World of Real Estate Journal
SWIAT NIERUCHOMOSCI

For Whom and What are the Benefits of Revitalization? Critical Assessment of the Consequences of Urban Renewal on the Housing Market

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ABSTRACT

Purpose – Assessment of the direction and strength of the impact of revitalization processes on price changes on the secondary housing market in downtown of Poznań. In the wider perspective – discussion of the nature of redistribution of the revitalization effects on the housing real estate market.

Design/methodology/approach – Transaction data on housing from the secondary market in Poznań downtown were used. They were obtained from public registers of real estate prices (from the period of 2006-2016). With the use of quantile regression (QR), the direction and strength of the impact of revitalization processes on changes in real estate prices were determined.

Findings – Revitalization usually causes various effects of increases in apartment prices in revitalized areas, with the strongest increase in prices in the case of the most attractive properties. On the other hand, in special situations, such as the least attractive housing stock, there may be a negative impact of city renewal on the real estate market.

Research limitations – Limited access to transactional data, time and labor consumption of the database building process, errors in the source transactional databases in public registers (e.g. data redundancy).

Research implications – The impact of revitalization on the housing market points to two hitherto unknown dangers:

1) Unequal distribution of market consequences of revitalization changes in relation to the value of housing, which significantly changes their levels of economic availability.

2) Shifting surplus values resulting from revitalization away from weaker housing stocks towards better housing stocks.

Keywords:	revitalization; urban renewal; housing market; housing prices; real estate
JEL codes:	R21, R31, R38, R58, O2, O18
Article type:	research article
DOI:	10.14659/WOREJ.2021.116.01

INTRODUCTION

Revitalization processes are widely used in Polish cities, an integrated tool of public intervention. They concern crisis areas that require comprehensive recovery programs. Among the many aspects of urban economics and sociology, influenced by the complex impacts of revitalization, relatively little attention is paid in the scientific discourse to the relations between these processes and the real estate market.

The main aim of the study was assessment of the direction and strength of the impact of revitalization processes on price changes on the secondary housing market in downtown of Poznań. In wider perspective – discussion of the nature of redistribution of the revitalization effects on the housing real estate market. The following research hypothesis was established: revitalization usually causes various effects of increases in apartment prices in revitalized areas, with the strongest increase in prices in the case of the most attractive properties.

The analysis covered all market transactions recorded on the secondary housing market in the 11-year period (2006-2016), comparing them with the revitalization activities undertaken in the capital of Wielkopolska region. Using the possibilities offered by the analysis of quantile regression (QR), statistical-econometric models illustrating the relationships in the studied area were proposed.

The diagnosis and critical discussion of the relationship between the housing market and the revitalization of urban space, in reference to the theory of land rent and external effects, led to the formulation of summative conclusions of a methodological and application nature.

LITERATURE REVIEW

Crisis phenomena in cities in Poland, as in the rest of the world, are caused by many reasons, the most important of which include deindustrialization, social problems of various grounds, and technical, functional and compositional degradation of buildings (Kaczmarek & Kazimierczak, 2019, p. 71). The provisions of the National Strategy for Regional Development 2030 indicate the high rank of urban regeneration processes, which is to foster territorial cohesion and equal opportunities for problem areas. However, revitalization in Poland is perceived as a relatively new issue, still in the phase of recognition by economic and public practice. Also in the research context, it is difficult to fully illustrate and verify it. Although it is a field well-recognized in terms of social, technical, and spatial-functional

conditions and dependencies, there are still few works that deal broadly with the importance of economic, market and business revitalization (Belniak & Belniak, 2006; Belniak, 2009; Bryx, 2009, 2012; Jadach-Sepioło 2009, 2011; Jadach-Sepioło & Sobiech-Grabka, 2016).

One of the areas that has not been fully explored are the economic relations between revitalization and the real estate market, including, in particular, the emergence of the consequences of this process on the housing market. This comprehensively researched market is an important, and most of all a common and indispensable, component enabling the satisfaction of needs and the achievement of various goals: from social, through public, to economic. In the scientific discourse in Poland, it is usually assumed a priori that revitalization results in an increase of prices on the local real estate market. On the other hand, quantitative research in this area is rarely undertaken, and at the same time it presents the issues narrowly and fragmentarily (Palicki, 2015; Bieda, 2017, 2019). According to studies from around the world, the impact of urban renewal on the real estate market can be complex and it is difficult to assess it unilaterally, which is a derivative of various macroeconomic and local conditions (Melo & Cruz, 2017; Chau et al., 2019).

In the processes of urban regeneration, particular attention should be paid to the possible occurrence of the phenomenon of appropriation of values produced in the public space. It is related to the assumptions of the theory of externalities. They are defined as "unintended and side effects of the actions of economic agents that are unavoidable under conditions of limited resources" (White, 2015, p. 313; Głuszak, 2019, p. 39). A side effect of externalities is interfering with the market mechanism. The impact of the phenomena accompanying the development of the market, of a long-term or incidental nature, has become the subject of numerous scientific considerations.

Among the stimuli from the surroundings of real estate, which should be considered as influencing in the long term, the negative impact of airports and the noise they emit was analyzed (Thanos, Bristow & Wardman, 2015; Batóg et al., 2017; Habdas et al., 2017; Huderek-Glapska & Trojanek, 2018; Cellmer, Bełej & Konowalczuk, 2019, p. 471-483) as well as other means of transportation (Kim & Lahr, 2014; Trojanek & Głuszak, 2018). Also multidirectional impact of the vicinity of green areas and broadly understood environmental resources was investigated (Koramaz & Dokmeci, 2012, p. 1222-1237; Zygmunt & Głuszak, 2015; Trojanek, 2016; Jun & Kim, 2017, p. 10-22). Among incidental circumstances causing external effects on the real estate market, environmental threats were indicated, e.g. earthquakes,

landslides, floods, disasters in nuclear power plants (Kawaguchi & Yukutake, 2017; Kim et al., 2017).

Research aimed at explaining public intervention in the field of spatial policy on the market value of real estate should be considered a separate issue. This subject also includes the issue of the impact of revitalization on this value (Leishman & Watkins, 2017, p. 202-217; Wadu & Chu, 2018, p. 1418-1436; Lai & Chau and Cheung, 2018, p. 240-248). Except for North America and Asia, relatively little of this type of work is recorded. Authors from outside Poland arrive at various conclusions in this regard, which results from the contextual nature of the revitalization processes. For example, Chau, Lai, Liang, Ng, and K.T. Wong (2019) concluded that the revitalization of urban space in Hong Kong, already at the stage of its announcement, led to a decrease in the value of premises, both in new and longer-used multi-apartment resources. They explain these phenomena primarily by anticipating an increase in demand for investment land located in the area of transformation, which in a short time will rapidly raise the supply of new investments and thus weaken the competitive position of the existing resource. Other studies in Hong Kong show that the scale of projects implemented in revitalization programs and the share of commercial projects planned in them are also important (Chau & Wong, 2014, p. 546-560). It was found that the urban renewal had reduced the market value of nearby buildings, located just outside the limits of the revitalization program. This negative effect was strongest for older properties.

Melo and Cruz (2017) presented a case study of Lisbon, in which there was a statistically significant decrease in demand for real estate in areas intended for revitalization compared to other areas of the city. According to the authors, the reason for such a state of affairs is an unfavorable assessment of the expected income from investments in building materials located in the area of planned transformations.

The reported discrepancies in the results of research by scientists from around the world indicate the need to deepen the knowledge about the effects of revitalization on the real estate market in Polish cities through empirical verification of these consequences.

RESEARCH METHODOLOGY

As indicated by numerous authors, in the case of the analysis of the phenomena in the real estate market, econometric models based on estimation resistant to the problem of heterogeneity of the variance of the residual component may be helpful. Quantile regression is considered to be

the most common in real estate market research within this group (Zarihovic-Hernert & Chatterjee, 2012; Wen-Chi & Xizhu, 2012). Therefore, in the research procedure, quantile regression models of many variables were designed, which made it possible to show the directions and strength of relationships between the independent variables and the dependent variable in the form of the unit price of residential real estate on the secondary market in the downtown of Poznań city, as clearly and in a multi-thread manner as possible.

It was considered particularly important from the point of view of the verification of the research hypothesis to show the role of city regeneration processes as a factor of which variability would help explain changes in transaction prices of flats. The models include the following independent variables (the basic statistical characteristic of the chosen independent variables is given in Table 1):

- Year_2007, Year _2008, Year _2009, Year _2010, Year _2011, Year_2012, Year _2013, Year _2014, Year _2015, Year _2016 – variables determining whether a given transaction was carried out in 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, respectively, (binary time variables with the following values: 1 - the transaction was carried out in a given year, 0 - the transaction was not carried out in a given year); 2006 was not introduced as a variable, as it served as a reference unit (ensuring non-zero variance of variables in the database);
- ŁAZARZ, JEŻYCE, WILDA, ŚRÓDKA – the variables responsible for the location of real estate purchase/sale transactions in subsequent downtown residential estates in Poznań; respectively: Łazarz, Jeżyce, Wilda, Śródka, but the area of the Old Town was not entered as a variable, because it served as a reference unit, ensuring non-zero variance of variables in the database (binary variables, with values: 1 - belongs to a given housing estate, 0 - does not belong to a given estate);
- REV_PO – a variable specifying whether a given transaction was carried out within the area covered by revitalization programs in the downtown of Poznań (binary variable with the values: 1 - belongs to the area covered by revitalization, 0 - does not belong to the area covered by revitalization);
- UA – usable area of the premises, which is the subject of the purchase/sale transaction (continuous variable with positive values, expressed in sq. m.).

The research sample was consisted of 9232 real estate market transactions. The dependent variable was the price of 1 sq. m. of usable area of flats from the downtown of Poznań.

Table 1. Basic statistical characteristic of the chosen variables

Independent variable	Average	Median	Standard deviation	Minimal	Maximal
ŁAZARZ	0.41	0.00	0.49	0.00	1.00
JEŻYCE	0.22	0.00	0.42	0.00	1.00
WILDA	0.17	0.00	0.37	0.00	1.00
ŚRÓDKA	0.03	0.00	0.18	0.00	1.00
REV_PO	0.17	0.00	0.37	0.00	1.00
UA	54.95	48.44	25.99	11.70	227.05

Source: author's analysis.

Table 2 shows the parameters characterizing the models used. The quantile estimation of the unit price of apartments was used at different percentile levels (5^{th}, 25^{th}, 50^{th}, 75^{th}, 95^{th}).

Table 2. Quantile estimation of 1 sq. m. price of the flat - for the chosen percentiles of prices

Independent variable	Coefficient (for percentiles)				
	5^{th} perc.	25^{th} perc.	50^{th} perc.	75^{th} perc.	95^{th} perc.
Constant	2308.68***	3718.55***	4669.48***	5409.49***	7164.77***
Year_2007	391.07***	1458.18***	1864.70***	2079.60***	2567.69***
Year _2008	524.77***	1652.64***	1990.52***	2229.69***	2810.58***
Year _2009	1053.58***	1696.92***	1688.61***	1806.25***	2193.87***
Year _2010	1335.09***	1858.56***	1868.31***	1932.96***	2147.75***
Year _2011	1232.78***	1881.46***	1886.66***	1889.41***	2146.01***
Year_2012	945.07***	1500.69***	1454.70***	1590.89***	1715.40***
Year_2013	1369.22***	1471.79***	1347.62***	1303.37***	1595.22***
Year_2014	1334.79***	1534.57***	1520.55***	1627.33***	1951.84***
Year_2015	1162.42***	1628.81***	1653.79***	1655.48***	2069.27***
Year_2016	1370.26***	1953.07***	1791.64***	1818.39***	2329.35***
ŁAZARZ	-86.99	-341.83***	-680.15***	-964.98***	-2182.99***
JEŻYCE	29.45	-247.98***	-479.18***	-707.14***	-2067.77***
WILDA	-69.17	-508.17***	-693.93***	-906.87***	-2209.25***
ŚRÓDKA	-315.97	-524.21***	-900.32***	-1367.91***	-2934.18***
REV_PO	-181.51***	-3.30	208.52***	574.06***	1292.87***
UA	-12.38***	-17.68***	-18.74***	-15.65***	-4.72***

*** statistical significance (p-value 0.01)

Source: author's analysis.

Among the most important information provided by the comparative analysis of parameters of independent variables, estimated in various variants of quantile regression (for the 5^{th}, 25^{th}, 50^{th}, 75^{th} and 95^{th} percentile), the following should be noted (see Tab. 2):

1) In at least several years of the analysis (2010, 2011, 2012, 2015) it turned out that the differences in the estimation of the impact of time compared to the base year (2006) were small between the first quartile, the median and the third quartile of 1 sq. m. of flat prices. In some situations, it is even visible that the estimates indicate higher parameters for the first quartile or median than for the third quartile (e.g. 2013, 2014, 2016). This seemingly gives the impression that disturbances are difficult to interpret, nevertheless such deviations are possible and have their justification. The reason lies in the distinctness of each of the quantile estimates for different percentiles. Each time they are independent econometric models in which the estimated parameters are influenced by the structure of empirical data for the assumed, specific quantile positions (percentiles).

2) Location variables (ŁAZARZ, JEŻYCE, WILDA, ŚRÓDKA) show a slight volatility of 1 sq. m. of flat prices (in terms of price volatility between the first and third quartiles) in the case of Wilda and Jeżyce. The differences amount to approximately PLN 400-500. In the area of Łazarz, this spread increases to about PLN 600, and in Śródka to over PLN 800. The analysis of the influence of location on the price of 1 sq. m. of flat typical for the 5th percentile level is omitted due to the lack of statistical significance of parameters for these variables. On the other hand, the assessment of the coefficients for the 95th percentile shows a sharp change in relation to the third quartile: in Łazarz, Jeżyce and Wilda, it reaches PLN 1,200-1300 per 1 sq. m., and in Śródka even almost PLN 1,600 per 1 sq. m. It should be noted that with the shift to higher percentiles in the 1 sq. m. of flat price distribution for each of the indicated locations, ever greater drops in these prices were recorded. For example, for the 95th percentile, locating the transaction in Śródka results in a decrease of 1 sq. m. of flat price by PLN 2,934.18 (compared to the location in the Old Town, which was the reference point in the research).

Such reaction of the housing market is an interesting hint for investors: for example, prices of 1 sq. m. of flat in Śródka are strongly lowered due to the location especially in the segment of the most attractive apartments. Therefore, they can be purchased relatively best, i.e. at significantly lower prices compared to apartments from

outside Śródka. In the case of premises with 1 sq. m. of flat prices falling on the lower percentiles, the downward correction of real estate prices in Śródka in relation to other downtown areas is weakening.

3) Revitalization in the downtown of Poznań affects the price of 1 sq. m. of residential premises the most in the case of apartments with prices at the highest market levels (the highest percentiles of prices). For the 95th percentile in the price structure, an increase in prices was observed as a result of the revitalization of downtown areas in Poznań by nearly PLN 1,300 per 1 sq. m. Meanwhile, for the median of prices, this impact was estimated at only PLN 208.52 per 1 sq. m. In the case of prices at the level of the first quartile, the estimated parameter was not statistically significant. On the other hand, for the 5th percentile (i.e. apartments with prices at the lowest market levels) it was a negative impact and amounted to almost PLN 200 per 1 sq. m. decrease. Such a decline should be understood as the negative impact of revitalization processes on the market perception of a specific property.

4) The decrease in the price of 1 sq. m. of apartments as a result of theoretical increasing their usable floor space by 1 sq. m. differs for various percentiles in the price structure. It was the strongest for the median of prices and amounted to -18.74 PLN per 1 sq. m. The mildest drop (by about PLN 4 per 1 sq. m.) was recorded for apartments with the highest prices (95th percentile in the ordered non-decreasing price structure).

RESULTS & DISCUSSION

The studies carried out on the impact of revitalization on the housing market show that the higher the attractiveness of flats (which is reflected in higher prices), the better the ability to absorb the positive effects of revitalization. Revitalization causes the greatest increase in the prices of those residential properties which are assessed most favorably on the market. At the same time, the revitalization processes of Poznań downtown reduce the prices of the most neglected premises with the lowest market attractiveness. The changes in the downtown of Poznań did not affect all real estates to the same extent, and they could even cause different reactions as regards the direction of the impact on prices. Thus, the described mechanism works unevenly, and in some situations also in different directions.

In a broader sense, it was possible to demonstrate the accompanying revitalization transfer of value from real estate with a weaker market position

to real estate with a better market position. It does not help to equalize market potentials, on the contrary - it makes the difference even worse. It should be remembered that the overall balance of the observed phenomena of the impact of revitalization on the value of flats is positive. We can talk about a certain asymmetry of the impact of revitalization, i.e. shifting the positive effects of city renewal towards real estate with a relatively higher level of attractiveness.

Interpretation of the phenomena signaled in the perspective of social and market revitalization indicates two unknown types of dangers:

1) Unequal distribution of market consequences of revitalization changes in relation to the value of apartments, which significantly changes their levels of economic availability.

2) Shifting surplus values resulting from revitalization away from weaker housing stocks towards better housing stocks.

In particular, the latter observation is disturbing and creates the risk of destroying the chances of achieving the assumed social revitalization goals. In the longer term, this phenomenon means a progressive polarization on the housing market - by creating mechanisms of appreciation of real estate already initially perceived as attractive, at the cost of depreciation and technical degradation of the weakest facilities, unable to compete for participation in the positive effects of revitalization. This is a paradoxical effect that stands in opposition to the assumptions of the revitalization processes postulating a sustainable improvement of the condition of crisis areas and the living conditions of the people located there. The direction of changes, reflected in the housing market, shows that the problems in both areas are deepening. Simply put - the affluent population can get richer thanks to revitalization, and the poor inhabitants, who occupy unattractive housing resources, are in a deteriorating situation.

These conclusions should lead to a discussion and a revision of the programming methods and instruments for the implementation of revitalization in Poland, at least in the scope of covering the housing resources with the lowest market potential with specific forms of care. Of course, the indicated mechanisms require further verification, taking into account other big Polish cities, in order to investigate the scale of the problem more widely. In the event that the phenomenon is confirmed as common, changes in the programming of revitalization of a systemic nature: legislative and methodological should be considered. In the category of legal changes, it is worth pointing to the possibilities offered by the concept of Land Value Capture, well described in the literature (Murakami et al., 2015; Śleszyński et al., 2021). The use of its assumptions allows public entities to

recover some of the positive effects of revitalization taken over by private owners of real estates.

The research findings may be biased, which results from the failure to take into account important real estate pricing factors, such as the standard, age or construction technology. Such a situation was caused by the lack of access to that data. Nevertheless, the analyzed area of the Poznań downtown is characterized by high homogeneity, considering the indicated factors, hence possible including them should not change the research results significantly.

CONCLUSION

The conducted research allowed to positively verify the hypothesis that was established: revitalization usually causes various effects of increases in apartment prices in revitalized areas, with the strongest increase in prices in the case of the most attractive properties. On the other hand, in special situations, such as the least attractive housing stock, there may be a negative impact of city renewal on the real estate market.

The empirical research presented in the article was carried out in the downtown of Poznań, so taking into account the local nature of the housing market and the contextual nature of revitalization, the observed regularities should be subject to wider verification in other cities. Assuming that similar phenomena also take place in other local real estate markets, accompanied by the implementation of revitalization programs, and that there are no other specific conditions, the discussed dependencies may turn out to be more universal.

Among the known Polish empirical studies in the analyzed area, interesting researches by A. Bieda (2017, 2019) should be mentioned. The author, using geospatial models, has identified the basic reactions of the Krakow real estate market to revitalization. In the fundamental conclusion, A. Bieda points to price increases.

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