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ul. 1 Maja 50, 40-287 Katowice, tel. (032) 257-76-35, fax (032) 257-76-43
www.wydawnictwo.ue.katowice.pl, e-mail: wydawnictwo@ue.katowice.pl

URBAN ECONOMIC RESILIENCE – NEW CONCEPT FOR POST-INDUSTRIAL CITY TRANSITION

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Adam Drobniak

THE URBAN RESILIENCE – ECONOMIC PERSPECTIVE

Introduction

Cities now playing the role of engines for economic development, which offer opportunities for growth, but at the same time they also face with many internal and external problems (challenges) like: poverty, migrations, pollution, decay, natural disasters, economic crisis.

Thus, every city is affected by trends of transformation. These internal and external problems (challenges) also occur in transforming post-industrial areas, probably in the most extremely strong way. Some of them can adapt to such problems (challenges) while in others structural change leads to decline. Therefore the concept of urban resilience and urban economic resilience seems to offer an idea that makes it easier to understand and manage.

While there is an emerging research focus on sustainable cities, smart grow, green city, competitive city, creative city, attractive city, or 'shrinking city', there still remains poor scientific understanding of factors that make some cities (including those with industrial background) resistant to shocks (external and internal problems). Hence, the underlying question of the paper is:

– how the concept of the resilience can be understand in urban transition processes?

To answer this question, the following steps of investigation were implemented:

– first – to explore different meanings of the notions like: resilience, urban/ /regional resilience, urban economic resilience,
– second – to show two basic research approach for the urban economic resilience along with the model of urban economic resilience,
– third – to present selected studies on the urban/regional resilience made so far.
– And finally, the general conclusions arising from the urban economic resilience concept were formulated.

1. Resilience, urban resilience, urban economic resilience

The idea of resilience to urban and regional studies has been introduced by the debate about sustainable development along with adaptation to climate changes (Simme, Martin, 2009). Urban resilience notion is also triggered by the major urban threats and disasters in the last few years, like the terrorist attracts in New York, the Asian tsunami and Hurricane Katrina in New Orleans, or bombing attack in London.

According to the Latin root, resilience is a "resilire" that means: to leap back or to rebound (Simme, Martin, 2009). Generally speaking notion of *resilience* is the ability of an entity or a system to recover from disturbance and disruption of some kind.

Of course, there is much ambiguity across the term of resilience, and there is no universally agreed definition of resilience in economics as well as in the regional and the urban studies. So, we have quite long list of definitions, like:

– reaction to specific extraordinary events and shocks (Simme, Martin, 2009);
– stability of a system against interference, but it is more than response to, it is a kind of systemic property (Welter-Enderlin, 2006);
– capacity to avoid and manage natural and human-induced hazards (Bosher, Coaffee, 2008);
– concept for understanding managing complex socio-ecological systems (Walker et al., 2006).

In turn, the notion of *urban resilience* can be perceived as a degree to which cities are able to tolerate disruption before re-organising around new set of structures and processes (Alberti et al., 2003). According to this, it means the urban resilience is not only "response to impact" (like disaster or economic decay) but also it is a society and economy that is flexible and able to adjust in the face of uncertainty. That lead us to the following definition of the urban resilience: the ability of a city to anticipate, prepare for, respond to and recover from a disturbance (Barnett, 2001; Foster, 2007).

Urban economic resilience is seen as the capacity to solve the local economic problems in a way that generates long-term success. Local and regional development is often a subject of disruptions like (Simme, Martin, 2009):

– periodic economic recession,
– rise of major competitors elsewhere,
– unexpected plants closure,
– technological change.

The way a local economy respond to these "events" shows in consequence how it develop and evolve. Finally, we can say the *urban economic resilience* is:

– the ability of a city's economy to:
  • maintain a pre-existing to shock level of growth,
  • return to previous (i.e. pre-existing to shock) level of growth,
  • or completely change the economy structure and reach the previous level of growth at least – after experiencing external shock.

The level of local growth could be measures for example by level of: output, employment, population, migration.

In relation *to old industrial cities* the idea of resilience helps to understand (Simme, Martin, 2009):

– serious problems of adaptation arising form features of these kind of areas like (Lever, 1987):
  • release of large number of low qualified workforce,
  • factories closedown,
  • income polarization,
  • living conditions polarisation along with unequal assess to public services,
  • de-urbanisation,
  • decrease of tax revenues,
  • ghettoisaton,
  • lost of the socio-economic importance of a city in a country and abroad,
  • release of the post-industrial areas in a city's centre and its other districts.
– slow recovery of such areas, because of these features.

The urban economic resilience concept is also helpful in answering the question of when recovery may occurred in the post-industrial cities. That is only in case the sufficient number of new developments coincide to provoke fundamental change in economic structure of such areas, or in the case they bounce back its pre-shock growth path by maintaining old patterns of production.

2. Urban economic resilience – research approaches

The urban economic resilience is unlikely to be invariant over time. It may depend on the nature of shock and changes over time as well as on specificity of city's socio-economic structure – which also evolves over time. That makes two basic approaches for study of the urban economic resilience. That are:

– the economic equilibrium approach (Simme, Martin, 2009; Hill et al., 2010),
– the evolutionary approach linked with adaptive cycle models from panarchy theory (Simme, Martin, 2009; Hill et al., 2010).

Equilibrist approach is more traditional, sometimes called "engineering resilience". It is focused on the stability of a system near an equilibrium or steady state and returning to pre-existing equilibrium (Pimm, 1984). It is also explained as ability of a system (like a city) to absorb and accommodate perturbation without structure transformation or with collapse. That means that shock moves a city's economy off its equilibrium growth path but with the assumption of self-correcting forces, that bring it back onto the growth path again (like on Figure 1).

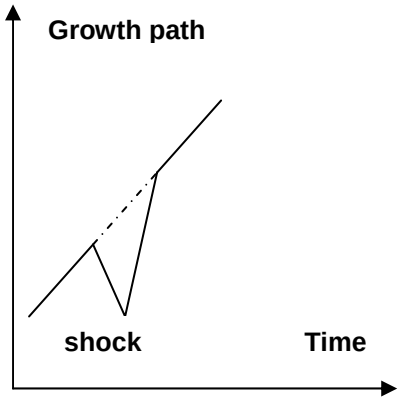

Figure 1. Response of an economy to a shock – equilibrium approach
Source: (Simme, Martin, 2009).

The problem with equilibrium approach is that, if the urban economy resilience is defined as ability to return to equilibrium after a shock, it is difficult to reconcile the notion with the idea of qualitative urban development and evolution (which assumes the fundamental change of structure and new equilibrium). Because – according to the equilibrium approach – the more resilient is the a city, the less it would change over time.

In evolutionary approach it is assumed that a city is the example of complex adaptive systems. It is living, dynamic, connected, and open system – evolving in many and varied ways to both internal interactions and the influence of external factors (Batty et al., 2004). Therefore resilient urban economy would be one capable of absorbing and accommodating extreme shocks without any significant change, or that one which is able to create in a quick way new socio-economic structures with success (Simme, Martin, 2009).

Therefore, there is no single equilibrium state or path but several possible states and growth paths, and a city's economy can be shifted from one such equilibrium to another by shocks. The resilient economy would be one that adapts successfully, resumes, or still improve its long run equilibrium path (Simme, Martin, 2009) – see the Figure 2.

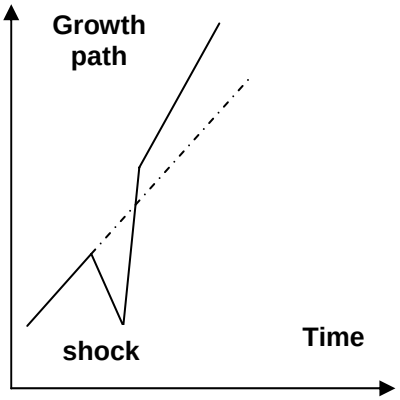

Figure 2. Positive response of an economy to a shock – evolutionary approach
Source: (Simme, Martin, 2009).

In contrast, a non-resilient city's economy would be one that fails to transform itself successfully and instead becomes "lock-in" in frame of outmoded structure with lowering its growth-path (Simme, Martin, 2009) – see Figure 3.

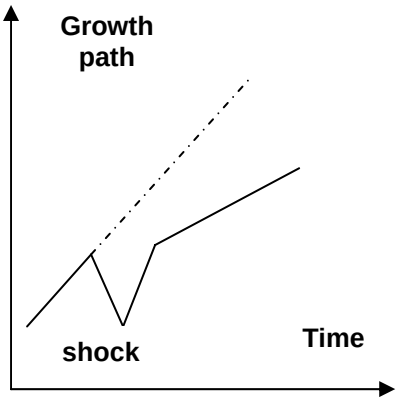

Figure 3. Negative response of an economy to a shock – evolutionary approach
Source: (Simme, Martin, 2009).

3. Urban economic resilience – 4 research perspectives

When we link the resilience concept with urban aspects and evolutionary approach, this opens up four possible research perspectives (Simme, Martin, 2009):

– *General Darwinism* – which emphasis variety and adaptability of a system (like a city). According to this, in urban dimensions:
  • variety means structural or sectoral diversity of firms and their behaviour;

- adaptability means potential of local firms, institutions to adjust to changing circumstances in an appropriate way; for example by unfolding new behaviour patterns such as innovations.

Putting variety and adaptability together, it is expected that high level of variety and adaptability influences the urban economic resilience in a positive way.

– *Path Dependency Theory* – the standard path-dependency concept assumes the notion of "lock-in". This is the process whereby an urban economy becomes "lock-in" in particular trajectory of economic development (David, 2005). Imparting the "shock" into the path-dependency concept makes two basic interpretations:
  - first: an urban economy is resilient if it is able to maintain its "lock-in". Thus, it is a positive attribute of an urban economy; this is akin to the notion of "engineering resilience" (positive lock-in);
  - second: "lock-in" has a negative attribute as holding back the adaptation processes of urban economy; so, path-dependency undermines the urban economic resilience (negative lock-in).
– *Complexity Theory* – according to it – an urban economy represent complex adaptive system, characterised by several features, like for example (Martin, Sunlay, 2007):
  - degree of connectivity – referrers to functions and relationships that are distributed across the system elements;
  - boundary between a complex adaptive system and its environment; it is neither fixed nor easy to identify making its operational closure difficult (like an economy linkages in and out of a city);
  - self-organisation which imbues complex system with the potential to adapt its structure and dynamics to response to changes from external environment or internal shifts.
– *Adaptive cycle model from panarchy theory* – it links resilience with "adaptive cycle". It posits a four phase process of continual adjustment in socio-economic and environmental systems. Each phase of the model is characterised by different levels of three dimensions (Simme, Martin, 2009):
  - the potential of accumulated resources to the system – like: competences of local firms, skills of local workforce, local institutional forms and arrangements, physical and soft infrastructure;
  - the internal connectedness of a system actors or elements – it relates to patterns of trade and untraded dependencies among local firms, local network of trust, knowledge spillover, formal and informal business associations, pattern of labour mobility;

- the resilience – perceived as measure of a system vulnerability to shock; high resilience is associated with phases of creative and flexible response – they would depend on innovative capacity of local firms, entrepreneurial capabilities and setting up of new firms, institutional innovation, access to investment capital, willingness of workers to improve educational attainments.

4. Urban economic resilience within the adaptive cycle model

The adaptive cycle model from panarchy theory applied to the urban economy includes two loops (Pendell et al., 2008):

– first: *exploitation to conservation* – this is the emergence, development and stabilisation of a city's economic structure and growth path,
– second: *release and reorganisation* – this is rigidification and decline of a city's economy structure and growth path, and opening up of the new potential types of activity and growth sources for exploitation.

The movement between these phases (see Figure 4) in an urban economy is the following (Pendell et al., 2008):

– *In the exploitation phase* urban growth develops, human and knowledge capital are accumulated, new local industries exploit comparative advantages. Resilience is high.
– *In the conservation stage* – as growth continues, the connectedness among elements of urban economy increases and the pattern of development becomes rigid. So the resilience to potential shocks decreases.
– *In release phase* – if shock appears, structural decline and loss of growth momentum are likely to follow. Firm close or move out of the city. The degree of connectedness decrease. The old patterns of production and the institutional forms unravel and resources are released. Resilience is low but may increase.
– *In reorganisation phase* – connectedness is low, the potential for creation of the new paths high. The trajectories of development are opened and thus, resilience is high. If – at this stage – the new activities as new technologies are introduced and started to exploit, new comparative advantages appear. And new round of the urban growth and accumulation is set in motion.

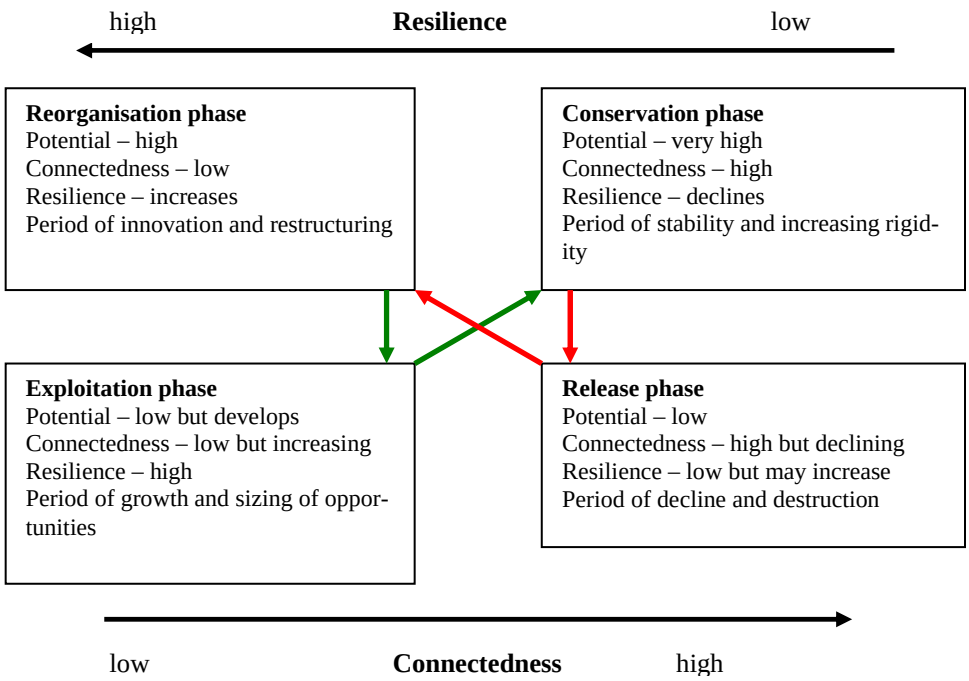

Figure 4. Adaptive cycle model and urban economic resilience
Source: (Holling, Gunderson 2002); (Simme, Martin, 2009).

5. Economics shocks

Finally, there are few considerations about the economic shocks. Some urban economies are resilient to shocks while others suffer substantially downturns. So, partly according to the Hill research (Hill et al., 2010), cities may suffers from four kinds of shocks:

– *global economic shock* – caused by downturn in whole world economy – like financial crisis in last years;
– *national economic shock* – cause by downturn in the national economy;
– *sectoral industry shock* – cause by downturn in particular industries that are important part of a city's export base, like for example the automobile industry;
– *other shocks* – cause by other external factors like natural disaster, movement of important firm or institution out of a city.

These shocks are not mutually exclusive. So, an urban economy may experience more than one simultaneously. Not all shocks throw a city's economy off its prior growth path. That means (Hill et al., 2010):

– when shock do not cause a city's economic downturn – we term a city: *"shock-resistant"* to that shock;
– when a city's economy is adversely affected by the shock we considered it *"resilient"*, if it returns to its prior path growth or a new path growth with relatively short period of time; that means a city's economy simply bounced back – because of favourable shift in the demand for its existing products, or because of upgrade of existing technologies, or because of produce of new products;
– if a city's economy does not return to its previous growth path we called it *"not-resilient"*.

Please note, that a city prior growth path is not necessarily a good thing. For example, if the prior growth path was low or stagnant or environmentally harmful.

6. Research on urban and regional economic resilience

The examples of research on regional urban resilience were conducted mainly in the first decade of 2000. Among them there are research networks, scientific projects, as well as institutions aimed at examining the resilience concept in regional and urban context. For instance:

– Gleaser and Saiz (Gleaser, Saiz, 2004) run researches on importance of human capital in region's resilience. According to them, human capital along with educational attainment and skills of the region' workforce are the main drivers for growth and resilience.
– Building Resilience Regions is the example of research network establish in 2006 by MacArtur Foundation.
– Briguglio (Briguglio, 2006) – according to him, concentration of a nation's exports in a few industries inhibit resilience. This suggests similar hypothesis of regional and local export industries.
– Stockholm Resilience Centre, established in 2007, is organised into research themes that address different issues of resilience and transformation – not only on a regional or an urban scale – like:
  • freshwater, food, and ecosystem services,
  • global and cross-scale dynamics,
  • governance of coastal and marine systems,
  • adaptive governance, networks and learning,
  • regime shifts,
  • urban social-ecological systems,
  • Baltic sea ecosystem management.

– Resilience Alliance Initiative for Transitioning Urban Systems Towards Sustainable Future was established in 2007 and it is organised by: CSIRO* Canberra, Arizona State University, Stockholm University. The Alliance was established to generate scientific bases to formulate positive strategies for urban future in the context of urban resilience. The urban resilience is defined by four elements (see Figure 5):
  - *Metabolic flows* – focusing on interactions: production, supply and consumption chains. For example, production systems that rely on one type of fuel – as their energy source – can be highly vulnerable if the particular fuel is in shortage. So diversifying fuel sources moves the system (a city) to higher resilience.
  - *Social dynamics* – focusing on demographic changes (excessive growth or shrinking cities problems), human capital changes (like educational attainments) and inequality (like social stratification in housing leading to problems of extreme disadvantages in living conditions).
  - *Governance networks* – focusing on changes in institutional structures like shift of power, decentralisation of public services, privatisation, emergence of institutions that are able to produce, capture and share knowledge (Thilo Lang, 2010).
  - *Build environment* – focused on urban landscape, a spatial organisation of a city and thus its infrastructure, physical locations of roads, railways, airports, green areas. All these features of urban landscape may have significant influence on the flow of commerce and people in and out of a city.

* *Commonwealth Scientific and Industrial Research Organisation.*

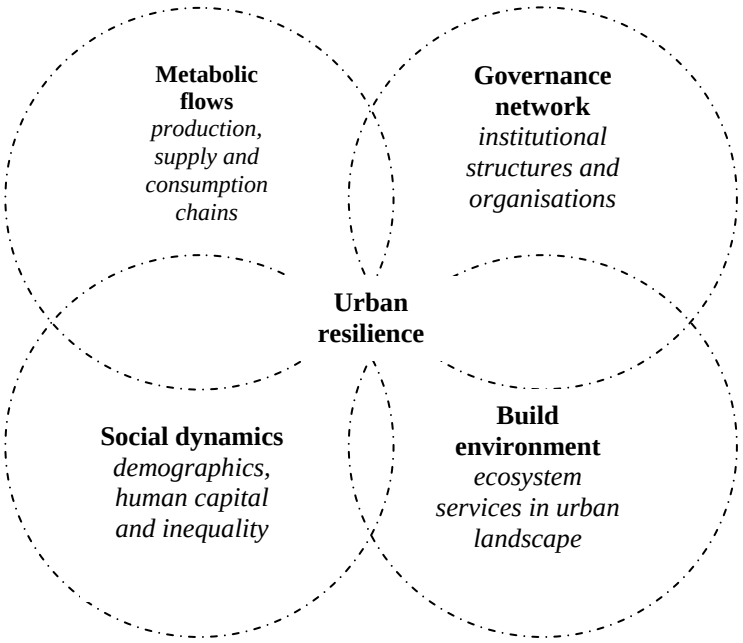

Figure 5. Four interconnected research themes within the Resilience Alliance Initiative
Source: Resilience Alliance Initiative for Transitioning Urban Systems Towards Sustainable Future (2007).

- Duval, Elmeskov, Vogel (Duval, Elmeskov, Vogel, 2007) – according to them, the public policies that restrict firms' ability to lay off or reassign workers make shocks less severe but also make them last longer;
- Feyrer, Sacerdote and Stern (Feyrer, Sacerdote, Stern, 2007) run research on counties that experienced auto and steel industry job losses in late 1970s and early 1980s in the U.S. According to them, employment and population of counties after a shock failed to growth during nearly two decades after shock;
- Christopherson and Clark (Christopherson, Clark, 2007) – according to them, the growth and regional resilience may be inhibit by domination of: regional labour markets, suppliers, R&D units, informal business association by a few large vertically integrated firms;
- Desmet and Rossi-Hansberg (Desmet, Rossi-Hansberg, 2009) also run the researches on the regional resilience and according to them regional economies can be renewed if their firms can introduce new goods or services for export in a quick way or use new technologies to produce such goods and services;
- Gerst (Gerst, 2009) explores the different paths of development in IT centres localised in urban areas in the US (after the IT bust in 2000). The research revealed that: impact of decline and path of recovery varied considerably,

showing differences in urban economic resilience. IT centres specialised in IT services performed better than those in manufacturing because of their highly educated labour force.

Studies of Hill (Hill et al., 2010) are relatively important for urban policy formulation. He runs researches on urban economic resilience in metropolitan areas of the U.S. According to him, cities that experienced employment shocks, recover to their pre-shock employment rate but not to their pre-shock employment levels within eight or fewer years. The reason is that: workers in the U.S. quickly leave cities that have experienced large job loss – while the lack of emigration of jobseekers help a city's employment rate to recover. Moreover employers do not relocate jobs to cities that have experienced large employment shocks (Blanchar and Katz, 1992).

Hill also noticed that durable goods manufacturing makes the metropolitan areas more susceptible to economic downturns. Cyclical demand for durable goods makes employment in that sector susceptible to downturns. It could be resilient in case of eventual rise of demand. On contrary, cities with dominance of health care sector and public administration sectors are more shock-resistant.

Additionally cities with large share of population with low levels of education are more susceptible to downturn. If after a shock, pre-shock demand for low qualified workforce return they are resilient. But if not, they are not-resilient.

Cities with lower levels of income inequality (measured as gap between high- and low-income households) are less susceptible to downturns (shock-resistant). And finally the presence of large number of research universities appears to enable a city's economy to recover more quickly (resilient). But there is one condition: the research universities and R&D units must lead projects with high level of commercialisation and spin-offs.

Conclusions

The urban resilience concept formulates relatively new question in local development studies: how a city should develop to successfully cope with external and internal changes. In evolutionary approach the urban economic resilience is perceived as ongoing process rather than a recovery to steady state or equilibrium. Cities as complex adaptive systems is being self-organised with few critical processes creating and maintaining these self-organisation. Such systems combine social, economical and environmental elements which are "interlinked" in never-ending – but changing considerably among cities – adaptive cycles of growth. Thus, the urban economic resilience concept:

– seems to be the useful attempt for explaining processes of a city transformation in complex way under the conditions of changeability of external factors influencing an urban economy;
– allows for and justify the selection and application of other urban economic development concepts (like creative city, smart growth, competitive city, etc.), which under the specific internal and external conditions as well as on different stage of a city's transformation may substantially determine an urban growth. And thus, make a city "resilinet" or "shock resistant";
– shows the reason to prompt public policy response, so it allows to adapt governance and institutional approach into the urban development processes;
– can be perceived as an effective frame for an urban policy formulation both at different levels of a self-government and for different cites' types – referring to their stage of transformation and development. Therefore, it may be used as theoretical background for strategies, programmes, and projects aimed at creation of "resilient" or "shock-resistant" city in turbulent environment;
– is particularly useful for the post-industrial cities coping with large number of socio-economical and environmental problems of transformation and experiencing external shocks more severely than other urban areas at the same time.

Urban economic resilience identifies the points at which a city is capable of accepting positive change as well as points it is vulnerable. The high resilient city opens gates for novel combination of resources and trigger innovation. In contrary – improvement of a low level of city's economic resilience – like in the case of post-industrial cities – requires:
– recombination of a city's economy elements,
– and need for recombination and innovation to occur simultaneously to open a window for creating fundamental change.

The important factor in building cities' economic resilience for long-run success is *the ability of flexibility*. This should base on knowledge how to adapt industry, technology, labour force, institutional structures to changing competitiveness, technological, and market pressure as well as to capitalise opportunities in quick way.

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University of Economics in Katowice

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Jan Sucháček

ON THE EMERGENCE OF RESILIENCE AND ADAPTABILITY: AN EVOLUTIONARY PERSPECTIVE

Introduction

The beginning of New Millennium witnessed the birth of ideas that gave rise to concepts, which are currently known as territorial resilience and territorial adaptability. The latter refers largely to long-term trajectories. On the contrary, territorial resilience can be in a way perceived as a short-term subset of territorial adaptability. Nonetheless, it should be stressed that qualitative aspects of both evaluated concepts are not the same. Evolutionary nature of both above mentioned concepts also causes that basic framework of our evaluation will be based on historical development of general approaches towards regional development.

Thus, the main objective of the paper consists in evaluation of resilience and adaptability concepts from evolutionary perspective. The paper is organized as follows: after introduction, an attention will be devoted to the evolution of regional development conceptions as well as different nature of Central East Europe and advanced western economies (Sucháček, Wink, Drobniak, 2012). Further on, concepts of resilience and adaptability with an emphasis on their sources and development will be depicted.

1. Territorial Development: Evolutionary and Spatial Perspectives*

Albeit territorial development might seem to be similar in various nation states, in reality there exists a strong differentiation that can be seen for instance between relatively continuously evolving western countries and transition countries that for a long period suffered from totalitarian regime in the sphere of politics and central planning in the realm of economy. These differences are reflected also in the evolution of economic – political approaches towards regional and local development in individual countries. As it will be apparent in the following text, we are currently entitled to speak about emerging 'two Europes' in the sphere of territorial development.

In the course of last two or three decades the move from exogenous approaches towards regional development that rely on inner potential became tangible. However, rather than by remade endogenous doctrine, exogenous Keynesian paradigm was replaced by new neo-endogenous doctrine, which accentuates the creation of general conditions for the stimulation of inner endogenous development possibilities and capabilities in individual regions. Neo-endogenous stream of regional development was formed as an intersection of new concep-

* This chapter is the adapted version of (Sucháček, 2010).

tions, such as learning regions, flexible specialization or industrial districts that underline the importance of profound spatial differentiation in institutional characteristics. Contemporary neo-endogenous and to a certain extent eclectic stage of regional development is path-dependent upon the history of regional development paradigms.

Currently, basically all transition countries find themselves under the strong pressure stemming from the endeavor to apply neo-endogenous approaches to the regional development that are fashionable. The key cause of this strain consists in the presence of deformed system macrostructures, which embody the heritage of socialist times. The problem of the tension between neo-endogenous practice of regional development and dysfunctional system macrostructures that actually form the wider framework for all spatial processes in transition countries is stated only seldom, nonetheless it becomes increasingly palpable issue in these economies.

As it is visible in Table 1, regional development approaches are distinguishable as follows:

- Interventionist, i.e. Keynesian and extremely interventionist Marxian-Socialist;
- Non-interventionist, i.e. strongly non-interventionist liberal paradigm and rather non-interventionist modern neo-endogenous conceptions of regional development.

In other words it is possible to talk about ‘top-down’ conceptions that rely upon the outer interventions and are inherent to Keynesian and Marxian-Socialist paradigms on the one hand and ‘bottom-up’ approaches, which emphasize the stimulation of inner regional development potential and are typical for liberal and modern paradigms of regional development on the other hand.

Modern, neo-endogenous approaches towards regional development emphasize the importance of the stimulation of endogenous potential in the region. At the same time, these conceptions implicitly consider that system macrostructures are distributed in the way, which enables approximately even conditions for the development of individual regions and localities in the framework of the country. In this context, one has to take into consideration that system macrostructures bear distinct spatial dimension, which substantially affects the quality of these macrostructures.

System macrostructures are embodied by public administration (namely the power and manoeuvring space of state administration and self-government from financial perspective as well as the organisation of their competences) or by both physical and social infrastructure.

There should exist balance between state administration and self-administration on the one hand and the spatial distribution of infrastructure should be at least approximately bound to the settlement system as well as the overall socio-economic significance of particular territories on the other hand. All of these system macrostructures determine developmental possibilities and limitations of regions. More importantly, all of these macrostructures are formed on the basis of concrete political – economic decisions.

Adequately distributed system macrostructures ensure approximately even developmental conditions for all regions, which is also the prerequisite for efficient accomplishment of modern, neo-endogenous development. However, in the reality of transition economies, the occurrence of qualitatively good and spatially adequately distributed system macrostructures is rather an exception than rule. From this point of view, administrative, infrastructural as well as institutional system macrostructures in contemporary transition economies find themselves in an embryonic stage of their development (see Figure 1). Obviously, it brings a great augmentation of transaction costs in these countries (Jurečka, 2002 or Sucháček, 2005).

Table 1

Chronological Development of Regional Developmental Paradigms

General Paradigm	Characteristic Features	Typical Regional Policy
Liberal/non-interventionist/ **endogenous development**	Convergent spatial development, there is no necessity to intervene in market forces. Non-interventionist approach	'Workers to the work'school, instruments increasing the labour mobility
Keynesian/interventionist/ **/exogenous development**	Divergent spatial development, it is necessary to intervene in market processes. Interventionist approach	'Work to the workers' school, tools supporting the inflow of investments into problem regions
Marxist-socialist/ extremely interventionist/**exclusively exogenous development**	Divergent spatial development, necessity of planning and management of spatial development. Extremely interventionist approach	Central planning and management of spatial development, ignorance of spatial-market signals
Modern/'transformed' **neo-endogenous development**/formation of frame conditions for endogenous initiatives	Divergent spatial development, however, it is necessary to stimulace inner regional potential. Rather non-interventionist approach	Support of milieu, which facilitates networking, development of small- and middle-sized firms, innovations and learning. Augmentation of institutional thickness, coopetition (co-operation and competition)

Comparisons show symptomatically great institutional similarity of Central East European economies that underwent totalitarian political regime and cen-

trally planned economy. It is thus only hardly surprising that transition economies can largely serve as excellent examples of dysfunctional institutions, which are not suitable for modern, neo- endogenous recipes for territorial development.

In practically all Central East European economies, there existed strong administrative-political centralization of virtually all decisive mechanisms of societal life into the capital cities. This could be perceived as a spatial manifestation of totalitarian political system. This constituted the basis for future developments of these countries which are nowadays strongly path-dependent (Lux, 2008 or Mlčoch, Machonin, Sojka, 2000).

The function of system macrostructures in contemporary transition countries is often braked and to certain extent deformed by centralizing approach of state administration that does not want to give up its financial resources and competences. Subsequently, the self-government is practically oppressed by an excessive influence of state administration and specific, neo-core-periphery pattern of these countries has evolved.

The key problem consists in the fact that the development in Central East European countries 'jumped over' or more precisely avoided the Keynesian stage of regional development. Deformed system macrostructures that represent the heritage of socialist era disallow an adequate application of modern approaches towards regional development, which are well-known and well-tested in western economies. In comparison with transition regions and localities, their western counterparts go from approximately equal technical, competence as well as financial categories that evolved in the framework of market economy and political democracy mainly during Keynesian era.

Relative consent between transformation of system macrostructures and regional policy paradigm in individual countries can be perceived as probably the most important element of the whole Keynesian period. In spite of interventionist character of Keynesian doctrine, market mechanism was not replaced in any advanced country. Concurrently existing central planning in combination with political totality in Central East Europe brought the deformation and namely centralization of de facto all basic components of life.

On the contrary, countries that applied Keynesian direction of development were generally able to create adequately distributed system macrostructures that facilitate the development of particular regions and localities substantially. Succinctly, advanced countries generally realized that they cannot afford socioeconomic 'black holes' within their own territories and that more or less evenly distributed system macrostructures ensure the socioeconomic development of the whole country. Not surprisingly, a great decentralization combined with the support of local and regional self-governments took place during the Keynesian and Post-Keynesian period in practically all advanced countries.

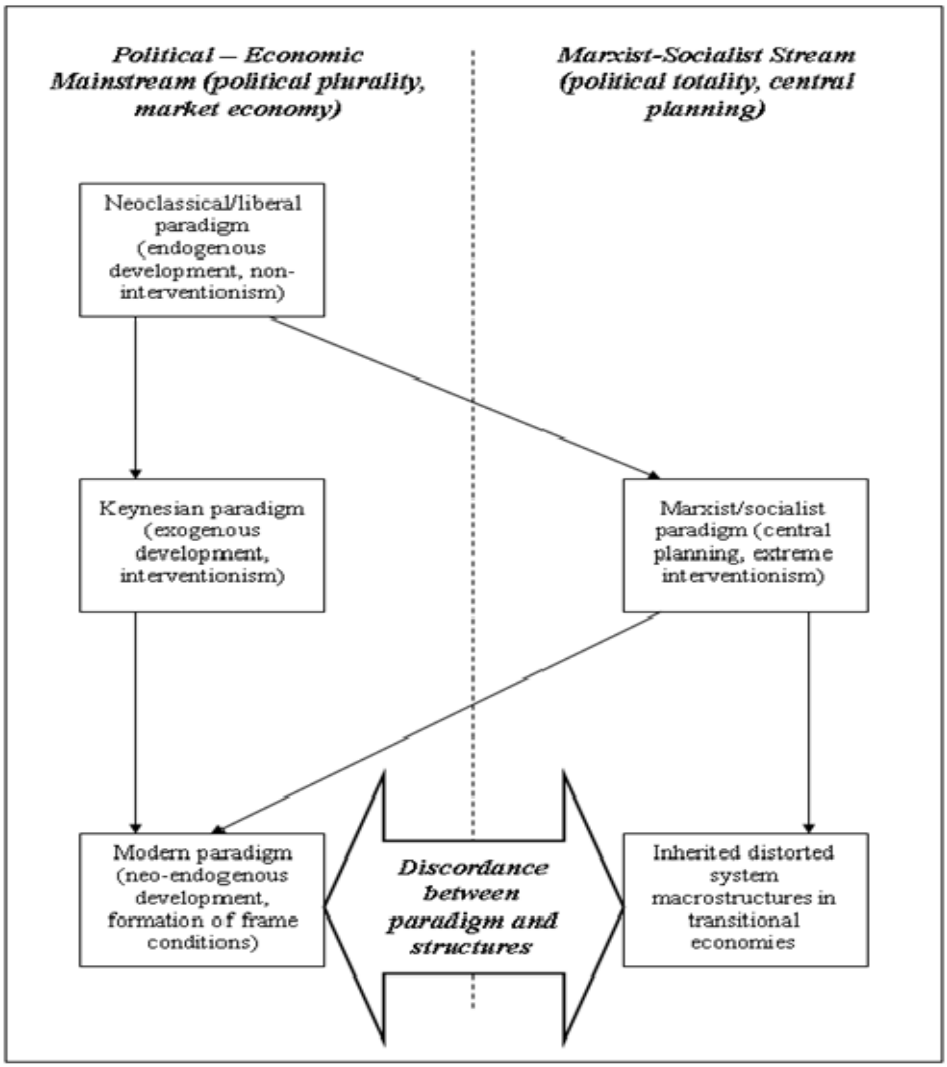

Figure 1. Discrepancy between Modern Paradigm on Regional Development and System Macrostructures in Transition Countries

At the same time, one has to differentiate also among western countries. Evolutionary trajectories in some of them (e.g. Germany or the Netherlands) led to the spatial model which might be called decentralized concentration and which is in compliance with settlement systems in these countries. On the contrary, for some countries (e.g. Great Britain or France), the historical centralization of virtually all relevant aspects of life into the capital city was typical and this changed namely during Keynesian era, when national governments (par-

tly under external political and economic pressures) understood that location of economic, social and other activities should follow the settlement system as well as developmental potential of individual territories (Vanhove and Klaasen, 1987).

While in advanced countries both formal and informal institutions crystallized out naturally, in an evolutionary way, in transition economies, for which numerous developmental discontinuities are characteristic, the informal institutions played a relevant role in transitional years (Mlčoch, 1997). The significance of networking, lobbying or embeddedness is much higher in transition economies than in their western counterparts (see Figure 2). We are talking namely about hierarchical connections among regional and national actors, which are caused just by insufficient maneuvering space of self-governments.

Development, which is based on inner regional potential, is both effective and efficient, since it changes the quality of social and economic structures of individual territories. However, in many transition countries, markedly heterogeneous character of system macrostructures very often distorted or even eliminated the endogenous activities of local and regional actors. Developmental conditions of individual regions and minor cities in Central East Europe turned out to be rather differentiated and very often, one of the most important criteria of success or unsuccess is geographical and/or social distance from the capital cities. In Central East European localities and regions, the problem of discrepancy between relatively inertial and non-adequately distributed system macrostructures and neo-endogenous approaches towards regional development appeared.

Formal institutions were not defined well namely at the beginning of 90s. Corrective processes that concern informal institutions exposed to fifty years long incidence of Marxist-socialist paradigm on regional development, will probably last two or three generations. Obviously, these unfavourable facts afflict the applicability of modern approaches to regional development in Central East Europe.

It is thus possible to state, that location attractiveness and developmental conditions of particular localities are not given, but formed by concrete regional-political decisions and measures taken mainly by central institutions within nation states. Constitution of qualitatively good system macrostructures represents the first challenge in the process of the return to the natural developmental track. However, it is only requisite, but not sufficient condition, since history does matter and the redress of informal institutions is undoubtedly the question of longer time.

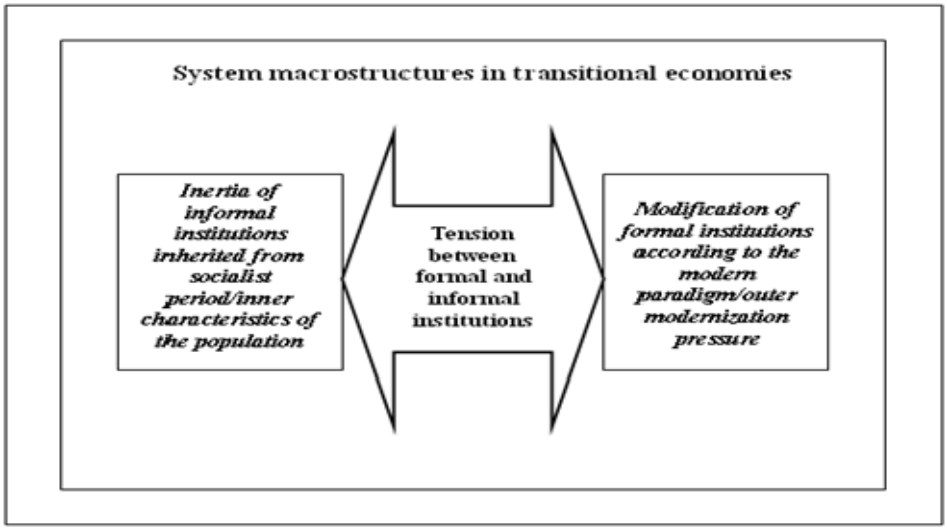

Figure 2. Inner Institutional Tension of System Macrostructures in Transition Economies

One has to consider the influence of system macrostructures, which do not ensure standard developmental conditions for all regions and localities. This fact is detrimental for the application of territorial – developmental approaches in the form well-known from western economies. Qualitatively well organized and distributed system macrostructures represent one of implicit presumptions of territorial development in advanced western economies.

2. Territorial Resilience and Adaptability

Both conceptions – i.e. resilience and adaptability – share an important feature: both of them raised and developed in advanced western economies. As already indicated, the economies of these countries underwent relatively continuous, unbroken development. That is why both of these conceptions, which are currently in vogue, apply to western economies rather than transition/post-transition countries.

As already indicated, territorial adaptability should be understood as wider notion than territorial resilience. Territorial adaptability can be perceived as spatially differentiated capacity of territorially-connected and established actors and structures to follow, create and influence possible territorial developmental trajectories in time. The final shape of territorial developmental trajectory is formed by accumulation and transformation of previous history on the one hand and by responses to the impulses (including both long-term trends and sudden

shocks) from external environment on the other. Production, employment, salaries, capabilities, knowledge, technologies or institutional density reflect both qualitative and quantitative aspects of territorial adaptability (Pike, Dawley and Tomaney, 2010).

While territorial adaptability is understood as a long-term ability of a territory to sustain performance and prosperity in the context of contemporary preferences, territorial resilience is related rather to short time span. As an organic subset of territorial adaptability, territorial resilience embodies an ability of territorial economy to react to a change of conditions and to create a new state of equilibrium. This new state of equilibrium can be of higher quality/level or of lower quality/level than the previous one. In contrast to adaptation, resilience constitutes an immediate response and adjustment to the changes.

As already indicated, both resilience and adaptation were born in the context of matured, western institutions. Both of these concepts should be understood as a natural continuation of neo-endogenous conceptions of regional development, which apply largely to economically advanced world. As it could be seen e.g. in Figures 1 and 2, both of these conceptions have only a limited validity for transition/post-transition economies, which are institutionally a completely different story.

Transition/post-transition economies were exposed to innumerable number of shocks of various kinds during both socialist era and last twenty years of transformation. These shocks that markedly differed from western world were both political and economic. Moreover, they were multiplied by political totality and absence of market during socialism and by painful return to natural developmental trajectory and general outer modernization pressures in last twenty years. Consequences of these enormously complicated processes were thoroughly depicted in previous chapter. In any case, we are entitled to talk about peculiar series of resilience or responses to almost permanent and at the same time specific shocks in Central East Europe.

From the perspective of adaptability, the difference between Western and transition/post-transition economies is even higher. Transition/post-transition territories suffer from intense developmental discontinuity in the presence of unsettled, and largely also ill-fitting institutions. Thus, resilience and adaptability applying to more affluent western counterparts can barely provide us with satisfactory explanations of contemporary processes in Central East Europe. To put it another way, transition/post-transition economies stay vis-à-vis the great challenge concerning the creation of original, non-copied and tailored approaches to the regional development in Central East Europe.

Conclusions

Adaptability and resilience are getting increasingly popular. They provide a certain explanatory framework that can be utilized also for the purposes of interpretation and evaluation of processes in various types of regions. One cannot omit, however, that both concepts are applicable mainly in advanced western economies enjoying the advantages of relatively long and continuous socioeconomic development. This applies much less to Central East European economies suffering from frequent developmental discontinuities and deformed system macrostructures. Paradoxically, deformed historical trajectories closely interconnected with these peculiar 'series of resilience' and contemporary projections of these previous developments are taken into consideration only rarely.

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University of Economics in Katowice

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Marcin Baron

DO WE NEED SMART CITIES FOR RESILIENCE

Introduction

It is obvious in contemporary urban studies that there is no such a fancy idea in the early 21st Century that could overcome the concept of Smart City. This notion has rapidly drawn attention of not only urban planners and policy makers, but (maybe first of all) is strongly supported by hi-tech businesses that consider introducing ICT in urban space as a vast market and real business challenge. Moreover Smart City is quite appealing to expectations and lifestyles of modern urban citizens, especially the young and 25-40 aged generation, who are well accustomed to utilizing ICT in everyday life and work.

Smart City mainly stands for transition in municipal (metropolitan) services based upon implementation of new technologies that allow new pathways of delivery or brand new services related to communication, security and sustainability. It is also an approach to face social, spatial and economic challenges in urban areas. Therefore, Smart City can be considered:

– a specific strategic orientation towards development of new (or revitalised) quarters in which technologies: support interactions between service providers and consumers, force expected social behaviours or enhance civil security;
– a way of implementing technological solutions into existing urban structures by which a real-time (or prompt) response is offered to citizens' and businesses' needs as well as to emerging risks and dangers.

On the other hand, there is another concept – deeply scrutinized in this Volume – the urban resilience. A resilient city is able to tolerate disruptions before reorganising around new set of structures and is able to anticipate, prepare for, respond to and recover from a disturbance (Drobniak, 2012). This can be achieved via several long-term strategies or by mid-term or short-term programmes and task forces; where applicable supported by new technologies – technologies related to Smart City.

Having this in mind it is worth focusing on theoretical linkages between the concept of Smart City and achieving urban resilience. The question pinpointed in the title is a synthesis of a methodological approach presented in the paper, which should be treated as a starting point to further empirical studies.

1. The urban context

Utilizing the concept of Smart City becomes a serious business and policy challenge, especially though urban areas are expected to continuously grow in the forthcoming years. McKinsey claims that for market analyses and technolo-

gical development scenarios one needs to assume that by 2050 70% of World's population will live in heavily urbanised areas (Bughin, Chui, Manyika, 2010). The forecasts by United Nations show that by 2050 85% of Europeans will live in urbanised areas (Caragliu, Del Bo, Nijkamp, 2011). Moreover the European Commission assumes that Europe is one of the most urbanised continents – contemporarily two thirds of Europe's population live in urban areas; and the ratio is expected to grow. In the European perspective it will be the urban growth to determine future economic, social and territorial development and as such shall be supported by the EU policies (Cities of Tomorrow, 2011; Investing in Europe's Future, 2010). The trend scenario delivered by ESPON shows that by 2030 the current European growth pentagon is going to expand and cover areas as far as: Dublin, English Midlands, Stockholm, Madrid, Barcelona, Budapest, Katowice and Cracow, Warsaw and Lodz (Scenarios on the territorial future of Europe, 2007).

Implementation of Smart City concept shall not be limited neither to the administrative borders of a given city nor to criteria differentiating 'town' and 'city'. Anyway it is worth remembering that usually by cities we understand bigger towns (at least 50,000 population) characterised by urban lifestyle and specific specialised or prestigious public services or infrastructures available. Moreover – as Smart City refers very often to analysing loads of data and managing big structures using the systemic approach – in Europe it is relevant to consider Smart City solutions an instrument supporting development of Functional Urban Areas Cities of tomorrow, 2011) or Metropolitan European Growth Areas (Scenarios on the Territorial Future of Europe, 2007).

2. Defining Smart City – research based approach

Smart City for the moment is more a brilliant idea, a concept, than a theory (theoretical approach) itself. Therefore there is no agreed definition of Smart City neither set of indicators that could clearly distinguish smart and non-smart cities. In general Smart City is a kind of buzz word that refers to implementing ICT in metropolitan services. A study by S. Allwinkle and P. Cruickshank (Allwinkle, Cruickshank, 2011) revealed that the idea emerged in break of centuries from "intelligent city" characterised by:

– "the application of a wide range of electronic and digital technologies to communities and cities;
– the use of information technologies to transform life and work within a region;
– the embedding of such ICTs in the city;

– the territorialization of such practices in a way that brings ICTs and people together so as to enhance the innovation, learning, knowledge, and problem-solving that the technologies offer".

This kind of approach is also widely referred to as "wired city".

A transition from "intelligent" into Smart City concept is related to adding social and human capital aspects as well as sustainability (Hollands, 2008). As such it becomes a wide urban planning approach that integrates all possible "smarts", offering a kind of paradigm shift. One of the most popular exemplifications of this attitude is based upon a study by R. Giffinger (Giffinger et al., 2007) who claim that Smart City can be disaggregated into: smart living, smart environment, smart mobility, smart governance, smart people, and smart economy. The open question remains whether we really face a paradigm shift or just observe a good branding for already known issues? Especially though, as it was pinpointed by A. Caragliu, Ch. Del Bo and P. Nijkamp (Caragliu, Del Bo, Nijkamp, 2011), "[…] the characteristics proper to a smart city that tend to be common to many of the previous findings as follows":

– the utilization of networked infrastructure to improve economic and political efficiency and enable social, cultural, and urban development;
– an underlying emphasis on business-led urban development;
– a strong focus on the aim of achieving the social inclusion of various urban residents in public services;
– a stress on the crucial role of high-tech and creative industries in long-run urban growth;
– profound attention to the role of social and relational capital in urban development;
– social and environmental sustainability as a major strategic component of smart cities.

Anyway the authors provide a sound working definition of Smart City by stating that: We believe a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance (Allwinkle, Cruickshank, 2011).

3. Defining Smart City – business based approach

There is no doubt that first of all Smart City shall be considered as a bundle of serious business models offered and adapted by global hi-tech players to cities across the World. It is the market, not advances in urban studies, that drives the notion of Smart Cities.

Smart City is mainly associated with a product and communication strategy of IBM, launched after the company had switched from personal computers production to delivering IT solutions for users who need large computing capability. Being a part of "Smarter Planet" (IBM, 2012) initiative the concept involves following focus areas: analytics, banking, buildings, business agility, cities, cloud computing, commerce, communications, computing, education, energy, food, government, healthcare, oil and gas, products and services, public safety, rail, retail, security and resilience, social business, sustainability, traffic, transportation systems, water. The main assumption of IBM reads: The city is a microcosm of the major challenges and opportunities facing the planet today – intensified and accelerated. Here, all man-made systems come together and interact with one another (Smarter Cities, 2009). The basic typology of interacting systems is presented in Table 1.

Table 1

Smart City systems, according to IBM

System	Focus
City operations systems	City services
City user systems	People
	Businesses
City infrastructure systems	Water
	Communication
	Energy
	Transport

Source: Author's selection based upon: (Smarter Cities, 2009).

Within the IBM's logic, these interactions are made possible thanks to three characteristics of smart solutions that are (Smarter Cities, 2009):

– instrumented (event capture and filtering for timely response);
– interconnected (any to any linkage of people, process, and systems);
– intelligent (deep discovery, analysis and forecasting).

According to this logic, some examples concerning transformation towards smarter systems are presented in Table 2.

Table 2

Exemplary transformations towards Smart City, according to IBM

System	Elements	Instrumentation	Interconnection	Intelligence
City services	– Public service management, – Local government administration	Establishment of local authority management information system	Interconnected service delivery	Immediate and joined-up service provision
People	– Health and education, – Public safety, – Government services	Patient diagnostic and screening devices	Interconnect records for doctors, hospitals and other health providers	Patient driven preemptive care
Business	– Business environment, – Administrative burdens	Data gathering on use of specific online business services	Interconnect stakeholders across city's business system	Customised service delivery for businesses
Transport	– Cars, roads, – Public transport, – Airports, seaports	Measuring traffic flows and toll use	Integrated traffic, weather and traveller information services	Real-time road pricing
Communication	– Broadband, wireless, – Phones, computers	Data gathering via mobile phones	Interconnect mobile phones, fixed line, broadband	Information for consumers on city services in real time, on their own time
Water	– Sanitation, – Freshwater supplies, – Seawater	Gather data for water quality monitoring	Interconnect businesses, ports, energy users of water	Real-time quality, flood and drought response
Energy	– Oil, gas, – Renewable, – Nuclear	Fit sensors to gather data on usage across the energy system	Interconnect appliances and devices between energy consumers and providers	Optimise the use of the system and balance use across time

Source: (Smarter Cities, 2009).

Having in mind similar functional areas (compared to IBM) the other important ICT player – Ericsson – focused on ICT infrastructure and enablers. According to Ericsson the main technical components of Smart City are (Höller, Ljungberg, Williams, 2009):

– an underlying ubiquitous ICT infrastructure (high-speed internet access, wired and wireless; sensor and actuator deployments everywhere);
– an ICT service enablement suite (smart media service enablers; city-wide "open" access to sensor and actuator services).

Ericsson's perspective encompasses four building blocks of Smart City (Höller, Ljungberg, Williams, 2009):

– ubiquitous high-speed internet infrastructure (servers, routers, switches, IP access: mobile, WMAX, fibers, cables);
– smart media service technologies (connections, payments, synchronization, play, interactions, subsrcibing to or publishing media, management services, location services, web access and mobile platforms);
– sensor and actuator instrumentation (utility infrastructures, buildings and houses, fixed transport infrastructure, mobile infrastructure – all connected to the common IP infrastructure via existing access infrastructures in buildings, cellular, radio meshed networks);
– city wide access to sensor information (application enablement thanks to secure and reliable access to sensor and actuator information services for multiple players and efficient information sharing across "verticals").

Cities involved in establishment of this kind of infrastructures need to face technical challenges of: vast amount of data, high degree of automation, concurrent optimisations, real time control and unified access to data. Moreover, information enablement calls for aggregation and collection of data, directory services, data brokering and service composition, information federation, privacy and integrity protection, access policy enforcement as well as accounting and revenue systems. Anyway these characteristics are not specific to Smart Cities. They will remain the same for all operators dealing with vast data packages.

Finally, it is worth pinpointing that urban areas are nowadays becoming equal to military sector as creation and pilot areas for new technological solutions. It is closely related to a new logic behind public service delivery (characterised by growing expectations concerning: efficiency, effectiveness, sustainability, prosumerism, etc.) and to emerging immunology or terrorist threats in the areas of high population density. Both premises make Smart City technologies one of possible focal points of achieving urban resilience. Foresights on urban trends in a fairly clear way show this link between technological capacity of cities and their ability to react to changing circumstances. A concise review of approaches presented by leading business think tanks is presented in Table 3.

Table 3

Smart and resilient cities, according to IBM, RAND, and McKinsey

Think Tank	**IBM**	**RAND Corporation**	**McKinsey**	**IBM**
1	2	3	4	5
Key message	Six significant forces are simultaneously reshaping societies and governments around the world	Top future technology applications	Ten tech-enabled business trends to watch	Innovations that have the potential to change how people live, work and play in cities around the globe over the next five to ten years (2010-2014-2019)

Table 3 cont.

1	2	3	4	5
Elements creating the context of smart/ /resilient city	– Changing demographics, – Accelerating globalization, – Rising environmental concerns, – Evolving societal relationships, – Growing threats to social stability and order, – Expanding impact of technology	Selected future technologies: – Cheap solar energy collection, conversion, and storage, – Wireless communications, – Communication devices for ubiquitous information access anywhere, anytime, – Chemical, biological, radiological, nuclear (cbrn) sensor networks in cities, – CBRN sensors on emergency response technicians, – Secure video monitoring, – Biometrics as sole personal identification, – Ubiquitous radio frequency identification tagging of commercial products and individuals, – Unconventional transport, – Improved diagnostic and surgical methods, – Monitoring and control for disease management, – Cheap autonomous housing	Producing public good on the grid: – Wired cities, – Smart grids, – Embedded sensors, – Cloud computing	– Cities will have healthier immune systems, – City buildings will sense and respond like living organisms, – Cars and city buses will run on empty, – Smarter systems will quench cities' thirst for water and save energy, – Cities will respond to a crisis – even before receiving an emergency phone call

Source: Author's selection based upon Government 2020 and the Perpetual Collaboration Mandate (2008); Silberglitt, Antón, Howell, Wong et al. (2006); Bughin, Chui, Manyika (2010); Next 5 in 5, IBM (2009).

4. Policy support to Smart Cities

In terms of achieving certain technological levels mentioned above, implementation of the Smart City concept needs specific policy actions that will provide a push effect, e.g. in an European dimension. A scrutiny over the current EU policy documents clearly shows that at the moment it is the energy efficien-

cy context that drives support to what we could call conversion into smarter urban systems. Looking into the Europe 2020 (Communication From The Commission, 2010), strategy one can only find these elements of Smart City there that are directly linked to energy issues with no *expressis verbis* reference to the idea of Smart City. Anyway the other key policy proposals provide a slightly wider perspective and the main findings have been summarized in Table 4.

Table 4

Smart Cities in the EU policies

Policy document	**Fifth report on economic, social, and territorial cohesion**	**Europe 2020 Flagship Initiative Innovation Union**	**A Digital Agenda for Europe**
Reference to Smart Cities	[The EU could:] Extend both the scope and scale of financial engineering instruments: in terms of scope, to encompass new activities (e.g. sustainable urban transport, research and development, energy, local development, lifelong learning or mobility actions, climate change and environment, ICT and broadband); in terms of scale, to combine interest subsidies with loan capital or other forms of repayable financing	[One of further potential Innovation Partnerships so far examined by the Commission is:] Smart Cities – By 2020, and taking 2010 as a baseline, the aim is to support a number of pioneering European cities (with a total population of at least 20 million) in reducing their carbon emissions by more than 20%, increasing the share of renewable energy in the energy used for electricity supply, heating and cooling by 20%, and increasing end-use energy efficiency by 20%. The Partnership will demonstrate the feasibility of rapid progress towards the EU's energy and climate objectives at local level while showing citizens that their quality of life and local economies can be improved through investments in energy efficiency, renewable energy sources and energy system management solutions, including smart metering and use of ICT innovations as well as more efficient urban transport	Cooperation between the ICT industry, other sectors and public authorities is essential to accelerate development and wide-scale roll out of ICT-based solutions for smart grids and meters, near-zero energy buildings and intelligent transport systems. It is essential to empower individuals and organisations with information that will help them to reduce their own carbon footprint. The ICT sector should deliver modelling, analysis, monitoring and visualisation tools to evaluate the energy performance and emissions of buildings, vehicles, companies, cities and regions. Smart grids are essential for the move to a low carbon economy. They will enable active control of transmission and distribution via advanced ICT infrastructure communication and control platforms. For the different grids to work together efficiently and safely, open transmission-distribution interfaces will be needed

Source: Author's selection based upon: Investing in Europe's Future (2010); Europe 2020 Flagship Initiative Innovation Union (2010); A Digital Agenda for Europe (2010).

Nevertheless, it needs to be pinpointed that there is almost no direct reference to the concept named Smart City in the EU policy documents, even in the main contemporary document focusing on cities and urban policy (Cities of Tomorrow, 2011). Various elements of a Smart City are highlighted but it is

hardly referred to as a whole idea. There may be two reasons for that. The first – and quite obvious – is that the European Commission would rather refrain from using name that is widely associated with one business entity (IBM). The other is that it is to wide for setting up policy arrangements in terms of split into intervention types, focus areas, earmarking headlines, etc. As a consequence the policy makers may rather prefer to use more precise wording as: smart grids, smart metering, efficient urban transport, green cities and so on.

5. Implementing the Smart City concept

Summarizing the findings described above the two main notions behind implementation of the Smart City concept can be identified:

– the energy and environment notion (energy security, energy efficiency, sustainability), which is mainly promoted by international, national and regional policy makers (de Oliviera Fernandes et al., 2011; Mitchell et al., 2008);
– the ICT development notion (broadband, sensors, wireless access and monitoring, e-services, information society) which is mainly promoted by business entities, especially large infrastructure providers and operators.

These notions and actors play a key role in public service transition from "traditional" public services to smart services. There is also another interrelated notion referring strictly to foresight studies. It is an expectation that thanks to breakthrough solutions concerning ICT and environmental technologies the urban areas will be converted into sustainable or self-sustaining cities (territories) mainly in terms of water and energy (Siemens, 2010). Predictions encompass creation of city-gardens where both natural and technology-based processes will join together and create synergies to fully: reduce carbon footprint, accumulate and re-use water, achieve high energy performance, generate energy out of renewables or waste, etc.

Anyway, the mainstream discussion at the moment reflects the quoted academic approach by A. Caragliu, Ch. Del Bo and P. Nijkamp (Caragliu, Del Bo, Nijkamp, 2011), claiming that Smart City is something more than technologies itself. The Expert Working Group on Smart Cities Applications and Requirements established within the Net!Works European Technology Platform (Correia et al., 2011) stressed that in the heart of the Smart City concept is making ICT enabled services and applications available to the citizens, companies and authorities that are part of a city's system; aiming at increasing citizens' quality of life, and improving the efficiency and quality of the services provided by governing entities and businesses. This perspective requires an integrated vision of a city and of its infrastructures, in all its components. Thus social and gover-

nance issues become equal to technology and infrastructures. Several challenges emerge where these elements meet. They are related to:

– readiness to share and use data in a privacy context;
– setting up standards concerning city and citizens data gathering and aggregation across huge number of microscale installations;
– offering data security in a large system composed of numerous sub-systems;
– stability of the system and its positive impact on city transformation;
– creation of business models related to Smart City solutions that follow strategic objectives of urban growth as well as stabilize market or quasi-market fundamentals of public service delivery;
– technical skills within the society that enable all social groups to use infrastructures and platforms based upon mobile applications, remote access or cloud computing.

Having this in mind some phases or levels of achieving city smartness can be identified. An approach by the EU supported (FP7) project THINK – presented in Table 5 – can be used for this typology.

Table 5

Overview and illustration of the different levels of city smartness

	Conceptually		Examples	Smartness
First level of city smartness	Self-managing actions by city authorities	City authority as a public actor	– Public buildings (e.g. schools, social housing infrastructures, etc.), – Street lighting, municipal fleet	Lead by example
Second level of city smartness	City authorities managing private actors reluctance to act	City authority as a local policy maker	– Regulation: land-use (urban planning), building codes, city entrance charges, – Facilitation: info centers, trainings, subsidies	Govern the private urban actors
Third level of city smartness	City authorities managing coordinative actions	City authority as a coordinator	– Combined action with city-scale demonstration of innovative infrastructures that enable a smarter use of energy, in combination with actions from city authorities to promote the use of the associated services	Integrated approach

Source: (de Oliviera Fernandes et al., 2011).

Y. Alobaidan (Alobaidan, 2009) stresses the fact that various players of an urban area may have totally different understanding of smartness and in consequence may apply different definitions, measures and indicators. Nevertheless it is not only a game of definitions nor conceptual approaches, but an interplay of stakes as well. Keeping the right balance between the government, private sector and the end user is – according to Alobaidan – the biggest social challenge for a Smart City as well as coping with the technological evolution. The identified trade-offs refer to:

– revenue and profit incentives of private sector vs. social and economic motives of government;
– long-term plan vs. quick wins;
– incentives for each service provider vs. service quality to the community.

It is however of an utmost importance to pinpoint that these issues are not new in urban and regional studies. They have been a subject of multi-perspective and multi-level discussions for a long time already, since trends of: opening the markets in public services, contracting-out, privatisation, New Public Management, etc. emerged. In other words, in case of the Smart City concept, this is rather not the logic of public service delivery that changes but the mechanisms of delivery and the responsiveness on both supply and demand side.

6. Smart City and Resilient City – draft research agenda

As this paper is expected to match a wider scope of desk research summaries concerning urban resilience (included in the Volume), defining the latter concept directly here is not relevant. It is enough to highlight that there are different approaches to this idea; all within one non-economic definition by C.S. Holling (Holling, 1973) "[…] resilience is a measure of the persistence of systems and of their abilities to absorb change and disturbance and still maintain the same relationships between populations or state variables". Probably the most popular approach referring to urban resilience is related to capability to survive natural or man-made hazards, e.g. disasters, catastrophes, attacks, etc. (Ouyang, Dueñas-Osorio, Min, 2012; Campanella, 2006). There are several perspectives within this approach – some related to technical issues (infrastructural resilience) the other to simulations or economic (financial) analyses; finally there are perspectives bridging recovery of infrastructure and society after serious hazards. The other mainstream approach builds up upon the capability of economic and social tissues of the city to survive crises or sustain competitive advantage (Simmie, Martin, 2010; Girard, 2011). Again an array of inner perspectives varies from solid economy to co-existence of "creativity, sustainability and resilience for a human sustainable city" (Girard, 2011).

Even this very short review shows that both concepts, i.e. Smart City and Resilient City are operationalized on the basis of similar or even the same systems, having similar trajectories of development and similar dilemmas to be solved. Both of them can be either purely technical (core, traditional understanding) or societal (complex, modern understanding). Both of them apply to city users and urban public services not to individuals neither dispersed networks. As such the further studies over urban resilience in a context of Smart City could be focused on finding out whether there is a certain degree of correlation between cities getting smarter and more resilient. The idea is depicted on Figure 1.

HIGH RESILIENCE sound economic, social and infrastructural tissues of a city	Hypothesis on existing "quiet and good place to be" strategies	Scrutiny over "half-way" cities' strategies and actions	Hypothesis on existing strategies utilizing investments in smartness to achieve or sustain resilience
MEDIUM RESILIENCE well established city infrastructures, certain vulnerability to social and economic shocks	–	Scrutiny over "half-way" cities' strategies and actions	Scrutiny over "half-way" cities' strategies and actions
NO RESILIENCE vulnerability to social and economic shocks, basic and non-efficient infrastructures	–	–	Hypothesis on possible overinvestment and/or lack of integrity in approaching smartness
	BUSINESS AS USUAL public services or e-services delivered according to known standards and schemes, reacting local government, almost no integration and use of collective data	**MEDIUM SMARTNESS** certain level of e-services or intelligent solutions available for city users, responsive local government, partial integration and use of collective data	**HIGH SMARTNESS** plethora of public services delivered using the smart infrastructures and real-time interactions with city users, extend integration and use of collective data

a context of city users and urban public services

Figure 1. Smart City and Resilient City – research scheme

Utilizing the proposed matrix based upon two dimensions, i.e.:

– level of smartness (business as usual, medium smartness, high smartness),

– level of resilience (no resilience, medium resilience, high resilience),

allows identification of the two areas of future research. The first area may refer to testing hypotheses on possible existence of the three types of 'clear and coherent' urban strategies:

– strategies utilizing investments in smartness to achieve or sustain resilience (high smartness, high resilience);
– strategies focused on creating the quiet and good place to be (high resilience, no special care about smartness);
– strategies focused on whatever smartness, failing due to lack of integrity with local preconditions (high smartness, no anchorage in resilience).

The other area may be focused on scrutinizing strategies and actions of cities that seem to be somewhere "half-way" towards smartness or resilience in order to find out whether these strategic orientations are important to them and what are the expected trajectories of development.

The whole research scheme can be operationalized in different scales, comparing urbanised territories in regions, countries and internationally. A set of indicators decomposing the levels of smartness and resilience must be applied according to the wider scope of background studies and exact objectives of the planned comparative analysis.

Conclusions

Even though Smart City and Resilient City are quite "container words" they have slowly become anchored not only in business praxis but in regional and urban studies as well. One can select characteristics of both concepts and elaborate a precise research agenda upon both of them individually or – as it is proposed in this paper – jointly. The main idea behind this paper was to bring these concepts together and make it a starting point for future research and reflection concerning development strategies of cities that pursuit smartness and / or resilience. Further steps can be undertaken using the presented research scheme.

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University of Economics in Katowice

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Adam Polko

PUBLIC SPACE DEVELOPMENT IN THE CONTEXT OF URBAN AND REGIONAL RESILIENCE

Introduction

The resilience concept has become popular because of increasing sense of uncertainty and insecurity and a search for formulas for adaptation and survival (Christopherson et al., 2010). Financial crisis, political disturbance, other extraordinary events and especially the international debate about possible environmental disaster caused by climate change have a strong influence on the popularization of the term (Müller, 2011)[*]. However, the ability to recover from shocks caused by natural hazards is not mostly challenge that urban areas have to face. Cities and regions in the transformation countries of Central and Eastern Europe meet not sudden but long-term challenges of deindustrialization or demographic change.

In case of people a high degree of resilience can be build through proper diet, exercise, recreation, interesting work or family support, which could play role of driving forces of individual development. However, due to the different types of threats, as well as the complexity of human nature, it is difficult to propose one and only right risk reduction strategy. Just as people, cities and regions may be resilient too. And just as people cities and regions are complex system. The discussion about application of resilience to cities and regions is in the primary stage (Müller, 2011)[**]. Therefore, we should be very careful in applying the term 'resilience' to everything related to change towards local and regional development (Müller, 2011). Otherwise the term 'resilience' remains relatively 'fuzzy' concept, using within policy documents as a buzzword (Dawley et al., 2010).

Examining theoretical foundation of urban and regional resilience, significant set of questions is:

- How do we understand urban and regional risk, and why an adverse regional event occurred?
- What factors affect ability of regional economies to respond to change?
- Why do some regions or cities manage to overcome short-term or long-term economic adversity to maintain high quality of life while others fail?
- Which regions have proved resilience in the past and how such resilience was achieved?

[*] In his paper B. Müller mentions the first global forum on this topic "Resilient City 2010" congress in Bonn, and "Making Cities Resilient Campaign" of the United Nation International Strategy for Disaster Reduction.

[**] "Cambridge Journal of Regions, Economy and Society", Vol. 3, Issue 1, March 2010 consists of set papers on "The Resilient Region". The 2010 edition of the German Annual Spatial Research and Policy gives overview of resilience-related spatial research and practice in Germany. See: (Muller, 2011).

– What resilience may have to offer the formulation policy?
– How can regional and local institutions develop adaptive capabilities? (Christopherson et al., 2010; Pike et al., 2010; Hassink, 2010).

Firstly the paper is an attempt to explore different understandings of urban and regional resilience, secondly focus on application of the resilience debate to urban public space development.

1. Urban and regional resilience concept at glance

There are two types of challenges in general, that urban resilience concept can be used. For one thing cities and regions may be resilient in the face of sudden and episodic shocks, for instance natural disasters (the Asian tsunami and Hurricane Katrina in New Orleans as a best-known examples) or terrorists attacks in 9/11 New York. For another thing cities and regions tend to be more or less resilient in the face of the long-term stress, for instance deindustrialization, shrinking and aging population or urban sprawl and suburbanization.

Müller (Müller, 2011, p. 4) notes that we must distinguish between shocks and "slow burns", which are typical for systems undergoing transformation. As he write: "While shocks may bring people together, 'slow burns' may increase competition for shifting resources, creating winners and losers". In this case, the disturbance will be evaluated positively or negatively, depending on perspectives of different local or regional stakeholders. A good example on the local level is gentrification, in which beneficiaries are new middle-class property owners, while losers are poor households forced to displacement. A good example on the regional level is metropolisation, in which development concentrate on large cities, expecting the rest of the region to profit from core-periphery spillover effects but instead further rising socio-spatial disparities (Lang, 2011).

Therefore, a lot of authors define regional resilience broadly as the ability of region to recover from shock or disruption (Foster, 2007; Hill et al., 2008). The roots of these definitions can be found in the ecological studies, where it was coined terms engineering resilience and ecological resilience (Dawley et al., 2010). The *engineering resilience* focuses on the stability of a system, where resilience means resistance to disturbance and the speed of return to the pre-existing equilibrium or steady state. The *ecological resilience* differs from engineering approach, that a resilient region may not only return to its pre-existing shock single equilibrium state, but it may also move to one of a number of multiple equilibriums, perhaps performing better or worse than the pre-shock (Dawley et al., 2010).

In this case it could be measured by indicators like water quality and the rate of return of certain species (Holling, 1973; Primm, 1984; Berkes and Folke

1998). In case of natural parks or others protected environmental areas, the approach mentioned above could be appropriate. However, the engineering view is limited, only concerning with how fast or how easily a region 'bounces back' or recovers from a particular challenge. Cowell (Cowell, 2012, p. 212) claims that "[…] Such frameworks say nothing about the tradeoffs associated with 'bouncing back' or adjusting to a new equilibrium. Nor do they say nothing about how regional actors might prepare themselves to deal with future problems or might have learn from mistakes they have made in response to given challenge".

From economic point of view the most applicable perspective of resilience is to think about individual region or city as a complex adaptive system which can never be in equilibrium (Cowell, 2012; Dawley et al., 2010). The above-mentioned assumption underlies the evolutionary approach, in which "[…] economic evolution depends on the actions of individual economic agents, who can learn, innovate and adjust their behaviour" (Simmie, Martin, 2010, p. 30). In such system resilience is a "[…] dynamic attribute associated with a process of continual development" (Pendall et al., 2010, p. 6).

Evolutionary approach explanation of different kind of resilience is based on notion: adaptation and adaptability. *Adaptation* reflects an inherent tendency of cities and regions to improve their situation along the path that has been successful in the past, while *adaptability* means decisions to leave a current growth path in favour of a new related or alternative trajectory (Dawley et al., 2010).

Most authors mention the path dependency, variety and adaptive cycle as the research perspectives of urban and regional resilience (Simmie, Martin, 2010; Dawley et al., 2010). In *path dependency* concept regional economy is resilient if it is able to maintain its "locked-in" development path even when disturbed by an external shock (Simmie, Martin, 2010). The *variety* of sectors (diversified economies) leads to more resilient cities and regions because of dissipating negative effects, allows for regional spill-over's of knowledge (Dawley et al., 2010). *Adaptive cycle* concept consists of the four phases: *exploitation* (time of growth), *conservation* (time of stability), *release* (time of "creative destruction"), *reorganization* (time of innovation). Any given region will experience varying levels of resilience, depending on where it is within the four-phase cycle: *exploitation* (high, but decreasing resilience), *conservation* (low resilience), *release* (low, but increasing resilience), *reorganization* (high resilience) – (Simmie, Martin, 2010; Dawley et al., 2010; Cowell 2012).

Table 1

A comparison of equilibrium approach and evolutionary approach in urban and regional resilience

Approach	Equilibrium approach	Evolutionary approach
Disciplinary context	environmental studies	• evolutionary economics, • evolutionary economic geography
Time perception	Time is measured in moments (pre-shock, shock, post-shock)	Regions are in a constant process of transition
Key words	• equilibrium growth path • multiple equilibrium (alternative) growth path	• adaptation • adaptability
Concept framework	• ecological resilience • engineering resilience	• path dependency • variety • adaptive cycle
Example	Resilience of New Orleans after disaster from hurricane can be measured by an equilibrium-based rebound in tourist expenditure or employment	Analysis of the casual path that decreased the potential of New Orleans resilience, answering the question: "How did the projects undertaken by the US Army Corps of Engineers to reshape the port to make international shipping easier and more profitable eliminate the wetlands that provide the city with natural protection from potential hurricane damage?"

Source: Based on (Christopherson et al., 2010; Dawley et al., 2010).

Müller (Müller, 2011) note some weaknesses* of the attempts to extend the resilience concept on cities and regions. The first is due to the complex and open character of urban and regional system, that means resilience has to incorporate many socio-economic aspects, such as human perception, interaction or governance. A second challenge in present theoretical concept is related to the weak links between social and economic dynamics, governance issue, environmental aspects, land-use patterns and the built environment, which all should be integrated. Other challenges are:

– need to compare the resilience concept to other existing theories or urban and regional development, such as innovative city, creative city, learning region;
– greater emphasis on the spatial dimension of resilience, for instance research on different level of resilience between core and periphery or different residential areas.

* Maybe more appropriate word would be "challenge".

2. How urban public space could increase resilience and decrease vulnerability? Theoretical and research framework

Just as cities are good example of complex adaptive system, so urban public spaces are example of dynamic, connected and open (micro-scale) system within urban areas. Debates about urban public space are multi-dimensional and multi-objective, focusing on design, environmental, social, economic and political aspects.

There are many different ways to define public space. Carmona (Carmona et al., 2008, pp. 4-5) offers broad and narrow definition. In the first case "[…] public space relates to all parts of the built and natural environment, public and private, internal and external, urban and rural, where the public have free, although not necessarily unrestricted access. It encompasses: all the streets, squares and other rights of way, whether predominantly in residential, commercial or community/civic uses; the open space and parks; the open countryside; the public/private spaces both internal and external where public access is welcomed – if controlled – such as private shopping centres or rail and bus stations; and the interiors of key public and civic buildings such as libraries, churches or, or town halls". Because of private property rights and internal structures of some places above-mentioned, free access can be restricted. For this reason, narrower definition would exclude private and internal space, such as shopping malls, restaurants or libraries.

From economics perspectives most of urban public spaces are *impure public goods*, thus they are non-rivalrous and non-excludable until reaching congestion/crowded externalities. Urban public spaces are usually *local pubic goods*, that means they are more and more excludable when longer distance between public space and consumers. In summary, the level of consumption of urban public spaces, depend on the level of consumption of externalities generated by public spaces (Markowski, 2001).

Searching linkages between urban public spaces and urban resilience, we have to take into account all types of public space, regardless of location and rank. Depending on disturbance, both best-known, iconic urban public space and system of neighbourhood backyards can play important role in reaction and adaptation process.

In order to answer the question of how public spaces influence urban resilience, I tried to adapt "four priorities" approach proposed by The Resilience Alliance[*]. In this concept the four themes recognized as a important elements for the resilience of urban system are:

[*] The Resilience Alliance is a multidisciplinary international research consortium (CSIRO Australia, Arizona State University, Stockholm University) which aims to provide novel solutions to managing resilience and coping with change, uncertainty in complex social-ecological system.

- *metabolic flow* as the critical interconnections and interdependencies along chain of production, supply and consumption;
- *social dynamics* as a demographic changes, human capital and social stratification and inequality;
- *governance network* as a institutional structures and mechanisms for redistributing services;
- *built environment* as a ecosystem services in urban landscape (Resilience Alliance, 2007).

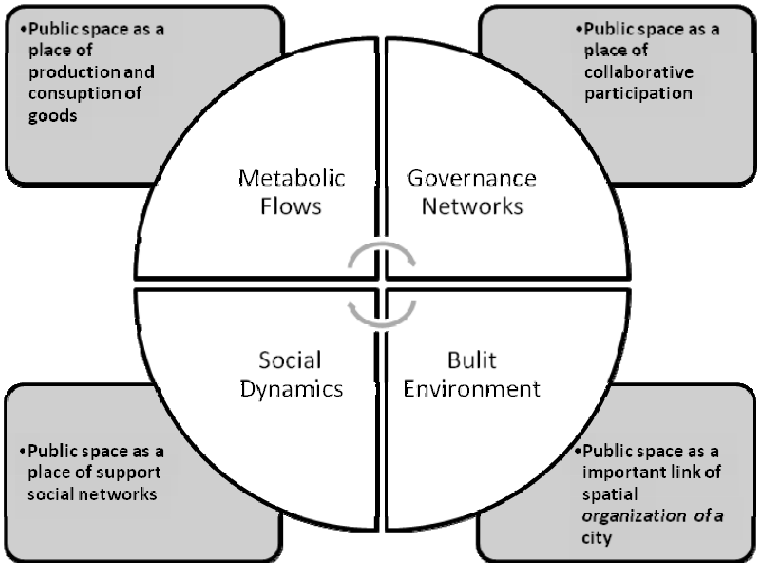

Figure 1. The role of urban public spaces in multi-level resilience of urban system
Source: Based on (Resilience Alliance, 2007).

Taking into account multi-dimensional character of urban public spaces in cities development, they play important role in the specific resilience of four components of the urban system (Figure 1).

Public space and metabolic flows

If we assume that interconnections and interdependencies along chain of production, supply and consumption have influence on urban resilience, thus condition urban public space can play important role in this process. Well-design, green, safely, and accessible public space could support:

- minimize the use of energy (for transportation) and maximize use of local labour, by implementing *new urbanism* principles, such as walkability, connectivity, mixed-uses and diversity, increased density, green transport and so on[*],
- reducing both risks of natural distress, such as flood, fires, and disadvantages caused by people activities, such as industrial noise, air pollution,
- strengthening linkages between producers, consumers and a city, taking advantages from urban public spaces, they are more conscious of risk, more responsible for a place.

Public space and social dynamics

If we assume that both communities with dense social networks have greater capacity for adapting to change and social stratification lead to greater vulnerability, this means that condition urban public space may promote one of the above-mentioned situations. Gehl (1987) in his influential "Life Between Buildings" describes essential elements that contribute to people's enjoyment of space in the public realm. He emphasizes that life between buildings is a dimension where social interaction and perception, urban recreation, and sensory experience of city life take place. He distinguishes between necessary, optional and social activities in public spaces. While necessary activities regardless of the quality of the physical environment (for instance waiting for buses), optional activities depend to quality and significant degree on what the place have to offer (for instance walking, jogging, window-shopping or eating lunch outside). Social activities occur spontaneously when people meet (for instance children's play, conversation). The better a place, the more optional and social activities occur and stronger links are created between local society. Well-design, functional, accessible and friendly public space could support:

- civic engagement and social inclusion,
- mutual trust between different groups of society,
- reducing social stratification and willingness to live in gated-communities,
- activities of institutions as place and scenery of cultural, educational, political and other social events.

During shocks urban public spaces play a crucial role, becoming the main places where people can help each other and organize themselves to face the treat. However, we must also take into account that threats such as terrorist attacks, violence or riots usually take place in urban public spaces.

Public space and governance network

If we assume that governance as a collaborative participatory approach have greater capacity for adapting to change and cities with 'good governance'

[*] http://www.newurbanism.org/newurbanism/principles.html

have mechanism for redistributing services and benefits to their population, thus urban public space co-management (governance) may increase level of urban resilience. The Resilience Alliance gives example based on Pirez (2002) who describes Buenos Aires as a private metropolitan city. In this case planning based on large private developments, including gated-communities has led to spatial fragmentation, social inequality, lost of public interests. Therefore, existence of urban public space is a prerequisite of effective land use planning and local governance. Urban public spaces are complex adaptive system within city, so – in urban resilience context – they are perfect to:

- implement more organic, adaptable and flexibly urban management,
- test innovative tools of land use planning and local governance, more focusing on learning-by doing,
- test better solutions in the provision public goods.

During shock urban public spaces play a crucial role, becoming a place of provision of some goods, which are usually private but disturbance forced to deliver them as a public. For instance during the long drought period people will use public swimming pools resign from private pools or distribute swimming services within still operating private pools as a commons.

Cities in the process of restructuring are characterized by vacancy. As Fuhrich and Goderbauer (Fuhrich, Goderbauer, 2011, p. 53) suggest: "In order to keep options for using existing areas or buildings open for the municipality, thinking strategically in terms of interim solution, permitting interim uses, and planning for them as far as possible can be a reasonable approach". Land formerly occupied by residential, industrial or military buildings and infrastructure, now with open access as a public space can be scenery of "temporary uses projects" from the fields of arts, culture, sport, recreation. Recessions spurs creative temporary uses of urban lots, which often grow out citizen's involvement and build governance networks.

Public space and built environment

If we assume that condition of built environment such as urban infrastructure has a significant influence on location decisions of people, firms and institutions, thus urban public space development rise adaptability of the system. Taking into account urban public space resilience, there are two good examples of *path dependency theory*.

In the first case we assume that city is resilient if it is able to maintain "lock-in" in particular trajectory of economic development. Brueckner, Thisse and Zenou (Brueckner, Thisse and Zenou, 1999) in paper titled *Why is Central Paris Rich and Downtown Detroit Poor?* An amenity-based theory try to ans-

wer this questions focusing on differences in urban amenities offered in this two cities. Central Paris is permanently attractive because of buildings, parks and streets, that are aesthetically pleasing to residents and tourists. Central Paris also offers wide range of excellent and famous restaurants, theaters, museums, that are difficult to copy or transfer to the suburbs. Because of above-mentioned public space amenities central Paris maintain "lock-in". By contrast, downtown Detroit lacks the rich history, the infrastructure does not offer appreciable aesthetic benefits. All necessary amenities can be offer in suburbs, that caused downtown declining.

In the second case we assume that city is resilient if it is able to "de-locking" and find alternative trajectory of economic development. One of most influential and most cited example is a city of Bilbao and so-called "the Guggenheim effect". This post-industrial city redefined itself as a cultural centre. Transformation of urban public spaces by "flagship" projects was one of the main factor, that help to jump into new trajectory of city development.

Resilience Alliance (2007) in his research focus on effects of urban public spaces planning on public health and society resilience. More availably sidewalks and paths than roads, shifts people from driving to walking. Therefore well-organized, pedestrian-oriented public space contributes to physical activity, decreasing so-called life-style disease, such as obesity, diabetes or cardiovascular.

Conclusions

Linking urban public space development with resilience concept should increase awareness of influence that urban public space have on adaptation and adaptability of city to both shocks and long-term disturbances. Based on rich literature studies, Carmona (Carmona et al., 2008) lists benefits that public space is able to deliver across economic, social and environmental spheres:

- economically:
  - positive impact on property prices (neighborhood externalities), and increasing of property taxes,
  - boosting commercial trading,
  - raising levels of investments,
- for human health:
  - encouraging activity with associated health benefits,
  - reduces mortality by avoiding car-dominated environments,
- socially:
  - delivers learning benefits for children,

- can help to reduce anti-social behaviour,
- promotes neighborliness and social cohesion,
- provide a venue for social interchange,
- promotes governance networks,

– environmentally:

- encourage the use of sustainable modes of transport,
- improve air quality, reduces heat islands effects, pollution and water run-off,
- creates opportunities for urban wildlife and flourish,
- supports growing recycling networks and industrial metabolism.

Therefore, both condition of urban public space and governance strategy are important contributor to the vitality and viability of urban system, both well-being of local population and dynamics of economic development.

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University of Economics in Katowice

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Rüdiger Wink

ECONOMIC RESILIENCE AS THE EVOLUTIONARY CONCEPT FOR POST-INDUSTRIAL REGIONS: THE CASE OF LEIPZIG AND HALLE

Introduction

Due to the repeated occurrence of international crises and the recognition of increased inter-connectedness of regional and national economies worldwide, the question how to cope with exogenous shocks became one of the most urgent challenges for regional economists in the last years (Simmie, Martin, 2010). The term "resilience" – with a long scientific tradition in physics, ecology, psychology and many other disciplines – shall describe the capabilities to minimise negative effects from shocks beyond the influence of (regional, national or organisational) actors (Lukesch et al., 2011; Wink, 2010). Post-industrial regions face a specific challenge in building up resilience capacities, as the structural change from industrial sectors towards service and knowledge economies and an increasing relevance of creative industries already caused major stress on adjusting capabilities within the region and required a long-term change of qualification and collaboration patterns (Bathelt et al., 2011; Hassink, 2009). Central and East European post-industrial regions are even more experienced in being exposed to external threats due to their needs to go through political transformation and find ways into the distribution channels and value chains of Western industrialised countries (Suchacek et al., 2012). The following paper shall try to explain these specificities in terms of economic resilience and illustrate these explanations against the background of experiences in the two East German urban areas of Halle and Leipzig, which had to follow different pathways towards more resilient economic structures.

The paper is organised as follows: after reflecting the discussion on regional economic resilience concepts and the need for an evolutionary perspective to understand economic resilience indicators for vulnerability and adjusting capabilities are introduced to look at general preconditions for economic resilience and the specific challenges of Central European post-industrial regions to develop these preconditions. This argumentation is then illustrated by the two cases of Leipzig and Halle and finally summarised.

1. Concepts of economic resilience

In general, regional economic resilience describes the development in a region after an exogenous shock. Concepts, however, differ when defining which kind of development can be identified as "resilient" and reflect different disciplinary references. Ron Martin (Martin, 2010) distinguishes three directions by referring to approaches of "engineered (equilibrium-focused) resilience", "eco-

logical (panarchy-focused) resilience" and "adaptive (complexity-focused) resilience". Engineered resilience is the concept with closest relations to physics and describes resilience as a capability to bounce back to equilibrium. A common approach in this context would be to look at deviations of GDP or unemployment ratios from original trend (equilibrium) development and the time necessary to return to the original pathway (see e.g. Swanstrom et al., 2009; Hill et al., 2010). Macroeconomic hysteresis was often closely connected with these observations of deviations from original equilibrium towards a new one (see critically on this perspective Martin, 2010).

Ecological resilience leaves the perspective of the equilibrium as a reference for development. Instead, an adaptive cycle describes the process of a region to change its adaptability, connectedness and accumulation along a given path (Martin, Sunley, 2011 referring to Gunderson, Holling, 2002). This perspective of a given pattern for the adjusting path is completely left by "adaptive resilience" concepts, as these approaches understand regions as areas being permanently within evolutionary processes of change and exogenous shocks as additional stress factors on these evolutionary processes (Martin, Sunley, 2011). Resilience then describes the capacities to find adjustment processes preventing a permanent reduction of welfare or other indicators of regional economic performance. These concepts refer to regions as complex systems in multi-level governance structures and in permanently overlapping endogenous and exogenous forces to structural changes (Lukesch et al., 2011 on the regional perspective; Dopfer, Potts, 2008; Foster, 2005 on complex systems). As regions consist of actors on different levels (micro, meso and macro) and complex linkages between single system elements (Schröder, 2011), the "adaptive resilience" concepts are the most suitable approaches to mirror the reality of regional economic resilience challenges. Consequently, arguments and criteria from complex system theory have to be investigated as candidates for a theory of regional economic resilience.

What does that mean for the identification and explanation of regional economic resilience? Identification becomes more complex than solely looking at single indicators in an equilibrium state. Instead, the fundamentals of regional development have to be understood and analysed reflecting the specific regional conditions. Single criteria like regional GDP per capita or employment might offer hints on regional economic development but have to be completed by investigations of regional productivity, demographic and migration structures or economic inequalities to understand how regional evolutionary processes actually have been affected by shocks (Wink, 2010). These statistical data might then be even contrasted by subjective assessments in the region, as subjective cognitive processes might include additional factors, such as identity, pride or fears,

into the assessment. Additionally, it is necessary to agree on the time frame for adjustment, i.e. how long an adjustment process can last to call the region "resilient". Due to the overlapping structure of shocks causality problems have to be considered, as it will be difficult to isolate the effects of single shocks. Furthermore, "slow burning" shocks cause specific identification problems, as the long time between the origin of the shock and the actual observation of an impact increases the probability of missing links. Even if there is an agreement on these elements, regional economic resilience can still be understood in different ways:

– "untouchable regions" with a relatively low vulnerability to shocks due to strong regional fundamentals and a high level of adjusting capacities – examples for this group include global metropolitan areas as London, Paris, New York or Tokyo;
– "isolated island regions" with a relatively low vulnerability to shocks due to few linkages to the rest of the world but also limited adjusting capacities, as they never have to be used – examples for this group include remote rural areas and peripheral islands without a high share of tourism;
– "rollercoaster regions" with a relatively high vulnerability to shocks but also strong adjusting capabilities to bounce back to original pathways – Silicon Valley is a prominent example for this type of region, as short-term job losses after exogenous shocks (e.g. the "dotcom-bubble") were later compensated by growth in other technological segments;
– "avant-garde regions" with a reduced vulnerability due to the anticipation of exogenous shocks and successful emergence of adjusting capacities due to early investments before the shock – examples for this group include creative and knowledge regions as Singapore, Los Angeles or Midi Pyrenées.

From a strategic perspective becoming an "avant-garde region" seems to be the most challenging but also promising approach, as it offers opportunity to avoid negative effects from shocks by intentional precautionary measures. However, the successful implementation requires an understanding of determinants for resilience (vulnerability and adjusting capacities) and early-warning systems to improve the preconditions for resilience.

This requirement leads us to explanations of regional economic resilience within the evolutionary framework of "adaptive resilience". These explanations are closely related to vulnerability and adjusting capabilities, as they decide how probable it is that an exogenous shock will hit the region and how well the region can adjust to this additional stress. Vulnerability is based on exposure to exogenous shocks (Briguglio et al., 2008). Consequently, the level of concentration in the openness ratio of the region, the intensity of integration into single external value chains and the level of uncertainties within the contracts with

external actors are important indicators to understand the vulnerability. Additionally, slow burning shocks cause additional risks of vulnerability, as the visibility of the stress is reduced, which might limit the acceptance of necessary precautionary measures to introduce early adjustment.

Adjusting capabilities reflect how well a complex system can evolve endogenous capacities to cope with external stress. These capacities depend on (a) diversity and redundancy, (b) creativity, learning and openness and (c) connectivity and modularity.

Diversity and redundancy are preconditions for the availability of alternatives in cases of shocks particularly affecting single regions or industries (Essletzbichler, 2007). Within evolutionary economic geography, related variety is recognised as an important amendment to diversity, as the relatedness between single industries allows easier transition within labour or technology markets, while variety reduces the dependence on single incumbent industries and technologies (Boschma, Frenken, 2011; Frenken et al., 2007; Boschma et al., 2010; Neffke et al., 2011; Brachert et al., 2011). Therefore, technological platforms serving as a technological basis for different industries form a suitable approach to strengthen the related variety in the region (Cooke, 2011; Asheim et al., 2011). Spin-offs or firm pivots are often observed as the agents within these platforms supplying technological products and services to customers from different industries or looking for varieties in their sales markets (Klepper, 2010). Redundancy is often interpreted as a limiting factor to efficiency, as various contacts and directions have to be kept up causing additional costs to a concentration on one or two central linkages. In terms of resilience, however, the long-term efficiency can only be achieved, if there are redundant options as potential alternatives in case of a destruction of single linkages by a shock. Redundancy also calls for regional inclusion to avoid segregation processes, as an increasing number of qualified residents and workers increase the availability of sources in case of crisis (Grabher, 1994, distinguishing between redundancy of elements within the system, redundancy of functions covered by the system elements and redundancy of relations between the system elements).

Creativity, openness and learning are capabilities to extend the range of options and to identify alternatives to existing organisational or production pathways. Openness and learning deal with the processing of own or foreign experiences to increase the existing knowledge stock (see Agrarwal et al., 2006; Saxenian, 2002, on experiences in transnational communities), while creativity opens up new directions to build up new experiences. The extension of existing knowledge and capabilities helps to overcome path-dependencies within development. The way new paths are created, however, is still only weakly explored,

as complex feedback mechanisms of unforeseen interactions and cause-effect relationships as well as deliberate interventions are observed in several case studies (Garud et al., 2010; Sydow et al., 2007). Openness and learning depend on the absorptive capacities in an economy, which are influenced by the level of qualifications, international contacts and routines (Taheri, van Geenhuizen, 2011; Cohen, Levinthal, 1989; Enkel, Gassmann, 2010). Creativity is more related to the level of incentives and freedom for experimenting new and unknown ideas and security to reduce fears of making mistakes (Andreasen, 2006).

Connectivity and modularity describe the internal linkages within a region. Modularity shall increase the flexibility of the regional structures, as the value chains can quickly be segmented into single units, which might be replaced, if an exogenous shock particularly hit single units (Langlois, 2002; Longo, Ören, 2008). Modularity and the objective to increase flexibility, however, increase the level of uncertainty for the regional actors, which could cause a trade-off with measures to reduce vulnerability (fixation of contracts) or increase creativity (security to allow failure of new ideas). Connectivity refers to the structure and character of linkages expressing the expectation that redundancy of linkages and characters of linkages (social, professional or contractual) and decentralisation of linkages (reducing the dependence on single central actors and gatekeepers) should support the emergence of adjusting capabilities (Broekel, Hartog, 2011).

Summing up, an evolutionary concept of regional economic resilience refers to the capabilities to avoid (mid- to long-term) negative effects of exogenous shocks on development pathways. Resilient regions should be able to show either factors reducing the vulnerability to shocks or (and) adjusting capabilities. In the following section, we look at the specific challenges for Central European post-industrial regions to reveal these factors and capabilities.

2. Challenges to the regional economic resilience in post-industrial regions

Central European regions went through remarkable transition processes after the exogenous shocks by the "fall of the iron curtain". Existing trade linkages were cut and simultaneously the dominating industrial sectors lost their competitiveness causing a huge amount of job losses and emigration (Grabher, Stark, 1997). From an evolutionary perspective on regional economic resilience, it can be expected that these regions showed a higher level of vulnerability, as the industrial structure was typically dominated by a single sector and concentration on few products and distribution channels and the relative strength of this

sector and the long-lasting feeling of job security in this sector reduced the awareness for necessary precautionary measures to anticipate adjusting processes to exogenous shocks (Hassink, 2009).

The adjusting capacities within these regions were also limited by their characteristics as former industrialised regions. The dominating industries and single state-owned firms were not necessarily interested in redundancies and related variety, as they would fear to strengthen a competition by collaborating with organisations requiring the same technologies and firms pivots or spin-offs were missing as typical agents of change within a related variety platform. Furthermore, hierarchical structures due to political orders limited the emergence of a decentralised system of related variety, as this would become to complex to manage within a hierarchical system (Günther et al., 2010).

Openness, learning and creativity were also hindered by the hierarchical and centralised structure of the production and decision-making system. New ideas could be tested in public research institutes, but faced problems to be implemented, as the coordination between research and production systems was often relatively weak (Günther et al., 2010). The barriers to entrepreneurship during socialist times are still seen as a barrier for later cohorts of start-ups (Brenner, Fornahl, 2008; Wyrwich, Krause, 2011). Openness was hindered by the ideological borders between East and West Europe, which require at least formally a high level of secrecy. The lack of systematic contacts (although reduced by personal and informal contacts) also restricted the potential for learning, as several experiences were only poorly communicated across the borders (Matuschewski, 2005).

Modularity was limited by the relatively high level of integration within state-owned firms. Consequently, the single units only had limited options to choose potential partners, as most parts of the value chains were integrated into the same organisation. Connectivity was only given in general. The high level of centrality, however, increased the dependence on single actors and restricted the adjusting options in the regions.

Summing up, Central European post-industrial regions faced specific challenges to build up resilience capacities, and in the next section we will compare the two cases of Leipzig and Halle to show differences and similarities within the strategies to overcome the barriers.

3. Experiences in Leipzig and Halle

Leipzig and Halle are both located centrally in Germany and belonged to an industrial heartland in World War II (Sleifer, 2006). During the time of the

GDR, the whole region of Leipzig, Halle and Bitterfeld was particularly focused on chemical and energy production causing major environmental pollution problems and a high level of industrial concentration. The change of the political system and German unification hit the region drastically, as almost all industrial sites were immediately closed due to the environmental problems and the low competitiveness with West German producers (Günther et al., 2010). Leipzig and Halle are neighbouring urban areas with a distance of 40 kilometres and a joint international airport at a location between the two cities. Both cities belong to different regions (Leipzig to Saxony and Halle to Saxony-Anhalt), and both cities are not the regional capitals despite the fact that they are bigger than the two capital cities (Dresden and Magdeburg).

Leipzig had better opportunities to build up resilience capacities, as the city has a long tradition of international fairs, which served as important events for temporary geographical proximity for business contacts between East and West even during the GDR time (Suchacek et al., 2012). Furthermore, the urban centre of Leipzig was one of the only big cities in Germany without major destructions in World War II and a high attractiveness of architecture and facilities from late 19th century. Consequently, major investments went into shopping facilities as well as renovations of old galleries and malls. The image of Leipzig as trade location and intermediary between East and West was also used to attract major logistics investors. This positive development encouraged investors from the automotive sector to build new sites and form new industrial clusters. The image as an East German "boom town" reached finally its peak when Leipzig became the German candidate city for the Olympic Games 2012 followed by huge public infrastructure projects. Today, Leipzig is one of the few East German urban areas with increased population and has a relatively high degree of diversity with a high share of cultural and business-related services. Despite this positive development, Leipzig still has the highest unemployment rate of urban areas in Saxony.

Halle faced more difficulties to find its pathway after the German unification (Franz, Hornych, 2009; Suchacek et al., 2012). The political strategy was also directed towards strengthening of the service sector and the urban core. The weaker image and experiences of Halle, however, still caused major population loss and only a slower economic catching-up process compared to Leipzig. Today, Halle tries to establish itself as the knowledge centre for the solar industry with several university programs and public research institutes and received a major foreign direct investment by Dell.

The differences within the development can be illustrated by employment and population data[*]. Figure 1 shows the population development in both cities.

[*] All data are sourced from Statistical Offices in Saxony and Saxony-Anhalt.

The comparison is slightly distorted by an administrative reorganisation in Saxony declaring areas formerly not part of Leipzig as new urban districts of this city and increasing the number of inhabitants in 1999. Nevertheless the chart reveals the constant growth of population in Leipzig since 1999, while Halle continuously lost inhabitants until 2009. Figure 2 refers to the development of employment quotas in both cities, which are still below the level of 1995. Since 2005, employment quotas have been growing in both cities with a stronger growth in Leipzig, which is even more remarkable, as the population also grew in this period. Consequently, there is evidence that resilience capacities in Leipzig are stronger than in Halle. In the next section, some further hints on that are provided by looking at vulnerability and adjusting capacities in the two cities.

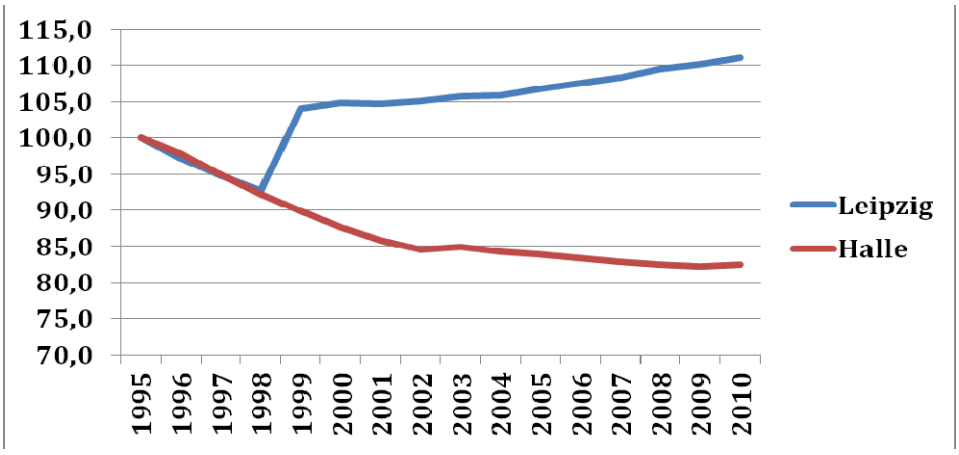

Figure 1. Population Development in Leipzig and Halle (1995 = 100)

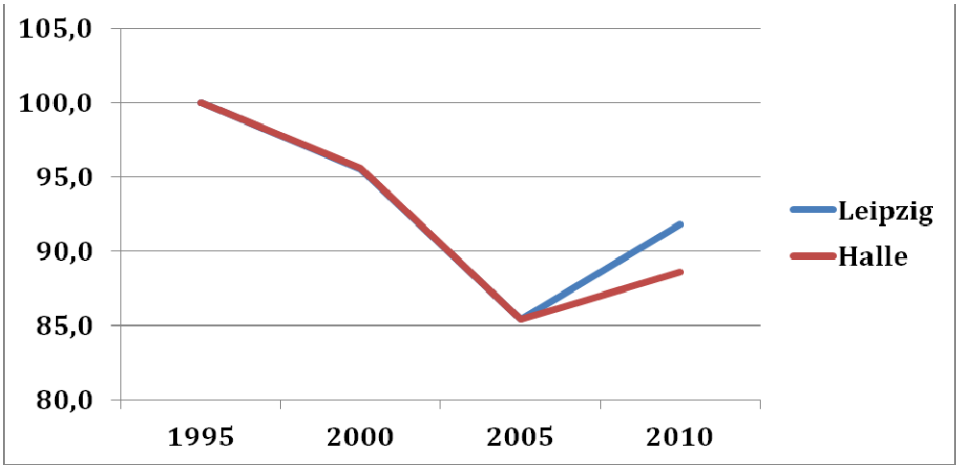

Figure 2. Employment quota in Leipzig and Halle (1995 = 100)

4. Resilience factors in Leipzig and Halle

In the second section, general factors to explain the regional economic resilience were introduced. This section provides first arguments, why Leipzig might show faster progress towards resilience than Halle, by looking at some suitable indicators for these factors. Vulnerability was connected to openness ratios and the level of concentration in external relations and sourcing. Business in both cities increased external linkages via trade, in particular as a result of foreign direct investors. Leipzig was especially successful in attracting big investors from logistics (Amazon, DHL) and automotive sector (Porsche, BMW; see Günther et al., 2008). These investments could have increased the dependence on business cycles in other regions or parts of the world, but so far no ending to growth processes can be observed. Another important external linkage is the attraction of Federal and EU funding based on the European Regional Development Funds. Leipzig and Halle are two of three East German regions being already phasing-out regions since 2007 (all other East German regions are still fully eligible to ERDF subsidies until the end of 2013). The imminent reduction of subsidies – intensified by cuts in German Federal feed-in tariff programs for photovoltaic energy – is recognised as a major threat to the further development with so far unforeseeable consequences.

Adjusting capabilities are based on modularity and connectivity, openness, learning and creativity and diversity and redundancy. Modularity has been strengthened in both city regions as a consequence of value chain management of foreign investors. As a result, several small and medium-sized enterprises were integrated into the value chains and developed strategies of diversifying their products and services to be able to switch between different industrial value chains. The connectivity originally based on contacts already in GDR times was adjusted to collaboration structures, which became closer to the structures in West Germany (Günther et al., 2010, on the existing differences in the innovation systems). Weaknesses are still recognised in the service industries, in particular cultural and media services, where several public initiatives did not reach their objectives so far (Rosenfeld, Hornych, 2010; Bathelt, 2005), while private activities, for example in the computer and video game industry caused remarkable growth results in Leipzig.

Openness, learning and creativity are closely related to the already mentioned topics of increased integration into international value chains, increased export ratios and collaboration structures within the innovation systems. Creative industries profited in both cities from the rich cultural heritage and the location of a regional public television and broadcasting organisation. Leipzig,

however, had to accept that nearly all big West German printing houses originally setting up locations at Leipzig already left despite the strong reputation of the international book fair. Leipzig as well as Halle attracted public research institutes and raised their number of students. So far, however, the research capacities are not as efficiently focused on key technologies as in Dresden and Jena, which are still the most important research locations in East Germany.

Diversity and redundancy were once again supported by the foreign direct investments. Leipzig succeeded in almost completely readjusting its industrial structure during the last two decades and Halle reduced its dependence on the Chemical industry remarkably. The most important sources for related variety were the regional SME, which were able to focus on technologies applicable to different sectors. The critical question for the future, however, will still be whether these relatively small firms will be able to overcome critical periods of change, as for example after the cuts in feed-in tariffs in the photovoltaic sectors.

Conclusions

This paper served to provide first ideas on understanding the specific challenges of regional economic resilience for Central European post-industrial regions. The concept of regional economic resilience requires an evolutionary perspective focusing on vulnerability and adjusting capabilities. The two cases of Leipzig and Halle illustrate the difficulties in building up these capabilities. Leipzig seems to be more successful within the transition process, which is particularly influenced by foreign direct investment projects and the already existing reputation as urban trade centre before German unification. The employment data, however, underline the limits to resilience even in this urban area with several supportive preconditions. Halle`s adjustment was mainly influenced by a continuous loss of population, and it will be an important challenge for this urban area to keep its existing level of employment and population in particular facing drastic reductions in public subsidies.

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Martina Krpcová, Martina Stachoňová

MEASURING ECONOMIC RESILIENCE BY LABOUR MARKET TRENDS IN THE DISTRICTS OF MORAVIAN-SILESIAN REGION

Introduction

The districts Ostrava-city and Karviná are traditional industrial areas, which belonged to the most prosperous regions until 1989. Then there was the transformation and subsequent restructuring, which led to a decline in industry. This fact completely changed the position of the region, which among other things, had to contend with a massive increase in unemployment. Government support alone wasn´t targeted in the right direction, so the local initiatives began to interfere with the development of the region. There began to supported the creation of industrial zones to attract new investors. The region still faces problems caused by no very happily performed transformation. Problems in the region were deepened by the recent economic crisis, which has again signed to the deterioration in the labor market.

The aim of the article was the comparison of the development of labor market and analysis of resilience to trends in the districts of Ostrava-city and Karviná.

1. Brief description of the situation in the labour market before the crisis in the districts of Ostrava-city and Karviná

Districts of Ostrava-city and Karviná are located in the Moravian-Silesian Region (MSR), which borders with Poland and Slovakia, in the northeastern part of the Czech Republic. They border with districts Frýdek-Místek, Opava and Ostrava-city district in addition with district Nový-Jičín in MSR. They have only an area of approximately 688 km^2, which represents 12.7% of area of the Moravian-Silesian Region. Districts of Ostrava-city and Karviná are the smallest in MSR, but there is the highest number of inhabitants. Their number was 603 991 inhabitants on the 31.12.2010. It is almost half of the population of the MSR, when district of Ostrava-city still remains with population of 333 579 the center of the Region. Both districts record annual population decline. This is due to declining birth rates and high emigration balance.

Contemporary economic position of districts is strongly influenced by the previous long-term historical development. A turning point in the development of this area occurred due to the finding of coal. Ostrava agglomeration has been as a traditional industrial area with a focus on heavy industry, especially coal mining and metallurgy, the core of the Region since the 19th century. The economic significance of the Ostrava´s industrial area was unquestioning for the

whole of Czechoslovakia before 1989; in the national production 86% of black coal (about 24.5 million tons per year), 82.5% of the coke (7.6 million tons per year), 66.8% of pig iron (6.6 million tons per year) and 60.3% of steel production (9.2 million tons per year) accounted for her in the eighties (Sucháček, 2005b, p. 79). Almost all production of black coal of the Czech Republic is concentrated here, although there is a decrease of extracted quantities.

Ostrava industrial region was in the very difficult position at the beginning of the transition period. Extensive restructuring of the economic base began here in the early 90s of the 20th century and whole area gradually began change its face. The new post-communist government sharply reduced subsidies in coal mining and metallurgy. Reducing of demand for production led to a significant reduction in coal mining and industrial production. The companies began lay off redundant labor force. The required number of new jobs wasn´t created for the unemployed. This was a long-term structural mismatch between supply and demand in the labor market. The numbers of unemployed have increased and the Region and individual districts began to cope with increasing unemployment rate, which increased until 2004 (Krpcová, Stachoňová, 2011).

The intensity of increase in unemployment and the rate of decline in staffing conditions by employers were the most pronounced between years 1997 and 1999 in both districts, when the unemployment was rising sharply and the employment was decreasing significantly. Since 2004, the labour market situation has started to slowly turn for the better, despite the still lingering impact of restructuring. The number of registered job seekers was decreased from 56 699 persons in 2004 to 32 258 people registered at the end of 2008. The positive development in the labour market was halted due to the impact of global crisis and registered unemployment has started to increase since 2008 again (MLSA, 2010).

2. The period of crisis and the labour market in the districts of Ostrava-city and Karviná

2.1. The unemployment

Moravian-Silesian Region has one of the highest unemployment rate in the Czech Republic. The highest unemployment rate was recorded in the Moravian--Silesian Region in 2003, when its value reached 16.8%. Then it began to decrease. Its decline was halted to 8.5% in 2008.

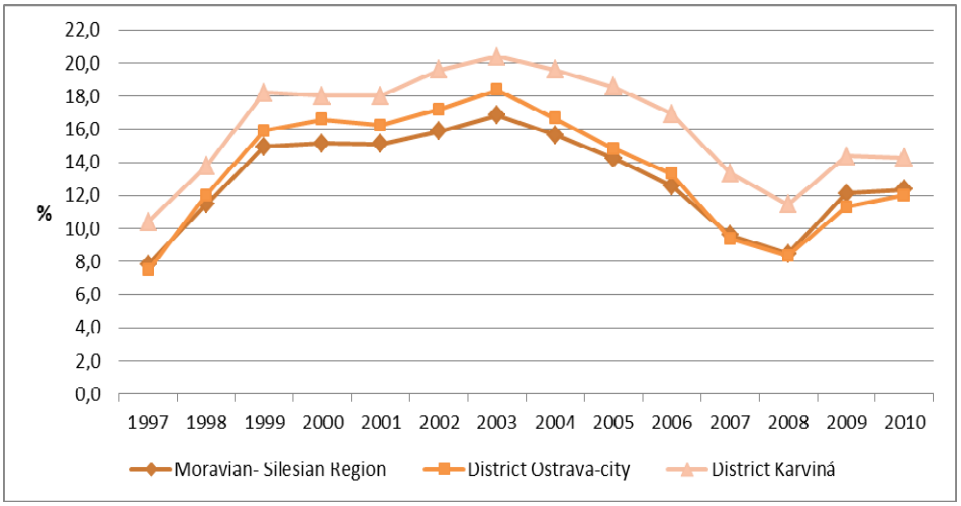

Figure 1. The changes of the registered unemployment rate in MSR and districts of Ostrava-city and Karviná in 1993-2010
Source: (Krpcová, Stachoňová, 2011); based on: portal CSO (2012).

The first signs of the worsening economic situation have begun to show at the end of 2008 and unemployment started to increase gradually. An annual increase rate of unemployment was recorded of 3.6% in the Region in the 2009. At the end of 2010, the Region struggled with 12.4% unemployment rate, which constantly exceeds the national average of 2.8%.

The changes in the labour market in both districts copied the trend of unemployment rate of the Region, but with higher values of the indicators. Both districts registered the highest unemployment rate in 2003 (Ostrava-city 18.4%, Karviná 20.4%) and then the unemployment rate began to decline as well as the values for the Region. After 2008, there was a significant increase in unemployment due to economic crisis and subsequent economic recession. Between 2008 and 2010, its value increased by 3.6% in the Ostrava-city district and by 2.8% in Karviná district. As follows from the graph above, district of Karviná was recording an average of almost 3% higher unemployment rate than district of Ostrava-city in the years 1997-2010.

Table 1

The changes of unemployment rate in the districts and MSR in 2007-2010

Cathegory	31.12.2007	31.12.2008	31.12.2009	31.12.2010
Karviná	13.4	11.5	14.4	14.3
Ostrava-city	9.4	8.4	11.3	12.0
MSR	9.6	8.5	12.1	12.4

Source: (Krpcová, Stachoňová, 2011); based on: portal MLSA (2012).

District of Karviná recorded the second highest unemployment rate in the Region and it was ranked in seventh place between districts in the Czech Republic in the 2010. In the district there is the most pronounced decline in employment in mining and quarrying.

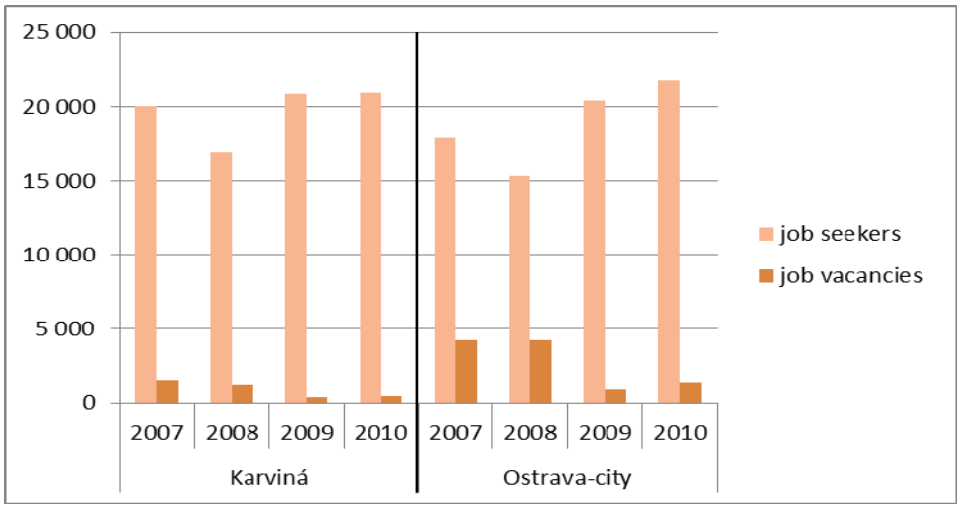

Figure 2. Job seekers and job vacancies in the districts of Ostrava-city and Karviná in 2007-2010
Source: Ibidem.

The labor market in the Moravian-Silesian Region recorded increase in the number of job seekers about 16 960 persons in the years 2007-2010. The district of Ostrava-city recorded the highest increase of job seekers, that is 3879 persons in this period (5038 people between 2008 and 2009). But the highest number of job seekers has long recorded in the district of Karviná. However, there was recorded an increase in this indicator only about 904 people in the years 2007--2010. At the end of 2010 these two districts registered 42 672 job seekers, which is 51.6% of all applicants in the Moravian-Silesian Region (82 776 people). The greatest share of job seekers in terms of age structure was formed by persons aged 50-54 years in the period 2007-2010. According to the educational structure ran for a job the most people having completed secondary vocational education without graduation and then people with basic education in the mentioned period.

There is an insufficient number of job vacancies due to the number of job seekers. The lowest number of job vacancies 386 in district of Karvina (i.e. 53.9 job seekers/one vacancy) and 889 in the district of Ostrava-city (i.e. 22.9 job seekers/one vacancy) was recorded during the period on 31.12.2009. Ostrava-city district recorded the greatest reduction of offered job vacancies (about 3383)

within the Region between 2008 and 2009. Although the district still offers the greatest number of job vacancies within the Region. In the next year, there was an increase of the number of job vacancies in both districts, but also an increase of job seekers. According to the breakdown of employed, the most job vacancies belonged in the class "Craftsmen and qualified producers and related trades workers" and the least in class, "Skilled workers in agriculture and forestry (including related fields)" in the period 2007-2010. The long-term unemployment is still very serious and persistent problem in the labour market in the district of Ostrava-city and district of Karvina. The districts show the highest long-term value within the Region.

Figure 3. The changes of long-term unemployed people in the districts of MSR to 31.12. Source: Ibidem.

There was a growth of this indicator from about the mid 90s of the 20th century until 2004-2005, when it reached the highest values. Subsequently, there was a decrease in the number of registered job seekers unemployed for more than 12 months due to positive economic development and the coming of investors who have contributed to the creation of new jobs. After 2008 there was again the worsening of the situation due to the economic crisis. In late 2010, there was recorded 63% from the total number 31 478 of long-term unemployed persons in the Region in these two districts (8813 in the district of Ostrava-City and 9334 in district of Karviná).

3. Impact of the world economic crisis on the labour market in the Ostrava-city and Karviná districts

The global economic crisis hit the Czech Republic in the second half of 2008. The first indications of the crisis in the Czech Republic exerted slightly, at first it influenced glass and automotive industry. Next it began to spread to all remaining sectors of industry.

3.1. Ostrava district

The employment rate in Ostrava district was positive in 2007. There were monitored the number of companies with more than 26 employees. In year 2007 increased this number by 91 companies. Annual employment growth was 1051 persons in companies operates in real estate and lease branch. Employment in automotive industry increased by 1050 persons. On the other hand, food industry, tobacco industry and mining had decreased rate of employment. Also year 2008 brought 14 new companies with more than 26 employees in Ostrava district. Manufacturing and transportation companies were most growing. Automotive industry increased by 1548 persons. However, textile industry had decreased number of employees. Year 2009 was affected by consequences global economic crisis. In year 2009 decreased the total number mostly in wholesale and retail, repair of motor vehicles and construction. The number of employers increased in information and communication branches. The decrease of 2 732 persons was mostly share of companies from manufacture of basic metals, fabricated metal production and foundry. The decrease was monitored also in transportation industry (791 persons) and construction (643 persons).

Manufacture was most contributing industry to decrease the number of monitored companies in 2010. The annual decrease was caused mostly by companies operating in wholesale and retail, repair of motor vehicles, construction, transportation and storage. The biggest number of new unemployed registered to Labour Office in January and September. The employment increase has been only in companies from manufacture of basic metals, fabricated metal production and foundry, production of metal constructions and metalworking products.

3.2. Karviná district

The trend of gradual decrease of employment by employers is long-term in Karviná district, because it started in 1997 already. The most impactful to this change were coal mines. The mines were denationalized, then restructured and other organizational changes happened.

In 2007, the biggest employment decrease was registered in mining industry; it was decreased by 12.2%. Annually, employment decreased by 1425 persons in mining plants. The most significant was the fall in attenuator plant Dukla in Havířov.

In 2008 was again most decreasing branch the mining with 465 persons less. Mostly the share of dropping employment was in mining plants. Some of OKD, a.s. suppliers had decreasing tendency in employment as well. The employment in machinery industry was reduced by 26.1% during year 2008. It was caused by changes of mining plants under other subjects.

Year 2009 is connected with most significant fall of employment in metallurgical and steel industry. The employment decreased by 17.7%, concretely 1156 persons. The reason of this fall was global economic recession, which caused cut of demand in the market not only in domestic market, but also in foreign customers. Some companies reduced their production due to this reason. This reduction caused the fall of employment. The transportation and warehousing branch had decreased of employment by 13.9%, because there were drop of goods transportation on railways and there were organizational changes in road transport. Mining industry decreased by 4.7%. It was caused by drop of orders and transfers of surface employees. Construction industry lost 580 employees, mostly caused by influence of global economic crisis. Two companies had to stop their business and another company moved its production to Ostrava in the first half of 2009.

The transportation and warehousing branch decreased employment in 2010 by 476 persons, because rail transport companies decided to drop the employment for economic reasons. In mining industry decreased employment by 377 persons (3.1%). This change was caused mostly by Government Regulation 363/2009, where employees were able to go to retirement 5 years earlier.

4. Resilience to trends in the labour market in the districts of Ostrava-city and Karviná

The transformation of this industrial area was not properly grasped. After 1990 there was a centralization of public administration. Regional and local issues were not given sufficient attention. The development of new activities in the region was based primarily on the initiative of local actors.

The emergence of informal civic association called The Economic and Social Council of the Ostrava agglomeration played the crucial role in the development of the region and of the Moravian-Silesian Region. This association acted as a representative of the interests of regional institutions. The first activi-

ties of this association consisted in research studies that outlined the future developmental possibilities of the region. On the basis of this studies the Council submitted action proposals to the government, which were accepted and reflected in the Government Decree No. 245 of 1991, Measures for the Restoration and Development of the Ostrava agglomeration for 1991-1992 with an outlook until 1995. The government provided CSK 200 million for the small enterprise development and the creation of new jobs in 1991 and 1992. At the beginning of 1995, Economic and Social Council of Ostrava agglomeration was transformed into the Union for the Development of Northern Moravia and Silesia that strived mainly for deeper co-ordination of its own activities with Regional Entrepreneurial Fund and Regional Development Agency. Union for the Development of Northern Moravia and Silesia and its ancestors contributed among others to the establishment of the first duty-free zone in the country, further to the creation of regional bank (that bankrupted recently, however) as well as to the modernization of the railway corridor that facilitates the connection with the other regions (Sucháček, 2005a, pp. 9-13).

In the second half of the 90s of the 20th century several smaller industrial zones have been established with the support of the Ministry of Industry and Trade in the Region. The newly planned industrial zones have been one of the main tools for reducing unemployment. Unfortunately, these primarily based industrial zones have not attracted any major investor so far. This unfavourable situation was caused mainly by the less advantageous investment incentives in comparison with neighboring Poland (and Katowice conurbation) – (Sucháček, 2005a, p. 13).

The first industrial zone in Ostrava agglomeration was Karviná-Nové Pole, which was financed by the first state grand. The industrial zone was prepared and implemented in 1998-2000. In the Czech Republic, this project placed the first in the category Industrial Zone with the greatest social benefit in the years 2000, 2001 and 2002. Zone has been gradually filling the investors and is currently fully occupied by 10 companies on 45 hectares area, which have created almost 1500 jobs. The most workers are from Karviná district, 75% people are from Karviná and about 15% are from Orlová. Others industrial zones that contribute to reducing unemployment in the district are Orlovská industrial and business zone and Český Tešín-Pod Zelenou. While the first of them still offers investors the free areas, about 700 people already found a job in a fully occupied industrial zone in the Český Těšín.

In the Ostrava-city district found several industrial areas such as industrial zones Mošnov, Hrabová, development zone Hrušov and Science and Technology Park Ostrava. Mošnov Industrial Zone is situated on 200 hectares and was

created in 2000. Today it is fully equipped industrial zone. The first investors namely Behr and Plakor Cromodora Wheels appeared in the industrial zone in 2006. Investors invested more than 1.03 billion crowns in the zone in 2009. In the future, is expected to increase by 1300 new jobs.

Implementation of Industrial zones Hrabová took place 2000-2007. CTP expanded the original intention to create an industrial area of 30+ 30 hectares by a further 50 hectares. The total investment was above 7.7 billion crowns in the zone in December 2011 and was created 6955 new jobs. Today is in the industrial zone located of over 40 companies. In 2004, 2005, 2007 and 2009 was the zone awarded in the competition for industrial real estate of the year by the Ministry of Industry and Trade.

Three local universities namely VSB-Technical University Ostrava, Ostrava University and the Silesian University in Opava, in cooperation with the City of Ostrava and the Agency for Regional Development became the founder of Science and Technology Park Ostrava, which serves also as an incubator for new businesses. Area of the complex amounted to 10 hectares at the end of 2011. Project of Science and Technology Park Ostrava is implemented in stages in order to build the area for commercially oriented scientific and technological research, industrial acquire of research results, product innovation and business development.

The arrival of South Korean investor to Nošovice industrial zone had an affect the reduce unemployment in the region in times of economic crisis. About 2400 people living in the Region commute to work in Hyundai. Karviná district has the largest share of employment in Hyundai and Ostrava-city district moves to third place.

In the year 2012-2014 is expected with the project "Gravity drainage Hrušov" that creates an industrial area in size of 40 hectares, especially for small and medium enterprises. The project will increase the field by about 3.5 meters and total investment will amount to 2 billion crowns. This will provide an industrial area with good transport links along the D1 motorway and railway line to the inland, in the direction of Poland and Slovakia.

In recent years, interest of investor comes alive about the Moravian-Silesian region. Companies are returning to the projects, whose implementation has slowed considerably emerging economic crisis. Investors are attracted by the Moravian-Silesian region which is equipped with a sufficient number of industrial zones, high-quality infrastructure, strategic location, skilled workforce and good quality secondary and higher education. This fact is confirmed by the 75% occupancy of industrial zones.

Due to the number of industrial zones, the focus of investors and other factors Ostrava-city district offers a more diverse and wider range of job oppor-

tunities, unlike Karvina district that does not diverse range of jobs due to unilateral economic focus.

Labour offices contributing to improve the situation in the labour market in the districts. One of the tools is an active employment policy, whose main purpose is to regulate the labor market so that it can be able most effectively respond to fluctuations in the economy.

Table 2

Expenditure on Passive and Active Employment Policy in Ostrava-city and Karviná districts 2007-2010

Years	**Ostrava-city district Index (in thousands of crowns)**			**Karviná district Index (in thousands of crowns)**		
	Expenditure on total employment policy	Passive employment policy	Active employment policy	Expenditure on total employment policy	Passive employment policy	Active employment policy
2007	723 068	247 500	418 286	367 195	224 943	119 223
2008	527 939	220 765	232 145	313 704	196 422	88 594
2009	668 744	462 534	134 282	521 746	370 069	99 999
2010	754 563	411 314	226 745	506 146	315 565	133 252

Source: Calculated by Stachoňová. Based on: Portal Ministry of Labour and Social Affairs (2012).

As we can see in the table, most resources, totally 754 563 thousands crowns, was used for the state employment policy in Ostrava district in 2010. In 2009, was totally used 462 534 thousands crowns for passive employment policy, the most of all years. While in 2007 was the most spent on active employment policy 418 286 thousands crowns. Most resources, totally 521 746 thousand crowns, was used for the state employment policy in Karviná district in 2009. In 2009, was totally used 370 069 thousands crowns for passive employment policy, the most of all years. While in 2010 was the most spent on active employment policy 133 252 thousands crowns. We observe an increase of funds passive employment policy in a period of economic crisis.

Most means of active employment policy is targeted at socially useful jobs, public works and retraining in the districts of Ostrava and Karviná. These tools are considered appropriate having regard to the demand for jobs in the labor market.

Professional structure of socially useful jobs is not very different each year in the districts. The largest number of socially useful jobs is constantly created in services, in business, production and craft activities. Karviná district has a high success rate of the instrument because of low return people back to the records.

Retraining targeted to a specific job seems to be most effective in Karviná district. The greatest demand is for computing courses, welding and specialty drivers. Retraining courses have a substantial impact on the quality of human potential and their success reaches 30%. In the Ostrava-city district are the most used retraining courses such as welding, computer courses, operation of motor trucks and courses to prepare for the self-employment. 90.5% of retraining courses were successfully completed in 2010.

Instruments of public works are the most costly in terms of average cost. Public works have only short-term, often seasonal in character and therefore the return of persons to register is very high. Nevertheless in the district of Ostrava-city emerges as a powerful tool and it focuses primarily on low-skilled and people registered long-term at the employment office. These include auxiliary and cleaning works, but also charitable activities and the labour in social spheres.

Creating employment through the above-mentioned instruments of active employment policy is depending on the current economic situation, which affects the development of the labour market. But we must take into account that funds of active employment policy aren´t always effectively targeted to individual instruments.

Conclusions

The districts of Ostrava-city and Karviná have constantly faced specific problems caused by changes that have taken place here since 1989. Not very well grasped transformation process is negatively reflected in economic, social, and institutional environment. As a result of restructuring there occurred a decline in industry production and then to massive layoffs in half of nineties. There was an imbalance between supply of jobs and demand for labor. The growing unemployment rate reached the highest values in 2003. In the next years, the situation much has changed and there were the positive changes in the labor market when there was a decline in the unemployment rate. This situation lasted only until October 2008, when the economic crisis deepened the difficult situation in the region. The big companies that operate in sectors with the greatest attenuation were forced into layoffs of employees. It was reflected to the increase in the unemployment rate and to the number of job seekers. At the same time the number of offered vacancies was reduced.

The coming of investors into the industrial zones helps to reduce the number of unemployed persons in the districts. They create new job vacancies. Total six industrial zones were already created in the districts. An important instrument for promoting employment is an active employment policy, which affects

the labour market situation and provides permanent jobs. The most funds were provided on active employment policy in the Ostrava-city district in 2007 and in Karviná district in 2010. The most effective tools, given the demand for jobs in the labor market, are socially useful jobs, public works and retraining in both the districts.

Although the districts faced the same problems in the past, the subsequent development of employment had a different course. It turned out that the district of Ostrava-city could respond on the incoming changes more flexibly. The result is a diverse and greater offer of job opportunities. Because of economic mono-structure, district of Karviná doesn´t offer such a diverse range of job. Therefore, the district of Ostrava-city became one of the main centers of commuting from neighboring districts.

In late 2010, the labor market situation partly improved in the districts. Nevertheless, barriers of the development remain there, such as industrial mono-structure, lack of innovative milieu, rigid institutions, or limited social and environmental attractiveness. Further development of indicators in the labour market is unclear. It will depend on the activities of public administration and on the state of the economy due to orientation of most companies to export.

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Adam Drobniak, Lucjan Goczoł,
Magdalena Kolka, Mateusz Skowroński

THE URBAN ECONOMIC RESILIENCE IN POST-INDUSTRIAL CITY – THE CASE OF KATOWICE AND BYTOM

1. Methodological remarks to the case studies

Presented case studies was focused on recognition of the research problem connected with evaluation of resilience level of the selected post-industrial cities (Katowice and Bytom) in relation to other Polish cities, which often have different circumstances of economic development (e.g. not always linked with a mining industry). Among comparative cities the following were identyfied: Wrocław and Gdynia.

The selection criteria for the comparative cities to Katowice and Bytom include the administrative division of the country. Hence, for Katowice as the capital of the NUTS2 Silesia region – Wrocław as the capital of the Low Silesia region was identified. While for Bytom as a town with the status of a county – Gdynia town, with the same status in administrative division and a similar population potential was indicated.

Research tasks make up the solution to the problem posed included:

– description of a socio-economic background of the analysed cities;
– indication of changes impacting the analysed cities development during 1995-2010, which significantly had determined their development paths;
– implementation of quantitative evaluation of identified changes on the analysed cities development paths. This was made by calculation of indexes reflecting: employment level, budgets revenues from companies' profit taxes, level of population in both surveyed cities along with comparative ones. The Hill approach was used in that part of research (Hill et al. 2010);
– identification of new developments in rebuilding Katowice's and Bytom's economic resilience;
– formulation of conclusions referring to level of urban economic resilience with application of research findings from Simmie and Martin investigations (Simmie, Martin, 2009).

2. The Katowice case

2.1. Katowice – the socio-economic background of the city

Katowice (306 thousands of inhabitants in 2010), as the capital of the Silesia Region (NUTS2 level, 4.6 million of inhabitants), is having the highest population and service sector potentials of the Upper Silesian Agglomeration (also called Silesia Metropoly)[*]. the Agglomeration remains the largest urbanised and

[*] The city's residents constitute approximately 16% of the Agglomeration's population, and the potential of service sector is approximately 30% of the overall services' sector potential within the Agglomeration.

industrialised area in Poland, numbering around 2 millions inhabitants. Its rapid social and economic development in the twentieth century was associated with a development of heavy industry, mainly mining and metallurgy sectors. The Agglomeration covers two basic groups of different cities (Klasik, 2008, pp. 52-53), i.e.:

– the first group includes the cities and towns numbering more than 100 thousands of inhabitants like: Katowice (the capital of the Silesia Voivodeship and the core city of the Agglomeration), Sosnowiec, Gliwice, Zabrze, Bytom, Ruda Śląska, Tychy, Dąbrowa Górnicza, and Chorzów;
– the second group includes towns with population from 50 to 100 thousands of inhabitants, like: Jaworzno, Mysłowice, Siemianowice Śląskie, Piekary Śląskie and Świętochłowice.

Just like in almost all the Silesia Region (Transformation, 1994), also in the case of Katowice and the Agglomeration processes of restructuring of heavy industry left their indelible 'mark' on the social and economic structures. The effects of structural changes in 1995-2010 were manifested inter alia in the level of unemployment, the number of companies, population's potential, the size of investment (Business Central Europe, 1997; Drobniak, 2003). The scale of these effects was also different in relation to individual cities and towns of the Agglomeration. Some of them, i.e. mainly Katowice, Gliwice, Tychy growed up to be leaders of change in terms of development of the service sector, attracting foreign direct investment, creation of new businesses and jobs. In other cities and towns (like for example: Bytom, Świętochłowice, Piekary Śląskie) the processes of restructuring traditional industries have had such a large socio-economic impact that the processes of their redevelopment – even now – are relatively weak (Suchaček, Wink, Drobniak, 2012).

2.2. Changes impacting the city development during 1995-2010

For Katowice the years 1995-2010 are the period of many positive and negative changes. Up to 2005 the most negative impact on Katowice's economy had changes in mining and steel industry sectors. During this period reduction of 300 thousands jobs in the Silesia region as a result of mining reform took place.

At the same time the city itself and the region took attempts to create conditions for new development impulses. For instance, the Regional Contract for Silesia Voivodeship, which is the first example in Poland of document relating to regional policy including assistance for a region undergoing major changes of economic structure.

In analysed period, in Katowice few essential investments were realised progressively changing its image and economic profile of the city, particularly in

science, culture, trade, transportation, attracting foreign investment, creating high-class floor space for service activity.

Significant changes, which certainly influenced the dynamics of development of Katowice, in recent years are: financial crisis from 2008 resulting in decline of the foreign investors' interest in the city, rejection of the candidature of Chorzów (neighboring town) for EURO 2012, and also the rejection – though in the second round – the application of Katowice to the European Capital of Culture 2016. A detailed list of the changes taking place in the city and its surroundings is presented in the table below.

Table 1

Changes in Katowice and its surroundings

Year	Changes in Katowice	Changes in Katowice's surrounding	
1	2	3	
1995	– Foundation of Upper Silesian Industry Park	– Regional Contrast for Silesia Voivodeship – first attempt in the country of programming a regional development	
1996	– Foundation of the Katowice Special Economic Zone	– Decision of General Motors to locate the Opel factory in Gliwice (a city within Upper Silesian Agglomeration) – Foundation of sub-zones of the Katowice Special Economic Zone*	– Crisis in mining and steel works sectors, reduction in employment from 400 to about 100 thousands jobs – Closedown of many mines in the Silesia region – Numerous government reform of mining sectors
1997	–	– The beginnings of the process of Poland's integration with the EU – start of the negotiations with six Central European countries, including Polish	
1998	– Opening the new building of the Silesian Library in Katowice	– Reform of Poland's territorial division – creation fo 16 NUTS2 regions	
1999	– Decision of the Katowice Coal Mine closedown	–	
2000	– Application for bankruptcy of the Baildon Steel Works	– Creation of South Energy Consortium	
2001	– Opening of the first in Katowice office space in A class (Chorzowska 50) – Foundation of the Academy of Fine Arts in Katowice	– Creation of Polish Entrepreneurship Development Agency	
2002	– Opening the entertainment center "44 Point" – important element of complex changes in post-industrial district Załęże	– Act on financial support for investment assuming assistance from government budget for modernisation investment of up to 500 thousand. euro	

Table 1 cont.

1	2	3	
2003		– Sale of the state shares in the Polish Steel Mills SA company to ArcelorMittal Poland – Restructuring and concentration of the mining sector – creation of the Coal Company S.A.	–
2004	– Opening the Office space „Altus" (A class)	– Integration of Poland to the EU	
2005	– Opening of the biggest in the Silesia Region shopping and entertainment centre "Silesia City Center"	– Handover of the A4 motorway segment passing through the Upper Silesian Agglomeration and linking it with Wroclaw and Krakow	
2006	– The completion of a tunnel under the Roundabout and Handover of the Katowice section of the DTS (main express road with the Upper Silesian Agglomeration – Location of the Rockwell Automation in Katowice – the biggest in Central and Eastern Europe supplier of industrial automation – Opening of the Film Arts Centre in Katowice	– Postponing adaptation of the euro by Poland	– Gradual improvement in the mining sector
2007	– Foundation of Science-Technology Park Euro-Centrum (it develops technologies of obtaining energy from alternative sources – Opening the Science and Music Education Centre "Symfonia"	– Foundation of Upper Silesian Metropolitan Association, which gather 14 cities and town of Upper Silesian Agglomeration	
2008	– Launch a complex revitalization of the former Katowice mine, including construction of: the communication system of the area, the International Congress Centre, the new headquarter of the National Polish Radio Symphony Orchestra, the new headquarter of the Silesian Museum	– Worldwide financial crisis – Opening the B terminal at the Katowice Airport in Pyrzowice (the regional airport) allowing for service for 3.6m of passengers per year	
2009	– The organization of the first European Economic Congress in Katowice – European Championships in basketball and volleyball women in Katowice	– Rejection of the Chorzów (neighborhood town to Katowice) application as a host town for the European Football Championship Euro 2012	
2010	– Application of the Katowice to European Capital of Culture 2016	– Stock market debut of the TAURON-Poland Energy (big energy company rooted in the Silesia region)	

* Kontrakt Regionalny dla Województwa Śląskiego (1995). Województwo Katowickie, Katowice.
Source: Katowice Municipality Office.

2.3. Impact of transition processes on selected social and economic aspects in Katowice

Implementing the restructuring of the mining and steel industry (perceived here as the economic shock) had a significant impact on the labour market in Katowice and other towns of the Agglomeration. The level of Katowice's employment from 1995 was never recovered in the analysed period (1995-2010). Although his level have started to rise since 2005, finally in 2010 it reached only 85% of the level of jobs in 1995 (see Figure 1). The net balance of workplaces in Katowice was negative, that was: – 28 thousands of workplaces.

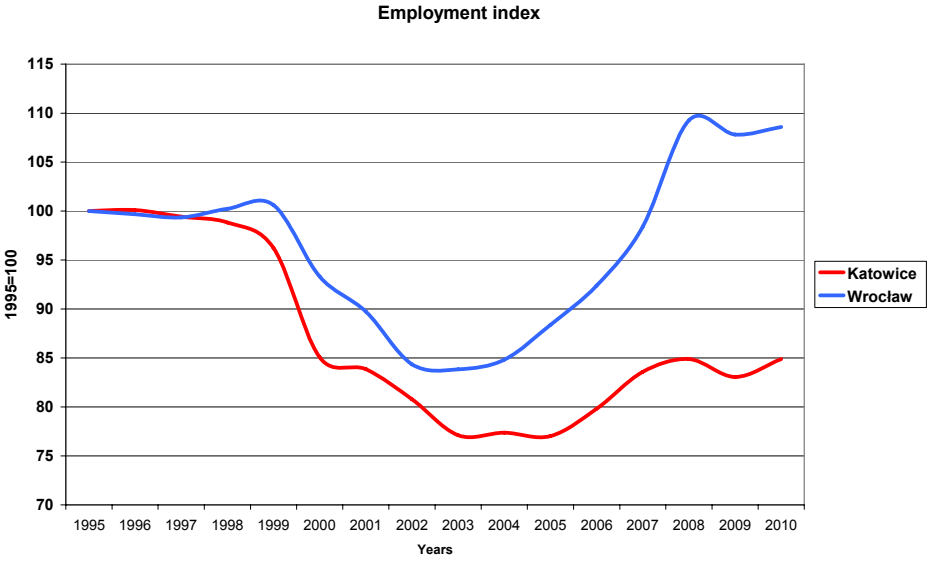

Figure 1. Employment index in Katowice and Wroclaw (1995-2010)
Source: According to data of Central Statistical Office, www.stat.gov.pl.

Moreover, when we compare the job growth in post-industrial city as Katowice to the same dynamics of jobs in a city that did not experienced the restructuring processes in the same time like Wrocław (the capital of neighborhood Lower Silesia Region) we can easily find differences in the urban economic resilience between these two cases. In Wroclaw job's growth started earlier (in 2004) and had higher dynamics. Finally, in 2007 the city exceeds the level of workplaces from 1995, and in 2008 reached the level of 110% of the baseline (see Figure 2).

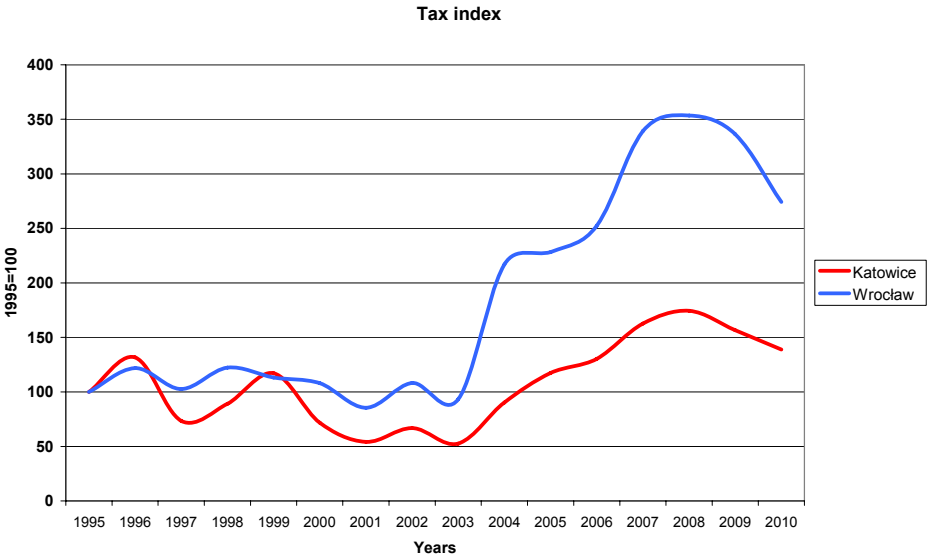

Figure 2. Katowice's and Wrocław's budgets revenues from companies' profit taxes
Source: Ibidem.

Economic conditions of cities described by the cities budgets' revenues from companies' profit taxes* also reflects significant differences in urban economic resilience between Katowice and Wrocław. The value of firms' profit taxes can reflect in interesting manner the economic base of a particular city. In case of Katowice the profit tax collected by the Municipality started to rise in 2003, and reached the level of 174% of the tax revenues from 1995.

* The revenues were discounted by inflation rate to establish their real value on the year 1995.

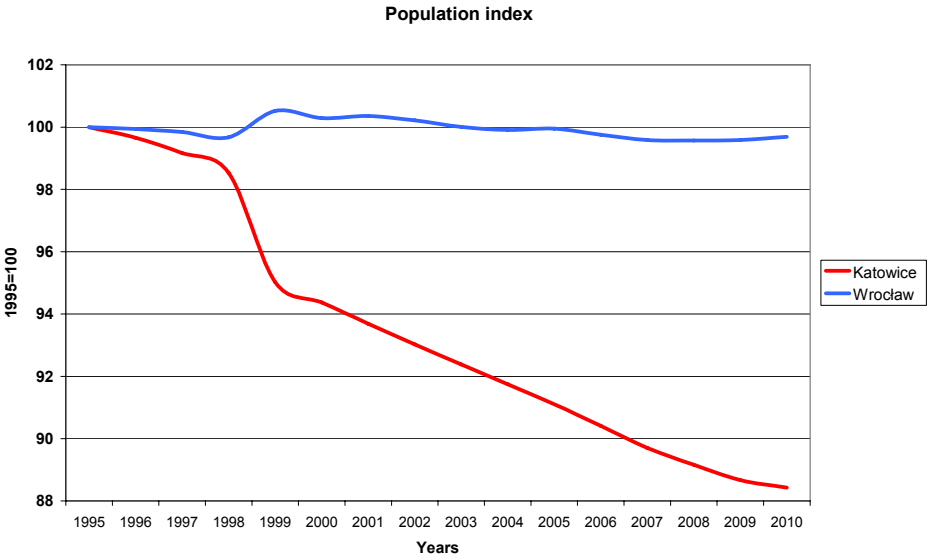

Figure 3. Population indexes in Katowice and Wrocław
Source: Ibidem.

Of course that positive dynamics showed the first financial effects of the city's efforts referring to rebuilding the local economy structure after restructuring decay. But at the same time Wrocław's companies provided much more tax revenues to the city budget – more then 350% of the year 1995 baseline. That shows probably stronger and more internationally competitive economic base of the Wrocław and thus, its better urban economic resilience.

Finally, the population trends which are also affected by a city economic resilience. The restructuring processes of coal mine industry and still works sector impacted significantly on Katowice population level. From 1995 to 2010 it dropped by 40 thousands labeling the city as not-resilient. In this period Wrocław – despite of country-wide deurbanisation processes – almost maintained the population level* proving its 'shock-resistance'.

2.4. New developments in rebuilding Katowice's economic resilience

Today Katowice is under the process of dynamic transformation both spatial and economic. The most distinctive changes can be noticeable in the activi-

* Overall drop of the Wrocław's population from 1995 to 2010 was 1.9 thousands of inhabitants (the city population in 2010 was 623 thousands of inhabitants)

ties concerning revitalization of the brownfield sites. In the history of Katowice more than 50 coal mines were founded, 12 endured till XX century and currently the post-mining facilities cover large areas. When mentioning Katowice, the city is sill associated with coal mines (but very few are still operating), which today are either closed or performing new functions. The shopping centre Silesia City Centre (SCC) is the most excellent and famous example of the first post-industrial facility in Katowice. For many years this place was the "Gottwald Coal Mine", extracting tons of coal per year, and later becoming one of the largest revitalized areas on the European scale. The mine was closed in 1996 and in 2005 the Hungarian investor – TriGranit placed in Katowice its first investment in Poland – the SCC. On the postindustrial areas for EUR 180 million was constructed multifunctional commercial center with total area of 80 thousands square meters, including retail area of 65 thousands square meters. The latter investor Immofinanz Group decided to extend the SCC for EUR 100 million, delivering extra 20 thousands square meters. Different way of adapting "Gottwald Coal Mine" urban-industrial areas, performed by TriGranit, is construction of the new residential – "Oak Terraces" apartments. The residential project consist of 4 stages and will offer ca. 1 thousand apartments in total.

In the very centre of Katowice existed other coal mine named: "Katowice". On its areas in 2013 for almost PLN 900 millions will be constructed 3 facilities, improving the quality of cultural and business infrastructure: the International Congress Centre, the New Seat of the Polish National Radio Symphonic Orchestra and the Silesian Museum. Those projects provide excellent examples of post-industrial land development and stand as a mark of changes taking place in Katowice.

Different area being the part of the municipality revitalization activities (included in the Local Revitalization Programme of Katowice for years 2007-2013) is Pawła-Wodna-Górnicza quarter. For the years, lack of resources and complex ownership structure has led to degradation and marginalization of this part of the city. The first stage of revitalization project in this area is tearing down 22 buildings and displacing 500 residents. The recovered plot was transferred to the University of Silesia, which will construct the new seat of the Radio and TV Faculty for PLN 20 millions.

The undertaken and planned revitalization projects of Katowice are a direct response to anticipated changes by the business environment. The city transformation that has already been started probably will enable Katowice to enter again into the path of dynamic economic growth. Accordingly, Katowice are changing its economic profile from industrial to services. In Katowice, over the past few years worldwide known companies from BPO/ITO/SSC sector (Steria, Ca-

pgemini, PwC), hotel services sector (Hotel Angelo, Best Western Premier) or R&D (Mentor Graphics, Display Link). have already invested. Mentioned investments will certify in near future the hypothesis that Katowice are dynamically transforming and economically expanding.

3. The Bytom case

3.1. Bytom – the socio-economic background of the town

Bytom, whose population amounts to 181,617, is a town situated at the heart of the Upper-Silesian conurbation. Boasting a 750-year-long history, it is one of the oldest towns in the region. Bytom encompasses an area of 69.44 square kilometres. Bytom's geographical situation is regarded as its great asset: it is located centrally within the Silesian Region, seated at an intersection of major transport routes and Pan-European corridors III and VI.

Bytom is a classical example of a post-industrial city. Not so long ago, Bytom was perceived as a town of coal and steel – these two heavy industries played an essential role in the life of the local community and represented decisive factors for its economic welfare. However, recent economic transformations exerted a substantial impact on the town's current situation. The restructuring efforts deployed at traditional economy sectors, notably coal mining and steel industry, have definitely closed this chapter in Bytom's history. At the moment, out of 7 coal mines and 2 ironworks, only one coal mine functions. Consequently, the economic base of the city has been destroyed and, what is in fact really important for the city development, it is still not recover (after 15 years from start-up of restructuring). Bytom is trying to change its image from the city of coal and steel to the city of services, first of all those connected with the culture industry.

The stagnation of most industries and decrease in the number of registering entities can be observed. The largest decrease was recorded in trade and repairs sector. The important increase took place only in industries related to financial and real estate activities.

3.2. Changes impacting the town development during 1995-2010

As in the case of Katowice, also in Bytom the dynamics of socio-economic development significantly was driven by restructuring of the mining and metallurgy in the years 1995-2010. However, in this case, the liquidation process was a much more severe in nature, leading to a significant depletion of the existing economic base of the town.

In comparison to the capital of the Silesia region, in Bytom less significant investments were made both in public and business sector – particularly during the period of 1995-2005. The result of the closedown of existing industries, and weak investment pulses were the highest unemployment rate in the region in 2004 (e.g. 26.7%).

Only measures implemented in recent years, such as opening the Bytom Industrial Park, signing a letter of intent on revitalizing the Szombierki mine, the start of construction of the A1 motorway, the launch of investor service office or the location of the modern shopping center can be regarded as significant development processes of the town. A detailed list of the changes taking place in Bytom and its surroundings was presented the table below.

Table 2

Changes in Bytom and its surroundings

Years	**Changes in the town**		**Changes in its surroundings**
1	2		3
1995	– Initiation of restructuring the mining industry in the town – Closure of liquidation processes of the Bobrek Steelworks	– Constant drop of work-places – Numerous mining damagedes – Deep depopulation trends	– Regional Contract for Silesia Voivodeship – first attempt in the country of programming a regional development – Establishment of the Upper Silesian Fund S.A. (support for capital market development and support for entrepreneurs)
1996	– The decision to issue municipal bonds to finance the revitalization of the market square of the town		– Foundation of Katowice Special Economic Zone*
1997	– Establishment of the Local Segment named "Enterprise Activation North Area" within the Regional Contract for Silesia Voivodeship – Foundation of the first tertiary education school in the town (School of Economics and Administration) – Closedown of the Szombierki mine		–
1998	– Separation from the Bytom's administrative division Radzionków district as an independent town (loss of about 30 thousands residents)		– The creation of 16 regions at NUTS2 in Poland – Availability of the PHARE pre-accession fund
1999	–		– Availability of grants and low-cost loans for low-emission reduction in the Voivodeship Fund for Environmental Protection and Water Management

Table 2 cont.

1	2	3
2000	– Foundation of The Economic Activity Zone in the frame of PHARE-STRUDER 2 programme – Foundation of the Bytom's Mines Restructuring Company – Steelworks Zygmunt bankruptcy	–
2001	– Integrated database of land and buildings was launched in Bytom – the first in Poland – General repair of the Silesian Opera House – Approval of the Bytom's Development Strategy for 2001-2015	–
2002	– Opening recreation and sports complex Dolomites "Sports Valley"	– Direct election of mayors of cities, reducing the number of municipal councilors (in Bytom from 50 to 25 members)
2003	–	–
2004	– Approval of the Bytom downtown master plan – The rate of unemployment reached 26.7% in the town (the highest in the Silesia region) – Finishing a closedown process of Rozbark mine and Powstańców Śląskich mine	– Accession of Poland to the EU – The inauguration of the cheap airline Wizz Air flights from the Katowice Airport (dynamic increase in number of passengers)
2005	– Finishing a closedown process of Miechowice mine	– Decision of localization of the whole A1 motorway part within the Silesia region
2006	– Accession of Bytom to the Upper Silesian Metropolitan Association	– Foundation of Upper Silesian Metropolitan Association – Completion of the S1 expressway connecting the Katowice airport with the cities of Silesian Agglomeration
2007	–	– The availability of the ERDF, ESF and Cohesion Fund during the EU programming period 2007-2013
2008	– Opening of the Bytom Industrial Park – Signing a letter of intent for the redevelopment of the former coal mine Szombierki	– Worldwide financial crisis
2009	– Starting the construction works of A1 motorway in Bytom – Approval of the Bytom Development Strategy 2009-2020 – Launching the Investor Service Office within the Office of the City Development	–
2010	– Opening in the inner city of the shopping center AGORA	– New strategy – EUROPE 2020

* Kontrakt Regionalny dla Województwa Śląskiego (1995). Województwo Katowickie, Katowice.
Source: According to the data of Bytom Municipality Office.

3.3. Impact of transition processes on selected social and economic aspects in Bytom

The process of industry restructuring has strong negative impact on social, economy and environment conditions in the town. Concentration of the enterprises connected with mining and coal processing tied most of inhabitants with the mining and metallurgy companies. Closedown of these work places has deprived many residents of their work and their families of income. Over 30 000 work places were closedown between 1995 and 2005 and their potential decreased to about 48 percent of its 1995 potential (see Figure 4).

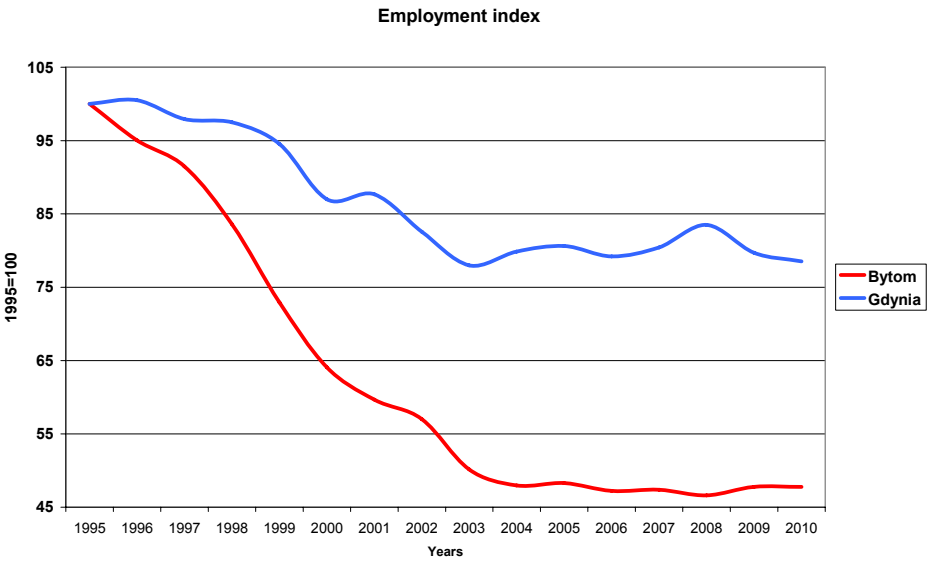

Figure 4. Employment index in Bytom and Gdynia (1995-2010)
Source: Ibidem.

It caused the excessive increase in the unemployment rate which reached its highest value in 2004, that is: 26.7%. For that moment Bytom had the biggest unemployment rate in the Silesia Region. In the 2008 the unemployment rate decreased to 12.7%, but in the following years it increased again, as the consequence of the world financial crisis.

Compared to Gdynia, which development was also related to a industry (shipbuilding, which was also a subject of restructuring in the surveyed period) decrease in the number of jobs in Bytom looks very dramatic. Deep restructuring of the shipbuilding industry in Gdynia indeed led to reduction of potential jobs

but "only" about 20%, while in Bytom economic base perceived by jobs had shrunk by more than 50%. In Bytom, as it was shown on the figure 5, the employment rate started to rise in 2005, but the growth is very small.

The financial condition of the town companies – measured in Bytom's budget revenues from profit taxes – has significantly improved after the period of 1995-2003. The growth of the town's budget revenues from the tax on companies profits was the highest in 2008 and reached about 180% of the level from 1995 (the calculation takes into account inflation, reducing the amount of revenue from corporate income tax to values from 1995).

Bytom situation therefore appears favorable. However, in a similar period, i.e. 2007 revenues from corporate income tax in Gdynia's budget grew by 450% in relation to their value in 1995. After 2008 the growth dynamics of revenues from corporate income tax in Bytom – but also in Gdynia – collapsed. It was partly an impact the global financial crisis (see Figure 5).

Figure 5. Bytom's and Gdynia's budgets revenues from companies' profit taxes
Source: Ibidem.

Since 1990 the population of Bytom has been decreasing constantly (it was 7.54% in the last decade). There are some demographical causes for this trend:

– The number of births has decreased from 16 on 1000 inhabitants in 1980 to the 9.7 in 2010 (the number of deaths is at the level of 11.1 on 1000 inhabi-

tants). The rate of the population change was 6 on 1000 inhabitants in 1980, and – 1.4 on 1000 inhabitants in 2010.

– The negative balance of the permanent migrations (since the 1994 there have been more people leaving Bytom forever, than people coming to Bytom to settle). The balance of net migrations was: 1,244 in 1990, and – 869 in 2010.

Another negative population trend in Bytom is the decreasing number of young people and economically active group. That is:

– strong decrease in pre-productive age group from 48.107 inhabitants in 1998 to 29.795 inhabitants in 2010,
– decrease in productive age group (from 130.769 in 1998 to 117.057 in 2010).

Concluding the Bytom's population trends it should be noted that in 2010 the town lost about 20% of its demographic potential from 1995 (see Figure 6). According to the official statistical forecasts, the population of Bytom in 2030 will drop to 151.772 inhabitants.

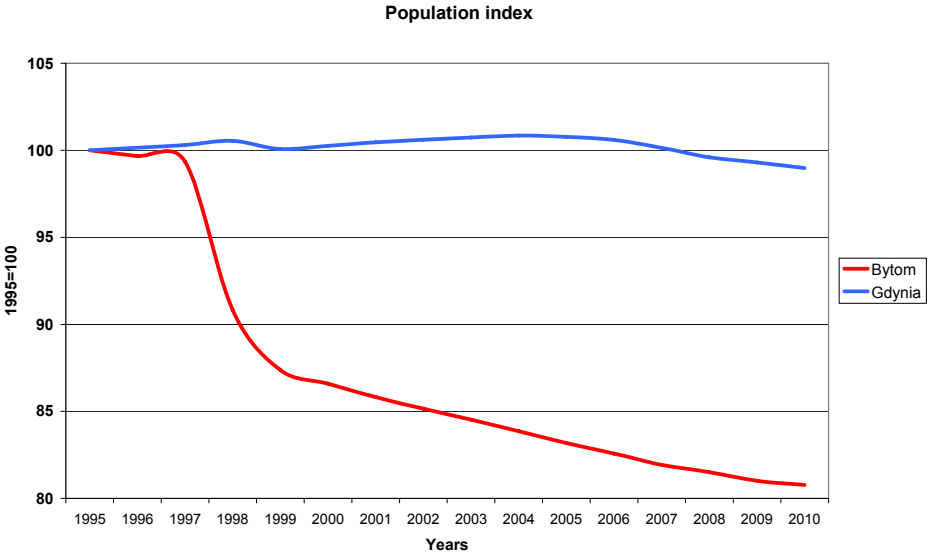

Figure 6. Population indexes in Bytom and Gdynia
Source: Ibidem.

3.4. New developments in rebuilding Bytom's economic resilience

Prior to 1995, when the restructuring process of mining started, mining areas had occupied 83% of the city area. At the moment they cover about 35% the whole town's area and the exploitation takes place underneath the districts like: Śródmieście (inner city), Rozbark, Karb, Miechowice, and Dąbrowa Miejska.

Some parts of the city resemble a „lunar landscape" – the remains of the liquidated mining plants. The recovery of many post-industrial monuments takes a long time. It is over 300 hectares to develop. Some of the city's plots still belong to the Kompania Węglowa (main maiming company). Thus, the Bytom Municipality cannot directly finance the revitalization of those areas. Whereas on the other hand, the owner does not feel responsible for taking care of them.

The premises mentioned above were the basis for the Development Strategy of Bytom update process, which was accomplished in May 2009. The strategy included new challenges, defined as follows:

– urban convenience,
– infrastructure of environment protection,
– high culture and free time,
– enterprise and innovation,
– sciences and higher education.

The main challenge for the city is the recover of the economic base.

In this context some successes and failures of the transition process can be observed. One of the successes in transition is exemplified by the area of the former Szombierki Coal Mine, founded in 1870. Up to 1873 two mining shafts were built: Hohenzollern (also called Ewa) and Kaiser Wilhelm (called Krystyna). In 1993 the process of the Szombierki Coal Mine closedown started. The coal mine's post industrial area covers about 60 hectares. For a long time the whole area was undeveloped. In 2008 a new private owner and investor – GC Investment – has signed the letter of intent with the city of Bytom, according to which the area would be developed in an integrated way, including trade and residential services as well as recreational functions. The presented initiative is an example of a wide revitalisation process of the post-industrial plot. The innovative concept assumes to develop this post-industrial area into a golf course with recreational parts and residential areas. Thanks to that the space will become more competitive and the Szombierki district will increase its value. Apart from these efforts also entrepreneurship and economic activity should be strengthened on the plot. For the further implementation of the project the investor will apply to JESSICA* fund, which will support the further revitalisation investments connected with commercial activity.

On one hand the Bytom Municipality is looking for external investors who are interested in the revitalisation of post-industrial areas like the GC Invest-

* JESSICA (Joint European Support for Sustainable Investment in City Areas) – is an initiative developed by the European Commission and the European Investment Bank, in collaboration with the Council of Europe Development Bank (CEB). Under new procedures, Member States are being given the option of using some of their EU grant funding, their so-called Structural Funds, to make repayable investments in projects forming part of an integrated plan for sustainable urban development.

ment. On the other hand the Municipality tries to develops new concepts of rebuilding the post-industrial areas on its on. The example is another area of the former Rozbark Coal Mine, where the Centre of Dance was raised (the seat of the Silesia Dance Theatre). Within this project two French artists, that are: Jean Paul Ganem and Pierre Lussiere, proposed to transform the area into an impressive garden, as they did in Montreal or in San Paulo.

At the same time, the Municipality of Bytom faces a lot of current challenges connected mainly with the effects of previous long-term mining operations. There are:

- infrastructure damages,
- local depressions (excessive land surface depressions is in the following districts: Śródmieście (inner city): – 7 metres; Karb: – 15 metres; Miechowice: – 14 metres),
- changes in terrain,
- pollution of environment,
- required new functions development on lot of post-industrial, derelict areas,
- building damages.

The most dramatic consequence of the mining influences was felt by the citizens of the district of Karb. During last 3 years the area lowered by 3 meters (from 1965 it is 18 meters). As the consequence of mining operations in the district of Karb there was a catastrophe on an unprecedented scale in Poland. Demolition of 28 housing structures caused by the mining damages, forced over 600 people to moved from their homes. The action of resettlement was started on July 2011 and is still continued.

Conclusions

There is not doubt that Katowice among other post-industrial cities and towns of the Upper Silesian Agglomeration transforms its economic structures in probably the fastest and most diversified way. The city is growing up to be the leader of transformation in terms of a service sector development and attracting a foreign direct investment. But, as was showed, in comparison to its competitors – like Wrocław – the post-industrial "heritage" of the Katowice still makes it more vulnerable to external shocks and not resistant to population outflow and workplaces reduction.

Relatively lower economic urban resilience is assigned to Bytom. Besides of the efforts undertaken by the Bytom's Municipality in last 15 years to rebuild of the town's economic base and strengthening its capacity to keep and attract new inhabitants – these urban policy priorities still remain not fully realised. After the shocks from years: 1995 (restructuring process), 2008 (influence

of the world financial crisis) and 2011 (geological catastrophe in the district of Karb) the town is still trying to return to its previous growth path, but it seems to be abandoned and alone in these processes.

No central government support in the form of funds and technical assistance focused on the post-industrial areas in Poland makes difficult for towns such as Katowice and Bytom to compete effectively for investors, public institutions, entrepreneurs on national and international level. Thus their economic resilience suffers substantially.

According to Simmie and Martin (Simme, Martin, 2009), typology of a city's economy response to a shock, both analysed post-industrial cities are still below to their prior (to shock) growth paths. They are not shock resistant and still vulnerable on internal as well as external changes. Probably because of the coal mining sector redevelopment* – coal mines still exist in Katowice and Bytom – the cities are also lock in their path-dependency trajectory of growth in some extent.

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* In 2011 Poland's coal mining sector recorded a very good financial performance connected with increasing internal and external demand on coal.

University of Economics in Katowice

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Małgorzata Suchacka

RESILIENCE REQUIREMENTS IN THE EMERGING KNOWLEDGE REGION – THE CASE OF CITIES AND ENTERPRISES IN THE SILESIAN CONURBATION

Introduction

The concept of *knowledge regions* (or *learning regions*) has become a wholly constructed model taking into account various dimensions. Reliable research on *learning regions* should take into account many aspects connected with human capital, the functioning of companies and institutions and also cultural specificity. The concept of resilience is one of these ideas that should be taken into account while talking about building the *knowledge regions*. *Learning regions* requires resilience and it appears as a result of cooperation between different actors and strategic planning. Having these abilities of cities and whole region it has a competitive advantage. The concept of resilience is associated primarily with the economic approach and concerns the capacity to solve the local economic problems in a way that it is the key to success. Analyzing this issue on the border on the border of economy and sociology, it is worth paying attention to these phenomena with a social background. A sequence of multiple processes depends on the state and the course of these phenomena. For these events we can include cooperation between main regional actors, their mutual adjustment and activities assessment, also the ability to set strategic goals, both by companies and local authorities. In the case of dynamic changes, that occur in industrial regions, where economic structure is changing, and the region becomes a region of knowledge – the ability to adapt to new conditions is particularly important.

The concept of resilience was described mostly in the context of preparedness to receive various types of unexpected events and react by increasing resistance and achieving economic stability. It was due to noticing some relationship between as the city cope with problems such as poverty, migration, pollution, natural disasters, economic crisis, the collapse of main sectors of the economy (Simme, Martin, 2009). Urban resilience is not only connected with response to a disaster or unexpected event, but also the ability to adjust in the face of uncertainty. According to Foster considerations, we can define resilience as an ability of a city to anticipate, prepare for, respond to and recover from a disturbance (Foster, 2007).

1. The aim of the article and methodology of research

Considerations on urban economic resilience should be conducted in a wider context of regional development, especially when we talk about old industrial regions. The purpose of this paper is to analyze the resilience capacity of

the Silesian conurbation. It is very interesting area that consists of many cities with close cultural, social and economic connections. The region is highly industrialized and it is still in the process of intensive changes, which is a result of collapsing of the dominant traditional industries. The analysis is going to be based on regional documents and research – mainly – interviews with key regional actors representing local authorities, experts like representatives of business support – and the company of three sectors of the economy. The qualitative method used in research made it possible to develop categories of response reflecting the most important trends in the relationship between the main regional actors. It also allowed to describe the ability to set the strategic objectives both by businesses and local authorities. This qualitative method and interview technique gave all respondents a free hand in their responses. The main technique for collecting data were in-depth interviews among intentionally chosen respondents. The territorial scope of study included Silesia, taking into account its subregions: central, north, south and west. There was conducted a total number of 100 interviews, 25 in each subregion. For the purposes of present description will be selected responses, that concern directly to the central part of the province – the Silesian conurbation.

The fundamental question of analysis therefore relates to requirements placed before the industrial regions, which gradually transform into regions of knowledge. Characteristics of these requirements will be developed on the base of positive examples of local government and regional enterprises, that maintain a stable economic and social position. Article presents main conclusions of research concerning regional cooperation between most important actors – its directions, barriers and opportunities especially in building knowledge region. Main difference between questions directed to entrepreneurs, experts and decision makers concerned their way of defining innovations and conducting or supporting this kind of process. The most interesting issues in that research have concerned opinion of entrepreneurs – their attitude to human capital, and knowledge transfer, applying innovations, cooperation between all actors. The second part of article will discuss examples of cities and enterprises (foreign corporation, a state enterprise, and with 100% private Polish capital), which can adapt to the external conditions and maintain their stable position in the region.

2. Regional cooperation – main directions, barriers, and opportunities

One of the main directions of cooperation mentioned by respondents, is the nearest surroundings – especially the local community and local authorities.

Building good relationships is essential to maintain a high level of trust. It is necessary in a situation threatening the stability. Companies from the central subregion, depending on the sector, to varying degrees, were engaged in relations with the community. It must be admitted, that sincerity of purpose was more convincing in other subregions, in the smaller towns of the region. In the conurbation there are many large companies and foreign corporations. Few of them have a policy of responsible business, intentionally setting their goals focused mainly on creating the image. This action is more planned, compatible with the general philosophy of the company's headquarters, often more independent of the pressure coming from this community.

In the case of the mining sector, entrepreneurs tend to be strongly rooted in the community. This is expressed through participation in local traditions, in activities related to a particular place – mine, settlement or parish. Claims attitude of the local community and the mine workers does not help to provide the appropriate relationships. This is one of barriers of development. In the central part of the region strong relationships with the local mines are very characteristic. It is followed by the Silesian tradition of mining, in which mines can not be separated from their social environment. This commitment takes the form of miners free time organizing, mining families support in difficult situations, and finally, environmental responsibility and ecological environment of the mine. These types of enterprises are particularly exposed to unexpected events especially of tragic final. The mine, usually part of a large mining company, takes care of the nearest surroundings connected with the area under which mining is carried out. However the entire company conducts its policy in the wider area, often covering the entire province of Silesia. A strong relationship with the region, rootedness in the region and awareness of social responsibility – are reasons for engagement at regional level through participation in important government bodies.

Most of the entrepreneurs of the industrial production sector implements policies directed in responsible business and has conducted campaigns for the stakeholders. However, these activities are rare and quite diverse, and initiatives have often employees derived from the nearest surroundings of the company. Most manufacturing companies are sensitive to the environmental consequences of their activities. It results from the EU requirements, and on the other hand from the desire to avoid conflicts with local communities. They try to build a positive image of business strategy, based on the symbiotic nature of relationships with the local community. Respondents underline, that companies are not lonely islands or enclaves separated from the environment. Maintaining good relationships with local municipal or county authorities, looking for close connections

between product and the local community – raise its appreciation in society. Some of the companies' activities are limited to financial support for local institutions or initiatives.

Entrepreneurs form service sector generally declared low level of financial commitment to the local community. It was proportionate to the size of the company. The lowest rates occurred in the involvement of companies, that were subsidiaries of international groups, providing standardized services in many areas of the globe, although some of them have adopted a policy of responsible business. Involvement was higher in indigenous firms, especially those providing specific services and adjusted to the local market. Weak business relationships with the local community in the Silesian conurbation may also result from the fact, that service companies often have branch character, or remain in a highly distributed dependence according to local authorities and densely populated society of the subregion. It happens, that some companies wish to deepen their relationship entering into a policy of social responsibility.

According to experts' opinion – the involvement of companies in relations with the community is apparent, provided it is calculated in future financial profits or it is associated with long-term policy of building the reputation of the company. Experts support the view, that foreign companies do not care properly for a good relationship with the local government and NGOs. According to the decision makers opinion, there is a stronger attachment to the community on the side of domestic firms. They have noticed, that there were more and more references to the local community in applications for EU funds. Respondents argued, that companies began to recognize the need and legitimacy to engage in their social environment.

Cooperation with the local community is the most common direction of business activity. As the research shows another type of contacts – for example with the authorities of higher level, institutions supporting the development of the region, and scientific institutions – are at moderate level. Good relationships are rather superficial. Entrepreneurs looked for reasons of low level of collaboration and usually indicated the lack of competence of local administration. In the research sector – it was primarily hierarchical distance very characteristic for the world of science.

Cooperation with higher level authorities concerns mainly larger companies, who feel responsible for the ecological impact of their activities. They try to be active in this regard, and simply care about their own image. It was pointed by some of experts – representatives of business support institutions – entrepreneurs emphasize economic calculation. Entrepreneurs, engaging in contacts with the local authorities, provide not only a good reputation in the community, but

also solve some of their business problems such as building roads, lower taxes, participation in public procurement. However, at the higher level of authorities, these interests are not always so obvious. That is why the desire to get involved should have an economic – often long-term justification.

Taking into account learning region`s development collaboration with the world of science is particularly important. In this case, this cooperation should be based on mutual understanding, planning and building a common reaction to the unexpected collapse of the market and unforeseen circumstances in which the rapid introduction of innovative production methods and application of new solutions may be the only solution of situation.

Entrepreneurs of the mining sector talked a lot about science and business cooperation assessing it as insufficient. It could not be stated that Silesian industrial companies do not maintain contacts with universities, however, these contacts are loose, occasional and quite superficial. Frequently, the most advanced form are training and internship opportunities for students. In the opinion of the respondents the most frequent examples of cooperation are fruitless and facade. Such opinions were quite common and included not only the central part of the province. The main criticism of the scientists – apart from the lack of language and parochial thinking – was an excessive love of hierarchy, creating knowledge on shelves, and a complete lack of market-oriented attitude. Entrepreneurs can also be prosecuted. Research shows that they feel self-sufficient and independent. They often stressed that they must rely on their own strength, and they also defended access to their technology. Some of them directly spoke about theft of *know-how*. They are afraid about it, so they have their own closely guarded laboratories. They do not trust business support institutions trying to liaise with the scientific side. A characteristic opinion of the entrepreneurs is the lack of transparency of business initiatives making on the crossroads of key partners: government, business, and science. They also underlined the lack of transparency in incubators and clusters functioning in collaboration with service users and lack of spectacular results of this cooperation.

There were also some questions about possibility of creating knowledge region in a wider area than the center of the region – for example the area including the Czech part of Silesia. There were no clear objections or enthusiasm for such an initiative. The main contacts are rather on the border areas and are associated more with business contacts, not science. The most enthusiastic about the submitted proposal were the representatives of business support institutions and regional policy makers. They pointed to the existing favorable conditions for creating such a region. It results from the presence of the A-4 motorway and other more convenient means of communication. They emphasized the impor-

tance of collaboration between technology parks, incubators and clusters in direction of creating transboundary automotive industry basin. Such a "top down" view on this type of region may be a strategic look at the development and preparation for further creating knowledge region. On the other hand, entrepreneurs have expressed fear about institutionalization of such a "solution". In their opinion organizational structure and allocation of funds in this region could be the biggest problem. This form should mature for some time, and on this basis can be created similar and join them in the future. Only one respondent expressed the belief that this area of knowledge already exists, which is proved by inhabitants themselves, who had to learn how to adapt to new economic conditions. This project, however, seemed to be very abstract for respondents. They usually had a positive assessment together with various concerns about the form it could adopted in practice.

3. Case studies – resilient cities

Among strategies of cities ready for cooperation – which provides flexibility of whole Silesian conurbation – it is worth looking through documents from Gliwice, Katowice, and Tychy. This kind of analysis is based on looking for such an actions, that indicate for planning in terms of knowledge development in wider area and connections between cities.

The most important strategic document for Gliwice is "Strategy for Integrated and Sustainable Development of Gliwice by 2022". Basing on the table of contents it can be concluded, that the city authorities have a clear concept of development, analyze the situation, carry out a diagnosis, have a vision for the city and on that base indicate priorities and strategic objectives. Authors of that document stress that "[…] vision is an anticipatory scenario, which means, that it expresses wishes and expectations concerning development of the city" (Strategy, 2007). Working on the vision it was taken into account a lot of levels of development such as the structure of the city, its cohesion, local development entities and their relationships, distinguishing features and advantages of the city, position and image of the city in the neighborhood. All these planes were described in detail. In the vision of the city of Gliwice it will become in 2022, inter alia, the national leader in implementing innovation economy. The development perspective therefore goes for national perspective. "A high level of innovation in the local economy will be possible thanks to:

- development of cooperation between science and business,
- attracting investment connected with modern technology,

– development of local, economic networks of cooperation enable to diffuse innovation,
– high level of residents technical competence" (Strategy, 2007).

References to the Silesian Agglomeration is common in the city vision. It reflects about wider perspective of decision makers and their awareness of connections in the region. Apart from the vision of the city, there have been designated five priorities:
– Construction of modern economic structures.
– Improving the quality of the city life.
– Development of metropolitan functions.
– Enhancing the attractiveness of urban space.
– Creating a civil society.

They are not mutually exclusive, and for each of them several strategic objectives were developed. They have been described in detail in the strategy. For each of them there is designated realization indicator. It convinces that the document is not facade action.

The development strategy of the city of Katowice "Katowice 2020" was established in late 2005. From initial information which includes a table of contents it can be concluded – as in the case of Gliwice – that the vision of the city has its justification in real diagnosis of the situation. Authorities analyze opportunities and threats, strengths and weaknesses of the city. The awareness of being a capital of the province and the center of Silesian conurbation go together with strategic plans. Therefore, authors of the paper emphasized, inter alia that "[…] the principle of partnership should be considered as a primary means of achieving synergistic effects of common using and developing endogenous potentials of the Silesian Agglomeration cities, which are potentials: the human and infrastructure" (Katowice 2020, 2005). Leading ideas of the vision, that have authorities of the city, are:
– "Katowice as a metropolis, in common actions together with central cities in the Silesian Agglomeration, particularly with Gliwice and Sosnowiec.
– Katowice as capital of twenty-first century in Upper Silesia, also as the national center for research and development in advanced technologies.
– Katowice as a center of Europolia in Central Europe including Kraków and Ostrava. Katowice as a business and financial center of the Silesian Agglomeration and the South of Poland" (Katowice 2020, 2005).

In the document, much attention was paid to development of innovations, research and development sector, and conditions of technology transfer. Katowice in the future has a chance to become a center of academic and scientific research in the field of advanced technologies, in areas such as biotechnology, in-

formation technology, mechatronics, electronics and nanotechnology. Katowice will be a place of establishment of R&D centers of domestic and international corporations and the place of effective cooperation between academic and business. The result of this cooperation will be transfer of technological, social, and organizational innovations. This is the place where develop a center of strong knowledge-based economy and concentration of enterprises form advanced technology industries. The city will also promote rapidly growing innovative small and medium enterprises which largely influence on restructured economic base of the city. No less important is the fact that Katowice was a community with enhanced competencies and entrepreneurial skills, and included a modern business infrastructure oriented for creating new companies and attracting investors. The document states, that Katowice has to become a modern city, and its development is mainly based on knowledge and innovations. These strategic objectives overlap with the vision of the central subregion of the Regional Development Strategy.

On the website of city council of Tychy, one can find a lot of strategic documents including: "Local Revitalization Program of the City of Tychy", "Social problem-solving strategy in Tychy (2008-2013)", "Development Strategy for the City of Tychy: Tychy 2013". There are also strategies for the development of sport, culture and education, as well as plan for revitalizing the "Paprocany" park in Tychy. In terms of time horizon, strategy of development of Tychy is the least-date, compared to two documents discussed above. The strategy describes key participants of the development, designates the vision, mission and development priorities for 2003-2013. The vision of Tychy future is organized around three key elements – "Entrepreneurship-Knowledge-Environment". They became basis for the formulation of three main priorities of the strategy:

- The development of entrepreneurship and competitiveness of the city.
- The development of information society and preventing social exclusion.
- The development of urban environmental infrastructure.

All specific activities agreed on these priorities are focused on local issues, reaching at most to using the benefits of the information society. Strategic projects of each priorities are focused mainly on solving local problems, such as labor market, education system, urban infrastructure and road communication. Also in the mission of the city there is no reference to values of supra-local and building them in a wider context, then the city one. The document shows Tychy as a city of small aspirations in the regional or national level. But it can not be prejudged about definitive criticism towards city authorities. Updating whole strategy will surely take place soon, and multiplicity and minuteness of other strategic documents of the city show a high level of decision makers awareness.

The most interesting seems to be the most recent document "Local Program of Revitalization City of Tychy", where one can find references to the "Silesian Regional Development Strategy for the years 2000-2020" (Local Program, 2003). In the context of building resilience in the knowledge region, it could be appropriate to have one most important document, which would show the unity of plans and awareness of regional networks.

4. Case studies – resilient enterprises

Resilience and readiness to face necessary changes in the process of building knowledge region concerns also companies and their strategic approach to development, including changes, that occur in the environment. Research discussed above also focused on issues related to strategic planning and business development. Among the 60 surveyed companies, there can be found examples, that very rationally analyze dimensions of their activities by focusing not only on economic aspects or short-term activities.

An interesting example was Johnson Controls Company. This large, international company is a global leader in diversified technology and industry. Its products and services are offered in over 150 countries. In Silesia region they mainly focus on the automotive industry, because of the numerous connections with other corporations such as Fiat and General Motors. The company is guided by values, that respondents mentioned in the first introductory sentences concerning the management and strategic planning. As he pointed out – these values have strengthen organization and have shaped organizational culture. They form basis for a ten-year plan (10-Year Marker), which is a set of strategic guidelines to achieve long term success. They most important values are: honesty, customer satisfaction, employee involvement, innovation, sustainable development. These values will both serve to build a good relationship with the environment, and development of the company. Honesty is manifested, inter alia, in respecting safety rules. In 2011, Johnson Controls International Ltd. located in Bieruń was awarded as "Employer-organizer of safe work". Equally important value is customer satisfaction. Employees serve with specialized knowledge and practical solutions. This approach – based on honesty – is going to strengthen relations between people from different business units and fulfilling different functions. The source of success and resilience to unforeseen situations, seems to be employees, whose development is under constant pressure. The company supports a culture, that promotes outstanding tasks, teamwork, turning to all employees. Employees are trained to act in the global market. Extremely important value are innovations. Company managers are aware, that it is always possible to devise a better way of action.

Therefore, they are always looking for commercialization opportunities for innovation around the world. It whole is accompanied by an idea of sustainable development, associated with promotion of effective use of resources, and community involvement for the environment and local community. The company activities have a global dimension, but also include activity for local community, education, environment, social welfare and development of leadership skills. Respondent gave several examples, that demonstrate engagement of the company. One of the most interesting project is the Blue Sky Involve – a program that encourages employees to create groups of volunteers working with local organizations to support projects related to environmental protection and development of leadership skills. Every year, number of employees providing in this way is growing. It is also a manifestation of growth of civil activity. The company stressed, that it builds a new generation.

Another interesting example of a company planning its long term development is the Famur Group – a leading manufacturer of machinery for mining. In 2011, the company took first place as "Most Dynamic Company" in Silesian province among large companies. Ranking list has been prepared by the Financial Paper and business intelligence Soliditet, belonging to the Group Bisnode. The list included 106 companies from the region of Silesia with a turnover exceeding PLN 200 millions and employing over 250 people. The priority of the Famur Group is to build effective, innovative company, flexibly responsive to customer needs. For this purpose Famur strategy focuses on the segment of machinery and equipment for mining industry. Automated longwall systems are designed to operate even in the most difficult mining and geological conditions. Delivery of a wide range of machines used in underground mining and surface mining is the core of company business. The authorities of Famur Group emphasize concern about innovative products, technology for their preparation and constant investments in research and development. The real expression of engagement to R&D activities is setting up their own laboratory – Famur Institute Sp. of o.o. (Formerly the Polish Centre for Mining Technology Sp.). It focuses on conducting research and development for the Famur Group. As an independent entity, it specializes exclusively on research and development using their potential as fully as possible and direct it to the activities typical for academic units (the Company has status of Research and Development Center). It supports development of innovative solutions and high specialization in the field of scientific research. Another area of Famur Group activity is an agreement signed by the company and the Silesian Technical University, which aimed to promote education and career development of young people and undertaking research and scientific work. As a result of this cooperation University employees will be able

to conduct surveys, analyzes and opinions in the field of technology, organization, and management. Common reaching out for funding will be also important, including grants from the EU. It will allowed effective and collaborative partnership. Representatives of the board emphasized, that the company focuses on innovations and will gladly share their knowledge.

Through all the year there are paid internships for ambitious students, who want to gain their first professional experience in the mining machinery industry. The whole initiative is addressed to technical students particularly in departments: electrical, mechanical – technology, mining and mechanical engineering. Internships last for four months and take place under the guidance of mentors, who are employees selected from company. Their job is to transfer knowledge and long-term experience for young, inexperienced trainees. Mentors shall ensure, that trainees have achieved the greatest benefit from the practical application of their skills and abilities in the assigned programs. Apart from establishment of their own research institute, cooperation with the Silesian Technical University, paid internships for students – the company has received support from the European Union under the Operational Program 4.4 and 1.4-4.1 Innovative Economy. Thanks to this, the company built one of the most modern factory in mining machinery sector in Poland. Company's impact on the development of knowledge region is undeniable, and financial results confirm growing scale and dynamics of the business.

Another company coverage includes not only the Silesian conurbation, but the entire province. Kompania Węglowa S.A. is probably the largest mining concern in Europe – employing 60 000 workers. Company management – although heavily dependent on state authorities – for years put stress on key competencies, based on innovation. For this purpose, they carried out cooperation with scientific institutions, local governments and economies. This activity is quite extensive due to the large area and number of employees. As a company associated with mining industry and damages arose as a result of extraction – authorities emphasize, that their priorities are environmental protection and worker safety. They feel responsible for the region and aware of creating thousands of jobs. Social security for inhabitants of Upper Silesia, the impact on regional culture and cultivating of mining tradition – are also important. It is worth to describe just two examples of actions demonstrating how that company takes into account conditions of their work. The first example concerns the situation of restructuring the mining industry, which resulted from linking mines. Since 1997, part of staff was encouraged to move away from mining.

The rest of workers from closure mines has been redirected to other mines, what had met with resistance. Transitions to other mines were connected with

breaking traditional ties, which were highly appreciated values. Traditional steam hook played a special role, because everyone there has their own place and the same neighbors. Emerging attachment was due to the fact, that employees working underground do not work in one place. They moved around as they move to the next board or areas. Steam – and that own hook – were the only secure place in the company. As a result of analysis conducted by the company it turned out, that the process of change should start by creating a new place reflecting conditions from the previous bath mine. This very subtle sense of vulnerability of employees was due to the openness of the leadership, readiness for an innovative approach to traditional culture and, above all, respect for employees. The ability to anticipate situations negatively affecting on the firm and rapid response turn out in this case the best choice. Similarly, in another example of actions that Kompania Węglowa has taken – this time in the field of environmental protection. Coal mining is associated with many nuisance to the environment – including creation of dumps or mining landfill. Carbon present in these wastes is prone to spontaneous combustion, which is a frequent cause of spontaneous fires. The landfill "Skalny" as the result of "Boleslaw Śmiały" mine activities in Łaziska Górne burned repeatedly. However, in the late 90's mine was threatened with closure, and there was a real danger of losing 2500 jobs. In 2000-2004 management of the mine with the support of the company, based on partly organized project, has taken on to extinguish the fire with their own forces and restoring "Skalny". They reached full effect. This happened as a result of exemplary business cooperation with many partners in the region. Numerous penalties were written off in the total amount of approximately PLN 480 millions. The entire process of extinguishing landfills engaged doctoral students and diplomats of several universities (technical, agricultural and other). It allowed to develop effective and affordable solutions. During these activities two patents had developed. Besides of the relations with the scientific world, particular care was put on regular contacts with all identified stakeholders (residents, local authorities, government, media). They were informed in a reliable way about intentions, conditions and progress of the work. This example of landfill liquidation indicates to thoughtful action and openness of the company and also its ability to flexible respond to challenges combining knowledge with social conscience.

Conclusions

The concept of resilience has its sociological dimension, which covers mainly the quality of relationship between main actors in the region. Taking into account regional development, and particularly construction of knowledge re-

gion – readiness of regional authorities and key companies to unexpected market situations, should primarily be included. The best evidence of this are: strategic planning, focusing on changes and opinion about the quality of collaboration between key partners. From a sociological point of view, it is worth to analyze phenomenon of flexibility and resilience of cities and regions with possible shocks. Analysis described above includes a reference to research concerning changes in the industrial region. These considerations also took into account urban strategies and assumptions for important companies. It follows a number of important conclusions.

From studies on changes in the industrial region concludes, that the best relationships are maintained at the local level. It concerns mainly large employers – both private and public, also small businesses associated with the nearest neighborhood. Large companies have often a policy of socially responsible business. They are involved in local events, that enhance the positive image. Companies from different sectors represent different levels of readiness for changes. It results from specificity of industry, different development plans, diversity of business and maintained contacts. Mining business are closely related to regional industrial tradition. Being aware of the specific industry, they are better prepared for unexpected economic events. Accidents at work causing death are completely unexpected critical events and it incomparable with economic shocks, because they are usually relatively slow process. In that particular case, preparation for this type of dramatic events must be at the highest level. Entire attention of managers focus on that. In the context of building knowledge region, there are developed multifaceted contacts, leading to the main goal – safe production. On the other hand, being aware of significance of their role, companies try to take care about social aspects of functioning in the region. This is closely connected with continuous improvement of knowledge of workers and applying it to conduct a social change within the company. Production companies pay attention to environmental aspects of their business. It is one of the potential risks – apart from major market changes. Preparations for possible environmental hazards have appeared in establishing good relations mainly with the community and local authorities. Scientific cooperation, which could potentially improve the quality of production – is sporadic. In the case of the Silesian service companies, their involvement in local issues depends on specificity of business and ownership structures. More involved were indigenous companies, providing specific service and tailored to the local market. Part of foreign service companies have implemented socially responsible strategies, and some of them did not get involved in regional affairs.

Regional experts and decision makers accordingly assess, that entrepreneurs recognized a necessity to engage in deeper relationships for regional development. It is connected primarily with a view of future actions of the company. Scientific cooperation, however, is still not a priority for most of businesses. From the perspective of development of knowledge region only the first relationship are built. The knowledge transmitted in that process is not necessarily scientific.

Analysis of strategies of selected cities showed extensive ambitions of their authorities. Expressed expectations about the growth included aspects connected with construction of knowledge region. Both Katowice and Gliwice based their development on innovation and knowledge capital of universities located in these cities. There can be found direct reference to the implementation of innovation and knowledge-based economy. However, references to cooperation between cities in the region, are not very frequent, and – taking into account readiness for possible different types of crises – it is not exposed in the strategic plans. An example of this is also a strategy of Tychy, which is not too extensive and focuses mainly on internal affairs of the city. Main reflection, which results from analyzes of individual cities documents, concern a fundamental focus on local issues without cooperation, as leading element of the development.

Analysis of enterprises readiness to development of knowledge region within its own structures had brought positive findings. Each company – both foreign company, Polish state company, and also private – realizes its own strategy, which takes into account creating of forward-looking relationship with local community, government and key institutions in the region. However, residual and shallow scientific cooperation is main obstacle for full readiness to potential market crises. In fact, only capital of knowledge is being built. Staff are extensively trained and their skills are continually improved and refined. It gives the conviction, that in situation of crisis their knowledge will be properly used.

It is impossible to fully predict crises. The concept of resilience in sociological terms, taking into account development of knowledge region, points to important aspects of maintaining good relations. This is necessary to deepen their knowledge and build readiness for the market collapse. Industrial region – such as Silesia – which is on the way to knowledge region – is in a unique situation, because it is exposed to shocks, that may have considerable social importance. The process of building resilience to unforeseen situations must take into account a common strategic approach of many regional partners being aware of common interests. At that moment this awareness is slowly, but steadily growing.

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University of Economics in Katowice

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Robert Pyka

MINIMIZING THE SIDE EFFECTS OF THE METROPOLIZATION AS A CONDITION FOR MAINTENANCE OF TRANSITION AND RESILIENCE IN POST-INDUSTRIAL AGGLOMERATIONS

Introduction

The globalization phenomenon is one of the main social processes that determine our contemporary reality. It may be analysed as a phenomenon by itself but today it is becoming a rather fundamental feature of most social phenomena which, under its influence, have completely changed their character. Globalization is a phenomenon that penetrates reality so deeply that it constitutes a new paradigm that must be used in order to comprehend present reality properly. One phenomenon that cannot be comprehended without taking global processes into consideration is metropolization which is globalization's elemental consequence in the city space. In this depiction, globalization might be defined as a phenomenon that relies on involution and the intensification of different kinds of flows and crossings of different processes which till now have been independent to a certain degree. Due to time and space compression, as indicated in the literature, a specific virtual global space was created in which interactions take place in unprecedented numbers through the actors that take part in it, and the subjects which are its content.

The global village described above constitutes immaterial space – Castells' space of flow or real virtuality (Castells, 2010). Searching for its manifestation in traditional or material space, in the space of places which are marked by the stamps left by globalization processes, big city agglomerations, also known as metropolitan areas, must be shown first. Net and nodal processes, described in these areas, touch material living spaces, modify peoples' surroundings, their life conditions and social relations in both desirable and undesirable, predictable and unpredictable ways.

In this context we can speak about new challenges for post-industrial agglomerations transition and resilience. We have almost left behind us the transformation process seen as restructuring of heavy industry, closing large industrial units. We step in to phase of transition where we still have to demonstrate our potential of resilience, but understand it in a different way. Transition and resilience can be recognized today as the ability to capture and control our development process making it more balanced in the context of global capitalistic economy affecting the biggest agglomerations and changing their social and physical space. Thus, one of the principal challenges of transformation and resilience in large post-industrial agglomeration, is the ability to control as much as possible the metropolization process by searching for appropriate conditions allowing agglomerations to use their potential fully and reduce unexpected side effects of metropolization. This means in fact balanced development of metropo-

litan areas by urban governance and creation of institutional solutions for metropolitan government.

As far as then main goal of this presentation is concerned is to show the metropolization process as a challenge form maintenance of transition and resilience in Raymond Boudon's theoretical view.

1. Metropolization and its results in Raymond Boudon's conception of unexpected consequences

Although the metropolization phenomenon has existed for a long time, globalization gave it a totally new dimension. "Metropolization is the local space system's response to the globalization phenomena" (Markowski, Marszał, 2006, p. 10). It is a process that changes the character and strength of the connection between the centre and a surrounding region, leading to modifications in the use of space, and it is manifested in the development of urbanized space (Markowski, Marszał, 2006, p. 10). In other words, metropolization is "[…] a process of taking over by some big cities managerial functions in post-industrial economy on the supranational scale" (Jałowiecki, 2000, p. 17). However, it doesn't mean that only the biggest cities with global reach might be called metropolis because they might also be national or regional and can in different, often not complete, ways meet ideal demands of its both, qualitative and quantitative, characters[*].

Taking complexity, number, and interrelation or the clash of processes that determine present social reality on a global scale into consideration, the theories based on simple hierarchical structure – common for Westfal epoch – lose their explanatory force. To properly understand contemporary phenomena which in their structure approach the polyarchy conception of Robert Dhal, it is indispensable to reach for theories which have heuristic ability to embrace what in a classical approach might be described as chaos or disorder (Ascher, 1998). It seems that the conception of functional and interdependent systems, as well as Raymond Boudon's aggregation effects, possesses features of such a theory (Boundon, 2009).

Metropolization might be considered in a twofold way. Most often, it is treated as an elemental process which is the consequence of global phenomena transmitted to the level of urban agglomerations. In this depiction, it is a result of the aggregation of different global processes which are spontaneously and uncontrollably reflected in city space where metropolization means emergence of

[*] Bohdan Jałowiecki writes about quality and quantity features (Jałowiecki, 2000, p. 18).

new functional systems as well as interdependent systems that generate a lot of costly social side effects.

Metropolization might be also considered as an institutional depiction, seen as an effect of intentional actions taken by social actors who aim to take "control" of the metropolization process in the first depiction. It is made by creating different kinds of institutional solutions, resulting in the overlapping of functional space: the politico-institutional metropolization phenomenon overlaps functional space, and searches to determine it. Institutional metropolization in this context, meaning the creation of new instruments of metropolis management in the perspective of Boudon's theory, is a pursuit to convert interdependent systems and negative aggregation phenomena into functional systems the effects of which are predictable and more easily modeled.

Metropolization in the first depiction of a phenomenon is a natural result of global processes acting in city space, and might be examined from the multiplication of interaction systems viewpoint. The space of metropolization action or metropolitan area is a type of space that is characterized by a high density of different kinds of interactions and network flows. These interactions, according to Boudon, might be divided into two varieties – interactions created on the basis of different functional connections between actors, which come as a result of their social roles and which might suggest cooperation and even lead to synergy. However, not all of the relations in which individuals are involved result from interactions between their social roles. In reference to social phenomena which do not have the features of a functional system, Boudon uses the term "a system of interdependence" due to the fact that activities of individuals do not cross as a result of functional correlation of the social roles they fulfil, but as a result of a general interdependence of social phenomena" (Pyka, Wódz, 2009, p. 16).

Looking at metropolization as a generator of new systems and functional correlations, we focus on its commonly recognized results as positive. Metropolis is treated here as a locomotive which propels the development of some areas due to the concentration of different capitals from which the richness and prosperity come. Spatial coexisting of services, institutions, supplies on the highest level, concentration of many actors from engineering, science, business, and authority produces huge innovational potential, and creates good conditions for cooperation and exchange. It was Alfred Marshall who noticed the positive phenomena in special concentration in his conception of "industrial district", producing formal and informal customs, ethos of work, initiative, in which spillage of knowledge and capacities among the local companies might be observed, as well as the development of supporting and similar branches of industry, easier access and possibilities to gaining specialist equipment and a local market of speciali-

zed and highly skilled employees (Marshall, 1920, pp. 221-231). The rise of various functional connections on metropolitan areas is contusive to the fast circulation of information and knowledge between cooperative actors, which helps to create new knowledge according to the model of "a spiral of knowledge circulation" (Nonaka, Takeuchi, 2000, p. 96). Organizational or institutional signs of rising functional systems in metropolitan areas, based on network connections of correlated partners, might be scientific-technological parks, business incubators, whose function might be concerned with the clusters conception.

According to Michael E. Porter, the concept of clusters is described as a "[…] geographic concentration of mutually connected companies, specialized suppliers, units providing services, companies acting in similar sections and connected with them institutions (e.g. universities, standardization units and trade associations), competing with each other but also cooperating" (Porter, 2001, p. 246). This specific synergy effect can be compared to Boudon's aggregation effect which displays amplified or intensified actions of particular actors, which are directed toward a vector of the same sight. Dynamic development in metropolitan areas of functional systems of interactions, characterized by an intensive flow of information, knowledge, competence and innovation between actors, who in different space conditionings would not have had the possibility to be in such good cooperation, may lead to a rise of something that in addition to the "learning region" conception, might be called the "learning metropolitan area" (Boekema, Morgan, 2000). The latter might be considered as the effect of synergic cooperation and exchange among the metropolitan actors, capable of auto-reflecting on their own action and projecting an optimal metropolitan cooperation network for themselves.

The metropolization phenomenon on one hand increases a chance for the dynamic development of some areas and for the growth of their competitiveness and innovation potential, while on the other hand it is the source of a great deal of problems which big agglomerations touched by this phenomenon must cope with[*]. These problems include all of the side effects that exaggerate big social costs and which are a result of the concentration of a large amount of interacting systems in a limited space. Only a certain part of the systems described above creates functional phenomena which lead to cooperation. A large number of interactions have the characteristics similar to Boudon's "interdependent systems" in which individuals directed by their own strategies of actions "collide into each other", leading to different kinds of aggregation effects, inversion or side effects

[*] Patrick Le Galès among others writes about double logics of the metropolization process (Le Galès, 1995, pp. 71-73).

which often stay contrary to the original intention of separate individuals (Pyka, Wódz, 2009, p. 18).

When transferring the above mentioned cognitive tools illustrated by Boudon to metropolitan areas, one can indicate from the expanded list of unintentional and frequently dysfunctional effects of metropolization that most often mentioned in the literature is the "expanding" of cities onto surrounding areas, which creates a number of challenges for ecology, such as shrinking of non-urbanized areas, and managing a surface that is transformed by individuals or companies in uncontrolled ways (Jałowiecki, 2000, p. 43; Ładysz, 2009, pp. 67-68; Lackowska, 2009, pp. 23-24). The uncontrolled peri-urbanization phenomenon causes essential disparities as far as the costs of maintaining metropolitan infrastructure, which is often concentrated in the centre of a metropolitan area from which resident tax payers move out, thus paying taxes in their new places of residence located in surrounding areas.

The Peri-urbanization process is not only an effect of escaping from the difficulties of living in the centre of the city, but it is also, to some extent, the side effect of a rapid increase in real estate prices in the centre of the metropolitan area, which is caused by international investments targeted at convenient localizations. An increase in demand for real estate affects their prices, which often becomes an obstacle for the indigenous residents of the area, making it impossible for them to purchase flats and forcing them to look for better conditions at a lower price outside of the centre of agglomeration.

The phenomenon of the aggregation of individual strategies of particular individuals, collective actors or public and private subjects, leads to a rise in competition on functional metropolitan areas, resulting in the mutual weakening or even destruction of projects. It can lead to a duplication of particular investments, for example within the infrastructure or buildings of public usage, such as congress halls or exhibition centres.

Metropolization, manifesting itself with great intensity in social and economic processes within a limited physical space, also brings essential problems concerning transport. The problem of traffic jams and the capacity of metropolitan road structures, as well as proper solutions concerning collective public transport as a way of avoiding communication blockage are direct effects of metropolization. The side effect of the intensity and density of social-economic activities in metropolitan areas also creates the problem of massive community waste that is generated.

Various social pathologies may also be included into the undesired effects of the functioning of metropolitan areas, a number of which increases with number of residents and dynamics of the local market. On the one hand it concerns

the raise of crime and illegal activities rate (drugs, prostitution) while on the other hand it concerns the increasing phenomenon of social exclusion of social groups that are left behind on the margin of metropolization.

The occurrence of unintended consequences of the metropolization phenomenon on the metropolitan areas which constitute a very thick network of functional and interdependent interaction systems, has resulted in the rise of a thesis stating the general crisis of big agglomerations and the lack of controllability of metropolitan areas. A great number of authors indicate that life and environment standards have become worse in these areas and they point to the disappearance of a city as the area for social groups which is a result of global capitalism*.

2. Metropolis in an institutional perspective – a reply to undesired results of the metropolization phenomenon

The consciousness of complexity and multi-directivity of the metropolization process causes a search for institutional and management tools which will minimize the dysfunctional phenomena and amplify those which are favourable for the balanced development of metropolitan areas. What we mean here is metropolization in the institutional perspective, which generates instruments that create favourable conditions for transforming uncontrolled and impetuous interdependent systems of interactions, rich in collisions and contradictions, into functional systems based on developed information channels and that manifest themselves in domination of relations based on cooperation. The purpose of the institutional system of managing metropolitan areas is to try to subdue, to the highest degree, the process of metropolization and to take from it the possible advantages understood as a balanced social-economic development of the area (Markowski, Marszał, 2006, p. 23).

In this context, the conceptions mentioned before indicating chaos, crisis, lack of authorities or explosion of contemporary cities have a fatalistic character and do not supply us with the tools needed to enable and operate social processes in new conditions. What seems to be a proper point of view is the assumption that metropolization brings both positive and negative social effects, gives enormous potential the realization of which implies particular side effects which can be controlled to some extent, and in some situations may be transferred into Boudon's functional systems, which may be accompanied by the synergy phenomenon.

* The authors presenting a thesis of lack of governance of metropolitan areas are shown in (Le Galès, Lorrain, 2003, pp. 305-317).

The elementary question is how to manage complexity and correlation of social phenomena, understood in such a way, and how to operate within something which is mainly associated with chaos. Surely traditional forms of governing characterized for vertical hierarchized structures, based on a one-directional subjection, resulting from concentration in a decision-making centre the resources essential for government, do not suit the contemporary reality of the metropolitan areas. The areas are characterised by huge increases in the number of independent actors shaping the metropolization process. The resources indispensable for controlling the space of metropolization in the contemporary reality have been spread among all of these factors. Nowadays, public administration is not the only place with a concentration of resources as knowledge, capital, creativity and innovation or real power which are spread among the subjects functioning, to a great extent, in an autonomous way. Freedom and autonomy release their creativity but they can also cause the undesired phenomena of aggregation, which can be avoided by creating favourable conditions for the flow of information, platforms and forums where knowledge and information can be shared, hence enabling the coordination of activities due to which particular actors obtain the consciousness of their individual strategies in the metropolization space.

In this way, we transfer from the phenomenon of power and administration in the classical sense of Weber (1998), to a polyarchic reality based on co-governing which in the literature functions as "metropolitan governance". Governance means the flexible division of power among institutional individuals and various social groups that the task or project concerns. Governance may in practice mean the negotiating of public policies when there is a high multiplexing of actors and levels of decisions and the necessity of coordinating them and keeping cohesion when the state does not possess the monopoly for defining commonwealth, and simultaneously the notion of local wealth is being created. This notion indicates changes within forming decisions by decreasing the meaning of institutional membership and traditional political and administrative hierarchies for the benefit of more flexible and informal relations in which authority, initiatives and leadership are better divided. Finally, it also indicates the disappearance of borders between the state, civil society, local government units and the market (Pyka, 2011a). Governance is "[…] a flexible pattern of a public decision making process based on loose networks of particular actors" (Lackowska, 2009, p. 44).

The notion of governance inscribes, in a wider perspective, the problem concerning the condition of contemporary representative democracy, what in Western Europe is known as the crisis of representation (fr. *crise de la représentation*), the remedy for which might be met in local democracy and its variety

of deliberation. The crisis of representation questions the basic function of political elites whose aim is to transfer the citizens' expectations in the direction of political decedents. This phenomenon means a growth of distance between the technocratic political elite and common citizens who are pushed on the margin of decisive processes because of the low level of their political competence (Perrineau, 2002, pp. 28-31). Pierre Bourdieu defined this phenomenon as the tyranny of experts and demanded to return to real democracy which nowadays is referred to as the conceptions of governance and deliberation democracy (Bourdieu, 1995). The latter might appear after changing the attitude to the problem of political competences. In the traditional depiction, the political competences are treated as individual's attributes which are a consequence of its accumulated knowledge, information and opinions, to which level they might be exposed in individual verification. In the pole of deliberation democracy, the citizens' political competences acquire a collective dimension and political judgments and positions are consequences of communication and common units' interactions. In this sense, the basic knowledge level of citizens is not so important in the final effect of deliberation. Public opinion which expresses the common good is not just a simple sum of units' opinions but is also an aggregation which is the result of its confrontation and adjusting (Blondiaux, 2007, pp. 761-771).

Deliberation democracy's doctrine does not negate the meaning of experts' knowledge and competence, however it points at their roles in the pole of democratic processes as an enrichment of public debate with a real engagement of people instead of negating its efficiency because of a lack of proper preparation (Pyka, 2011b). In this context, the notion of governance might be treated as a new form of creating and shaping a decisive process by using proper tools for a local deliberation democracy which goes outside of the canon of a representative system. It is connected with the fact that our societies are more reflective, and participation and local democracy are an answer to the aversion to politics in today's form (Jouve, 2005, pp. 322-323).

The notion of "governance" does not mean a defined state or a system of procedures, it is a process which, in the Boudon's sociological perspective, is the effect of the pursuit of giving a functional character to those new and incredibly complicated social relations which emerge in the areas of metropolization conditioned by globalization, in order to avoid or minimize the phenomenon of collision as well as the undesired effects of aggregation.

In Western Europe the consciousness of challenges accompanying the phenomenon of metropolization resulted in pursuing various kinds of institutional solutions, the purpose of which was to reduce the negative effects of the process while taking advantage of its development potential. The essential problem of

managing metropolitan areas was maladjustment concerning territorial range and competence of already existing units of local authorities that were not able to deal with the functional metropolitan area, which was most frequently rapidly expanding.

In France, a response to the above mentioned challenges of the emergence of metropolitan areas is the dynamically developing inter-communal cooperation which creates convenient conditions for the development of co-governing processes (governance).

The cooperation among municipalities in its various institutional forms on the areas of metropolization processes aims at transforming these municipalities into areas dominated by functional systems, thus minimizing negative effects of the phenomena of aggregation. The first forms of cooperation among municipalities in France were in the form of one or multifunctional unions of municipalities, which date back to the XIX century. They were not a reaction to the metropolization phenomenon, but they were rather connected with the development of such public networks as sewage systems or power lines. In the 1960s, the biggest French cities were under the influence of far developed metropolization processes, the social and economic results of which began to be present also in field of politics. In this way, in 1966, the French State decided to create the first "Urban Communities" (fr. *Communauté Urbaine*) which constituted an obligatory form of cooperation among municipalities for the largest French cities (Bordeaux, Lyon, Lille and Strasburg). The metropolitan authorises created in such a way, possessing crucial obligatory and facultative competences among others within land, waste or transport management, the ability to institute their own tax system, were to accompany the harmonious development of French metropolitan centres.

Although the idea of imposing cooperation on the biggest cities was received with reserve by the local decision makers, the institutional solutions which were introduced were quickly accepted, and soon after, others big agglomerations of more than 500 thousand residents took advantage of this through creating Urban Communities. Today, there are 16 Urban Communities functioning in France which constitute the area of metropolization processes. Owing to metropolitan management structures, the communities are trying to control urbanization processes, carrying out a cohesive policy of land management and coordinated communication, transport, and waste management systems for the whole metropolitan area. An interesting aspect of the counteraction against the negative effects of metropolization was the introduction of a common tax rate for companies in order to avoid unhealthy competition among the municipalities of metropolitan community. The 1999 Chevenement Act which created conditions for developing cooperation among municipalities on a larger scale, and also introdu-

ced financial encouragements for urban centres that decided to cooperate in agglomerations below 500 thousand residents, turned out to be the key legal solution in France. As a result, today more than 80% of French society lives in an area where the communities of municipalities function. At present, there are works in progress in France concerning the next territorial reform which is to answer the challenges of metropolization to an even larger extent. The resolution of the project predicts the development of a "Metropolis" as a unit of municipalities in cooperation which will take essential competences of department and region in order to govern the metropolitan area in a more effective and cohesive way. The reform intends also to create Metropolitan Poles (Poles metropolitains) which would constitute a network connection of two metropolitan centres that are close to each other.

Units of management of metropolitan areas functioning in France constitute the instruments of harmonious development of these centres by "metropolitan governance". In this context we cannot forget to mention a very important organ of inter-municipality units, the Councils of Development which gather local actors representing scientific, economic, cultural and other fields, hence creating a platform for discussion and coexistence with the actors who participate in the process of metropolitan governance (Pyka, 2010, pp. 134-136). Owing to such activities, the uncontrolled and impetuous process of metropolization is limited. However, one must bear in mind that there are many limitations of such mechanisms which frequently only allow for a decrease, to a crucial extent, but not an elimination of negative phenomena.

Additionally, it sometimes happens that the practical functioning of some deliberation tools, as mentioned above in Development Councils, which are the adviser bodies functioning in the large French agglomeration, lead to unexpected consequences. This phenomenon is indicated by French researchers who show that although Development Councils should have been gathering a representation of civil society when opening decisive processes to public debate, they have now become the cover for creating new semi-elitist regimes, where participation is to be closed to a classic frame and institutional logic.

Gilles Pinson focuses on this phenomenon, and describes this European form of governance as pluralistic and semi-elitaristic at the same time (Pinson, 2006, p. 646). In public debate, which is in theory open to everybody, the same people often participate, those who have enough motivation and time and those who are noticed and are then always invited to different kinds of consultation groups and projects. Participation democracy, in an institutional version, causes its actors who come from civil society environment to participate against themselves in a reproduction of norms and hierarchies in the previous political order.

Bernard Jouve calls these deliberation elites "professionnels de la participation", what might be translated as "professional activists" (Jouve, 2005, p. 326).

In this perspective, it is worth looking at the Polish situation, in which the biggest agglomerations also face positive, negative and unwanted effects of metropolization process. Although Polish agglomerations do not fully meet the definition criteria of a metropoly of international importance, some of them surely constitute regional metropolises, and are for sure a place of influence of global processes in a physical space. This includes: Warsaw, Cracow, Wrocław, Łódź, tri-city areas of Gdańsk, Gdynia and Sopot and the Silesian conurbation. Without going into the problems of defining and delimiting the issue of metropolitan areas in Polish space (Markowski, Marszał, 2000, pp. 23-25), we shall focus on the challenges connected with the functioning of the largest Polish conurbation which is the Silesia conurbation. Silesia conurbation constitutes an area with one of the largest development potential in Poland, and at the same time accumulates the largest number of threats resulting from the negative effects of metropolization. This is why a lack of mechanisms in order to limit the negative effects of aggregation may cause the biggest damage in this area, impeding the development of the area as a whole. The situation results from the exceptional territorial structure of the upper Silesia metropolitan region, which contrary to other Polish agglomerations concentrating around one strong urban centre, is constituted of several cities with less than 300 thousand residents (only Katowice is close to this number), which altogether creates a common, functional urbanized area, constituting one big urban organism with a population which significantly exceeds two million residents. The crucial problem concerning this area is the fact that this big urban organism, facing problems which most European metropolises have to face, is governed by separately functioning individual towns constituting the conurbation, so the institutional system is not adequate in any way to deal with the real social processes taking place in this functional area.

Although currently the upper Silesia metropolitan area is developing dynamically, as it is a very attractive location for investors, the lack of cohesive governance of the area causes the overlapping of the consequences of the development, weakening the dynamics of development which in the future, due to negative effects of aggregation, may be completely quashed. The most urgent problems requiring functional systems of co-governing (governance) are those connected with land management with regards to the uncontrolled movement of population and the irregular distribution of metropolization costs. Other spheres where this lack of thorough cooperation between particular cities in the agglomeration may weaken developmental potential are: the system of transport, community wastes management, and the system of city information on the metropolitan level which makes it easier to move around in the conurbation area.

There are two basic obstacles to face in creating a balanced development of the Upper Silesia conurbation. These are connected with eliminating the negative effects of metropolization while at the same time trying to use its increased dynamics.

The first obstacle is connected with the lack of appropriate institutional structures of metropolitan management able to transfer negative effects of aggregation into functional systems. Since 2007, although the Upper Silesia Metropolitan Association (Metropolia Silesia) has been functioning in the upper Silesia metropolitan area, it has been operating in a way that is characteristic for voluntary inter-communal systems with limited competences and financial resources, personnel which includes only about 15 workers and a scope that includes only 14 of the biggest cities of the agglomeration, which does not cover the functional area of influence in the metropolization process. In the Polish legal system there is no so called "metropolitan regulation", which would equip metropolitan areas with management tools adapted to their reality. Works on such a regulation have been carried out since 2006 but the process has not been completed successfully, mainly because of political reasons. Legal solutions and institutions constitute only some kinds of frames and tools, and their functioning depends on the people working there and their mutual relations. What matters here is some kind of social capital meaning the consciousness of the actors participating in this metropolitan game, based on compromise and trust. While observing the functioning of the Upper Silesia Metropolitan Association's political scene nowadays one can have the impression that in many cases the actors participating in the metropolitan game of interests, do not treat it as a positive sum game but as a field of competition where one can achieve something by taking advantage of others. One can ask a question here if the metropolitan regulation will solve the problem of cooperation. Surely this is the case only to some extent. Although the situation is alarming, similar experiences from Western Europe show that creating metropolitan areas, managed in a cohesive way by being conscious of actors' common interests, is the effect of a long-term social process of collective learning. What is crucial in this process are the institutions generating knowledge and creating specific metropolitan discourse in order to help the metropolitan area be present in the consciousness of both the residents of the area and most importantly, in the consciousness of local political elite. In France this is the role of Urban Agencies, functioning in the biggest metropolis, which employ architects, town planners, sociologists and other specialists involved in the balanced development of the metropolitan area. The lack of such institutions in Poland is significant and it increases the above-mentioned lack of cooperation.

Conclusions

The metropolization phenomenon, as one of the effects of globalization, creates an intensification of connections and interactions which take place among local and global actors, who have so far been functioning within relatively closed and spatially limited systems. The compression of time and space, characteristics of the globalization process, in turn create very complex, net and diverse interactions on both the global and local level. These configurations differ from the simple, hierarchic and limited to a few actors' relations, specific for the Westphalian era, in which the dominated role was played by states and their agendas. Although the notions of chaos and ungovernability appeared as the first reactions to the new reality at the beginning of 21st century, today we know that it demands a new approach on an explanatory level as well as on a new administrative process level. The changes mentioned above also result from an evolution in contemporary democratic political systems, in which the citizens are searching for a new, more effective and more direct form of political participation, whose reflection is deliberation democracy connected with the notion of governance.

The metropolitan areas are points which the phenomena characterized above focuses on. The multiplying of interrelationships and net interactions might assume the form of functional systems strengthening the development dynamics of metropolitan areas. But it may have also negative and undesired consequences because of aggregation phenomenon. In this context, the theory of unintended effects of social activities by Raymond Boudon is a theoretical approach that enables one to understand the complexity and multidimensionality of the contemporary reality and also allows to go beyond a simple statement of chaos. This theory supplies us with crucial analytical tools, by means of which the metropolitan phenomenon may be analysed and one can diagnose its course and possible institutional solutions which are favourable in order to create a balanced development of metropolitan areas.

These issues constitute one of the most important challenges for the biggest Polish cities because their dynamic development determines further modernization of the country as a whole. In order to make this possible, it is necessary for Polish political elites to take into consideration that all the changes of reality demand new forms of government. A centralistic approach and aspiration to control development processes from the capital city seem to be unsuitable with today's demands and development processes in which dynamics are transferred to the local and regional level and are connected with global actors and networks. This kind of changes made in France, a country famous for its centralism

and Jacobins traditions are impressive although the country might also be the source of negative experiences and side effects like elitism or the multiplication of institutional beings. The lack of similar changes in the Polish condition and the inertia of the government system can significantly reduce the potential to use all future possibilities to develop Poland as a country. Deficits of integrated metropolitan government and governance, of trust and cooperation in Upper Silesia retard the process of its transition into learning region. Learning region require resilience and appear as a result of various flows of knowledge, information between different actors which generate creativity and innovations. Maintenance of regional modernization means today transition in to learning region and control on results of high-speed development process. It means take advantage of multiplication of interactions systems characteristic for metropolization process, by avoiding collisions and clash of particular actions and transforming them into functional system producing cooperation and synergy.

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University of Economics in Katowice

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Łukasz Trembaczowski

LEARNING REGIONS AS DRIVING FORCES FOR URBAN ECONOMIC RESILIENCE – TWO SUBREGIONAL EXAMPLES OF POST-INDUSTRIAL CITY TRANSITION

Introduction

As seen from the regional perspective, the economic development gained lately two important concepts, which stimulate the debate: the learning region concept and economic urban resilience concept. Both concepts have different theoretical groundings and apparently focus on topics that are not so related.

Urban resilience appeared as an influential topic after terrorist attacks and natural disasters which occurred in first decade of the 21st century (Godschalk, 2003). It was noted, that some cities are overcoming those shocks and crisis better than others. Explanation of this phenomena was connected with infrastructure, social and economical structures that can absorb the disruption and allow the city to recover faster.

Economic urban resilience is the ability of a city to cope with the economical shocks either of global or local origin. Whether it means a return to previous levels and patterns of growth or rather its complete reconstruction which allows a return of growth to unprecedented levels is a matter of secondary importance.

The learning region concept is founded on the conviction that knowledge and ability of its creation as well as transfer is a precondition of regional economical development and competitiveness. Knowledge is a key resource in innovation based economy, and this made the learning region concept very popular: both between researchers and authorities. The popularity of the concept led to its attenuation because it was used to cover different understandings of learning and knowledge creation (Suchaček, 1999). Despite those difficulties, the learning region is a fruitful concept. It embraces problems of learning, institutional thickness, regional cooperation, knowledge transfers and innovations.

Do those two concepts have anything in common? The answer to such a question is "Yes, they do". What underlies this paper is a conviction about the specific interrelation between those two concepts. They correspond well, because features specific for the learning region contribute to economic urban resilience.

Learning regions should be seen as driving forces for urban economic resilience. Features of a learning region make the region more resilient. Different levels of analysis: urban and regional, should not mislead our interpretation. Urban areas concentrate most of the economic life of the region, and talking about learning regions one must have especially cities in mind. City life fosters the knowledge flows, institution creation and cooperation between key agents.

Simme and Martin (Simme, Martin, 2009) in their evolutionary approach to economic urban resilience describe the model on three dimensions:

- the potential of accumulated resources to the system, like: competences of local firms, skills of local workforce, local institutional forms and arrangements, physical and soft infrastructure;
- the internal connectedness of a system actors or elements – it relates to patterns of trade and untraded dependencies among local firms, local networks of trust, knowledge spillover, formal and informal business associations, patterns of labour mobility;
- the resilience – perceived as a measure of a system's vulnerability to shock. High resilience is associated with phases of creative and flexible response – they would depend on innovative capacity of local firms, entrepreneurial capabilities and setting up of new firms, institutional innovation, access to investment capital, willingness of workers to improve educational attainments.

Most of the factors enumerated in this model include: resources of knowledge, competences of firms and employees, institutional thickness, business associations, and patterns of cooperation, untraded dependencies, networks based on mutual trust, knowledge spillover sometimes through labour mobility, innovative capital and firms, entrepreneurial spirit are also integral elements of learning regions. In other words Simme and Martin's model describes the learning region with added resilience components to it, or rather, they see the learning region as a resilient one.

What is presented in the example of two subregions of Silesian voivodeship, a region possessing some features of a learning region that copes better with unexpected changes and shocks of an economical or political nature.

1. Research method and area

Examples that are discussed in this paper are based on research results from a grant from Ministry of Science and Higher Education No. N N116 335538 "Industrial region as 'learning region'. Sociological conditions of transformation on example of Silesian Voivodeship". This research was conducted in Silesian voivodeship in all its four subregions. This paper concentrates on two subregions: southern and northern.

Both discussed subregions in many spheres are on opposite sides of the scale. The southern subregion, covering 2354 km^2, is developing and prosperous. It has the lowest unemployment rate in the voivodeship and highest entrepreneurial index. The northern subregion, covering 3050 km^2, on the opposite suffers because of stagnation. It has the highest unemployment rate and lowest entrepreneurial index.

However, in many spheres these subregions are similar. What makes them comparable? Both subregions consist of three land counties and one urban county, which is the capital of the subregion. Those capitals are: Bielsko-Biała in the southern subregion and Częstochowa in the northern one. Both mentioned cities were previously capitals of voivodeships until 1999, when the administrative territorial structure of Poland was reformed. The reform altogether reduced the number of voivodeships from 49 to 16. In effect, the former częstochowskie voivodeship and bielskie voivodeship were merged with former katowickie voivodeship and created together Silesian voivodeship. The loss of capital city status challenged development processes in both cities, but its consequences were different in each of the analyzed subregions.

The theoretical framework of the learning region was confronted during in-depth interviews with respondents recruited from three different spheres: regional political authorities (recruited from municipal and county level), experts connected with business support organizations (recruited from the most important and influential organizations) and entrepreneurs from three main sectors of economy (following Clarks' divide): primary sector – mining and agriculture, secondary sector – industry, and third sector – services. Altogether there were 100 in-depth interviews, giving 25 in each subregions.

Conceptualisation of research was difficult because of the immaturity of the learning region concept. The whole research program was based on the theoretical framework of learning region by Asheim (Asheim, 1996), Storper (Storper, 1993), Florida (Florida, 1995) as well as by Rutten and Boekema (Rutten, Boekema, 2007a). The main examined relations were triangular interconnections between regional authorities, institutional set-up and companies. This led us to choose those groups of respondents. What should be pointed out, it is that this perspective is similar to the regional innovation systems approach (Cooke, Morgan, 1998; Cooke et al., 2004).

2. Theoretical framework of learning region

Learning region is the key concept to our research. "It pertains to the transfer, creation, absorption and implementation of knowledge among regional partners, which, in turn, triggers innovation and regional renewal" (Rutten, Boekema, 2007a).

In a learning region, regional actors engage in collaboration and coordination for mutual benefit, resulting in a process of regional learning. Regional characteristics affect the degree to which the process of regional learning leads to regional renewal.

Analytical distinction between learning region and regional learning is of key importance here. The learning region is "[…] the theory that explains regio-

nal learning; that is, the process of knowledge creation between actors within a region while accounting for the characteristics of that region, its actors and the relations between them" (Rutten, Boekema, 2007b, p. 276). In other words, regional learning is the dependant variable in this proposal, while the learning region is the independent variable. What are the components of this independent variable?

Conceptualization of the earning region concept given by Rutten and Boekema (2007a), enumerates groups of variables that should be taken into consideration.

Spatial proximity facilitates regional learning through agglomeration advantages, where economy scale stimulates the development, and fosters exchanges of knowledge (including tacit knowledge) in cooperation and competition. However here we face the danger of lock up situations typical for industrial districts dominated by one or two branches of economy.

The institutional set-up of region includes here a presence of knowledge centers that enable cooperation between researchers and businesses and smoothens flows of knowledge in the region. Moreover it covers presence of so called animators, that would be mainly business support organizations.

Regional interfirm networks – such networks function best when partners are rather equal in size and market position. Such networks, that build on horizontal relations, between cooperating as well as competing partners are best to bring about knowledge diffusion and innovations.

Social capital is one of the most important variables. It is the basis for cooperation, both for institutionalized as well as informal networks built on trust. Regionally embedded conventions must also be taken under consideration here. This covers, for example, the ability of the local community to cooperate in a moment of crisis or willingness of workers to improve educational and professional skills.

Regional innovation policy is "[…] what local authorities do to facilitate the process of regional learning" (Rutten, Boekema, 2007a, p. 137) . It doesn't close in the paper copy of the local development scenario but rather in the attitude of authorities to cooperate with firms and help them to cope with administrative difficulties.

Mentioned variables all together facilitate regional learning and innovation-creation.

3. On the way to regional renewal – advantages of the learning region

3.1. Spatial proximity

Having all those variables in mind, one can investigate both mentioned subregions and compare how advanced they are on their way to becoming learning regions. The provisional hypothesis underlying this paper is that leraning regions

are more resilient. As it will be presented, none of those subregions can be said to be a full fledged learning region, but the one that is more advanced with this seems to be more resilient to stress of economic and political origin.

To prove this statement, it is necessary to follow all variables step by step. First Spatial proximity variables should be discussed.

As already mentioned, both northern and southern subregions were struck by administrative reform and loss of capital position by both cities (Bielsko-Biała and Częstochowa) put them in a difficult situation. But thanks to their former position, both cities play key roles in following subregions and generally they are doing better than the rest of the subregion because in the main cities economic life of those subregions is concentrated.

The lack of space for new investments is an indicator of this spatial concentration of companies in Bielsko-Biała. It is a very untypical situation in Poland, but Bielsko-Biała doesn't really have new green-fits. This lack of new spaces for investments is partly due to natural conditions. The urban sprawl is limited by mountains and hills surrounding the city. But on the other hand the transformation process wasn't the cause of the closure of so many companies, and most of them after reprivatization still have the same localization as before. So the supply of free industrial spaces was rather low. Both these factors made space for investments scarce.

All suitable spaces were already sold to investors, and only some of the old industrial spaces can be reused. Because the city still attracts new investors, the lack of space is an incentive to select those with good prospects to stay in the city for longer periods of time and contribute to regional development.

On the contrary, in the northern subregion, investors are scarce. The high unemployment level leads local authorities to lure any investments they can. As one respondent from local authorities pointed out that: it is better to have investments in non-innovative branches than none.

The transformation process led in both cities to liquidation of the textile industry. Both cities suffered a rise in the unemployment rate. But what is important, Bielsko–Biała is called the city of 100 industries, that's why textile industry was only around 10% of its labour market. In Częstochowa, as well as textile industry there were also ironworks, which were also closed. This deepened the crisis.

Entrepreneurial spirit is strong in Bielsko–Biała. To measure entrepreneurial attitudes in subregions it is best to take measure of registered enterprises per 10 thousands citizens (see Table 1).

Table 1

Number of registered enterprises per 10 thousands citizens

Subregion	Number of companies per 10 thousands inhabitants
central subregion – Bytom district*	850
central subregion – Gliwice district	901
central subregion – Katowice district	1018
central subregion – Sosnowiec district	969
central subregion – Tychy district	925
northern subregion	891
western subregion	733
southern subregion	1042
Silesian Voivodeship in general	923

* Because of changes of data aggregation there is no general data for the central subregion. Districts enumerated in table, are based on GUS aggregation procedures.

Source: GUS (Central Statistic Office).

As one can see, northern region has rather low entrepreneurial index (891) while it is highest in the southern subregion (1042). It is even higher than in the very centre of the region (Katowice district). The structure of these enterprises is dominated by rather small, family firms. Their existence is possible thanks to the spatial proximity of big companies. This is also, what stimulates the small enterprises to keep up to that level. Cooperation with well developed partners is beneficial for companies as this provides advancements in technology and quality. Interviewed entrepreneurs pointed out that cooperation with bigger and more advanced partners forced them to develop their own company, to meet their partners' requirements. This way we can see the spill over effect of investments.

Very important, in this light, is what Asheim called industrial climate. Industry was located in both joined cities (in Bielsko and in Biała) before World War I (WWI), and since then, different industries are present in the city. We can say that this region has strong industrial traditions. In fact, in all families someone always worked in industry. During World War II (WWII) the city wasn't damaged much, and after the war, technologically advanced companies like car manufacturer (FSM), a glider factory, electric tools producers (Befama), a medical equipment producer, a light bulbs factory and other industries were located in Bielsko-Biała.

All groups of respondents stressed this industrial tradition of the region. They pointed out that it wasn't heavy industry but often technologically advan-

ced industry. This required well educated employees with high levels of skills, and who could not only maintain or operate the equipment and tools, but took care of them. Respondents mentioned "advanced industry mentality" both on the level of workers and on the level of management. This knowledge potential allowed many redundant employees to start their own companies during the transformation period.

While the southern subregion is dominated by white-collar workers and the elite of blue-collar workers, in the northern subregion most of the workforce are pink-collar workers. These are employed in services not requiring high qualifications like commerce, tourist services, restaurants, etc. Częstochowa is one of the most important religious centers in Poland. Every year hundreds of thousands of pilgrims follow to Częstochowa. This creates demand for tourist services. However, what must be mentioned, is that many of those pilgrims are one-day visitors, they don't stay in the city for more than one night. Moreover these pilgrimages follow Częstochowa from all directions, making transportation more difficult. This factor doesn't lure investors to the city.

3.2. Institutional set-up of the region

Most businesses support organizations from the southern subregion of Silesian voivodeship concentrated in Bielsko-Biała. Those organizations are of different kinds: chambers of commerce, guilds of crafts, but also such institutions like Regional Development Agency (ARR). The Regional Developed Agency functions as a public company. Its creation was initiated by municipal authorities, which until now are major shareholders. As it was cleared by the respondent representing local authorities, such a company can react much faster and is much more flexible when cooperating with companies and enterprises than municipal authorities can ever be. Local authorities intended to create such an institution to be mediating and coordinating between authorities and local business.

Respondents were also asked whether, in their opinion, there is a need for such institutions. They usually answered negatively to this question, instead they often pointed out, that instead of creating new organizations, already existing institutions should be more flexible and adapt to changing conditions and demand.

In the northern subregion, business support organizations are also present, but their activity is much less noticeable. Interviewed entrepreneurs from the southern subregion easily enumerated a few such institutions even if they didn't cooperated with them. In the northern subregion, most entrepreneurs couldn't mention one, and sometimes they didn't know that such organizations existed. In fact, when they needed training, information or help connected with European funds they turned to other companies, they just bought those services.

To sum this up, in both cities business support organizations are present and in both entrepreneurs expect them to work better than they do now. However, there is a big difference between the northern and southern subregions. Business support organizations in Bielsko-Biała are numerous and flourishing, while in Częstochowa they are rather sparse and not recognizable to entrepreneurs.

3.3. Regional interfirm networks

Regional interfirm networks in the southern subregion usually take the form of clusters. The most prosperous one is Silesian Aviation Cluster. It was built by companies that emerged from liquidated glider factory. Those companies are functioning in composite branch. However most of them are rather small ones. The cluster is effective because there is real coopetition (cooperation connected with competition). They often compete offering a similar spectrum of products, but they also often subcontract one another or pass contracts which they can't do to other cluster members that can.

The cluster activities led to the creation of *Bielsko Technology Park – Aviation, Enterprise and Innovation* in Kaniów, near Bielsko-Biała.

The park was built on a mine slag heap and is a good example of forging handicaps into opportunities.

There is also an IT cluster named NTT Hills located in Bielsko-Biała, however it is not very active. That is so, because firms cooperating in this cluster are not competing with one another, they found their local niches and they don't penetrate other members' territories. This results in rather low levels of knowledge exchange~~s~~ (simply because there is no need for such exchange and not because of lack of good will).

An energetic cluster is located in the central and southern subregion. However its headquarters is in Katowice, that's why it's activity is not so noticeable in Bielsko-Biała.

A newly born building cluster appeared as a grass roots initiative. Building branch companies needed some assistance in technological development and they found it at the local University[*]. This is a good example of where small and medium enterprises cannot generate the knowledge they need, by their own efforts, and they must acquire it from within regional context.

The University of Bielsko-Biała is mentioned most often by interviewed businessman as a main research partner, but it must be admitted, that nearly all universities from all over the region were mentioned too.

[*] University of Bielsko-Biała (original polish name: Akademia Techniczno-Humanistyczna).

In the northern region such activities are scarce. There appeared an idea called New Technologies Uplands. As a respondent from local authorities put it, the goal is to create an area of new technologies such as silicon valley. So far the initiative wasn't fruitful.

To sum it up: in the southern subregion there are several business clusters, but only one or two of them are prosperous. However they are mostly upwards initiatives. In the northern subregion, such clusters are nearly nonexistent. The only one mentioned is surely unrecognized by interviewed entrepreneurs and is a top – down initiative.

3.4. Social capital

The southern subregion has strong local identity and long tradition differing its citizens from upper Silesia. Those differences originated in the period of Partitions of Poland. Bielsko and Biała were border cities. As one of my respondents pointed it out, people living in borderlands are more active.

This specific location resulted in some creativity which was stimulated also by ethnic differences. Before WWII 30% of citizens of Bielsko were Germans, 30% Jews and the rest were the Poles. After the war, when only Poles stayed in the city, people migrated to Bielsko from all over Poland. To quote one of respondents: "Those, who were migrating were those who were active, who were adventurous, who were not afraid to take risks".

To all these differences, one must add religious differences. The southern subregion is the only part of Poland, where protestants are numerous. Poland is a Catholic country, but in the Bielsko area, protestants are very active. This protestant tradition is strong. When Bielsko was part of Habsburg empire it was the main protestant enclave in the whole empire. Up until now, the only statue of Luther in Poland is located in Bielsko.

If we turn to Florida's Melting Pot Index, it would be highest in the southern subregion of Silesian voivodeship. It is a typical borderland region with active and creative citizens.

Regional mobilization in a moment of crisis is a good example of high levels of social capital in the subregion.

After administrative reform, when Bielsko lost its status of voivodeships' capital many institutions were transferred to the central subregion. However**,** this resulted in local mobilization and cooperation of local authorities, politicians from this region, companies and citizens to keep key institutions like a customs office, a national court register, an economic department of district court etc. in Bielsko-Biała. This mobilization was successful and those institutions stayed in

the city. So the loss of capital status was a challenge but not a disaster. Bielsko-Biała was just more resilient than Częstochowa.

In the northern subregion**,** loss of voivodeship status is treated as a disaster and all respondents blame it for the difficult situation the city and region face. What must be mentioned, is that many institutions stayed in Częstochowa after administrative reform. Even Silesian Voivodeship Office has its department in Częstochowa.

3.5. Regional innovation policy

Regional Innovation Policy is what authorities do to foster knowledge creation and transfer to stimulate innovations in the region.

The formal activity of regional authorities is encapsulated in the local development strategy prepared and consulted in cooperation with experts recruited from knowledge centers (university) and businesses supporting organizations.

The triangular interrelation between local authorities, business supporting organizations and firms was of prior interest in our research project. This cooperation and interrelation is specific. Public-private partnership between companies and local authorities are not very popular, however some good examples of such partnerships were mentioned by respondents representing both authorities and companies. However, experts stressed that the climate is not good for such partnerships. Local authorities are afraid of corruption, accusations and all cooperation between the public and private sphere is seen in this light. That is why, as one of respondents said: "The easiest and safest strategy for authorities, is to do nothing and offer nothing and to give nothing to entrepreneurs".

Where business supporting organizations as mentioned earlier the Regional Development Agency, are a key intermediary between local authorities and businesses. Direct partnerships between entrepreneurs and authorities are sporadic. In other words, the triangular interrelation is a rather linear one.

In the northern subregion, the climate for private – public cooperation is also not favourable (as is for the whole country), but weak institutions are not playing their intermediating role. In fact, interviewed businessman claimed that they are left without any help and often stressed, that they can rely only on their own.

4. Failures and biases

Is the southern subregion a learning region? To such a question one must answer no, but it has many features typical of a learning region. So far presented were factors contributing to regional learning, but now failures and biases of this process should be discussed.

Let us start with the weaknesses of the networking process. Only one of mentioned clusters is prospering well (aviation), and one prospecting to be prosperous (building). The best example of networking processes' weakness is the Animation cluster failure. In Bielsko-Biała, are located prosperous animated movies companies, and the city had quite a long tradition in this business (*Bolek i Lolek*, *Reksio* movies). Some of these companies are now Disney's subcontractors, so we can say they are keeping a good level.

Those companies were willing to join the cluster and several meetings were held. They haven't succeeded because there was no animator (paradoxically), who would animate all the processes and run the cluster at its beginnings.

The other bias is weakness of agricultural producers' groups. Even though, membership in such a group is beneficial to its members, farmers are not willing to join these groups. As respondents stressed, farmers have a strong sense of individuality. It doesn't mean they are not cooperating. In fact the flows of knowledge were noticeable and farmers seemed to be proud that they learned from one another. However, this spontaneous cooperation and readiness to help neighbours doesn't lead to institutionalization of this cooperation.

The main weakness is still a low level of companies' development. Interviewed experts pointed out that many firms are based on very simple ideas and that they are not developing. Entrepreneurs lack knowledge, they are not reflective, they usually have no clear vision of their business and aims. They don't have strategies and usually can't build them. They introduce changes and products reactively. That's why they are unable to name their expectations and plans toward institutions. In effect, they can't build long-term strategies and relationships.

And the last biases, which have already been mentioned are difficulties and barriers in cooperation between companies and local authorities

Those biases are easy to find also in the northern region. However**,** more often respondents had difficulties naming them (blaming the transformation process or administrative reform). In fact**,** simple-idea businesses are as popular in the northern region as they are in the southern. However**,** no respondents pointed it out. The difference is of what isn't known. If you don't know something and you are aware of it, you search for information, you search for knowledge. Lack of knowledge isn't disqualifying**,** only lack of activity to overcome this situation is. On the other hand, when you don't know that you don't know, there is no chance to overcome this bias. This is also the difference between the northern and southern subregion.

5. Learning region as resilient system

Turning back to the concept of economic urban resilience features of resilient system should be considered. Godschalk (2003, p. 139) claims that redundant systems are:

- *Redundant – with a number of functionally similar components so that the entire system does not fail when one component fails*. In Bielsko-Biała we can find this redundancy in numerous business support organizations or inter-firm networks like clusters. A given company can find support and assistance in different institutions, and can search for key resource of learning economy: knowledge in many partners it cooperates with.
- *Diverse – with a number of functionally different components in order to protect the system against various threats*. In Bielsko-Biała this diversity is noticeable in a broad array of branches of industry. It is called city of 100 industries. Its resilience was proven after textile industry collapse. All redundant workers were soon absorbed by newly created enterprises in different branches of industry
- *Efficient – with a positive ratio of energy supplied to energy delivered by a dynamic system.* This efficiency is best seen in the way the city manages its scarce investment space resources.
- *Autonomous – with the capability to operate independently of outside control*. Incorporation into Silesian voivodeship was a challenge towards local autonomy. One of indicators here may be the reaction of respondents to the sharing of funds in voivodeship: in both locales respondents said that funding is concentrated in central area, but when in the northern region frustration dominated, respondents from the southern subregion commented usually: "Well it is so, but we can do on our own".
- *Strong – with the power to resist attack or other outside force* B-B showed its strength in its moment of crisis, when main actors mobilized and saved local independent institutions.
- *Adaptable – with the capacity to learn from experience and the flexibility to change*. This adaptability is one of the key features of a learning region. Adaptability would be a feature of the city's inhabitants: workforce willingness to learn, ability to use their knowledge and skills in different business, and to create their own enterprises.
- *Collaborative – with multiple opportunities and incentives for broad stakeholder participation.* Dense cooperation networks, strong interrelations and opportunities for cooperation should be mentioned here. Stakeholder participation is still problematic but appearing more and more often.

The main idea underlying this paper, is that learning regions are driving forces for urban economic resilience. Based on two examples, it can be stated now, that areas that have more features of learning regions are more resilient, cope better with an oncoming crisis and are better managing altogether. What this analysis doesn't explain is the origins of such a comfortable situation in the southern subregion. It is focused on the question on how we can build a resilient learning region. One of main weaknesses of the learning region concept is its descriptive character: we have plenty of case studies and examples but we still lack good, fully fledged theory of the learning region. If we turn the perspective now, and see learning regions through lenses of urban economic resilience we may find the hints to build such a theory.

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University of Economics in Katowice

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Jiří Adamovský, Lucie Holešinská

COMPARATIVE ANALYSIS OF CHOSEN DEVELOPMENT ASPECTS IN SELECTED CENTRAL AND WESTERN EUROPEAN REGIONS

Introduction

Resilience and adaptability concepts represent a progressive regional science theory these days. Both concepts were developed in Western Europe and their applicability in Eastern Europe may be problematic.

The aim of this paper is to highlight the differences in the character and development of Central East Europe, which may pose applicability barrier of both concepts in those regions.

Development in selected Western and Central European "old industrial regions" is illustrated within the case study, which draws a comparison between the position of the Moravian-Silesian region and three other regions in terms of selected economic, social and territorial aspects of individual regions development. The analysis is consisted in evaluation by way of integrated indicators. Realms as Economic potential and competitiveness and Labor market, are solved in the Economic sphere. Social sphere includes integrated indicators as Social pathology and exclusion and Education. Thematic realms of Environment and Transport infrastructure belong into the Territorial sphere. Evaluation of the case study together with theoretical base may support or refute the claim that resilience and adaptability concepts are not well applicable for Central East European regions.

1. Character and development differences in selected regions

Transformation processes as well as formal and informal institutional characteristics differ in the compared Western and Central East European "old industrial regions". Firstly, the societies of Central Eastern Europe have undergone double transformation: the specific processes of the transformation from the totalitarian to the democratic political system, and from the centrally planned to the market economy. The long-term administrative-political centralization of all decisive mechanisms brought about the presence of deformed system macrostructures, which represent the heritage of the socialist times. The system macrostructures are embodied by the public administration (namely the extent of power and maneuvering space of the State administration and self-government from both the financial perspective and organization of competences) as well as the physical and social infrastructure (Sucháček, 2008).

There are also considerable differences in the course of restructuring and transformation between the "old industrial regions" in Central Eastern Europe.

A different approach is apparent between the Moravian-Silesian region and the Silesian Voivodeship. In the former, the restructuring was tackled in a "shock" way and, as should be noted from experience, somewhat hastily while in the latter, only a very gradual decline of industry occurred and new jobs had been generated before the old ones were eliminated (Sucháček, 2004). Despite this, or perhaps because of this, comparing the position of Moravia-Silesia to the selected regions of the European Union is beneficial.

The Moravian-Silesian region is one of the traditional industrial areas of Central Europe. At the same time, the economic performance of the region is an important potential of the Czech Republic. The Moravian-Silesian Region had been slightly improving its position until 2003 and it ranked among the fastest growing regions of the Czech Republic between 2003 and 2006. However, this growth has "cyclic" nature. Based on the final report on the implementation of regional development strategies, it can be established that the region is sinking again (BermanGroup, 2009). This statement alone shows the lack of resilience in this region.

Three regions having relevant features in common with the unified Moravian-Silesian region (CZ08) were chosen for the comparative analysis. The most important feature was having made an extensive structural manoeuvre as a result of attenuation or extinction of historically fundamental sectors or productions. Of the four compared regions, two fall under the 'old' EU countries, in which the core structural changes occurred about twenty years ahead, and two belong to the "new" member states, in which the most significant structural manoeuvres have been taking place over the last fifteen years. According to these aspects, the following region of NUTS II level were selected: the province of Liège (Province de Liège, BE33), Silesian Voivodeship (Województwo Śląskie, PL22), and Northumberland, Tyne and Wear (Northumberland and Tyne and Wear, UKC2).

2. Methodology

The database of the statistical office of the European Union – Eurostat was used as a major source of statistical data for the individual areas of the development. For a comparison of disparities between the selected NUTS II regions, relevant indicators were chosen. These were subsequently integrated into thematically homogeneous units – integrated indicators in the economic, social and territorial development areas. The selected integrated indicators and their structure and classification were based primarily on the methodology of the research project 'Regional disparities in the spatial development of the Czech Republic' (Kutscherauer et al., 2010). Nevertheless, it was essential to adjust to the restrictions of limited availability of the relevant statistical data for the minor territorial units within the European Union when choosing the appropriate indicators.

Given the intention to explore primarily the course and breadth of the disparities between the analyzed regions, the point method with weighted sum of indicators was used to calculate the integrated indicators. The essence of the point method (by M.K. Bennett) is to find a body that reaches optimal values of the analyzed indicator relative to the purpose of the analysis and is used as a comparative basis (criterion value). The difference in the calculation of the optimum value lies in regarding either an increase or a decrease of the indicator as progressive. The maximum value is used in the case of progression perceived by an increase in the indicator, while the minimum value is selected in the opposite case when a decline in the value of the indicator is identified as progressive. The body is evaluated at 1.000 points while other bodies are scored according to the amount per mille, which is formed by the value of their indicator from the fixed criterion value (Tuleja, 2009). Mathematical expression of the integrated indicator calculation is thus as follows:

$$INI_x = \frac{1}{p}\sum_{i=1}^{p}\frac{x_{ij}}{x_{imax}}, \text{respectively } \frac{x_{imin}}{x_{ij}}, \quad (1)$$

where INI_x is the final point value of the integrated indicator, p is the number of the indicators, x_{ij} is the value of the 'i' indicator for the 'j' region, x_{imax} denotes the maximum value and x_{imin} is the minimum value of the 'i' indicator.

The comparison was made against the average of the indicators at the level of EU27. Where the data was not available, the analyzed regions average was used. The calculation was carried out with indicator weights set by experts. When it was not possible to clearly distinguish the weight of each indicator, the same weights were established. For indicators unavailable at the regional level, comparison at the state level was made. This meant identifying the position of the Czech Republic against Belgium, the United Kingdom and Poland, and subsequent evaluation of the position of the unified Moravian-Silesian region to the Czech Republic.

3. Development of disparities within set integrated indicators

3.1. Economic Potential and Competitiveness

The "Economic Potential and Competitiveness" integrated indicator shows the current economic strength of a region and its ability to further development. To express it, three indicators were selected from the available relevant data:

GDP per capita (weight 0.5), gross added value per capita (weight 0.3) and gross fixed capital per capita (weight 0.2).

The economic performance disparity between the analyzed regions in 2000-2008 has an overall convergent progression (see Figure 1). The disparity dispersion of 734 points in 2000 was lowered to 482 points in 2008. Approaching of the regions of the new member states (Moravia-Silesia, Silesian Voivodeship) to the economic performance and competitiveness of the regions of the old member states (Liège, Northumberland & TaW) is a positive development from the viewpoint of Moravian-Silesian region. However, it can be considered a negative that this is occurring along a reduction of the economic potency of the two western regions.

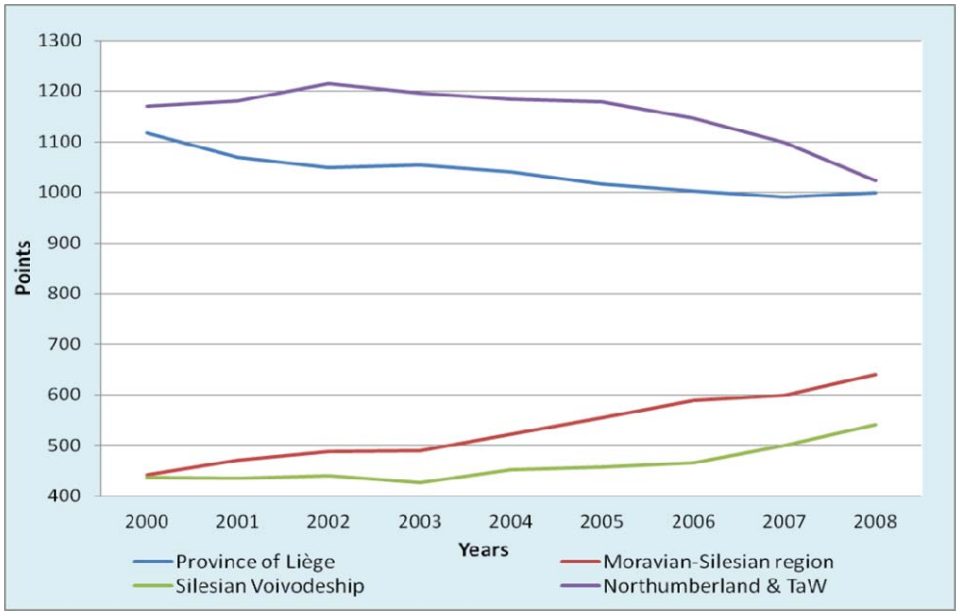

Figure 1. Economic Potential and Competitiveness
Source: Based on: Eurostat (2011).

The long-term highest values to the EU average were consistently achieved by Northumberland & TaW; however, it declined by 148 points in eight years. The Liège region was second by a small gap. However, both of these regions were virtually aligned with the EU average by 2008. The lowest values of the analyzed period were evident in the region of the Silesian Voivodeship although there was a positive growth (as in Moravian-Silesian region). The highest growth values were reached by the Moravian-Silesian region (up by 199 points). The default value, representing 44% of EU average, grew through the growth dynamics to 64% in 2008.

3.2. Labour Market

The "Labour Market" integrated indicator describes situation on the labour market in terms of labour supply and demand. It consists of two indicators with equal weights: employment rate (age group 15-64 years) and long-term unemployment (12 months and longer).

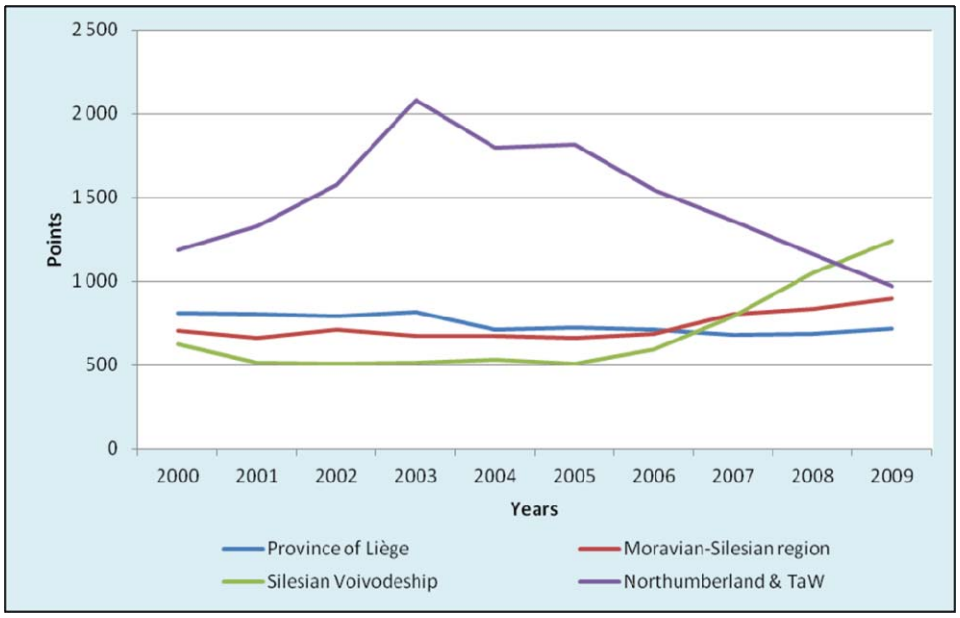

Figure 2. Labour Market
Source: Based on: Ibidem.

Between the years 2000-2009, there was a gradual convergence in the labour markets of the selected regions (see Figure 2). The spread of the disparities decreased by 7% in 2009 compared to 2000. However, opposite trends are apparent between the Eastern and Western regions. While the labour market development in Moravia-Silesia and especially Silesia was positive in terms of the above-mentioned indicators, the trend was completely reversed in the Liège region and particularly in Northumberland & TaW. Although Northumberland & TaW had been reaching values significantly above the EU average for a long time, this favourable development was disrupted in 2004 and was gradually phased out afterwards. In 2009, the integrated indicator of the region even dropped slightly below the EU27 average (by 30 points). With a relatively stable trend and with no significant deviation, the region of Liège was also consistently below this average. However, its original level of 81.2% of the EU27 average fell to 71.4% in 2009.

In Silesia, where the summary indicator of the labour market had had the lowest values of the analysed regions until 2006, the situation improved considerably in the last three years (2007-2009). Due to an increase in employment and a considerable reduction of unemployment, the integrated indicator's value increased by 98% from 2000 to 2009. If we express this dynamics of growth to the EU average, the initial level of 62.3% reached 123.9% of the EU27 average. The same trend can be also seen in Moravia-Silesia from 2006 although its growth dynamics is much lower than in adjoining Silesia. The original level of 70.2% increased to nearly 90% of the EU27 average.

3.3. Social Pathology and Exclusion

The integrated indicator "Social Pathology and Exclusion" affects undesirable side effects that lead to social exclusion or negatively influence the society in terms of health, life or safety. It consists of four indicators with equal weights: substantial material poverty rate (% of total population), the population threatened by poverty or social exclusion (% of total population), the number of crimes per 1000 people* and long-term unemployment rate (12 months and longer). Due to missing data for the regions of Liège and Northumberland & TaW, the integrated indicator was expressed at the national level. Comparison at the regional level was carried out only for Moravian-Silesian region and Silesian region.

From 2004 to 2009, there was a joint convergence between the countries (the range of the disparity decreased by 58.6%). However, while the positive above-average values of the Western countries approached the EU average (negative trend), the Eastern countries (the Czech Republic, Poland) positively moved away from it (see Figure 3). The highest rate of the positive disparity, i.e. the highest number of points, was achieved by the Czech Republic. This was influenced by a low proportion of the population at risk of poverty or social exclusion and less crime in comparison with the Western countries.

* In case of obtaining the number of crimes per 1000 people the average of the countries was selected as the optimum value for calculations through the point method due to unavailability of data for the EU27.

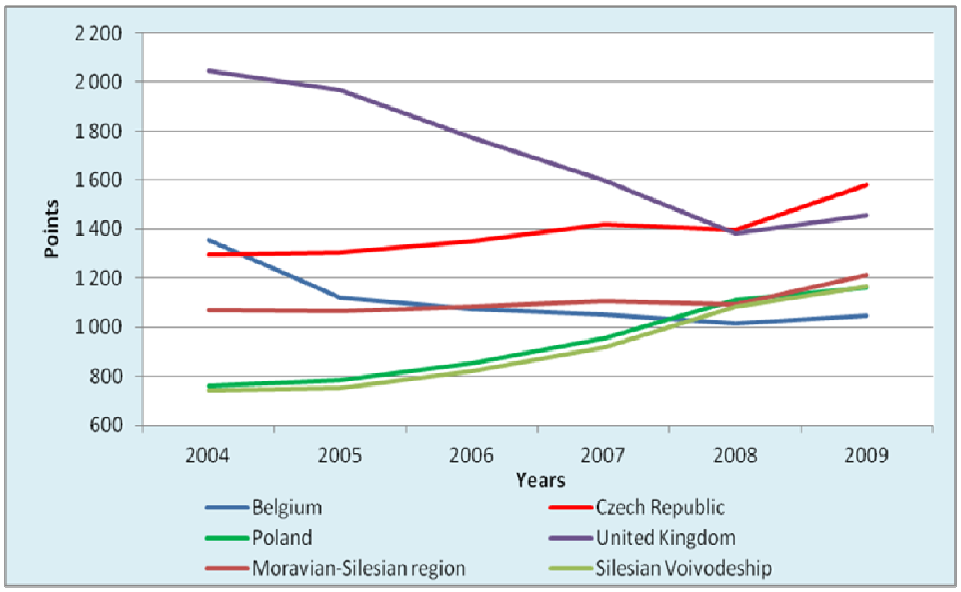

Figure 3. Social pathology and exclusion
Source: Based on: Ibidem.

The interregional comparison (Silesian and Moravian-Silesian region) showed a significant convergence. This was predominantly caused by higher dynamics of the decrease in the signs of social pathology and exclusion in the Polish region. The dispersion of the disparity decreased by 86.7% by 2009 and both of these eastern regions reached values above the EU27 average (i.e. lower level of the signs of pathology), making it a positive trend. In the Moravian-Silesian region, the positive disparity in the area of social pathology and exclusion increased by 11.6% during the reporting period. However, the region still achieved only 77% of the Czech Republic's average. Yet it should be noted that its position in this field is higher than that of Belgium, Poland and Silesia.

3.4. Education

The integrated indicator "Education" describes educational structure of individual regions. Education is valuable not only as a key social factor of development but also of regional competitiveness. Additionally, it is closely related to the prerequisite of sustainable development and innovation potential of regions. To express it, four indicators with the following weights were selected: people aged 25-64 with completed secondary education (%, weight 0.2), people with completed tertiary education* (%, weight 0.4), with completed lower se-

* Data for people aged 25-64 and with tertiary education was not available for the EU27. The regions' average was chosen as a criterion value.

condary education (%, weight 0.1) and with completed upper secondary education (%, weight 0.3).

The disparity development (see Table 1) between the analysed regions had an overall convergent course. The disparity spread decreased from 372 points in 2008 to 337 points in 2010. The convergent course is a result of a higher growth rate in Moravia-Silesia (42 points) and Silesia (49 points) and conversely an almost stagnant development in Liège (8 points) and a decreasing level of educational structure in Northumberland & TaW (–13 points). In this case, the polarization of the Eastern and Western regions is also apparent. In terms of the educational structure, Liège reached the best result as it achieved values at the EU level (1011 points). Northumberland & TaW recorded a slight decline, yet it maintained the levels of the EU average (930 points).

Table 1

Education

	2008	2009	2010
Province of Liége	1,003	1,004	1,011
Moravian-Silesian region	631	660	674
Silesian Voivodeship	719	753	768
Northumberland & TaW	943	940	930

Source: Based on: Eurostat (2011).

Despite the increasing number of university graduates, Moravia-Silesia performed the worst of the evaluated regions and its educational structure was around the 67% average. If Moravia-Silesia maintains this growth dynamics, it will fail to achieve the current level of the EU by 2020. Silesia was rated better in comparison with Moravia-Silesia but even this region attained only 76% of the level and exhibited similar growth dynamics as Moravia-Silesia.

Table 2

Persons aged 25-64 with tertiary education attainment (% of population)

	2008	2009	2010
Province of Liége	29.00	30.40	31.40
Moravian-Silesian region	11.90	14.10	15.40
Silesian Voivodeship	17.60	20.50	22.00
Northumberland & TaW	26.70	27.50	27.80

Source: Based on: Ibidem.

3.5. Environment

Despite the significance of environmental issues for the development of all regions, relevant data in the field of environmental indicators at NUTS II level are not yet monitored in the Eurostat database. Some indicators are available at the member state level in a very limited extent. The Czech Republic and Poland display a positive disparity in terms of the monitored indicators of environmental quality (especially PM10 production – see Table 3). However, the regions of Silesia and Moravia-Silesia are far below the average of the two countries according to the available indicators as shown in the Tables 4 and 5 below.

Table 3

Urban population exposure to air pollution by particulate matter (PM10)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Belgium	32.9	33.9	33.2	36.5	30.3	29.6	30.7	26.3	26.0
Poland	41.8	37.9	45.0	44.4	35.1	38.9	44.6	34.0	33.4
United Kingdom	23.4	24.2	23.2	25.8	22.6	23.5	24.6	23.3	20.4
Czech Republic	32.7	35.6	40.2	47.0	38.4	39.6	40.6	31.9	29.8
Moravian-Silesian region	34.9	42.0	42.9	50.1	39.9	46.7	46.9	38.5	36.4
EU-27	27.7	27.1	28.1	31.2	27.8	29.2	30.8	29.0	26.8

Source: Based on: Eurostat (2011), CHMI (2011).

Table 4

Emissions of solid pollutants (t/km²)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Poland			1.50	1.50	1.40	1.50			
Silesian Voivodeship			7.20	7.50	7.60	6.80			
Moravian-Silesian region	1.33	1.21			1.27	1.04	1.05	1.26	0.56
Czech Republic	0.61	0.60			0.59	0.43	0.42	0.42	0.41

Source: Based on: RIS (2011), GUS (2011).

Table 5

Emissions of nitrogen oxides (t/km²)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Poland			2.50	2.60	2.60	2.60			
Silesian Voivodeship			9.20	9.50	9.10	9.70			
Moravian-Silesian region	4.10	4.41			4.30	4.58	4.34	4.38	3.77
Czech Republic	2.06	2.10			2.08	1.96	1.94	1.97	1.77

Source: Based on: Ibidem.

3.6. Transport Infrastructure

A comparison of the state and development of infrastructure in the analysed regions had to be limited to road transport only due to the unavailability of required data. To calculate the integrated indicator, the following indicators with the specified weights were used: freeways (km/100 km², weight 0.5), other roads (km/100 km², weight 0.25) and number of vehicles per 1000 people (weight 0.25).

The development of the interregional disparity of this integrated indicator (see Table 6) was slightly convergent at a very wide dispersion (1684 and 1523 points respectively). This was caused by the significant distance of the Liège region that exhibited considerably higher values in all default indicators, especially in the length of highways. The disparity between the other three regions was not so striking (range 308, respectively 223 points). However, Moravia-Silesia reached the lowest values. It is worth noting that the region of Silesian Voivodeship achieved almost double the values of Moravia-Silesia over the period. The situation in Moravia-Silesia began to improve slightly only from 2005.

Table 6

Transport Infrastructure

	2006	2007	2008	2009
Province of Liege	2153	2139	2110	2053
Moravian-Silesian region	135	138	200	241
Silesian Voivodeship	452	481	512	531
Northumberland and T&W	1260	1241	1178	1175

Source: Based on: Eurostat (2011).

Air transport, the fastest and one of the most important forms, especially for international passenger transport in the world today determines the distance. Direct connections with other cities and regions are increasing the availability of the region and allow to rise in passenger, always depending on the nature and conditions of carriage. The indicator Air transport of passengers may be under certain circumstances considered as an apposite indicator for evaluating the success of the region.

Number of passenger air traffic show utilization of airports in the region (see Table 7), each region has analyzed international transport terminal. Values for the region Province of Liége are affected by the proximity exceptional transport accessibility of Brussels airport.

Table 7

Air transport of passengers per 1000 inhabitans

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Province of Liège							0.29	0.31	0.37	0.33
Moravian-Silesian region			0.11	0.13		0.19	0.22	0.24	0.25	0.22
Silesian Voivodeship							0.29	0.39	0.51	0.50
Northumberland & TaW	2.25	2.42	2.43	2.80	3.37	3.71	3.86	4.01	3.58	3.26

Source: Based on: Ibidem.

Tiny decline of Air transport of passenger in 2009 to 0.50 for Silesian Voivodeship despite the global crisis in air transport indicates a significant improvement of local conditions. Although flights from Katowice airport are operated by only four airlines, of which 90% of flights operate low-cost airlines, passengers are offered a direct connection with 27 cities. In 2011 there was over 2.5 milion passengers, which represents an annual increase of 140 000 passengers. Although Northumberland & TaW catchment area is only slightly greater than of Moravian-Silesian region, number of passengers carried in 2007 reached a value of 5.6 million people and the airport in Newcastle offers direct connections to 84, even transoceanic cities. On the contrary, maximum of 311 000 passengers were carried in Moravian-Silesian region in 2008. This number has decreased to 273 563 passengers in 2011. This finding is all the more important that the airport in Ostrava had a much better starting position than Katowice airport.

Conclusions

The performed results of the case study clearly show that the polarization of the Western ("old") and Central East ("new" regions of the EU member states) persists. With the exception of the assessed labour market characteristics, the regions of Moravia-Silesia and Silesian Voivodeship significantly lagged behind Liège and Northumberland & TaW as well as the EU mean in many indicators throughout the analyzed period. Although the compared regions of Central East Europe display a positive development trajectory, the dynamics is inadequate and insufficient.

Out of these regions, Silesian Voivodeship achieves higher quality parameters in many of the indicators although the region was in a worse starting position at the beginning of the transformation period. This finding is critical for the Moravian-Silesian region due to the "fragile" relationship between the two regions: on one hand, they seek to cooperate but on the other, they compete in many ways. Therefore, the finding supports the claim that the Polish restructuring model was clearly more successful.

Due to the different development conditions and specific character of Central East European regions, modern western theoretical concepts such as adaptability and resilience are not well applicable for Central East Europe. Rather than trying to apply western concepts accent should be given to the creation of concepts tailored to the specific conditions of Central East European regions.

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