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Spatial structure research by analysing land prices

ABSTRACT

During the period of planned economy, without the forces of market economy, land prices were not taken into consideration as the factors of settlement development appropriate to their significance.

In the current socio-economic conditions, land prices are notably influenced not only by the regularity of demand and supply but also by social judgement. Land prices can provide the most realistic view of different social judgements in a region.

Expanding the investigations related to land price analysis, a study by TÁNCZOS-SZABÓ L. (2012) demonstrates the territorial aspects of the issue through the example of Bács-Kiskun county enriching the methodology of spatial structure researches. The land price map of Bács-Kiskun County demonstrates the main features of the spatial structure and the characteristics of the centre-periphery relationships at municipal level.

Based on the results of our researches, we can state that land price analysis can be utilized in spatial structure researches.

Keywords: social judgements, spatial structure, land price map, Bács-Kiskun County

INTRODUCTION

Several studies analysing the relationships between the structure of cities and the social phenomena (BURGES, E. W. 1925; HOYT, H. 1939; HARRIS, C. D. – ULLMAN, E. L. 1945 etc.) underline the importance of land prices in the evolution of urban land-use zones and thus social stratification. During the period of classical capitalism, extreme disparities developed between the land prices of the innovative central financial districts and those of the peripheral areas, primarily in the American cities. Land price slope was influenced by mainly the levels of profits in those days.

During a more advanced stage of urbanisation which can be observed in the contemporary Hungary, as well (DÖVÉNYI Z.–KOVÁCS Z. 1999), recreational zones appearing around cities become the

most attractive residential areas for the society. It means that the areas close to nature become more significant, therefore the environmental conditions of settlements have a modifying effect on land prices.

During deurbanisation being the next phase of urbanisation, the migration to rural regions also having a modifying impact on land price structure can be observed. Settlement development is accompanied by changes in the social structure of municipalities with the appearance of new phenomena. Hence, land prices are also influenced by social conditions. Segregation and ghettoisation (KÖSZEGFALVI GY. – LOYDL T. 1999, 2001) emerging in greater and greater number in the disproportionately changing space undoubtedly modify the land prices, which results in a relatively quick deflation or devaluation of certain areas.

Mental environment existing within the collective consciousness of the society is the space where individuals make their own decisions relating to the environment. Mental environment has an important role in the development of land prices (ENYEDI GY. 1996). Its condition is affected by several factors such as interests, the level of education, social situation, cultural values, taste etc. and by the cultural environment in which the individuals make their opinions of the environment surrounding them. It is no coincidence that experts (COSTANZA, R. 1997) usually suggest that in case of landscape assessment and evaluation, the monetary value of a visual landscape should be determined by land price analysis besides ecosystem assessment and travel cost analysis. Hence, in the current socio-economic conditions, land prices are notably influenced not only by the regularity of demand and supply but also by social judgement.

During the period of planned economy, without the forces of market economy, land prices were not taken into consideration as the factors of settlement development appropriate to their significance. That's why the publications related to settlement research didn't focus on the issue, either. Around the millennium, more and more publications studying the relationship between settlement development and land prices were released in response to changes in ownership relations (SCHIFFERNÉ KOVÁCS K. 2000, BARTKE I. 2002, LENGYEL I. – MOZSÁR F. 2002 etc.). A general lack of data limiting the opportunities and the existence of more easily accessible data (INGATLANADATTÁR 2002) drew, however, the researchers' attention to land price analysis within real estate transactions. Thus, such geographical investigations focus mainly on the territorial characteristics of housing conditions and real estate market (LENGYEL GY. 1995, KISS G. 2002, TÓTH K.–KESERŰ I. 2001, TÓTH K. 2004). However, the reliability of housing prices on more detailed territorial levels can be questionable when the datasets also contain resale flats with very different values situated in the same district.

There is a strong relationship between land prices and housing prices in the real estate market, but not in case of the market prices of resale flats. New-home market has a more dominant role in land price development (TILK L. G. 2006). Consequently, land prices can provide the most realistic view of different social judgements in a region through housing market analysis.

The first publication which attempted to analyse the land prices of territorial units larger than settlements was released one and a half decade afterwards that market conditions became prevailing (TÁNCZOS-SZABÓ L. 2003). Following that, serving as background publications of this study, further articles (TÁNCZOS-SZABÓ L. 2005, TÁNCZOS-SZABÓ L. – ULCZ GY. 2005, TÁNCZOS-SZABÓ L. 2006, BRIN-

DZA A. – TÁNCZOS-SZABÓ L. 2009) were released underlining the usability of land prices in spacial structure analysis.

Professor Tóth's spacial theory demonstrates the spatial changes of land prices the most clearly, thereby being the most conclusive among the spacial structure theories represented by the most prominent experts of the Hungarian spacial structure researches (TÓTH J. 1982, RECHNITZER J. 1993, NEMES-NAGY J 1997, SÜLI-ZAKAR I. 2003, etc.). The most concentrated clusters of the uniform space characterised by the interactions among natural, socio-economic and infrustructural spheres are situated in the centres and around them. However, as the distance from the centres increases, which also means the decline of innovations, the "texture" of space becomes sparser. Since the spacial dominance of centres doesn't fade completely even away from cities (HAGGETT, P. 2001), the previously outlined spatial structure determination requiring a complex approach raises the review of the problem of land prices. Whereas land prices play a key role in the settlement structures and even in the social structures of cities, they must have an effect on the spacial structures of the vicinity of big cities where the socio-economic space is getting denser and denser and on the more peripheral areas, as well (TÁNCZOS-SZABÓ L. 2004).

AIMS AND METHODS

Expanding the investigations related to land price analysis, a study by TÁNCZOS-SZABÓ L. (2012) demonstrates the territorial aspects of the issue through the example of Bács-Kiskun county enriching the methodology of spatial structure researches.

The study not only compare the land prices of the settlements being part of the spatial structure of the county, but it also analyses the space-forming role of Kecskemét being the number one innovation centre of the county and the relationship between the settlement structure and the land prices of the city. Hence, the presentation of the socio-economic effects of land prices forming the spacial structure of Kecskemét is a dominant part of the study which is also reflected in its length. The research problem raised in this study was analysed by investigating the following issues

- Was the period being more than a decade enough for the market conditions becoming prevalent after the change of regime to differentiate the land prices significantly in the spatial structure of a region which, on top of it all, doesn't belong to the developed part of the country?
- How did the land prices change in the county and in its settlements during the period considered?
- What socio-economic factors cause the spatial differences of land prices?
- Can the differentiation of the spatial structure be detected away from the innovation centres by land price analysis similarly to cities? How can the centre-periphery relations of the region be defined by land prices?
- Is there a relationship between the land prices and the functional development of the towns in the region?
- What differences can be detected among the land prices of micro-regions with different image and different development levels in the county?

The research was based on the county land price data of 2000 available at the *Bács-Kiskun County Duties Office*. The database contains the average land prices of the municipal built-up areas and those of the municipal outskirts and it also gives information on the land use categories of the outskirts (arable lands, meadows, pastures etc.). In case of bigger towns, the average land prices of the downtowns and those of their surrounding areas can be found in the database, respectively. There are also available data on larger districts having a significant impact on the functional settlement structure of Kecskemét in the database, which made us possible to expand our in-depth investigation to the suburb of the county seat, as well. By updating the data to the year 2007, we could also analyse the temporal changes of land prices.

The temporal changes of land prices over a period of less than a decade were analysed. The cause of the short investigation period was partly the lack of detailed data for the previous years. A more important reason was, however, the fact that land privatisation was still in progress 10 years ago. In addition, it was a very slow process indicating only the beginning of the evolution of market conditions. More realistic land prices affected by market conditions started to evolve only in the second part of the 90's.

Since we were interested primarily in the inner structure of land prices, we ignored the inflation rate and we didn't apply inflation multiplier during the analysis of the temporal changes of land prices.

We managed to complement the database above with further real estate transaction data concerning the investigation period of 8 years, thus making possible to compare the spatial and temporal changes of land prices and real estate transactions. The whole database being unsorted in many respects involves approximately 250 000 data series containing the data of sold properties by settlements. Based on the data series, it was possible to determine the number, the year of sales, the locations, the types (residential, resort, agricultural, industrial etc.) and the values of real estates.

The sorting and filtering of data was a huge, time-consuming job. We corrected the wrong settlement names by using their postal codes. We separated the real estates of the municipal built-up areas and those of the municipal outskirts from each other with the help of their land registry numbers. For further refinements, we used the maps of the local land offices. Data reconciliation enabled us to sort the data by parts of municipalities, which was also helpful in the extension of our investigations concerning Kecskemét. In spite of the corrections, there were lots of useless data (the lack of important values, the presence of unrealistic data, non-identifiable areas etc.). Omitting them from the database was unavoidable. We applied SPSS statistics data editor and Microsoft Excel software to process and filter the immense amount of data, calculate the indicators and create data tables. After filtering, the remaining 200 000 data proved to be reliable to be used during our investigations.

Statistical analyses were primarily aimed at revealing the relationships and the supposed correlation between certain indicators of land prices and social activities in the settlements of the study area. We used the 2001 census data available at the Hungarian Central Statistical Office and the statistical yearbooks of Bács-Kiskun County to complement the database with the data of municipal level necessary to carry out correlation analysis. To analyse the outskirts, we also incorporated the Gold Crown values of the areas available at the land office of Bács-Kiskun County into the database.

We carried out the correlation analysis using 50 different statistical indicators of municipal level. Some of them were related to the land prices (of municipal built-up areas and the municipal outskirts and their changes during the considered period), others gave information on socio-economic and infrastructural levels (demography, economic activity, housing conditions, transportation etc.) which could be used in spatial structure analysis. To determine the strengths of correlations, we applied values with a significance level below 5 %, no matter if the correlation was either positive or negative.

We represented the municipal features of data used in correlation analysis on maps. The category boundaries weren't drawn by using arbitrary values, but the average values of the county, the towns etc. calculated from our compiled data series to ensure a more reliable comparison among municipalities and the parts of municipalities.

Maps and figures were created by MapInfo software. However, we also needed to build adequate digital basemaps of municipal level, micro-region level and town level (Kecskemét) on our own.

To clarify the concepts of different forms of real estates, we used the National Settlement *Planning and Construction Requirements*. According to the guide, a parcel is considered as a registered piece of land having a unique parcel number. Their values depend on the types of their utilization (residential parcels, building sites, arable lands, industrial sites, tourist sites) which are reflected in the average land prices applied by us in the studied region.

We used our large database containing information about the real estate transactions only to demonstrate the relationship between the sales of the most important types of properties and the land prices. The detection of the relationship mentioned above was assumed previously in spite of the fact that only the number and the values of the properties could be taken into consideration instead of the prices per square metre which would have given more accurate information.

Since the land price database also includes the data of the larger districts of Kecskemét, we could extend our detailed investigations in that respect, too. Hence, our study aims at not only comparing the land prices of settlements building up the spatial structure of the county but it also analyses the space-forming role of the number one innovation centre together with the relationship between the settlement structure and the land prices of the town. That's why the demonstration of the socio-economic effects of land prices forming the spatial structure of Kecskemét is a voluminous part of the study where the study area is the built-up area of the town. We represented the main features of land prices of the built-up area of the county seat according to the functional settlement structure so we also utilized the population census data supplied by the Directorate of the Bács-Kiskun County, Hungarian Central Statistical Office (KOVÁCS T. 2003).

THE MAIN RESULTS OF THE RESEARCH

The correlational calculations have supported the hypothesis that a decade after the changing of the property conditions significant differences can be detected in the land prices. At the same time these differences also reflect the main features in the county's spatial structure.

Settlement-level land prices show the centre-periphery characteristics as well. By the turn of the millenium land prices in the inner areas of the six oldest towns fulfilling the roles of centres (Kecskemét, Baja, Kiskunfélegyháza, Kiskunhalas, Kalocsa and Kiskőrös) were much higher than in other

settlements. Their attractiveness can be seen in the land prices of other settlements near them. Going away from them also means a decrease in land prices, although in this respect transport conditions also play a role.

At the beginning of the research period it was initially thought that the urbanized town centres with higher land prices in the inner areas of the new towns of the region - including Solt, Izsák, Kerekegyháza, Tompa, Dunavecse and Hajós- would take longer to develop. By now it has become obvious that the fact of actually becoming a town speeded up their urban development in a functional sense as well.

The intensive growth rate of land prices in the inner areas are typical of that part of the socio-economic space, which has more favourable conditions. In this sense it is the north-eastern part of the county that has become more prominent. The villages located near Kecskemét including Ballószög, Helvécia, Nyárlőrinc and Szentkirály are now in a more favourable situation, owing to the central role of Kecskemét as a county seat, also inducing the process of suburbanization.

When considering the natural resources in the outer areas, interestingly it was not the quality of agricultural lands that was the most important, but those resources which promoted the development of the tertiary sector. These resources include Lake Szelidi in Dunapataj, the Kalocsa resort in Foktő and possibilities for rural tourism in Ladánybene.

Land prices are in accordance with those figures which had earlier been published on the basis of nationwide research. By far the highest prices were found in the micro-region of Kecskemét while the lowest average prices were detected in the disadvantageous areas of the Bácsalmás and Jánoshalma micro-regions.

By the turn of the millenium a sharp decline in land prices had become visible, meaning in relation to the centre-periphery contrast that the difference in value was more than fifty-fold. Considering the town's real estate prices in the inner areas they were occasionally 1,000 times higher than the ones in the outer areas.

By outlining the social environment of Kecskemét it has been demonstrated that there is a detectable relationship between land prices and spatial social arrangement. Changes in plot prices in the individual segments of the city show the strengthening of segregational processes.

SUMMARY

Based on the results of our researches, we can state that land price analysis can be utilized in spatial structure researches. The applied correlation analysis confirmed our assumption that scarcely more than a decade after the change of ownership relations, great differences can be detected among land prices, which reflect the main features of the county's spatial structure.

The land price map of Bács-Kiskun County demonstrates the main features of the spatial structure and the characteristics of the centre-periphery relationships at municipal level. Analysing the data of micro-regions and towns also proves the relationship between the land prices and the spatial structure. High land prices are typical in the areas which are rich in innovations and can be characterized with denser texture. Getting farther from them, the land prices become lower. Their temporal changes are also consistent with the interactions taking place in the spatial structure.

The results of our investigations inspire us to continue our researches, with particular emphasis on the temporal monitoring of dynamics of changes.

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