	PEOPLE – 5 POLYCE SIMILARITIES: • Bratislava, Ljubljana (+) • Budapest, Praha, Wien (-)
MOBILITY	The key development / policy area MOBILITY shows the above average overall values in Wien and Praha while bellow the average overall values in Budapest, Ljubljana and Bratislava. Amsterdam shows the highest overall average value in MOBILITY among 50 MEGA. The overall average value of MOBILITY is higher than the total scores for POLYCE metropolis in Wien and Praha, slightly higher than total scores in Budapest and Bratislava while lower than total score in Ljubljana.	MOBILITY – 5 POLYCE SIMILARITIES: • Wien, Praha (+) • Bratislava (-) • Budapest, Ljubljana (--)

METROPOLITAN KEY DEVELOPMENT / POLICY AREA	RESULTS	SIMILARITIES BETWEEN 5 POLYCE METROPOLISES:
ENVIRONMENT	**The key development (policy) area ENVIRONMENT shows the overall above average values only in Wien, the overall average value is found in Praha while bellow the overall average values are found in Ljubljana, and especially in Budapest and Bratislava. Bordeaux shows the highest overall average value in ENVIRONMENT among 50 MEGA.** **The overall average value for ENVIRONMENT is lower in all POLYCE metropolises than the total scores for POLYCE metropolises.**	**ENVIRONMENT – 5 POLYCE SIMILARITIES:** • **Wien (+)** • **Praha (0)** • **Ljubljana (-)** • **Budapest, Bratislava (--)**
LIVING	**The key development (policy) area LIVING shows the above overall average values in all POLYCE metropolises especially in Wien and Praha. Amsterdam shows the highest overall average value in LIIVING key policy area among 50 MEGA.** **The overall average value for LIVING is higher than total scores for all POLYCE metropolises especially in Budapest and Ljubljana.**	**LIVING – 5 POLYCE SIMILARITIES:** • **Wien, Praha (++)** • **Ljubljana, Bratislava, Budapest (+)**
TOTAL METROPOLITAN SCORES	Total metropolitan scores taking in consideration all 5 key development / policy areas with 25 factors in 50 MEGA are above the average in Wien (0,21) and Praha (0,13), slightly bellow the average in Bratislava (-0,04) and Ljubljana (-0,07) while showing bellow the average score only in Budapest (-0,18).	**FINAL 5 POLYCE SIMILARITIES:** • Wien, Praha (++) • Bratislava, Ljubljana (0) • Budapest (-)
5 POLYCE RANK	**Among 50 MEGA – POLYCE metropolises Wien is ranked the best (11) followed by Praha (15) while Bratislava (30), Ljubljana (37) and Budapest (43) are catching up.**	
50 MEGA RANK	**Among 50 MEGA the most successful metropolises (1-10) in Europe are: *Amsterdam, Munchen, Stockholm, Luxembourg, Madrid, Helsinki, Barcelona, Brussels, Frankfurt, Copenhagen.***	

METROPOLITAN FACTORS	RESULTS	SIMILARITIES BETWEEN 5 POLYCE METROPOLISES:
Economic Performance	Wien is showing above the average values in productivity factor, Bratislava shows the average value, while Ljubljana, Praha and Budapest are showing bellow the average values. Luxembourg shows the highest value in productivity factor among 50 MEGA – *due to higher GDP, GVA and disposable income levels.*	• Wien (+) • Bratislava (0) • Ljubljana, Praha, Budapest (-)
Entrepreneurship	The enterpreneurialship factor is showing the above average values in Budapest, Wien and Praha, Bratislava is slightly above the average while Ljubljana shows bellow the average value. Berlin shows the highest value in enterpreneurialship factor among 50 MEGA – *due to new businesses dynamics, private sector employment and number of congresses held.*	• Budapest, Wien, Praha (+) • Bratislava (0) • Ljubljana (-)
Knowledge-based Economy	Innovative spirit is above the average in Bratislava and Wien, slightly less in Praha and Budapest, while Ljubljana shows bellow the average value. Stockholm shows very high value in innovative spirit factor among 50 MEGA – *due to higher R&D expenditure, patent applications, scientific and technical employment, and creative class activities.*	• Bratislava, Wien (++) • Praha, Budapest (+) • Ljubljana (-)
Labor Market	Flexibility of labor market is above the average in Praha, Ljubljana and Budapest, slightly bellow the average value in Bratislava, while Wien shows bellow the average value (due to higher unemployment). Copenhagen shows the highest value in this factor among 50 MEGA – *due to low unemployment rate and higher proportion of public sector employment.*	• Praha, Ljubljana, Budapest (+) • Bratislava (0) • Wien (-)
R&D Funding	Public investments factor shows bellow the average values in all POLYCE metropolises, Budapest shows slightly better average values than other POLYCE metropolises. Seville shows extremely high average value in this factor among 50 MEGA – due to higher *regional policy and ERDF investments.*	• Budapest (-) • Wien, Praha, Bratislava, Ljubljana (--)

International Embeddedness	International embeddedness factor shows above the average value only in Wien, while bellow the average values are found in other POLYCE metropolises, especially in Ljubljana. Amsterdam shows the highest value in this factor among 50 MEGA – *due to higher number of HQ of transnational firms and subsidiaries owned by HQ in MEGAs.*	• Wien (+) • Praha, Budapest, Bratislava (-) • Ljubljana (--)
Structural Disparities	Structural disparities in POLYCE metropolis are showing the above average values in Praha and Wien while bellow the average values in other POLYCE metropolises, especially in Budapest showing economic disparities in the metropolis – regional context. The least structural disparities with higher above the average values are found in *Warsaw* and *Hamburg* (*with less difference in GDP level and sectoral employment*) while the worst structural disparities exist in Sofia with higher bellow the average value among 50 MEGA.	• Praha, Wien (+) • Ljubljana, Bratislava (-) • Budapest (--)
ECONOMY	**The key development (policy) area ECONOMY -.Wien and Praha show the overall above average values, Bratislava shows the average value, while Budapest and Ljubljana are bellow the average among 50 MEGA. Stockholm shows the highest value in ECONOMY area among 50 MEGA.** **The overall value of ECONOMY is lower than the total scores of POLYCE metropolises in Wien, Praha and Ljubljana while the overall average values of ECONOMY are higher than total scores in Budapest and Bratislava.**	**ECONOMY POLYCE SIMILARITIES:** • **Wien, Praha (++)** • **Bratislava (0)** • **Ljubljana, Budapest (-)**
Demography	The factor of demography is bellow the average in all POLYCE metropolises especially in Wien and Budapest. Madrid and Barcelona show the highest above the average values among 50 MEGA – *due to higher population density, life expectancy, lower demographic dependency, higher in-migration rates.*	• Praha, Bratislava, Ljubljana (-) • Wien, Budapest (--)
Education	Affinity to learning factor is above the average in Bratislava and Ljubljana, Budapest shows the average value, while bellow the average values are found in Praha and Wien. Helsinki shows the highest above the average value in this factor among 50 MEGA – *due to high proportion of university educated population, number of students and higher participation in life-long learning activities.*	• Bratislava, Ljubljana (+) • Budapest (0) • Praha, Wien (--)
Ethnic Diversity	Ethnic plurality factor show above the average values in Wien and Praha, while bellow the average values are found in Bratislava, Budapest and Ljubljana. Luxembourg and Valletta show the highest above the average values in ethnic plurality among 50 MEGA – *due to higher proportion of foreign*	• Wien, Praha (++) • Budapest, Bratislava, Ljubljana (-)

	citizens and students.	
PEOPLE	**The key development (policy) area PEOPLE shows the overall above average values in Bratislava and Ljubljana, while bellow the overall average values in Budapest, Wien and Praha. Madrid and Luxembourg show the highest overall average value in PEOPLE area among 50 MEGA.** **The overall average value of PEOPLE is lower than the total scores for POLYCE metropolises in Wien and Praha while overall average values are higher than the total scores in Ljubljana, Budapest and Bratislava.**	**PEOPLE POLYCE SIMILARITIES:** • **Bratislava, Ljubljana (+)** • **Budapest, Praha, Wien (-)**
Public Transport	Public transport factor shows the above average values only in Praha, Wien and Ljubljana are slightly bellow the average while in Budapest and Bratislava the average values in this factor are bellow the average. Helsinki shows the highest above the average value in public transport factor among 50 MEGA – *due to good public transport network.*	• Praha (+) • Wien, Ljubljana (0) • Budapest, Bratislava (-)
Commuting	Commuting factor shows bellow the average values in Ljubljana and Budapest (with higher levels of in-commuting to CC) while above average values are in Wien, Praha and Bratislava (with higher reciprocal morphology and better public transport facilities). Copenhagen and Wien show the highest above the average value in commuting factor among 50 MEGA – *as an example of functional polycentric metropolises and good public transport facilities.*	• Wien (++) • Praha, Bratislava (+) • Ljubljana, Budapest (--)
International Accessibility	International accessibility factor shows above the average values only in Wien, while Praha has the average values. Budapest, Bratislava, and especially Ljubljana show bellow the average values among 50MEGA. Frankfurt shows very high above the average value in international accessibility factor among 50 MEGA - *due to good accessibility by air, rail, motorway and number of air passengers and freight transport.*	• Wien (+) • Praha (0) • Budapest (-) • Bratislava, Ljubljana (--)
Availability of ICT	Availability of ICT factor is above the average in Wien and Budapest, while bellow the average values are found in Ljubljana, Bratislava and especially in Praha. Amsterdam shows the highest above the average value in this factor among 50 MEGA - *due to internet and broadband access for households and businesses.*	• Wien, Budapest (+) • Ljubljana, Bratislava (-) • Praha (--)

MOBILITY	**The key development /policy area MOBILITY shows the above average overall values in Wien and Praha while bellow the average overall values in Budapest, Ljubljana and Bratislava. Amsterdam shows the highest overall average value in MOBILITY among 50 MEGA.** **The overall average value of MOBILITY is higher than the total scores for POLYCE metropolis in Wien and Praha, slightly higher than total scores in Budapest and Bratislava while lower than total score in Ljubljana.**	**MOBILITY POLYCE SIMILARITIES:** • **Wien, Praha (+)** • **Bratislava (-)** • **Budapest, Ljubljana (--)**
Land Use	Sustainable land use factor shows the above average values in Praha, slightly bellow the average values are found in Wien, Ljubljana and Bratislava while bellow the average values are found in Budapest. Tallinn shows the highest above the average value in sustainable land use factor among 50 MEGA – *due to lower proportion of new built-up land in metropolis and sealed area until 2006.*	• Praha (+) • Wien, Ljubljana, Bratislava (-) • Budapest (--)
Environmental Conditions	Attractivity of natural conditions are above the average in Budapest and Bratislava, slightly above the average in Wien, slightly bellow the average value in Praha while well bellow the average value in Ljubljana. Seville and Valencia show the highest above the average values in this factor among 50 MEGA – *due to better climatic conditions.*	• Budapest, Bratislava (+) • Wien, Praha (0) • Ljubljana (-)
Pollution	Wien shows the average value of pollution factor while bellow the average values can be seen in Praha and Ljubljana and especially in Budapest and Bratislava. Stockholm shows the highest above the average value in pollution factor among 50 MEGA – *due to lower air pollution levels in the metropolis.*	• Wien (0) • Praha, Ljubljana (-) • Budapest, Bratislava (--)
Resource Consumption	Sustainable resource management factor shows the above average values in Ljubljana and Praha, the average value in Budapest and bellow the average values in Bratislava and Wien. Stuttgart show the highest above the average values in this factor among 50 MEGA – *due to sustainable use of water, waste treatment and green and protected areas in metropolis.*	• Ljubljana, Praha (+) • Budapest (0) • Bratislava, Wien (-)
Environmental Quality	Assessment of urban environmental quality is above the average only in Wien while bellow the average values are found in Ljubljana, Praha and especially in Budapest and Bratislava. Luxembourg shows the highest above the average values in this factor among 50 MEGA - *due to citizens satisfaction of urban environment quality in the city.*	• Wien (+) • Ljubljana (-) • Praha, Bratislava, Budapest (--)

ENVIRONMENT	**The key development (policy) area ENVIRONMENT shows the overall above average values only in Wien, the overall average value is found in Praha while bellow the overall average values are found in Ljubljana, and especially in Budapest and Bratislava. Bordeaux shows the highest overall average value in ENVIRONMENT among 50 MEGA.** **The overall average value for ENVIRONMENT is lower in all POLYCE metropolises than the total scores for POLYCE metropolises.**	**ENVIRONMENT POLYCE SIMILARITIES:** • **Wien (+)** • **Praha (0)** • **Ljubljana (-)** • **Budapest, Bratislava (--)**
Cultural Facilities	Cultural facilities factor shows above the average values in all POLYCE metropolises especially in Wien and Praha, with the exception of Bratislava with the bellow the average values among 50 MEGA. Lisbon shows the highest above the average values in this factor among 50 MEGA - *due to number and capacities of museums, cinema, theatres and their attendances in the city.*	• Wien, Praha (++) • Budapest, Ljubljana (+) • Bratislava (-)
Health Facilities	Health facilities factor is above the average in all POLYCE metropolises especially in Bratislava and Praha, with the exception of Ljubljana with bellow the average value (due to lower number of doctors). Bucuresti shows the highest above the average value in health facilities factor among 50 MEGA – *due to higher numbers of hospital beds and doctors in metropolis.*	• Praha, Bratislava (++) • Wien, Budapest (+) • Ljubljana (-)
Housing	Housing factor shows above the average value only in Wien while bellow the average values are observed in other POLYCE metropolises, especially in Budapest. Wien shows the highest above the average value in housing factor among 50 MEGA - *due to larger dwelling size and provision of rented non-profit housing in metropolis.*	• Wien (++) • Ljubljana (-) • Praha, Bratislava, Budapest (--)
Touristic Attractivity	Tourist attractivity factor is above the average in all POLYCE metropolises especially in Praha, Wien. Roma shows the highest above the average value in tourist attractivity among 50 MEGA – *due to number of tourists and visitors and monument and tourists sights in metropolis.*	• Wien, Praha (++) • Ljubljana, Budapest, Bratislava (+)
Safety	Individual safety factor is above the average only in Bratislava and Ljubljana while bellow the average in Praha, Wien and Budapest. Lyon shows the highest above the average value in individual safety among 50 MEGA – *due to lower crimes rates, homicides and suicides.*	• Bratislava, Ljubljana (+) • Wien, Praha, Budapest (-)

Urban Services	Assessment of urban services quality is above the average in Wien and slightly above the average in Praha and Ljubljana while showing bellow the average values in Budapest and Bratislava. Rotterdam and Munchen show the highest above the average value of the assessment of urban services among 50 MEGA – *due to citizens' satisfaction with urban services quality in the city*.	• Wien (++) • Praha, Ljubljana (+) • Budapest, Bratislava (-)
LIVING	**The key development (policy) area LIVING shows the above overall average values in all POLYCE metropolises especially in Wien and Praha.** **Amsterdam shows the highest overall average value in LIIVING key policy area among 50 MEGA.** **The overall average value for LIVING is higher than total scores for all POLYCE metropolises especially in Budapest and Ljubljana.**	**LIVING POLYCE SIMILARITIES:** • **Wien, Praha (++)** • **Ljubljana, Bratislava, Budapest (+)**
TOTAL METROPOLITAN SCORES	Total metropolitan scores taking in consideration all 5 key policy areas with 25 factors in 50 MEGA are above the average in Wien (0,21) and Praha (0,13), slightly bellow the average in Bratislava (-0,04) and Ljubljana (-0,07) while showing bellow the average score only in Budapest (-0,18).	**FINAL POLYCE SIMILARITIES:** • Wien, Praha (++) • Bratislava, Ljubljana (0) • Budapest (-)
5 POLYCE RANK	**Among 50 MEGA – POLYCE metropolises Wien is ranked the best (11) followed by Praha (15) while Bratislava (30), Ljubljana (37) and Budapest (43) are catching up.**	
50 MEGA RANK	**Among 50 MEGA the most successful metropolises (1-10) in Europe are: Amsterdam, Munchen, Stockholm, Luxembourg, Madrid, Helsinki, Barcelona, Brussels, Frankfurt, Copenhagen.**	

10.5.2 MEGA Data File (descriptive statistics)

				VIENNA	PRAGUE	BUDAPEST	BRATISLAVA	LJUBLJANA		POLYCE (5)		MEGA Capital cities (23)				
CHA	METROPOLITAN FACTORS	INDICATOR	spatial level	AT001	CZ001	HU001	SK001	SI001		AVERAGE	STDEV	NO	MIN	MAX	AVERAGE	STDEV
ECONOMY	Economic Performance	GDP (PPS) per capita	regional	**36276,6**	27878,6	24924,8	35128,1	29886,4		30818,9	4811,7	23	16540,7	63109,2	30792,7	10905,0
		Difference between GDP (PPS) per capita according to EU average	regional	**153,6**	118,1	105,5	148,8	126,6		130,2	20,4	23	70,0	267,2	130,4	46,2
		Difference between GDP (PPS) per capita according to EU average 1995-2006	regional	**-24,6**	22,1	31,7	**46,7**	23,7		19,9	26,7	23	-26,3	57,8	19,4	26,2
		Total GVA of LUZ	regional	**78429,0**	35710,1	36680,2	10564,0	9808,0		34238,3	27920,7	23	7015,3	154899,9	50420,1	40993,5
		Total GVA per capita in LUZ	regional	**34,4**	14,6	12,6	17,2	19,4		19,6	8,6	23	5,1	56,5	24,4	14,0
		GVA of business and financial services NACE (J-K)	regional	**23646,0**	8769,2	10877,4	2909,0	2614,1		9763,1	8559,4	23	1700,3	42873,3	15568,5	12873,0
		% GVA NACE (J-K) in total GVA	regional	**30,1**	24,6	29,7	27,5	26,7		27,7	2,3	23	20,5	45,7	29,6	6,1
		Disposable income	regional	**19205,4**	11357,8	10686,75	12972,2	12781,2		13400,7	3383,8	21	5018,2	19205,4	12864,5	4070,3
	Entrepreneurship	New businesses registered	local	6145,00	6249,00	**21461,00**	9498,00	3531,00		9376,8	7078,9	22	1071,0	41941,0	**10406,2**	9591,1
		Companies gone bankrupt	local	1928,00	381,00	3310,00	**4331,00**	127,00		2015,4	1822,3	19	18,0	18001,0	3035,4	5226,9
		Companies with HQ in the city quoted on stock market	local	22,0	16,0	29,0	**45,0**	34,0		29,2	11,2	18	2,0	184,0	**46,2**	42,4
		Number of congresses held in region*	regional	**160,0**	86,0	**87,0**	13,0	26,0		74,4	58,6	23	0,0	160,0	56,8	43,6
		Private sector employment	regional	0,16	0,14	0,17	**0,19**	0,12		**0,16**	0,03	23	0,07	0,26	0,15	0,05
		Self employed	regional	11,44	**19,08**	15,49	14,01	10,16		14,04	3,51	23	5,88	23,38	13,26	4,44
	Knowledge-based Economy	R&D expenditure of GDP	regional	**2,41**	2,18	1,38	1,12	**1,90**		1,80	0,54	23	0,26	4,31	1,71	1,17
		Scientific and technical employment	regional	34,97	40,04	34,26	**41,27**	33,24		36,2	3,6	23	23,6	50,0	33,5	6,9
		Creative class	regional	0,06	0,05	0,08	**0,10**	0,04		**0,07**	0,02	23	0,01	0,12	0,06	0,02
		Patent applications	regional	**138,41**	17,03	39,29	21,87	59,82		55,3	49,4	23	2,6	362,7	84,5	107,0
	Labor Market	Unemployment rate in CC	local	**8,90**	3,90	6,30	3,60	5,30		5,60	2,14	22	1,10	15,30	7,33	3,72
		Unemployment rate in LUZ	regional	**6,99**	2,90	4,74	4,30	2,90		4,37	1,68	23	2,90	14,86	5,80	2,81
		Unemployment rate LUZ/national	regional	**158,74**	54,43	64,33	38,62	60,11		75,2	47,7	23	38,6	172,5	91,4	35,5
		Public sector employment	regional	0,29	0,24	0,27	**0,30**	0,26		0,27	0,02	23	0,24	0,40	**0,30**	0,05
		Perception to find a good job (survey))	local	39,60	**74,80**	23,70	60,40	47,10		49,1	19,5	23	12,0	74,8	43,4	17,0
		Difficulty paying the bills at the end of the month (survey)	local	16,70	15,60	**34,00**	27,20	25,00		23,7	7,7	23	14,0	55,6	**31,0**	11,7
	R&D Funding	ERDF funding*	regional	190,37	182,46	**272,31**	36,17	44,10		145,1	102,1	20	8,4	4546,6	600,2	1020,8
		Regional policy funding	regional	260,36	296,83	**1016,44**	177,36	125,90		375,4	364,6	20	12,9	5456,1	1054,6	1331,0
	Internationl Embeddedness	Number of headquarters of transnational firms*	regional	**7**	2	2	0	0		2,2	2,9	23	0,0	24,0	5,4	7,0
		Foreign subsidiaries owned by HQ located in MEGA*	regional	**3651**	155	163	45	60		814,8	1586,4	22	9,0	6530,0	1565,3	2194,0
		Foreign subsidiaries owned by HQ located in MEGA (%)*	regional	**75,83**	62,50	51,91	64,29	46,51		60,2	11,4	22	5,6	92,4	56,2	25,4
	Structural Disparities	Disparities in the development level between the metropolis and its region	regional	0,70	0,20	1,04	**1,45**	0,65		0,81	0,47	21	0,20	1,45	0,79	0,39
		Change of disparities in the development level between the metropolis and its region	regional	-0,06	-0,20	**0,28**	0,21	0,10		0,07	0,20	21	-0,20	0,61	0,18	0,23
		A synthetic view of the structural differences between the metropolis and the region for the three principal sectors.	regional	19,1	22,6	23,0	**26,1**	21,0		22,4	2,6	21	2,5	39,7	18,4	7,5
		Structural similarity changes in metropolis-region context	regional	1,9	**3,6**	-2,6	2,1	0,8		1,2	2,3	21	-8,6	9,6	0,0	4,6

				VIENNA	PRAGUE	BUDAPEST	BRATISLAVA	LJUBLJANA		POLYCE (5)		MEGA Capital cities (23)				
CHA	METROPOLITAN FACTORS	INDICATOR	spatial level	AT001	CZ001	HU001	SK001	SI001		AVERAGE	STDEV	NO	MIN	MAX	AVERAGE	STDEV
PEOPLE	Demography	Population of LUZ	local	2278,9	2351,6	**2864,20**	608,8	506,3		1722,0	1087,2	23	372,6	6120,9	2114,9	1526,2
		Population density of CC	local	**3735,2**	2486,3	3241,7	1165,2	980,8		2321,8	1225,5	22	980,8	20466,6	**4285,4**	4034,6
		Population density of LUZ	local	481,8	300,6	**994,81**	300,3	199,7		449,2	306,3	22	125,3	2027,4	666,5	541,9
		Average growth of core city	local	**0,62**	0,04	-1,56	-0,27	-0,36		-0,31	0,80	22	-1,59	2,76	0,07	0,88
		Average growth of LUZ	local	**0,42**	-0,04	-0,54	-0,07	0,39		0,03	0,39	23	-1,22	1,48	0,32	0,73
		Difference between annual growth of population in the suburbs and the CC	local	-0,20	0,88	**2,67**	**1,36**	**1,55**		**1,25**	1,04	22	-2,39	3,06	0,88	1,15
		Life expectancy	regional	79,60	77,60	75,00	76,30	**79,70**		77,6	2,1	23	71,0	82,5	77,7	3,3
		Elderly population in LUZ	local	15,22	15,49	**16,50**	12,14	14,85		14,8	1,6	22	9,7	18,8	14,7	2,0
		Demographic dependency: (<20 +>65) / 20-64 years in CC	local	**0,60**	0,49	0,55	0,44	0,55		0,53	0,06	23	0,43	0,74	0,54	0,07
		Demographic dependency: (<20 +>65) / 20-64 years in LUZ	local	**0,62**	0,51	0,56	0,45	0,56		0,54	0,06	23	0,45	0,66	0,56	0,06
		One-person households in CC	local	**47,00**	37,00	34,60	36,70	27,80		36,4	6,9	22	21,5	53,3	36,3	10,0
		One-person households in LUZ	local	**42,00**	34,20	31,20	35,00	23,70		**33,2**	6,6	22	18,3	45,2	30,2	8,1
		Net in-migration rate*	regional	15,70	13,94	**18,08**	7,80	1,87		11,5	6,6	18	1,9	23,2	12,3	7,0
		Net out-migration rate*	regional	14,71	11,20	**15,26**	5,64	1,69		9,7	5,9	18	1,7	26,8	11,6	7,8
	Education	Active population with tertiary diploma	regional	21,71	20,91	**30,25**	29,14	21,62		24,7	4,6	23	15,7	46,9	**30,0**	7,6
		Population qualified at levels 5-6 ISCED in CC	local	20,00	NA	**26,30**	25,80	25,40		24,4	2,9	20	17,4	40,6	29,7	6,9
		Population qualified at levels 5-6 ISCED in region	regional	0,16	0,16	0,24	**0,25**	0,21		0,20	0,04	23	0,11	0,35	0,24	0,06
		Students at universities in CC	local	94,7	118,2	97,0	**178,8**	148,3		**127,4**	35,9	23	8,1	241,7	111,5	65,0
		Students at universities in region	regional	149034	138929	**152051**	71098	83384		118899,2	38583,1	22	1315,0	447571,0	144514,3	104595,1
		Students at universities in region among 15-24 age groups	regional	0,19	0,17	0,46	**0,83**	0,72		**0,47**	0,30	22	0,02	1,15	0,41	0,26
		Participation in life-long-learning	regional	**14,57**	12,10	3,40	6,00	**18,00**		10,81	6,03	23	1,80	33,34	10,66	8,13
	Ethnic Diversity	EU nationals*	local	**3,31**	0,70	0,21	0,83	0,10		1,03	1,31	21	0,01	33,79	**3,26**	7,49
		Non-EU nationals*	local	**11,65**	1,57	1,07	0,27	2,17		3,35	4,69	21	0,09	11,65	4,37	3,66
		Erasmus students*	regional	12,9	**23,76**	6,18	8,22	9,78		12,17	6,93	20	1,52	39,90	13,59	9,46
		Foreigner here are well integrated*	local	30,8	68,6	**84,5**	75,1	71,4		66,1	20,6	23	13,4	84,5	58,9	18,3
MOBILITY AND ICT	Public Transport	Public transport network per inhabitant	local	0,56	0,83	0,69	**1,35**	1,00		0,9	0,3	21	0,6	12,0	**2,3**	2,9
		Public transport ticket	local	**49,0**	20,5	32,8	19,2	33,0		30,9	12,0	21	14,0	72,0	34,7	16,0
		Satisfaction with public transport	local	**91,9**	78,6	50,6	34,0	70,8		65,2	23,0	23	25,8	94,9	65,7	17,8
	Commuting	*Inbound/outbound commuters*	local	139865	133693	**146058**	93000	54582		113439,6	16,5	18	29700,0	500929,0	**150134,9**	122438,6
		Inbound/outbound commuters per inhabitant	local	8,32	10,93	8,58	**21,90**	20,23		13,99	6,56	17	2,9	79,4	**19,3**	20,1
		Journey to work by car in CC	local	41,1	27,0	23,5	10,3	**62,9**		33,0	20,0	17	10,3	62,9	39,4	13,6
		Register cars in CC	local	392,4	513,9	350,4	288,6	**547,4**		418,5	109,4	20	173,8	707,5	**427,3**	146,1
		Register cars in LUZ	local	231,8	488,6	362,4	291,1	**543,0**		383,4	78,4	20	196,3	699,9	434,2	135,8
		Time of journey to work in CC	local	27,0	37,4	**71,0**	37,0	22,0		**41,9**	38905,2	17	15,0	71,0	31,9	12,2
		Road accidents	local	0,3	0,3	0,5	0,5	**0,6**		0,4	22,3	22	0,1	1,4	**0,6**	0,4
	International Accessibility	Potential ESPON accessibility*	regional	**145**	138	131	124	102		**128,0**	109,4	23	83,0	177,0	116,8	25,8
		Accessibility of MEGA*	regional	**34**	18	11	2	6		14,2	130,8	20	1,0	40,0	14,1	11,2
		Air transport of passengers*	regional	**15802,4**	10721,3	7918,1	0	1327,0		7153,8	20,7	21	0,0	41724,9	11227,8	10935,3
		Air transport of freight*	regional	**198**	42	54	12	6		62,4	0,1	23	6,0	706,0	117,3	162,1
	Availability of ICT	Households with Internet access (at home)*	regional	**70,97**	65,93	71	75	68		70,2	3,4	23	44,0	91,0	70,4	11,1
		Households with broadband access*	regional	**64,93**	58,40	62	57	62		60,9	3,2	23	33,0	87,0	61,8	12,6
		Satisfaction with public internet access	local	80,9	79,4	**88,7**	82,8	77,2		81,8	4,4	23	66,4	91,8	80,9	7,2
		Satisfaction with internet access at home	local	**94,2**	89,8	88,7	88,3	92,0		90,6	2,5	23	81,2	98,6	89,5	4,3

				VIENNA	PRAGUE	BUDAPEST	BRATISLAVA	LJUBLJANA		POLYCE (5)		MEGA Capital cities (23)				
CHA	METROPOLITAN FACTORS	INDICATOR	spatial level	AT001	CZ001	HU001	SK001	SI001		AVERAGE	STDEV	NO	MIN	MAX	AVERAGE	STDEV
ENVIRONMENT	Land Use	Land area of CC	local	415,18	496,60	**525,30**	364,45	275,04		**415,3**	101,2	23	39,0	1283,9	344,0	296,5
		Land area of LUZ	local	4611,78	**6982,9**	2538,4	2053,0	2547,0		3746,5	2061,0	22	246,4	17386,6	**4239,6**	3525,4
		Total area of CC divided by total area of LUZ	local	9,0	7,1	**20,8**	17,8	10,8		**13,1**	5,9	23	1,3	35,7	10,1	8,4
		Share of built-up area of CC	local	62,0	52,0	**67,0**	30,0	25,0		47,2	18,9	23	25,0	100,0	**62,7**	22,6
		Share of built-up area of LUZ	local	15,0	11,0	**29,0**	11,0	5,0		14,2	9,0	23	5,0	41,0	16,0	9,8
		Increase of built-up areas in CC 1990-2000	local	3,0	**4,9**	2,1	4,7	2,8		3,5	1,2	22	0,0	38,6	4,4	8,1
		Increase of built-up areas in CC 2000-2006	local	0,7	2,4	2,6	**3,1**	0,6		1,9	1,2	22	0,0	22,9	**3,1**	4,8
		Increase of built-up areas in LUZ 1990-2000	local	4,4	5,3	4,3	**5,6**	1,8		4,3	1,5	23	0,0	56,5	8,9	13,7
		Increase of built-up areas in LUZ 2000-2006	local	2,7	4,8	**8,4**	4,1	1,2		4,2	2,7	23	0,0	27,2	5,4	6,4
		Growth rate of residential areas in CC	local	**32,9**	20,9	9,2	7,4	5,2		15,1	11,6	19	0,0	68,6	22,5	18,9
		Growth rate of residential areas in the LUZ 1990-2000	local	20,8	**43,3**	9,6	36,1	4,3		22,8	16,7	21	0,0	79,0	32,3	19,9
		Growth rate of residential areas in the LUZ 2000-2006	local	22,4	**25,8**	8,2	3,5	6,3		13,2	10,1	22	0,0	53,3	19,9	14,1
		Share of new industrial, commercial and transport areas in new built-up areas in CC	local	59,2	18,6	**62,0**	56,0	37,7		46,7	18,4	19	1,4	100,0	**48,2**	27,1
		Share of new industrial, commercial and transport areas in new built-up areas in CC	local	38,6	49,2	71,7	63,1	**100,0**		**64,5**	23,6	20	16,6	100,0	48,3	20,8
		Share of new industrial, commercial and transport in new built-up areas in LUZ 1990-2000	local	76,6	36,0	**80,0**	47,3	48,9		**57,8**	19,4	21	8,8	100,0	52,1	22,0
		Share of new industrial, commercial and transport in new built-up areas in LUZ 2000-2006	local	72,3	66,7	68,7	**79,8**	**93,7**		**76,2**	11,0	22	36,6	100,0	62,5	16,7
		Sealed area per inhabitant in CC	local	34,5	18,8	**45,9**	17,1	13,9		26,0	13,7	21	13,9	71,8	**37,2**	16,2
	Environmental Conditions	Sunshine	local	5,3	4,5	5,9	**6,0**	5,0		5,3	0,6	22	3,8	8,1	5,5	1,3
		Rainy days	local	144	151	128	89	**155**		133,4	26,9	22	68,0	209,0	138,8	42,8
		Cold temperature	local	**3,3**	2,7	2,7	**-3,0**	2,5		1,6	2,6	23	-3,0	11,9	2,0	4,2
		Warm temperature	local	20,5	20,4	22,3	**23,0**	21,4		**21,5**	1,1	23	16,0	32,0	21,3	3,9
		Tourism Climatic index in warm months	regional	71,15	**72,40**	73,3	74,0	61,6		**70,5**	5,1	23	60,5	74,4	70,4	3,9
	Pollution	Summer smog	local	26,5	20,8	28,3	**29,0**	21,0		**25,1**	4,0	23	0,0	54,0	15,9	12,9
		Particulate matter	local	17,0	12,7	**39,0**	19,0	37,0		24,9	12,2	23	1,0	176,3	**37,0**	53,3
		Fatal chronic lower respiratory diseases	regional	599,45	732,15	**877,8**	807,8	691		**741,6**	107,0	16	466,0	976,1	681,4	151,9
	Resource Consumption	Consumption of water	local	79,9	78,8	**91,4**	79,2	86,7		83,2	5,6	22	49,7	131,8	83,2	26,7
		Collected solid waste	local	0,5	0,2	0,5	**2,5**	**1,5**		**1,0**	1,0	19	0,2	2,5	0,7	0,5
		Regional generation and treatment of municipal waste	regional	**1946,74**	826,17	1516,33	270,3	437,06		1181,6	677,8	15	268,4	3662,9	1403,7	1002,5
		Regional generation and treatment of municipal waste per capita	regional	**0,59**	0,34	0,52	0,44	0,46		0,47	0,09	16	0,33	0,73	0,50	0,12
		Green space	local	186,70	90,00	22,70	223,5	**272,00**		**159,0**	101,3	21	3,6	294,0	90,0	88,9
		NATURA 2000*	regional	0,05	3,27	26,75	44,05	**54,69**		**25,8**	24,2	23	0,0	62,9	19,5	17,5
	Environmental Quality	Resources are spent in a responsible way (survey)	local	**68,6**	41,8	35,9	29,9	27,6		40,8	16,5	23	19,9	68,6	39,9	15,4
		This is a clean city (survey)	local	**76,9**	35,8	18,2	25,0	67,8		44,7	26,2	22	10,2	76,9	42,0	19,7
		Air pollution is a big problem here (survey)	local	52,2	**84,8**	83,6	73,9	76,5		74,2	13,1	23	48,1	94,6	**77,3**	14,0
		Noise is a big problem here (survey)	local	56,2	81,2	**82,8**	67,6	67,8		**71,1**	11,0	23	37,7	92,4	69,8	13,8
		Satisfied with green space (survey)	local	**83,6**	65,8	49,7	36,6	67,1		60,6	18,0	23	25,6	92,3	67,0	19,0

Note:

black: selection of indicators for statistical analysis

light blue: indicators for descriptive analysis

**selection of indicators for polycentricity (networking/connectivity) of POLYCE metropolises in Europe*

10.6 Annex VI: Questionnaire

Maros Finka, Matej Jasso, Zuzana Ladzianska, Justin Kadi

"Perceived strengths and weaknesses of the POLYCE capital cities and their metropolitan regions"

Dear participant,

the following questionnaire is part of the empirical research of the POLYCE "Metropolisation and Polycentric Development of Central Europe" project. Main focus of POLYCE lies on the interrelation between metropolitan development and polycentricity as a precondition for inclusive spatial development. The project investigates this interrelation in the Central Danube Region and in five cities that are located in this region: Bratislava, Budapest, Ljubljana, Prague, and Vienna. POLYCE is conducted by a consortium of universities and research institutes in seven European countries, and financed under the ESPON 2013 program ("European Observation Network for Territorial Development and Cohesion").

The questionnaire concentrates on the perception of strengths and weaknesses of the five capital cities and the potentials for smart metropolitan development. Results will help identify perspectives for a successful positioning of the five capital cities in the European macro-region.

Your participation is fully deliberate. Your answers will be made anonymous and treated confidentially.

More information about the POLYCE project can be obtained from the website www.polyce.eu. There you can also sign up for a newsletter to receive the latest updates about the project. If you have not signed up yet, we would like to encourage you to do so. Also, please feel warmly invited to participate in the POLYCE conference to be held in fall 2011 in . The event is meant to bring together local stakeholders and experts, and to provide a forum for debate and discussion among them. We will inform you about the exact date and venue of the event in the coming weeks.

Should you have any questions or remarks please contact the person you received this questionnaire from or send an email to info@polyce.eu.

Many thanks for your participation.

POLYCE Project Team

How to use this questionnaire?

The following questionnaire is designed as an online questionnaire, to be filled in through a web interface. Should you feel more comfortable in filling it in on paper, you can use the paper version that you received by mail. If you rather prefer to answer the questions through a face-to-face conversation please contact the person you received this questionnaire from to set up an appointment.

The questionnaire is divided in three parts. Completing it will approximately take 30-40 minutes. Part one deals with recent urban development trends of and the current profile of the city. Part two is about the perspectives that you see for the future development of the city. The third part finally deals with the question how these perspectives can be realized, and what factors are of importance in this respect.

Throughout the questionnaire, a distinction will be made between the core city and the metropolitan region. The former refers to the city within its administrative boundaries, whereas the latter denotes the city with its surrounding region.

Part 1 – Recent urban development trends and city profile of

The first part of the questionnaire deals with the recent development of in economic, social, environmental and infrastructural terms, as well as with the overall profile that the city currently has.

1. Which of the following terms reflects the profile of ?

(Multiple answers possible)

industrial city	☐
centre of research and education	☐
centre of tourism	☐
centre of finance and business	☐
centre of innovation	☐
dynamic, growing city	☐
dormitory city	☐
historical city	☐
other…	☐
other…	☐
other…	☐

2. How would you assess the overall development of metropolitan the last five years in the dimensions below?

(Please rate them and add others that you consider significant)

Economic dimension	**Low**	**Rather low**	**Rather high**	**High**
Competitiveness	☐	☐	☐	☐
Attractiveness as business location	☐	☐	☐	☐
Research & Innovation	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

Societal dimension	**Low**	**Rather low**	**Rather high**	**High**
Social integration	☐	☐	☐	☐
Social mobility	☐	☐	☐	☐
International orientation / open-mindedness	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

Environmental dimension	Low	Rather low	Rather high	High
Environmental quality (air, soil, etc.)	☐	☐	☐	☐
Quality of open space	☐	☐	☐	☐
Sustainability of land use structures	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

Infrastructural dimension	Low	Rather low	Rather high	High
Green mobility (public transport, biking, etc.)	☐	☐	☐	☐
International connectivity	☐	☐	☐	☐
Quality of public services (education, health care, etc.)	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

Institutional dimension	Low	Rather low	Rather high	High
Modernization of administration	☐	☐	☐	☐
Participation of citizens	☐	☐	☐	☐
e-Governance	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

3. How would you describe the city with regard to the categories mentioned below?

attractive	☐	☐	☐	☐	☐	unattractive
ordinary	☐	☐	☐	☐	☐	unique
friendly	☐	☐	☐	☐	☐	hostile
tranquil	☐	☐	☐	☐	☐	hectic
clean	☐	☐	☐	☐	☐	dirty
progressive	☐	☐	☐	☐	☐	old-fashioned
affordable	☐	☐	☐	☐	☐	expensive
spacious	☐	☐	☐	☐	☐	dense
prospective	☐	☐	☐	☐	☐	with no prospects
safe	☐	☐	☐	☐	☐	dangerous
silent	☐	☐	☐	☐	☐	noisy
emotional	☐	☐	☐	☐	☐	rational

sophisticated	☐	☐	☐	☐	☐	simple
self-confident	☐	☐	☐	☐	☐	without self confidence

4. What is your experience regarding the social environment in the city?

(Multiple answers possible)

supportive	☐
inspiring	☐
friendly	☐
cooperative	☐
competitive	☐
split apart	☐
hostile/frightening	☐
tolerant	☐
indifferent	☐
snobbish	☐
other:	☐
other:	☐

5 A. According to your point of view, name the three most important POSITIVE projects or activities that influenced metropolitan development over the last ten years and explain why they were important.

Event	Why was it important?	Located where?
1.		
2.		
3.		

5 B. According to your point of view, name the three most important NEGATIVE projects or activities that influenced metropolitan development over the last ten years and explain why they were important.

Event	Why was it important?	Located where?
1.		
2.		
3.		

Part 2 – Perspectives for future development

The following, second part of the questionnaire deals with the perspectives for future development of as European metropolis. Referring to existing strengths and weaknesses of the city in economic, social and environmental terms, potentials for future development will be discussed. (Strengths and weaknesses describe those factors that are within the city's sphere of influence and that can be actively shaped and changed.)

6. Please name the most important strengths of the city.

Strength	
1.	
2.	
3.	
4.	
5.	

7. Please name the most important weaknesses of the city.

Weakness	
1.	
2.	
3.	
4.	
5.	

8 A. From your point of view, which projects or activities in the city or the metropolitan region do you consider to be important for future metropolitan development ?

(Please name them and if possible specify their location.)

8 B. Which projects or activities in the city or the metropolitan region do you consider to be most challenging or controversial and why?

(Please name them and if possible specify their location.)

9. Which of the projects or activities you mentioned in question 8 do you consider most promising for the positioning of the city?

Project / Activity	
1.	
2.	
3.	
4.	
5.	

Part 3 – Realization of inclusive metropolitan development

The third part of the questionnaire deals with the cooperative initiatives and factors that are important for achieving an inclusive metropolitan development of

in the future. In this context, inclusive refers to a cohesive and just development, both among social groups and different areas of the metropolitan region.

10. Irrespective of the situation in , which of the following factors do you generally consider to be important preconditions for cooperation?

Please rate the following factors according to their importance and add others you regard as important (1 = low importance, 5 = high importance). You may skip factors you do not consider to be important.

Legal stability	□1□2□3□4□5
Political stability	□1□2□3□4□5
Leadership and decision-making qualities	□1□2□3□4□5
Former experiences with cooperation	□1□2□3□4□5
Tradition of participation	□1□2□3□4□5
Transparency in decision-making	□1□2□3□4□5
Pro-active behavior of citizens	□1□2□3□4□5
Social security	□1□2□3□4□5
Legitimacy of political-administrative system	□1□2□3□4□5
Open-mindedness of society	□1□2□3□4□5
Environmental awareness	□1□2□3□4□5
Other:	□1□2□3□4□5
Other:	□1□2□3□4□5

11. In particular regarding the situation in , which of the following factors do you consider to be important preconditions for cooperation?

Please rate the following factors according to their importance and add others you regard as important (1 = low importance, 5 = high importance). You may skip factors you do not consider to be important.

Legal stability	□1□2□3□4□5
Political stability	□1□2□3□4□5
Leadership and decision-making qualities	□1□2□3□4□5
Former experiences with cooperation	□1□2□3□4□5
Participation culture	□1□2□3□4□5
Transparency in decision-making	□1□2□3□4□5
Pro-active behavior of citizens	□1□2□3□4□5

Social security	□1□2□3□4□5
Legitimacy of political-administrative system	□1□2□3□4□5
Open-mindedness of society	□1□2□3□4□5
Environmental awareness	□1□2□3□4□5
Other:	□1□2□3□4□5
Other:	□1□2□3□4□5

12. With regard to the positioning of , for which fields of metropolitan development do you consider cooperation to be important?

…on the level of the metropolitan region:

…with other cities:

13. Are you aware of existing cooperative initiatives of with other cities?

(Please name them)

… in the metropolitan region:

… with other POLYCE cities:

… with other cities:

From your professional point of view, is the city of an attractive partner for other cities?

If yes, why? If not, why not?

14. From your professional point of view, which cities can you imagine to be potential future partners for ? In which field of activity?

Cities / municipalities in the metropolitan region of :

Other cities:

15. What are your strategic recommendations for future metropolitan development of ?

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