Urban transformations as indicators of economic change in post-communist Eastern Europe: Territorial diagnosis through five case studies

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ABSTRACT

The fall of the communist regimes in the Eastern European countries supposed a drastic transformation in their economic systems that has been reflected in the urban development of their cities. Urbanism from the planned socialist economy has often been replaced by strong and accelerated urbanization processes of neoliberal economies with common issues and specific casuistries of each territory. The new economic inertia, coupled with the major development of infrastructures derived from the important arrival of cohesion funds from the European Union and western multinationals investors, have meant a sudden change in the urban landscape of their territory that needs to be diagnosed from a global comparative approach to really assess the actual transformation of these former communist European countries of Eastern Europe.

In the present article, the transformations which have occurred in the urban configuration of five representative cities will be evaluated through different space-time GIS indicators: Warsaw, Budapest, Prague, Bucharest and Sofia. These indicators will help planners and decision-makers to diagnose the issues derived from the rapid urbanization associated with the new economic and social context. Their numerical and comparative analysis allow us to draw conclusions about the current situation of these processes of transformation of the territory and the future perspectives of the inertias of change in cities suffering from unbalanced urban sprawl and growth phenomena of gated communities.

1. Introduction

The fall of the Berlin Wall in 1989 and the subsequent collapse of the Soviet regime marked a turning point in the development of Eastern European countries at all levels. The transformations that followed these events can be observed today, almost 25 years later these former communist countries having been incorporated into the Western world in an accelerated, sometimes radical, way (Sager, 2011). This process has also had an important impact on the development of cities, whose urban landscape has, in many cases, undergone a significant transformation.

In this sense, one could not say that the transition of cityscape from communism to capitalism has been gradual. The abrupt adaptation to the ways of life of the capitalist city has on several occasions generated issues derived from processes of urban sprawl that are excessively unplanned and accelerated, or even too radical. The execution of capitalist policies in many countries of the former Soviet bloc has often actually had more neo-liberal connotations than in countries of Western Europe (Hirt, Sellar, & Young, 2013). This has led to sharp changes in the housing markets of the cities and in the consumer habits of the ancient and traditional Eastern European countries whose capital cities have suffer strong urban growth. This phenomenon has been accentuated by the arrival of cohesion funds private investors from the European Union.

This urban transformation has been analyzed by different authors from a global and conceptual perspective (Borén & Gentile, 2007; Sýkora & Bouzarovski, 2012) and especially from a fundamentally socioeconomic approach (Hamm, King, & Stuckler, 2012; Åslund, 2002), but not from the perspective of global cityscapes. In any case, the consequences of this complex process in the cities of Eastern Europe have not been homogeneous: one can find cases with planning problems such as Skopje (Bouzarovski, 2011); situations inherited from the war like in Belgrade (Hirt, 2009); or green peripheries devoured by capitalist land consumerism as in Moscow (Blinnikov, Shanin, Sobolev, & Volkova, 2006). Despite this, analysis from a comparative point of view of the urban development in the cities as an evaluation indicator of this process of global transformation remains quite unexplored.

This work performs an analysis that goes beyond the usual particular case study approach of the evolution of the communist cities in

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their process of transformation to capitalism. Criteria for evaluating the evolution of the development of various cities over the last few years are analyzed through the development of GIS indicators, using spatial-temporal parameters. In this sense, five cities (Warsaw, Budapest, Prague, Bucharest and Sofia) will be analyzed and numerical evaluations will be proposed to enable an objective quantifiable comparative analysis of their transformation during the post-communist period to be carried out.

2. Methodology: indicators as a tool for assessing urban development

There are not many case studies pertaining to the post-socialism situation of cities in Eastern Europe from a real comparative focus (rare examples can be found in Brade, Herfert, & Wiest, 2009 or Wiest, 2013). Interesting case studies of spatiotemporal pattern analysis of cities in urban sprawl processes can be found easily for China, Western Europe, USA or South America using GIS tools (see for example Deng, Wang, Hong, & Qic, 2009; Arribas-Bel, Nijkamp, & Scholten, 2011; Weng, 2007; Garcia-Ayllon, 2016; respectively for each territory), but the post-communist phenomenon of Eastern Europe remains quite unexplored in this of urban landscape, despite presenting well-known deficiencies, as indicated by recent studies (Hlaváček et al., 2016).

One of the main characteristics of the urban development of the communist regimes was its homogeneity and typological uniformity of the urban plot. A common feature in Eastern Europe in the 1950s was that countries had suffered great physical damage during World War II and their economies were in a state of poverty (Bunce, 1999). There was therefore a need to rebuild the cities which had been severely damaged by the war. Since the financial resources of the countries of Eastern Europe were fully controlled by the government following the nationalization of industry and land, all development and investment had to be carried out by the State. Thus most communist regimes used a kind of centrally-controlled development with the use of simplified construction methods dictated by the Soviet guidelines that were introduced at the end of the Stalinist period (Axenov et al., 2006). Communist housing planning often resulted in the construction of almost identical apartment blocks in several countries, shaping a very homogenous urban landscape. In this sense, the Soviet model configured an urban plot that can easily be analyzed spatially using GIS tools.

Urban development following the fall of the Berlin Wall presents a more complex methodological analysis (van Kempen et al., 2005). The irruption of the capitalist culture into urban planning in Eastern European countries is more difficult to model because it presents less planned, accelerated and sometimes even anarchic processes due to the market distortions (Altrock et al., 2006). This difficulty in parameterizing development patterns and its derivatives in the urban structure of cities required the use of spatiotemporal indicators in order to assess the evolution of the urban plot in different post-communist cities over the last 30 years from a homogeneous and quantifiable perspective.

2.1. Family parameters: spatial direct indicators

This parameterization will be performed through two families of indicators implemented using GIS tools. These indicators will be of a non-dimensional nature to allow a homogeneous comparative analysis of the development patterns of the different cities evaluated. A first family of primary "static" indicators will evaluate current spatial data on the urban development process of the cities in order to establish a direct comparative analysis. That first family is comprised of:

2.1.1. Green landscape index (GLI)

One of the usual characteristics of unbalanced urban growth processes as a result of rapid urbanization without proper planning is often the scarcity of green areas (Blinnikov et al., 2006). This problem often appears in countries with the application of neoliberal ideologies in which deregulation or lack of proper administrative supervision generates speculative land markets that seek to maximize private gain. In this sense, this indicator shows the global proportion of green areas existing in the whole of the city compared to the urbanized area.

$$GLI = \frac{S_n}{S_{tr}} \tag{1}$$

S_n = green areas territory (all types, without distinguishing public from private, nor natural from artificial, m^2)
S_{tr} = territory surface in reference (m^2)

2.1.2. Indicator of infrastructural development (IFD)

One of the main problems associated with economic growth in the Eastern countries and unbalanced urban development is the lack of equipments and infrastructures. In this sense, communication infrastructures and service networks may be very interesting elements when diagnosing problems of accelerated city sprawl.

Calculation Method: evaluation of the fragmented territory linked to urban infrastructure (main roads, water supply, sewage, electricity, etc.). In this case study, to simplify the GIS analysis only road infrastructures will be taken into account as a good approximation of the rest of infrastructures.

$$IFD = \frac{L_i^2}{S_{tr}} \tag{2}$$

L_i = length of infrastructures (roads and streets as reference parameter, m)
S_{tr} = territorial surface in reference (m^2)

2.1.3. Indicator of urban fragmentation (UFI)

A more complex element for quantifiably analyzing is that derived from incorrect urban planning in the city landscape. Poor quality of the urban landscape is usually associated with dysfunctional urban plots. As has been seen in different cases (Ode, Tveit, & Fry, 2008), the absence of provisions or elements that ensure the quality of the landscape are often linked to increases in a fragmented or unplanned urban plot. Therefore, links can be established between the behavior of this parameter and the existence of unbalanced growth patterns in a city.

Calculation Method: the formula generates the product of two summations modeling fragmentation due to the increase in built-up areas and the fragmentation of territory within urbanized areas creating a barrier (the higher the percentage of the index the more important the fragmentation is).

$$UFI = \sum \frac{L_i}{L_{tr}} \times \sqrt{\sum \frac{Su_i}{S_{tr}}} \tag{3}$$

L_i = maximum dimension of urban boundary (m), L_{tr} = dimension of reference boundary (m)
Su_i = Urbanized territory (m^2)
S_{tr} = territorial surface in reference (m^2)

2.2. Spatiotemporal indicators

A second family of indicators will be used in order to assess spatiotemporal patterns in urban development of cities from a dynamic approach. These indicators take into account time and space variables and allow to analyze the difference of urban processes before and after the fall of the communist regimes. This second family of "dynamic" indicators will also consist of non-dimensional parameters in order to allow a comparative analysis of the cities evaluated. That second family consists of: