SZENT ISTVÁN UNIVERSITY

Analysis of the effect of urban open spaces and open space developments on property values in Budapest

THEORETICAL FINDINGS OF THE THESIS

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AIMS

It is well understood that the social and economic effects of the development of urban open spaces affect their immediate surroundings and the broader environment. The main aim of this study is to explore the financial effect of such developments on surrounding properties.

The sample areas of the research were in Budapest. The choice was motivated by its high interconnection of residential areas and open spaces (compared with other cities in Hungary) and by the huge number of open space developments which have taken place in the capital in recent years.

First of all, the study sought answers to the following questions:

1. Is there a connection between the physical features (e.g. size, proportion of green areas, function, quality, etc.) of urban open spaces and the value of surrounding properties?
2. Can an urban open space development stimulate the appreciation of the market value of surrounding properties?
3. If the answers are yes to either of these questions, would the data reveal precise correlations?
4. To what extent do local residents consider the characteristics of neighborhoods when selecting a property?
5. Are the residents really willing to pay more for a property in a more favorable residential area with pleasant surroundings?

Conclusions were drawn by analyzing recent literature and research studies on this subject (as listed in the reference section) and by

using various research instruments and methods to analyze the effects of open space developments in the capital in the last one and a half decades.

SOURCES, INSTRUMENTS AND METHODS

The literature review covers domestic and international studies pertinent to the subject. It presents an analysis of the research, providing insights into both the economic valuation of the elements of residential areas, and into research opportunities and methods that allow the interconnection between urban open spaces and property values to be examined.[1]

A complex set of research instruments and methods were created to achieve the predetermined aims and to test the hypotheses. These instruments included reviewing *Professional Publications* about open space developments in Budapest, creating *Datasets* which described the behavior of the real estate market and *Databases* which contained information about property prices, and distributing a *Questionnaire* to gather the opinions of residents in the sample areas.

The first method used for the analyses was a *Temporal Variance Analysis Method,* which helped to demonstrate the effects over a number of years. The second was a *Comparison Analysis Method,* whereby the

[1] The studies described in this paper represent about two decades of domestic and international research activity regarding the subject, in particular a small segment of the most relevant research which supports this study's findings from environmental analyses of the selected sample areas.

effects of open spaces of varying type, quality or condition on surrounding property values could be demonstrated. The third was a *Distance/Proximity Analysis Method,* which was based on the hedonic pricing model, allowing the economic valuation of accessibility to different kinds of open spaces. For the analyses of the questionnaire, *Prevalence Studies*, *Correlation Analyses*, *Multidimensional Scaling*, *Contingent Valuation* and *LVPLS Modelling* were used simultaneously.

RESULTS

The ten sample areas for the analyses, all located in Budapest, were Lövőház Street and Millenáris Park, District 2; the New Main Street program in the city center, District 5; Hajós Street, District 6; Károly Boulevard, District 7; Mátyás Square, District 8; Kerekerdő Park, Tompa Street and Ráday Street, District 9; and Szent István Park, District 13. Data was obtained and analyzed regarding the effects of open spaces and open space developments on surrounding property values. Analyses of responses to the questionnaire explored the ways residents with or without their own home garden used public open spaces, the importance they placed on accessibility to open spaces and other physical surroundings when choosing where to live, and how these considerations affected the prices they were willing to pay.

In addition, important findings of this study also rely upon a tabular summary of findings from domestic and international studies, and the methods used for examining the database of property values.

THEORETICAL FINDINGS

Following a predetermined list of numbered hypotheses, the following theoretical conclusions were drawn from the analyses.

Hypothesis 1:

Streets, public gardens and parks which are designed, made and maintained with great care have a positive effect on the value of surrounding properties.

Theory 1:

The results of the analyses demonstrated that, when considering open spaces that have similar physical features, residential property prices are higher near open spaces of higher elemental and aesthetic quality and with physical features that add to public amenity, compared with prices in areas with less favorable facilities.

The *Comparison Analysis Method* demonstrated disproportionate rises in property values in Ráday and Hajós Streets, confirming the hypothesis that open spaces of a higher quality, with physical features that add to public amenity can raise the prices of surrounding properties. Properties on Hajós Street rose in value (disregarding incidental price rises during the redevelopment) by around 25% more than those in the control areas (Zichy and Dessewffy Streets) between 2009 and 2013. Ráday Street property values rose by much less, about 10%, in comparison with those in the control area, Lónyay Street, between 2003 and 2013.

Hypothesis 3:

The degree of influence that different kinds of open spaces in Budapest have on nearby property values varies according to the distance between these open spaces and properties.

Theory 2:

According to the results, the degree of influence that open spaces in Budapest with different structural and functional features have on property values changes according to the distance between open spaces and properties, and depends on the structural and functional features of several open spaces.

The outcomes of *Distance/Proximity Analyses* clearly demonstrated the influence of urban open spaces with a significant role in public life have on property values according to their proximity. According to the analyses, the effect was noticeable in the case of Kerekerdő and Szent István Parks. In former case, being one meter closer to the open space increased property values by about 0.1%, and in latter case by around 0.3%, based on the betterment of property values in the sample areas in 2011.

Hypothesis 4:

The degree of influence that the development of open spaces has property values in Budapest could be seen some years before certain open space developments were completed.

Theory 3:

According to the results, it can be stated that near certain open space developments in Budapest between 1998 and 2013

property values increased before these open space developments were completed, highlighting the fact that some incomplete open space developments have a demonstrable effect on property values, even before such developments are completed.

The *Temporal Variance* and *Comparison Analyses* demonstrated such increases in property values, suggesting that some open space developments could influence the surrounding property values, even before these developments were completed. Károly Boulevard property values increased by one-fifth between 2009 and 2010, as did those near the New Main Street program by 15% between 2008 and 2009.

Hypothesis 7:

The characteristics of the local area are less significant to those buying or selling property than the physical characteristics of the properties themselves.

Theory 4:

According to the results, when buying or selling properties, people ascribe at least as much importance to characteristics of the local area as to the structural characteristics of the properties.

An analysis of responses to the questions about the attention paid to neighborhood characteristics, property characteristics, and accessibility to open spaces when buying or selling properties revealed that collectively the weighted averages of responses for the local area were 3.340, for the properties' structural aspects, 3.195 and for open space accessibility, 3.085. This result is the opposite to what was expected, but it is still intriguing none the less.

Hypothesis 8:

People with a higher income are willing to pay more for a property in a pleasant, well-maintained area than people with a lower income.

Theory 5:

According to the analyses, there isn't any correlation between the willingness to pay and the income levels of the respondents. Those with a higher income were no more willing to pay more for a property in a pleasant, well-maintained neighborhood than those with a lower income.

No correlation was found between the respondents' income levels and their willingness to pay more for properties in pleasant, well-maintained neighborhoods. The average rate of willingness to pay was similar at all income levels, with a confidence interval of 95% across all groups.

Beyond the scope of the original list of hypotheses, the following theory is based on the results of the analyses.

Theory 6:

Based on the results of the analyses some of the redeveloped open spaces in Budapest lost their influence on nearby property values over time. This phenomenon could be explained by functional changes, increasing usage, and the deterioration of physical features over time.

Both the *Temporal Variance* and *Distance/Proximity Analyses* were used with the Millenáris Park neighborhood, demonstrating that the

positive effect that Millenáris Park had on nearby property values during its construction (property values increased by about 20% between 2000 and 2005) reversed in 2011. Using the *Distance/Proximity Analysis* on data available from January and February 2011, it was revealed that being one meter closer to the park meant about a 0.2% decrease in a property's value per square meter. A *Temporal Variance Analysis* of properties on Tompa Street revealed an increase of about 60% in their values after the completion of open space development between 2001 and 2003. On the other hand, values decreased by about 20% and returned to the average for that district between 2003 and 2005. Also of note were a 15% decrease in prices in the vicinity of Kerekerdő Park between 2005 and 2009, and a decrease of about 40% in the case of Hajós Street between 2000 and 2003 and between 2005 and 2008.

RESULTS FOR PROFESSIONAL PRACTICE

Hypothesis 1:

Different kinds of open spaces and open space developments could influence the surrounding properties' value at different rates.

Practical result 1:

According to the results, property values varied at different rates during the creation or redevelopment of open spaces in Budapest with different functional and structural purposes between 1998 and 2003. This variation in rates could be explained according to the types of open space developments.

Based on the results of *Temporal Variance Analyses*, property values near several open space developments varied in value over time at different rates. These rates were positive in most cases, but were negative in others. During street renovations, property values near Tompa Street (2001) increased by about +3%, while for those near the New Main Street project (2010) the increase was about +7%, and in Lövőház Street, property values increased by about one fifth. In the case of a public garden redevelopment, after 2006 a decrease of about one-tenth, and conversely after 2008 an increase of about one-twentieth was noted in property values near Mátyás Square. During the creation of a new public park for residents, Kerekerdő Park, nearby property values increased by about one-twentieth, and in the case of a new regional public park, an increase of about one-tenth was noted in property values near Millenáris Park.

Hypotheses 5:

For those who live in a home with a garden, the quality and condition of nearby open spaces are less important than those who live in a home without any garden.

Hypotheses 6:

Those residents who have a garden use public open spaces less than those who don't have any garden.

Practical result 2:

The results of the questionnaire revealed that those residents who didn't have any garden are no more inclined to use nearby open spaces than those who have a garden. Additionally,

there wasn't any difference regarding their assessment of nearby open spaces. Respondents in both groups tended to rate the quality and condition of public and private open spaces as equally important.

Contrary to expectations, an analysis of the responses revealed that people who live in a home without a garden don't report using nearby open spaces more often than those who live in a home with garden. Responses to Question 23 revealed that most respondents had almost the same opinion irrespective of having access to a private garden. All respondents agreed that the maintenance of the neighborhood was important, what is more, they also considered certain statements regarding public open spaces as less important.

Beyond the scope of the original set of hypotheses, the following finding was made based on the results of the analyses.

Practical result 3:

By using the *Temporal Variance Analysis Method* and the instruments created for it to measure the degree of influence that open spaces have on property values, the influence of planned and as yet unplanned future open space developments in Budapest could be estimated.

In the course of applying the *Temporal Variance Analysis Method*, I corrected the mean prices in the selected database (KSH Real Estate Database) with the house price indices (FHB House Price Index). This correction was needed because the mere comparison of average prices in

any given years in itself can't produce exact results due to numerous property market pricing factors. By using the *Temporal Variance Analysis Method* to analyze the modified database, changes in property values over a number of years could be demonstrated. In the cases of Hajós Street and Károly Boulevard, not only the effect of the open space developments relevant to this study, but also the effects of other equally significant open space developments could be demonstrated. The degree of influence that these other developments had on property values could be estimated according to the changes in nearby property prices. Based on the degree of influence of open space developments, the scale of the effect that future developments would have on neighborhoods could also be estimated.

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