

# A Preliminary Analysis of Sustainable Development in the Belgrade Metropolitan Area

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**Abstract**—The paper provides a comprehensive analysis of the sustainable development in the Belgrade Metropolitan Region - BMA (level NUTS 2) preliminarily evaluating the three chosen components: 1) economic growth and developmental changes; 2) competitiveness; and 3) territorial concentration and industrial specialization. First, we identified the main results of development changes and economic growth by applying Shift-share analysis on the metropolitan level. Second, the empirical evaluation of competitiveness in the BMA is based on the analysis of absolute and relative values of eight indicators by Spider method. Paper shows that the consideration of the national share, industrial mix and metropolitan/regional share in total Shift share of the BMA, as well as economic/functional specialization of the BMA indicate very strong process of deindustrialization. Allocative component of the BMA economic growth has positive value, reflecting the above-average sector productivity compared to the national average. Third, the important positive role of metropolitan/regional component in decomposition of the BMA economic growth is highlighted as one of the key results. Finally, comparative analysis of the industrial territorial concentration in the BMA in relation to Serbia is based on location quotient (LQ) or Balassa index as a valid measure. The results indicate absolute and relative differences in decrease of industry territorial concentration as well as inefficiency of utilizing territorial capital in the BMA. Results are important for the increase of regional competitiveness and territorial distribution in this area as well as for improvement of sustainable metropolitan and sector policies, planning and governance on this level.

**Keywords**—Belgrade Metropolitan Area (BMA), Comprehensive analysis/evaluation, economic growth and competitiveness, sustainable development.

## I. INTRODUCTION

DEVELOPMENT of metropolitan cities is an important component of regional environment. Main feature of the complex urban system represent urban economy and social structure (their characteristics, processes, multiple functions) as well as spatial characteristics and processes. Contradictions between development of the main urban (sub)systems are getting more explicit, paralleled with advancement of overall sustainable development through processes of planning, evaluation, estimation, implementation, governing, monitoring and control.

Comprehensive evaluation is an effective way of coordinated metropolitan/urban and sustainable (socio-economic) development. Most often, it takes place by establishment of the referent set of indicators for specific

urban (sub) systems and their further evaluation for supporting planning decisions and management of sustainable urban development. Comprehensive evaluation and assessment as applied methodological approach is essential in that. The methodological approach is based on the situation analysis, comparisons and guidelines for improvement of the perceived problems of comprehensive and comparative developmental policy [1].

Comprehensive evaluation of sustainable urban development has “imperialistic” and “hybrid” character [2]. That is shown through different interdisciplinary analysis of sustainable development policies, their comparison and evaluation.

Comprehensive evaluation of sustainable development depends on the contextual factors which play an important role at the national, regional, metropolitan level. This implies that is needed to include the contextual factors and referent indicators, as the basic determinants of comparative research. Contextual factors and indicators provide a better connection among specific urban/metropolitan concept that is being analyzed, evaluated and compared.

The subject of comprehensive evaluation is sustainable territorial development and policy in the Belgrade Metropolitan Area (BMA). In concrete example of the BMA (NUTS 2 level) in Serbia, the main contextual factors can be named both in the transition process (transformation of economy, society, institutional framework, etc.), and in global economic and financial crisis and its repercussions on the territorial development. During the post-socialist transition recession in Serbia, strengthened by the global economic and financial crisis, the one million jobs has been lost (out of which 700,000 in the industry), with almost one million unemployed, 1.4 million illegal buildings (0.2 million in the BMA) and 1.3 million or 20% of poor inhabitants, the decline value of the shares, growth illiquidity, growing liquidation and bankruptcy of enterprises, and so on [3].

In the part of the “Serbian spatial banana” which comprises the Belgrade and Novi Sad metropolitan area, only 6.7% of the Serbian territory is concentrated with 27.1% of the total population (2,054,341 citizens) and 41.6% of total employees [4] realizing 60% of the national income with the allocation of around 65% SMEs of Serbia.

The identification of the main effects of sustainable/territorial development in the BMA is based on the comprehensive development framework approach, i.e. on comprehensive integrated approach in analyzing, planning, evaluation and implementation of sustainable territorial development. Methodological approach involves correlation

and linkages between national and regional/ metropolitan and local. The suggested approach implies mobilization of strengths and resources in development in conditions of prolonged global economic and financial crisis, with emphasizing metropolitan responsibility for development/ structural change and spatial components.

The applied comprehensive analysis of the sustainable development of the BMA includes:

- 1) dynamics and components of the metropolitan economic growth and development changes,
- 2) economic competitiveness, and
- 3) spatial concentration and sector specialization.

## II. APPLIED APPROACH AND METHODS

Defining approach for comprehensive analysis and evaluation of sustainable development of an area/region implies way to: a) choose analytic techniques, as well as to define their implementation; and to b) clearly and unambiguously define the way for researching individual characteristics and connect findings with initial thesis. All this has to enable reliable judgments on sustainable development by *ex-post* evaluation of the results of previous development and territorial policies, or by *ex-ante* evaluation of possible results of new policies. The recent approaches increasingly investigate the effects of integrated policies, as e.g., in the case of new European documents (economic cohesion, social cohesion and territorial cohesion) [1].

For analysis of the sustainable (socio-economic) development of the different regional/metropolitan areas analysts rely on standard tools: a set of *quantitative methods* that includes analysis techniques of the economic base, several models of production functions, Shift-share analysis, input-output analysis, location quotient (or Ballassa index), optimization techniques, cost-benefit methods, etc. These techniques can be used to compare regional differences (regional convergence / divergence and territorial cohesion) and traditional regional policy (allocation, distribution).

Quality research is a method for testing non-numeric data, research or explanation of a case, process or event based on known attributes and known context. Main aim is to understand social and other relations and behavior, as well as reasons which manage such behavior. Often, parallel are used also quantitative methods for testing the hypothesis.

In contemporary quality research, applied approach and methodology depend on initial theoretic paradigm. Guba, Lincoln [5] identified five main general scientific paradigms in contemporary quality research: positivism; postpositivism; different critic theories; constructivism; and participatory (cooperation) paradigms. Among the members of the various approaches there is constant dialogue and tension, and Max Veber [6] named it "the method conflict"(Methodenstreit), showing the confrontation between economics and other social sciences [7].

The "sincretic" and "eclectic" methods are applied in this paper, as this enables combination of several paradigms. In its basis lies the conviction that comparison is a main operation in any empiric research, as we start from the position that

thinking without comparison is inconsiderate [8]. For this approach, typology and classification are the main categories of analytical comparative approach in regional analysis and planning, as it is the case here.

The applied quantitative approaches in comprehensive analysis of sustainable development of the BMA have been included Shift-share analysis, Spider method (based on indicators) and location quotient (Balassa index).

### A. Shift-Share Analysis

Shift-share analysis is a widely used analytical technique used for retrospective decomposing of changes in employment in different areas or regions. The aim of this analysis is to identify changes in the industry or other economic activities with consideration of comparative advantages in particular areas regardless of whether they have growth or decline of employment and inhabitants. It usually studies agriculture, industry and services, indicating a competitive advantages, and rarely on the location advantages of the certain area.

According to the general form of analysis, total employment in the regional area is  $e$ , while is employment in the activity  $i^{th}$  of the region  $e_i$  ( $e_i^t$  at the beginning of the period and  $e_i^{t+n}$  at the end). The calculation includes the wider framework of reference area (country), where the total number of employees  $E$  ( $E^t$  at the beginning of the period and  $E^{t+n}$  at the end) with employment in the  $i^{th}$  activity  $E_i$  ( $E_i^t$  at the beginning of the period and  $E_i^{t+n}$  at the end). One assumption of the Shift-share analysis is that the larger comparative area (state) is closed economic system. Shift-share model is based on the growth/ decline in employment in the  $i^{th}$  activity of the metropolitan/regional area that is a function of three components [9]: (1) regional share in national growth; (2) mix of changes in the activities themselves; and (3) shift and change of activities in the regional area.

Changes in employment in the  $i^{th}$  activity of the regional area from the time  $t$  to time  $t + n$ , can be measured by the share change, mix change and shift change according to [9]:

$$e_i^{t+n} - e_i^t = \text{share change} + \text{mix change} + \text{shift change} \quad (1)$$

Accordingly:

$$e_i^{t+n} - e_i^t = e_i^t \left[ \frac{E^{t+n}}{E^t} - 1 \right] + e_i^t \left[ \frac{E_i^{t+n}}{E_i^t} - \frac{E^{t+n}}{E^t} \right] + e_i^t \left[ \frac{e_i^{t+n}}{e_i^t} - \frac{E_i^{t+n}}{E_i^t} \right] \quad (2)$$

Shift-Share analysis is used to determine contribution of the each component to the regional or local economic growth, by:

$$SS = NS + IM + RS \quad (3)$$

where: SS - shift-share, the share of changes, NS - the proportion of changes at the national level, IM - the share of industrial structure, the RS - the regional allocation changes.

The component "national share" (NS) is measured as increase of total employment in the local area due to the growth of national economy in the analyzed period.

The component “*industry (structural) mix*” (MI) identifies the growth rate of industrial sector in the local area based on national growth rates for individual industrial sectors. The allocative component “*regional change*” (RS) or the competitive effect is perhaps the most important among the components. It points to the potential and role of leading and lagging industries in the regional /metropolitan area. Specifically, the competitive effect compares the growth rate of regional /metropolitan area in the industrial sector with a growth rate for the same sector at the state level (or e.g. labor productivity). Leading industry is the one in which a local area has a higher growth rate compared to the growth rate of industry in the state.

Shift-share analysis has more varieties, and in practice is often used two types: the shortened form of Shift-share analysis and dynamic Shift-share analysis [10]. Shift-share analysis provides an overview of the complex changes in all activities or any activity in shift to or from regional area.

The advantage of Shift-share method is that it uses a simple way to decompose the territorial differences in economic or sectoral growth by analysis of the three growth components (employment, productivity): *structural, competitive/ sectoral and allocative* [11], [12]. Esteban J. [12] proposes the division of regional growth into three components: structural, differential and allocative. In addition, this technique can be used to identify the economic competitiveness of local industries.

In the practical application of this simple analysis, based on a small number of data, many researchers have begun to adapt it by introducing the probability and regression analysis models. In practice, other forms of regional industrial-economic analysis are used, such as econometric modeling, input-output analysis, location quotient, and others. But, even if used only in the rudimentary shape, it can be useful for obtaining the so called „quick and dirty“ insight in relationship of national and industrial contribution to regional or local growth in a simple and direct way. It is also useful for preliminary determination and selection of industry activities that have major potential and competition for future growth of the region [1].

Barff and Knight [10] show that, in order to bridge the gap between development policy of advanced and lagging regions, they need to focus on factors that affect the more balanced growth of productivity in the less developed regions.

Critics of this method suggest that it often reflects the initial resources of the area without showing its competitive effects, comparative and location advantages. General experience shows that this technique is basically a descriptive tool and should be used in combination with other types of analysis for the decomposition of regional spatial differences and determination of the regional economic and spatial potentials - the territorial capital. Main limitations are: it doesn't take into account other factors such as impacts of business and investment cycles, the identification of comparative advantages, the differences resulting from complex industrial trade, institutional and organizational solutions, etc. The analysis does not provide a clear picture of regional and

national economy, although the results are based on long-time series data. At the same time, this technique provides a simple and direct approach to extract the share of national and industrial contributions from regional or local growth, offers a simple and reliable decomposition of regional differences, from the standpoint of comparing the employment and labor productivity with regard to the national average. Technique indicates the competitive effect of the region and its allocative component in the decomposition of employment and labor productivity, as a reflection of local / regional conditions and potentials. Also, the analysis is useful for potential determination of types of industries that can offer significant opportunities for future growth.

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#### *B. The Analysis of Competitiveness by Indicators (Spider Method)*

Regional competitiveness is defined as the ability to achieve economic growth, i.e. appropriate level of economic productivity in GDP creation based on utilization of available resources. Today, very complex mechanisms and models for determination and monitoring of the regional competitiveness have been developed, based on numerous and complex indicators.

For the analysis of regional competitiveness of the Belgrade region, Spider method has been applied, according to the indicators of competitiveness.

Method „Spider“ is an analytical tool used for comparison and visualization of the relative advantages and shortages of a territory or different development scenarios based on variety of factors [13]. Method is a mean for presentation of larger spaces or different development options, and allows evaluation of suggested development policies. The most common usage of this method is in scenario analyses of regional development, transport and metropolitan areas [14], as well as in evaluation of “hypothetic scenarios” in spatial planning and management. During the method utilization, numeric data on each indicator are standardized, mapped on axes, starting from inner to outer edge of „spider“/“radar”. The smallest values are close to the center of axis intersection, while larger values are closer to outer edge of “spider”. Absolute and relative data values are aggregated on 10-points scale [15], [16].

The first step includes standardization of quantitative data. General data are used (surfaces, socio-economic data as population, population density, unemployment, GDP, etc.), as well as derived data on factors (indicators). In the second step, standardized values are presented on „Spider“ scale for each factor (indicator), including their visualization. This method has an extreme importance in comparison of different (regional) areas. Method has large communication potential as comparative analysis, evaluation and visualization of possible options by „Spider“ suitable for decision making on questions of regional planning and sustainable development.

### C. Location Quotient

Location quotient (LQ) is widely used analysis of economic base, as well as measure for determination of spatial distribution of individual branches (most often in industry), i.e. level of spatial concentration of activity of an area compared to a larger surrounding area. LQ is relatively secure method for assessing the degree of spatial concentration of industry. Industry development is measured regarding to the number of inhabitants, or total number of employed in an area. If we estimate industry productivity, a variable „GDP/employee” is also taken into account. Application of this technique can provide preliminary insight on reached level of specialization industry. The numerical value of this indicator is used as a basis for typology and classification of region compared to national level, while average value  $LQ=1$  means the average industry development. Values larger than  $LQ>1$  imply more developed region, with production specialization.  $LQ<1$  implies to weak industrial development and pattern. The main form for calculating LQ (the so-called „Balassa index”) is [17]:

$$(LQ) = \frac{e_i/e}{E_i/E}, \text{ or } LQ = \frac{e_i/e}{s/S} \quad (4)$$

where  $e_i$  represents number of employed in regional industry,  $e$  is number of total employed in the region,  $E_i$  is number of employed in national industry,  $E$  is total employment on national level,  $s$  is number of inhabitants in the region, and  $S$  is number of population in the country [18], [19]. Balassa index is often used in international trade for calculation of relative advantage or lack of certain goods and services in the specific country.

Location quotient provides typology and classification of an area (municipality, region etc.) according to relative industrial development. According to specialization level in a certain time period, regions can be [20]: a) highly specialized ( $LQ_t > 1.25$ ); b) averagely specialized ( $0.75 < LQ_t < 1.25$ ); and c) low specialized ( $LQ_t < 0.75$ ), where  $t$  refers to analyzed year.

Calculating LQ is a simple way for rating sectors where a certain area has comparative advantages. Additional information on possibility of a certain area for maintaining or increasing its comparative advantages in specific sectors can be obtained by application of dynamic LQ analysis. Data on LQ change provide rating of time schedule of specialization by sectors (for chosen area). If specific region in a certain period have LQ growth in sectors with high specialization level, those sectors can be considered as potential sources of regional competitiveness [21]. According to dynamic evaluation of specialization, regions can be [20]: a) regions with specialization growth ( $LQ_t - LQ_{t-1} > 0.1$ ); b) regions with specialization stagnation ( $-0.1 < LQ_t - LQ_{t-1} < 0.1$ ); and c) regions with specialization drop ( $LQ_t - LQ_{t-1} < -0.1$ ). For evaluation of productivity level (as a general competitiveness indicator for specific sector and specific area), this method

uses productivity of a specific sector in the region compared to average productivity of that sector on the national level.

Value  $LQ=1$  represents the character of „local industry good”, while growth of its value over 1 ( $LQ>1$ ) shows that is more an „export” good, i.e., products that are sold and used outside analyzed region.

In the sequel we present empirical results gained by application of several quantitative methods and discussion on decomposition of economic growth and development changes, competitiveness and spatial concentration and fragmentation in the BMA.

### III. RESULTS AND DISCUSSION

#### A. Decomposition of the Metropolitan Economic Growth by the Application of Shift-Share Analysis

By application of Shift-share technique we offered in this paper a way of general assessment on as to which part of the regional differences in the average employment can be attributed to/in specific regional employment (and productivity) and which part to the effects of certain sectoral structure. In order to distinguish the role of these factors, we used a standard Shift-share analysis for decomposition of differences in regional employment in relation to the national average, through three components: share of national influence factor, share of economic/ industrial structure and regional allocations and conditions. Empirical evaluation of the dynamic of regional development of the BMA based on this technique has been implemented in the period 1990-2012.

The analysis shows that in the analyzed area the greatest contribution to decline of industrial employment was weak and inappropriate competitive industry structure, then the impact of factors and components of the national economic growth trends. Favorable regional conditions had positive impact on the achievement of greater industrial employment, i.e. on prevention of larger decline in industrial employment than would be accomplished according to the dynamics of national growth/ decline. As a consequence of a set of general, contextual, local, institutional and favorable regional/ metropolitan factors and conditions the industry has recorded a smaller decline of employment (and of total employment) than the average decline in the national economy.

The results of Shift-share analysis are sort of indicators of sources of regional competitiveness, regional development conditions, passivity or activity in regional & urban development policies, the existing institutional and organizational arrangements, cooperation, spatial integration, the use of the regional capital, as well as indicators of the role of regional level in the creation of urban developmental and spatial disparities in the BMA. Hereafter are the specific empirical results, a brief discussion of the results.

Application of shift share analysis in determining the role and contribution of individual components in the economic growth of the Belgrade metropolitan area compared to the national level showed the exact results. Due to the intensive de-industrialization process, the BMA is characterized by a considerable volume of adverse impacts of industrial structure

with less adverse impact of national components. The empirical results show that although having negative values, the structural component of the Shift-share analysis of the BMA - a slightly better effect of regional economic decline than the national average. Industrial structure and the factors that determine it (compared to the national level of employment decline in industry and overall economy) led to the decline of industrial and overall employment in the Belgrade area by loss of 60,268 employees in the period 1990-2012. In other words, if the industrial sector in the region declined at the same rate as the industrial sector in Serbia, Belgrade would have lost that number of jobs. If the manufacturing sector in the region declined at the same rate as the overall national economy, it would deprive Belgrade – 52,148 jobs. The difference in these figures in relation to the actual change in industrial employment in Belgrade suggests that this region is competitive above average compared to the Serbian average (otherwise, the real loss would be 8,120 employees) as the real extent of loss of employment is lower for that amount. This is a consequence of the favorable metropolitan/regional conditions. The influence of extremely attractive and convenient metropolitan factors made a positive contribution to the economic trends of the area, measured in relation to the Serbian level of increase/ decrease in employment. A comparative research does not intend to study these advantages and limitations, territorial capital of Belgrade, nor the influence of development of the services sector as the dominant economic sector. Results of Shift-share analysis for the Belgrade region into period 1990-2012 are shown in Table I.

TABLE I

RESULTS OF SHIFT-SHARE ANALYSIS IN BELGRADE METROPOLITAN AREA IN THE PERIOD 1990-2012

	Real Shift-share values	Relative Shift-share values
Shift-share (SS)	- 101.073	- 0.1010732
National share (NS)	- 52.148	- 0.0521483
Industrial mix (IM)	- 60.268	- 0.0602689
Regional share (RS)	+ 11.344	+ 0.0113440

$$SS = NS + IM + RS$$

$$SS = - 52,148 - 60,268 + 11,344$$

$$SS = - 101,073.1$$

$$\text{Real SS} = - 0.049111 - 0.060532 + 0.018095$$

Results of the empirical analysis indicate that the process of de-industrialization, measured by a drastic drop in employment has been very intense in the BMA. Increased employee productivity and favorable regional conditions and territorial capital of Belgrade metropolitan area, as well as better management arrangements have contributed to alleviation of overall decline of industrial employment in this area, compared to the Serbian average. Allocative component of decomposed economic growth of the BMA has a positive value (+0.18096). This shows that the BMA is specialized in sectors whose productivity is above the national average. Comparative review of results of Shift-share analysis is presented in Table I, and in Fig. 1.

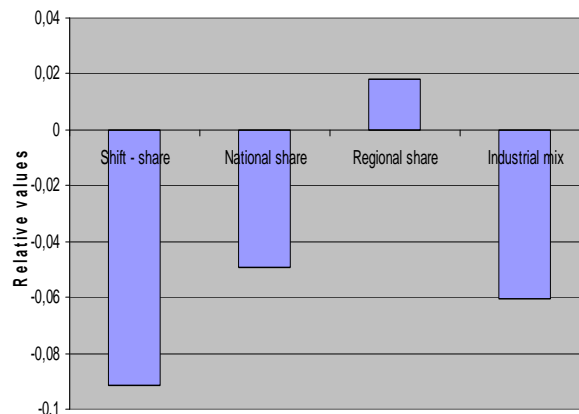


Fig. 1 Review of the results of Shift-share analysis in the BMA in period 1990-2012

### B. Analysis of Regional Competitiveness of the BMA by Spider Method

The analysis of regional competitiveness of this area is based on identification and usage of those indicators for which data were available at this territorial level (for the BMA - level NUTS 2). The Republic's statistics does not publish almost any economic data at the regional level (beside GDP and employment), so the selection of indicators was made solely according to the available data [22]-[24]. Despite efforts to apply indicators of competitiveness and regional development identified in the portfolio of the European strategic documents on sustainable development, the selection of indicators was conditioned and limited by available statistical material and strategic-development documents.

Empirical analysis of regional competitiveness of the BMA was carried out by application of Spider method. It involves translation of the absolute and relative values of eight indicators in *Spider* standardized values (Tables II and III and Fig. 2).

TABLE II

COMPARATIVE REVIEW OF THE DEVELOPMENT LEVEL AND COMPETITIVENESS IN THE BMA [31]

Indicators	Belgrade	Belgrade (RS=100)
GDP per capita (in €)	4.322	158.4
GDP/ km <sup>2</sup> (in thousand €)	2.154	937.7
Employment rate (in %), 2012	49.07	139.56
Industrialization level (in %), 2012	3.69	85.2
Unemployment rate (% of unemployed in economically active population) 31.12.2011	13.43	54.02
Investments per capita (in thousand RSD) 2011	142.61	207.85
% of population with high and higher education (B.A. degree) 2011	23.91	171.76
Net salary per employee (in RSD) April 2013	57.149	122.82

Fig. 1 shows results of evaluation and comparison of regional competitiveness of BMA and Serbia which are significant for sustainable development.

They point on absolute and relative differences in efficiency of usage of territorial capital for these areas, confirm absolute and relative domination of the BMA in the regional competitiveness in the Serbia.

TABLE III  
COMPARATIVE REVIEW OF THE DEVELOPMENT LEVEL AND COMPETITIVENESS  
IN THE BMA (SPIDER VALUES)

Indicators	BMA	Serbia
GDP per capita (in €)	10	6.31
GDP// km <sup>2</sup> (in thousand €)	10	1.06
Employment rate (in %), 2012		
Industrialization level (in %), 2012	7.45	7.71
Unemployment rate (%of unemployed in economically active population) 31.12.2011	3.86	6.99
Investments per capita (in thousand RSD) 2011	10	3.36
% of population with high and higher education (B.A. degree) 2011	10	5.28
Net salary per employee (in RSD) April 2013	10	6.84

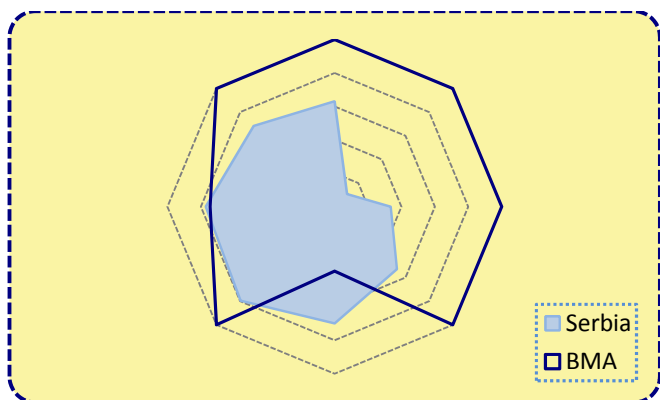


Fig. 2 Comparative review of the indicators of competitiveness and sustainable development in the BMA and Serbia (Spider values)

A strong process of the competitiveness, the intensive de-industrialization, the concentration of economic activities and productive forces in the BMA, with increasing geographical differences in the level overall and industrial development are the consequence of transitional recession and reflection of the lack of adequate regional policy, regional policy of industrial innovation, strong impact of global economic and financial crisis, the use of available territorial capital and spatial directing of activities [25], [26].

### C. Spatial Concentration and Industrial Specialization in the BMA by LQ

For analysis of spatial distribution and specific typization of BMA in regard to industry distribution, we used quantitative LQ values expressed by relation of industrial and total employment in BMA and on national level according to number of population of these territories. Based on LQ values [20] in BMA in the period 1990-2012, we estimate that there is a significant drop of LQ role in industry development, competitiveness and spatial concentration of industry (Table IV). Today, spatial concentration of industry in the BMA is approximately 2.8 times less than in 1990. According to criteria of LQ size, BMA has character of area with low industry development (LQ for the BMA is in category 0.4-0.699) so we can conclude that industry was a weak source of regional competitiveness. This trend was supported by intensified deindustrialization and stronger development of services in the BMA, especially due to effect of post-socialist

economic and societal transformation, as well as impacts of global economic and financial crisis.

TABLE IV  
DYNAMICS OF THE SPATIAL INDUSTRIAL CONCENTRATION BY LQ IN THE  
BMA IN THE PERIOD 1990-2012 (BALASSA INDEX)

Indicator	Value
LQ 1990	1.31
LQ 2012	0.47
Change LQ	-0.84
Difference in %	-278.7

Application of another type of LQ (Balassa index) as relation between regional industrial and total employment, and the same indicators on national level in period 1990-2012, obtained LQ values indicate drop of regional specialization of the BMA for 11.4% (Table V). Results show that, according to mentioned criteria, the BMA does not have developed industrial „regional function” and that there is additional weakening of industry specialization in post-socialist period.

TABLE V  
DYNAMIC OF THE INDUSTRIAL SPECIALIZATION BY LQ (BALASSA INDEX) IN  
THE BMA IN THE PERIOD 1990-2012

Indicator	Value
LQ 1990	0.67
LQ 2012	0.59
Change LQ	-0.08
Difference in %	-11.4

Classified according to LQ value [20] in period 1990-2012, the BMA area belongs to group of industrially low specialized regions (LQ<0.75). From the standpoint of territorial economy development, especially important are processes of spatial concentration, polarization and resource agglomeration. Territorial disposition of location-development potential and resources and trend of growth of metropolitan areas of Belgrade and Novi Sad, as well as some other big cities could intensify increase of regional differences in Serbia, i.e., further trend of functional marginalization of undeveloped areas [27]. Largest economic development is realized in cities with major concentration of production and service capacities. Before the global economic and financial crisis, there was a growth in real estate market, financial services, insurance, construction, trade, transportation and storage.

Regional development differences between BMA and other areas could continue to grow, with parallel strengthening of Serbian undeveloped areas fragmentation. This is a direct consequence (except the lack of adequate policies of development redirection) of the fact that metropolitan areas, large cities, areas along the Danube development corridor and highways, have attractive, competitive, favorable and high quality conditions for economic and industrial development.

## IV. CONCLUSIONS

The empirical results of the comprehensive analysis and preliminary evaluation of the three components of sustainable development in the BMA show that metropolitan economic

growth and competitiveness are almost entirely explained by differences in regional specificities in terms of employment. The results show that although having negative values, the structural component of the Shift-share analysis of the BMA - a slightly better effect of regional economic decline than the national average. The allocative component of decomposed economic growth of the BMA has a positive value as a reflection of specialization in the sectors of region, whose productivity is above the national average. The both analyses (Shift-share and Spider method) indicate that the process of metropolitan/regional de-industrialization, measured by a drastic drop in employment, was very intensive in the BMA. Favorable allocative factors - regional conditions and territorial capital of the BMA have contributed to alleviation of the overall decline of industrial employment in this area, compared to the Serbian average. Although having negative values, the structural component of the Shift-share analysis of the BMA shows a slightly better effect of regional economic decline than the national average. The comprehensive analysis of the economic development show substantive development changes, a decreased competitiveness, strong process of deindustrialization as well as certain higher level of labor productivity in the BMA. In according with Balassa index the BMA pertain to category of the industrial poorly specialized regions (with  $LQ < 0.75$ ). It is estimated that, if appropriate measures and activities are not taken, further spatial concentration and specialization of economic and industrial structures in the BMA with the growing regional disparities can be expected in Serbia. The BMA as part of the European Danube corridor VII zone [1] and the TENS - corridor X, provide attractive and competitive conditions for economic development. Serbian regional development policy as well as sustainable development policy of the BMA should be based on the combined market factors, the economic competitiveness, spatial competition, territorial capital and territorial cohesion and convergence [1], [15], [26], [27].

The empirical results of the comprehensive analysis of the three components in the BMA should be used in decision-making about territorial allocation of the economic/industrial activities on this area with the aim to achieving sustainable using of territorial capital and sustainable development. Our results indicate that Serbian regional development policy, especially horizontal industrial policy (i.e. industrial zones, eco-industrial parks, etc.), should be based on interrelation between market-led factors, territorial competition, territorial capital and principles of territorial cohesion [28]. We estimate that there is a need on defining (new) support to better competition and territorial cohesion of industry, in accord to European commitments [29], [30], and commitments of the *Spatial Plan of the Republic of Serbia* (2010) regarding the sustainable development and territorial convergence of development.

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#### REFERENCES

- [1] M. Vujošević, S. Zeković, and T. Maričić, *Novi evropski regionalizam i regionalno upravljanje u Srbiji, Knjiga 2, Regionalno planiranje i upravljanje u Srbiji i novi institucionalni dizajn*. Posebna izdanja no.75, Beograd: Institut za arhitekturu i urbanizam Srbije, 2015.
- [2] M. Dogan, "Political Science and Other Social Sciences", in *A new handbook of political sciences*. R.E. Goodin, H.D. Klingemann, Ed. Oxford: Oxford university press, 1996, pp. 97-130.
- [3] M. Vujošević, S. Zeković, and T. Maričić, *Novi evropski regionalizam i regionalno upravljanje u Srbiji, Knjiga 1, Opšti aspekti regionalnog pitanja i novi evropski regionalizam*. Posebna izdanja no.69, Beograd: Institut za arhitekturu i urbanizam Srbije, 2012.
- [4] M. Vujošević, S. Zeković, and T. Maričić, "Post-Socialist Transition in Serbia and Its Unsustainable Path," *European Planning Studies*, vol.20, no.10, pp. 1707-1727, October 2012.
- [5] E. G. Guba, and Y. S. Lincoln, "Paradigmatic controversies, contradictions, and emerging influences", in *The Sage Handbook of Qualitative Research*, 3rd ed., N. K. Denzin and Y. S. Lincoln, Eds. Thousand Oaks, USA: Sage, 2005, pp.191-215.
- [6] M. Veber, *Metodologija društvenih nauka*, Zagreb: Globus, 1989.
- [7] M. Vujošević, *Uloga prostornog planiranja u odnosu na druge instrumente razvoja*. Doktorska disertacija, Beograd: Geografski fakultet Univerziteta u Beogradu, 1997.
- [8] G. Swanson, "Frameworks for Comparative Research: Structural Anthropology and Theory of Action", in *Comparative Methods in Sociology*, I. Vallier, Ed. Berkeley: University of California Press, 1971, p.141-202.
- [9] B. H. Stevens, and L.C. Moore, "A critical review of the literature on shift-share as a forecasting technique," *Journal of Regional Science*, vol. 20, no.4, pp. 419-437, November 1980.
- [10] R. Barff, and P. Knight, "Dynamic Shift-Share Analysis", *Growth and Change*, vol. 19, no. 2, pp.1-10, April 1988.
- [11] J. Esteban-Marquillas, *Regional Convergence in Europe and the Industry-Mix: a Shift-Share Analysis*. Barcelona: Institut d'Anàlisi Econòmica, CSIC, 1999.
- [12] J. Esteban-Marquillas, "A Reinterpretation of Shift-Share Analysis", *Regional and Urban Economics*, vol.2, no. 3, pp. 249-255, October 1972.
- [13] M. Deakin, G. Mitchell, P. Nijkamp, and R.Vreeker, *Sustainable Urban Development Volume 2 The Environmental Assessment Methods*. Routledge, Taylor-Fransis, 2007.
- [14] F. R. Bruinsma, P. Nijkamp, and R.Vreeker, "Experts at Arm's Length of Public Policy Makers: A Case Study of Utrecht", in *Recent Developments in Evolution*, H.Voogd, Ed. Groningen: Geo Press, 2001, p.123-152.
- [15] S. Zeković, "Regional competitiveness and territorial development of industry in Serbia," *Spatium*, no. 21, pp.27-38, December 2009.
- [16] M. Vujošević, S. Zeković, and T. Maričić, "Undermined Territorial Capital of Serbia. Some Future Prospects and Predictable Scenarios", in *Regional Development, Spatial Planning and Strategic Governance*, M. Vujošević, Ed., Thematic Conference Proceedings, Volume 1, Belgrade: IAUS, 2009, pp. 21-52.
- [17] B. Balassa, *Trade Liberalisation and Revealed Comparative Advantage*, The Manchester School, 33, pp. 99-123, 1965.
- [18] M. Vresk, *Osnove urbane geografije*. Školska knjiga: Zagreb, 1980.
- [19] I. Krešić, *Prostorna ekonomija - osnove teorije, lokacije, razmeštaja i organizacije u prostoru*. Zagreb: Informator, 1982.
- [20] J. Puljiz, *Cimbenici regionalnog razvoja i regionalnih nejednakosti u Republici Hrvatskoj*. Doktorska disertacija, Sveučilište u Splitu, Split: Ekonomski fakultet., 2009.
- [21] I. Rosić, *Regionalna ekonomika*, Beograd: Naučna knjiga, 1980.
- [22] *Regionalni prostorni plan Administrativnog područja grada Beograda*, Službeni list grada Beograda, no. 10/04.
- [23] *Prostorni plan područja posebne namene koridora VII Podunavlje (kroz Srbiju)*, Službeni glasnik RS, no.1/2015.
- [24] *Spatial plan of the Republic of Serbia/Prostorni plan Republike Srbije*, Službeni glasnik Republike Srbije, no. 88/2010.

- [25] M. Vujošević, S. Zeković, and T. Maričić, *Postsocijalistička tranzicija u Srbiji i teritorijalni kapital Srbije. Stanje, neki budući izgledi i predvidljivi scenariji*. Beograd: Institut za arhitekturu i urbanizam Srbije, 2010.
- [26] S. Zeković, *Tehnički progres i regionalni razvoj industrije u Srbiji*. Posebna izdanja br.32, Beograd: Institut za arhitekturu i urbanizam Srbije, 1997.
- [27] S. Zeković, M. Vujošević, and T. Maričić, "Comparative Analysis of Territorial Development in the Belgrade Metropolitan Area and in Serbian Part of the Danube River Basin", in *Recent Researches in Engineering Mechanics, Urban & Naval Transportation and Tourism, Proceedings of the 5th IASME / WSEAS International Conference on Urban Planning and Transportation*, Cambridge, UK: WSEAS Press, 2012, p.120-126.
- [28] S. Zeković, Novi ekonomski polovi, vizija i vizualizacija prostornog razvoja metropolskih područja, In *Nova generacija evropskih dokumenata održivog razvoja i pouke za Srbiju*, M. Filipović, M. Vujošević, Ed. Beograd: Ekonomski fakultet Univerziteta u Beogradu, Institut za arhitekturu i urbanizam Srbije, 2008, pp. 109-130.
- [29] S. Zeković, and M. Vujošević, "Some global challenges for socioeconomic growth in the South-Eastern Europe: the role of industrial policy", *Second Conference of LSEE's Research Network on Social Cohesion in South East Europe Post-crisis recovery in Southeast Europe and beyond: policy challenges for social and economic inclusion*, London, 2014.
- [30] European Commission, *Cohesion policy 2014-2020*. October 2011.
- [31] *Statistical Office of the Republic of Serbia*, Belgrade, 2011, 2012 and 2013.

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