ANALYSIS OF TRANSACTION PRICES OF RESIDENTIAL PREMISES LOCATED IN THE VICINITY OF TRANSPORTATION ROUTE – PART TWO

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Abstract

In the study, an attempt was made to verify the hypothesis regarding the negative influence of road traffic noise on the prices of residential premises located in an area of noise impact - in Poland at the Bartodzieje Housing Estate of the City of Bydgoszcz. For this purpose, an analysis of transaction prices of residential real estate located in the proximity of a busy transportation route (national road). In the area of the analysed road above, two acoustic zones (ZONE I – noise zone and ZONE II – quiet zone) were indicated, and then, based on transaction prices from 2012-2016, the housing market in the area of their impact was assessed. Strategic noise map (SNM) resources and linear regression model were used in the research. The studies show that housing prices vary with acoustic zones. The presented research is a continuation of the works, the results of which presented at the international conference: Geographic Information Systems Conference and Exhibition "GIS ODYSSEY 2017" (SZOPIŃSKA, KRAJEWSKA, 2017). At that time, another research area in Poland was examined, i.e. the Błonie Housing Estate of the City of Bydgoszcz, located along the provincial road, whether the differences between transaction prices of premises located in the noise and silence zones were statistically significant. The published results indicated the importance of continuing research in order to further and more clearly confirm or deny the existence of a connection between the level of traffic noise and transaction prices in the housing market.

Key words: road traffic noise, transportation route, residential premise, real estate value, Poland

Introduction

The level of residential real estate prices is related to different levels of environmental variables, including road traffic noise, the values of which vary depending on the distance from the source (BLANCO, FLINDELL, 2011). The impact of noise on housing prices is felt particularly in the vicinity of roads characterized by high traffic volume (LEVKOVICH et. al, 2016). In Poland, these types of roads include those of national importance (indicated with the DK symbol). Research conducted in a number of Polish cities, i.e., in Olsztyn, Bydgoszcz and Szczecin, revealed a link between transaction prices and the level of road traffic noise. SENETRA and SZCZEPAŃSKA (2011) analyzed the prices of housing in Olsztyn housing estates by conducting the interpolation of market price distribution using Shepard's method (inverse distance weighted), and then by division into three price categories and graphic juxtaposition with the acoustic map of Olsztyn. In their conclusions, the researchers found that higher prices were obtained for premises located deep within housing estates, and observed a decline in the market prices of those close to roads, though they did not specify the extent of traffic noise's impact on prices. CELLMER (2011) pointed to the usefulness of geostatistical methods in research assessing the influence of road traffic noise on the market value of residential real estate in Olsztyn, showing that road traffic noise has a significant impact on value, while the results of a simple regression analysis suggest that, in the assumed research area, individual

prices fall by 16.53 PLN/m^2_{UA} with a noise level increase of 1 dB. KRAJEWSKA and SZOPIŃSKA (2012) examined the transaction prices of flats in one of the housing estates of Bydgoszcz by analyzing the average prices calculated for each zone, based on SNMs and accounting for "*ceteris paribus*" (with other conditions remaining the same) when selecting similar premises. The authors stated that, in the chosen research area of Bydgoszcz, buyers respond to the acoustic climate through the prices they are willing to pay for real estate, with lower market prices for flats located in areas with increased noise levels. Further research by the same authors has shown that the level of road traffic noise is a value-influencing market factor (SZOPIŃSKA, KRAJEWSKA, 2016). This is also confirmed by GNAT and BAS (2014, 2017), who analyzed the prices of flats in selected housing estates in Szczecin. They examined whether there is a statistically significant relationship between the level of the L_{DEN} indicator (long-term average noise level, determined for all days in a year) for road traffic noise and the average transaction prices of $1m^2$ of UA (Usable Area) on the housing market. Results obtained in the years 2009 and 2010 indicated that the relationship between average prices and noise was statistically significant in all analyzed local markets. The strength of this relationship as demonstrated by the correlation ratios between the tested variables was moderate. The research was repeated in 2015-2016, with the results showing that the 6-year period which separated the carried out studies did not influence the relationship observed in the years 2009-2010. In all of the analyzed areas, there was a statistically significant link between the levels of the L_{DEN} indicator for road traffic noise and real estate prices. All the above studies have been prepared based on information on the characteristics of residential real estate. Currently in Poland the building of the cadastral system is in progress. Therefore, there is no precise description of the subject of the transaction, e.g. the standard of finishing and functional layout of the premises or the technical condition of the building. Gaps in the completeness of data in Poland are indicated by RĄCKA (2017), who emphasizes that as many as 80% of the sources subjected to analysis contain incomplete information.

Another research conducted at the Błonie Housing Estate of the City of Bydgoszcz in 2017, presented at an international conference: Geographic Information Systems Conference and Exhibition "GIS ODYSSEY 2017" (SZOPIŃSKA, KRAJEWSKA, 2017), showed, that the prices obtained for residential premises located in zones of increased noise levels did not reflect the fact that the buildings and flats are subject to noise nuisance, and thus may result in the decreased comfort of living of their users. According to the obtained research results slightly higher prices (on average by 2.18%) were obtained for flats found in the zone with an increased level of noise, though the difference was not statistically significant. This may signify that, in the analysed housing estate, market participants give more importance to other market features than the level of noise in the vicinity of the purchased real estate. The authors at work state that the above the may also be the effect of pseudoadaptation to an altered environment. In space in which transportation innovations do not arise (regarding the expansion of roads or introduction of new solutions with significantly higher traffic volumes, e.g. city ring roads), market participants view the existing system as a positive feature influencing value, connected with commuting to the property. Living in a space that has been unchanged for years, they get used to certain nuisances which, after some time, they cease to notice, and assess their living space positively (SZOPIŃSKA, KRAJEWSKA, 2017). In the context of the above studies, one can put forward a conclusion that for housing estates located near roads which have been **existing for an extent of time**, the influence of noise on prices is not significant. The problem outlined above provides grounds for follow-up research on the impact of road traffic noise on the prices of living premises located in the area of busy transportation routes.

Assuming that the transaction prices of real estate reflect its features, an attempt was made to answer the question of: **whether, in the area under study, noise generated by a busy transportation route has an influence on the level of transaction prices of residential premises?** The answer to the posed question will, at the same time, serve as an attempt to verify the study hypothesis which was formulated as follows: **in the Bartodzieje Housing Estate of the City of Bydgoszcz the road traffic noise has negative influence on the level of transaction prices of residential premises located in a noise zone.** The article aims to diagnose the selected real estate market within the area affected by road traffic noise originating near one of the main streets of the Polish City of Bydgoszcz – Aleja Kardynała Stefana Wyszyńskiego (hereinafter referred to as Wyszyńskiego St.), national road DK5, a main access road, and the exit road from the city towards Gdańsk. In this research the analysis was carried out on transactions completed in the years 2012-2016, derived from notarial acts contained in the real estate cadastre alongside data on road traffic noise contained in an immission map of the L_{DEN} indicator of the strategic noise map (SNM) system of Bydgoszcz (SNM, 2012). The above acoustic data are the result of phase II of the SNM mapping system in Europe. The research was carried out using the following test methods:

- studies of literature and laws regarding the protection of the environment against road traffic noise,

- studies of source materials, including information from land and building registers, strategic noise map (SNM) resources, and a base map of the study area,
- an analysis of the transaction prices of dwellings,
- study of transaction prices, including econometric modelling.

Moreover, the following computer software was used for quantitative and qualitative analyses: GeoMedia Professional (program for spatial analyses), CadnaA (program for noise analyses), Excel spreadsheet software, Statistica 13.1 computer software and a program for analyzing real estate transaction prices called *Walor*. Site inspections were used for the description of the properties.

Analysis of Transaction Prices – Case Study of the Bartodzieje Housing Estate of the City of Bydgoszcz

Study Methodology

When looking to answer the question of whether road traffic noise influences housing prices, various research methods can be used, e.g. multiple regression or the hedonic pricing method. In the case of the above methods, the dependent variable in the model is the value (price) of the valued real estate, and attributes significantly influencing the price are the explanatory variables. An alternative proposal for the econometric valuation of real estate is the model of many singular regressions proposed by KOKOTA (2004), where, on the basis of the estimated models, theoretical prices are indicated, and then averaged using the weights assigned to individual attributes of the real estate. Undoubtedly, each of the above methods requires detailed analysis of the features of the studied real estate. Prices of residential real estate can be influenced by many factors, including internal factors (physical and environmental) which are related to the actual real estate, and external factors, which are divided by KUCHARSKA-STASIAK (2016, p.190) into the following: residential, economic, legal, demographic, political and social. While physical and environmental factors are often those that differentiate the value, external factors are those that create it. With respect to living premises, the typical driving forces for buyers are: the location of the real estate, legal status, floor area, technical condition of the building and standard of finishing, accessibility, state of development of the surroundings, prestige of the location and neighborhood, and environmental factors including noise, which increases along with socio-economic development and the location of objects causing noise nuisance.

In order to carry out the study were taken to select a data set on very similar real estate differing mainly in terms of the main feature, i.e. specific location, accounting for the level of noise. Unfortunately, in the present study, it was not possible to completely eliminate all the features differentiating the premises, particularly such individual aspects as the standard of finishing, the floor area and the floor a given flat is located on. In order to verify the formulated study hypothesis econometric modelling was carried out applying the multiple linear regression model. The adopted research method corresponded to the method described in detail by SZOPIŃSKA, KRAJEWSKA (2017) and additionally it was supplemented with econometric modelling. The research was conducted in the following stages:

- selection of research areas located in the area of a busy transportation route,
- designation of two acoustic zones: NOISE and QUIET, resulting from the analyses of immission maps of the L_{DEN} road traffic noise indicator presented on the SNM (Phase II of the SNM mapping in Europe) and the Polish legislation on acceptable levels of road traffic noise in the environment,
- selection of the type of analyzed real estate market and research period of price analysis with the selection of data (the assumed period corresponded to Phase II of SNM mapping in Europe),
- identification of two submarkets of residential premises corresponding to two acoustic zones,
- grouping transaction prices of residential premises along with their aggregation and allocation to two submarkets,
- carrying out econometric modelling,
- drawing conclusions from the analysis.

In order to obtain two submarkets differing significantly only in terms of one feature, i.e. road traffic noise, the immission road traffic noise map of the L_{DWN} indicator belonging to the SNM system of the analyzed area proved substantively necessary, as due to the creation algorithm it eliminates many factors differentiating city space (e.g., land relief and land development, the presence of different forms of noise protection including green belts, the distance of the building from the noise source, or the type of land) which affect the selection of the submarket.

Study Area

The study area, with an area of 1.24 km^2, is located in the northern part of the city, near national road DK5 - Aleja Kardynała Stefana Wyszyńskiego (hereinafter referred to as Wyszyńskiego St.), a main access road, and the exit road from the city towards Gdańsk. It is part of the Bartodzieje housing estate (cadastral districts: 192, 193 and 194), which is situated approximately 4 km away from the city center (Fig. 1). This area is dominated by multi-family residential use, with buildings from the 80s of the 20th century. Additionally, multi-family housing developments from the 1930s and basic service developments also appear in these area.

Fig. 1. Study Site in the context of the Bydgoszcz city.
Source: Own elaboration on the basis of (https://pl.wikipedia.org/wiki/Bydgoszcz).

Type of Analysed Market

For research purposes, the designated residential units were characterized by a similar general location in Bydgoszcz, a similar transport structure and access to the city center, the same technical and social infrastructure, and a similar technical condition of buildings (all from the 1980s and constructed using industrialized technology), the same building architecture and a similar functional layout. The analyzed real estate varies in terms of floor area (from 17.00m^2 to 82.45m^2), floor which the flats are located on, the standard of finishing and the detailed location, which is the feature of the real estate accounting for the noise level of traffic routes. For the defined type, market area and price survey period, a total of 395 transactions of residential units were aggregated, of which 103 were located in multi-family buildings. Transactions involving buildings which were erected after 2000 and tenement houses built in the 1930s were rejected for further analyses, as it was acknowledged that these transactions concerned real estate characterized by distinct technical conditions (117 transactions). Furthermore, transactions involving buildings subject to cross nuisance resulting from the impact of noise derived from cross-sources were eliminated (14 transactions). Thus, further analyses included: 264 transactions of residential units located in 70 multi-family buildings.

Study Period

Seeing as how the purpose of the research is to determine the impact of noise on the prices of residential units, transaction prices of purchase/sales transactions of flats derived from notarial deeds contained in the real estate cadaster were used in the research in comparison with data from the National Geodetic and Cartographic Resource. This is historical market evidence obtained by the method of individual data collection. The price survey period corresponded to the current SNM mapping phase in Poland (phase II: from the beginning of January 2012 to the end of December 2016). Studying the trend for the analysed premises showed that the passage of time had little effect on the price change. From a statistical point of view, the directional assessment of the linear trend function was statistically insignificant, hence showing no effect of time on price volatility. This made it possible not to make corrections connected with changes in the level of prices resulting from the passage of time and to compare the analyzed prices with the noise level presented on the SNM.

Identification of Communication Routes Generating Road Traffic Noise

Only one type of noise was identified in the analysed region – road traffic noise generated by existing transportation routes. The spatial layout of these routes is shown in Figure 2. When analysing the road layout of study area from the beginning of 2012 to the end of 2016, no transportation innovations consisting in the extension of the existing road system and the construction of new sections of roads were confirmed. Thus, SNM resources (the second phase of mapping) were used for further studies. Transportation in the analyzed area takes place on asphalt roads, with a good condition of the road surface. Most of these are municipal roads: bidirectional and single-lane roads, with a permissible speed for wheeled vehicles of 50 km/h. Following site inspection, no noise protection in the form of noise barriers or green belts was noted. The detailed characteristics of the homogeneous acoustic sections at the time of SNM generation have been presented in Table 1.

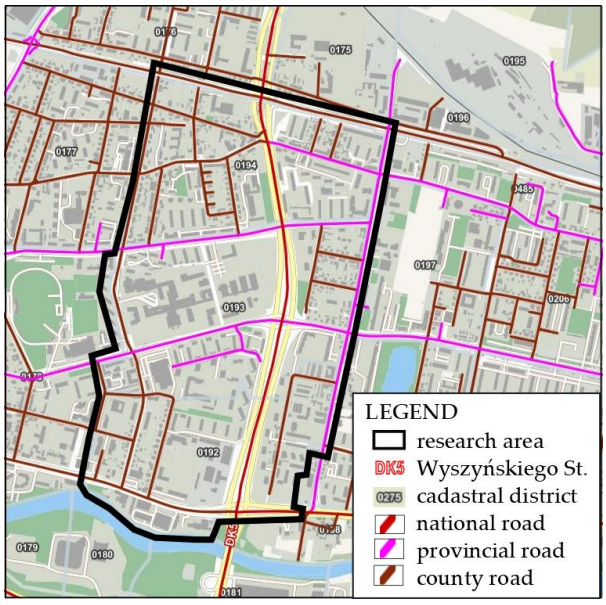

Fig. 2. Road layout for research area.
Source: Own elaboration on the basis of (SZOPIŃSKA et al., 2017).

In the analysed area, Wyszyńskiego St. (national road DK5, located in the central part of the housing estate, bidirectional, with four lanes separated by a green belt) was considered to be the main source of traffic noise (busy transportation route), characterized by the highest traffic volume (see Table 2 - row marked in red) and generating the highest level of road traffic noise, which along the road axis is over 75dB. Moreover, road traffic noise sources generating cross-nuisance in the area of residential buildings located at the first frontage alignment from the road were defined in the research areas. These are roads with traffic volume exceeding 1,000 vehicles per hour (see Table 2 - row marked in grey).

By analyzing noise data found on a road traffic noise imission map of the L_{DEN} indicator of the SNM system for the city of Bydgoszcz (SNM, 2012), two acoustic zones were identified for the main noise sources. For multi-family development, the borders of the above zones are determined by the value of the permissible road traffic noise level L_{DEN} indicator, which is equal to 68 dB (REGULATION, 2007), including:

- ZONE I (noise zone) is an area of noise nuisance created by the impact of road traffic noise exceeding the permissible value for the analyzed noise sensitive objects and the analyzed long-term noise indicator,
- ZONE II (quiet zone) is an area outside the zone of noise nuisance, created by the impact range of road traffic noise not exceeding the permissible values for the analyzed noise sensitive objects and the analyzed long-term noise indicator.

When analyzing the spatial range of the ZONE I, noise generated by Wyszyńskiego St. contributes to the emergence of noise nuisance in adjacent areas of almost 0.31 km^2. The ZONE II (quiet zone) represents the remaining area of 0.93 km^2, which accounts for two thirds of the total research area (Fig. 3).

Table1. Characteristics of road traffic noise sources in the analysed area.

NAME OF STREET	ROAD CATEGORY	NUMBER OF PASSENGER VEHICLES	SHARE OF HEAVY GOODS VEHICLES	SPEED LIMIT	TRAFFIC LIGHTS
Wyszyńskiego	national	1686	7.9	50	Yes
Kamienna	county	1367	4.6	50	Yes
Jagiellońska	county	1666	4.2	50	Yes
Fordońska	national	1545	7.5	50	Yes
Curie-Skłodowskiej	provincial	1183	2.0	50	Yes
Powstańców Wlkp.	provincial	891	3.0	50	Yes
Głowackiego	provincial	179	0.0	50	No
Gajowa	provincial	372	5.0	30	Yes
Kosynierów	county	27	0.0	50	No
Lansjerów	county	27	0.0	50	No
Żmudzka	county	72	3.7	50	No
Pałucka	county	51	0.0	50	No
Ściegiennego	county	43	6.0	50	No
Huculska	county	51	0.0	50	No
Lelewela	county	3	0.0	30	No
Cicha	county	36	7.4	30	No
Mierosławskiego	county	3	0.0	30	No
Chodkiewicza	county	43	0.0	50	No
Plater	county	127	0.0	40	No
Wybickiego	county	32	0.0	20	No
Powstańców Śląskich	county	32	0.0	50	No
Romańskiego	county	36	7.4	50	No
Łużycka	county	260	0.0	50	No
Jurasza	county	441	0.6	50	No
Pestalozziego	county	39	6.9	50	No

Source: Own study.

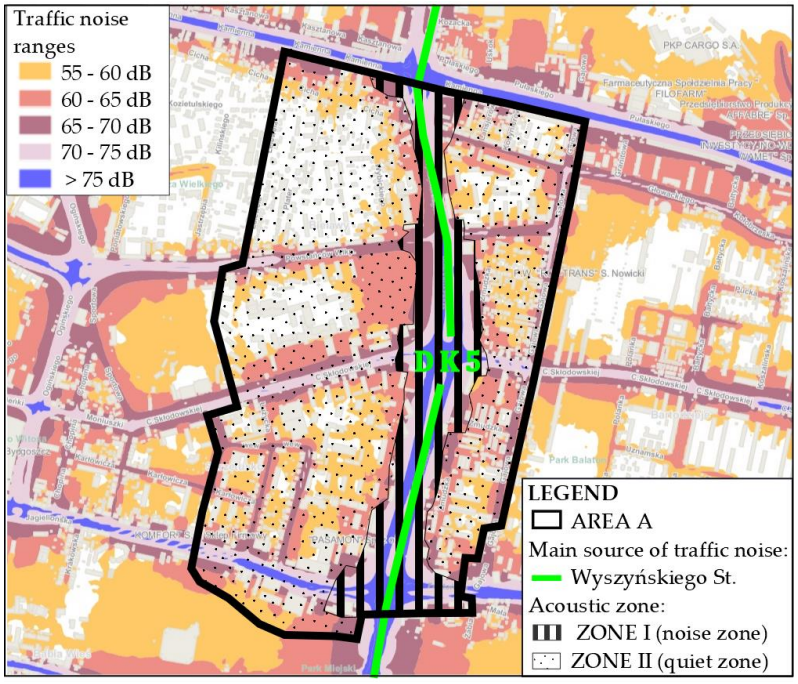

Fig. 3. The spatial range of acoustic zones with respect to the main sources on the ambient concentration road traffic noise imission map of the L_{DEN} indicator.
Source: Own elaboration on the basis of (Szopińska et al., 2017).

Analysis of transaction prices of residential units using a linear regression model

The location of the buildings at different distances from the main source resulted in the selection of two submarkets, the range of which coincides with the respective acoustic zones of: ZONE I and ZONE II. Information from the market of residential premises for the two zones has been presented against the background of the L_{DEN} indicator noise immission map of the SNM system of the City of Bydgoszcz (Fig. 4). Based on the data prepared by SZOPIŃSKA, KRAJEWSKA and PUTEK-SZELĄG (2017), the following submarket were distinguished:

- ZONE I (submarket I) – flats found in 22 buildings, located in the noise impact area – 89 authentic market transactions, the average price of which, for 2012-2016, was P_{av} = 3,413.89 PLN/m$^2_{UA}$ (P_{min} =1,884.57 PLN/m$^2_{UA}$, P_{max} =4,525.14 PLN/m$^2_{UA}$),
- ZONE II (submarket II) – flats, found in 48 buildings, located outside the noise impact area – 175 authentic market transactions, the average price of which, in 2012-2016, was P_{av} = 3,533.47 PLN/m$^2_{UA}$ (P_{max} =1,910.13 PLN/m$^2_{UA}$, P_{max}=5,258.62 PLN/m$^2_{UA}$).

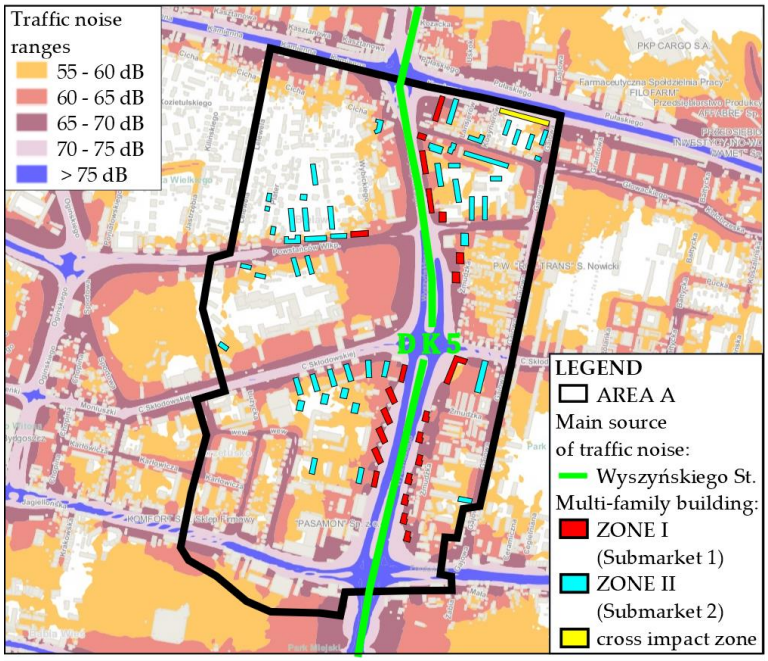

Fig. 4. Location of buildings with premises accepted for analyses.
Source: Own elaboration on the basis of (SZOPIŃSKA et al., 2017).

Multiple regression analysis was carried out using the ordinary least squares (OLS) regression model. The following assumptions were made when carrying out calculations:

- the model is linear (or can be brought to a linear form),
- explanatory variables (market features) are non-random values,
- co-linearity does not occur between the explanatory variables,
- the random factor is a random variable, the mathematical expectation of which is equal to zero, and variance is a constant,
- observations are independent,
- the random component is not correlated with explanatory variables,
- the number of explanatory variables is lower than the number of observations,
- there are no interdependencies between random components of individual equations of the model.

First analyzed was the correlation between prices of flats and their features. In order to assess the correlations of quantitative features, Pearson's correlation coefficient was used, with the test of independence χ^2 and adjusted contingency coefficient used for qualitative features. Further analysis accounted for the attributes of flats which were not strongly correlated with each other, presented in detail in Table 2.

Next, explanatory variables of low internal diversity (variation coefficient V≤0.10), as well as those which were statistically not significantly correlated with the explanatory variable (location on the ground floor) were eliminated from the set of attributes. For the analyzed area, a model of time series was constructed, showing the influence of explanatory variables on the price of an apartment in a given area at

a given time. The dependant variable in the models constructed below is the price per square meter [PLN/m^2_{UA}] of a flat. The obtained regression coefficients can be interpreted as the influence of individual variables on the changes in unit prices: how much, on average, the unit price will change (increase or decrease) in the case when the independent variable which the given coefficient refers to increases by one unit. The results of regression have been presented in Table 2.

Table 2. Qualitative and quantitative variables used in the regression model for flats.

VARIABLE	SYMBOL	DESCRIPTION
Price	Price	Price of flat [PLN/m^2_{UA}]
Area of apartment	Area	Usable area of apartment [m^2]
Type of building	Low – 1 (building of up to 4 storeys) High – 0 (building of more than 4 storeys)	A dummy variable. If the apartment is located on the 4th floor of a building, it takes the value of 1; otherwise it takes 0
Construction technology	Traditional – 1 (building constructed using traditional technology) Prefabricated – 0 (building constructed using prefabricated technology)	A dummy variable. If the apartment is located in a building constructed using traditional technology, it takes the value of 1; otherwise it takes 0
Floor	f0 (ground floor), f1 (1st floor), f2 (2nd floor), f3 (3rd floor), f4 (4th floor), f5 (5th floor), f6 (6th floor), f7 (7th floor), f8 (8th floor), f9 (9th floor), f10 (10th floor), f11 (11th floor), f12 (12th floor),	13 dummy variables. If the apartment is located on a given floor, it takes the value of 1; otherwise it takes 0
Technical condition of apartment	Average – 1 (apartment in average technical conditions) Renovation – 0 (apartment intended for overhaul)	A dummy variable. If the apartment is in good technical condition, it takes the value of 1; otherwise it takes 0
Acoustic zone	Quiet zone – 1 (if building in which the apartment is located is exposed to road traffic noise of under 68 dB) Noise zone – 0 (if the building in which the apartment is located is exposed to traffic noise of over 68dB)	A dummy variable. If the apartment is located in a quiet zone, it takes the value of 1; otherwise it takes 0

Source: Own study.

Table 3. Multiple regression.

VARIABLE	SUMMARY OF DEPENDANT VARIABLE REGRESSION: UNIT PRICE R= 0.31407499; R-SQUARED = 0.09864310; ADJUSTED R-SQUARED = 0.09173615; F(2,261)=14.282; P<0.00000; STANDARD ERROR OF REGRESSION S = 544.24; N=264					
	b*	Standard error from b*	b	Standard error from b	t(261)	p
Const.			3988.043	127.0725	31.38400	0.000000
Area of apartment	-0.300224	0.059204	-13.598	2.6815	-5.07103	0.000001
Acoustic zone	0.135604	0.059204	163.503	71.3840	2.29047	0.022792

Source: Own study.

The parameters of the regression function showed statistical significance (at the level of $p<0.05$). Based on the constructed model, it can be concluded that the prices of apartments in this area were influenced by:

- the area of the flat (destimulant) – along with an increase in area by 1 m^2 , unit price decreased, on average, by 0.30 PLN/m^2_{UA},
- acoustic zone (stimulant) – location in the quiet zone resulted in an average increase in price of 0.14 PLN/ m^2_{UA}.

R-squared indicator was 0.09864310. This means that the constructed model explained less than 10% of changes of the dependent variable. The value of the adjusted R-squared indicator (accounting for the number of independent variables in the model) equalled 0.09173615 and did not deviate significantly from the general coefficient.

Summary and Conclusion

This article confirms the hypothesis that noise generated by a busy transportation route (main source – national road DK5, Wyszyńskiego St.) at the Bartodzieje Housing Estate of the City of Bydgoszcz has an influence on the level of transaction prices of residential premises located in a noise zone. The results showed that property buyers react by prices to the presence of a busy transportation route generating noise impact in the area of real estate that is of interest to them. The carried out analysis makes it possible to formulate the following conclusions:

- accounting for the objective impact of noise, 22 of 48 multi-family buildings were located in the noise impact zone (ZONE I),
- the average price of residential premises in ZONE I obtained from 89 credible market transactions pertaining to the sales of residential premises situation in buildings under the impact of noise was P_{av} = 3,413.89 PLN/m^2_{UA},
- the average transaction price of residential premises in ZONE II, obtained from 175 credible market transactions pertaining to the sales of residential premises situated in buildings outside the noise impact zone was P_{av} = 3,533.47 PLN/m^2_{UA},
- based on the constructed linear regression model, it can be concluded that the prices of apartments in this area were influenced by: the area of the flat (destimulant) – along with an increase in area by 1 m^2 , unit price decreased, on average, by 0.30 PLN/m^2 $_{UA}$ and acoustic zone (stimulant) – location in the quiet zone resulted in an average increase in price of 0.14 PLN/ m^2 $_{UA}$.

As shown by the literature review and our own research, the research problem in question is important, both from a scientific and cognitive point of view. Following the analyses above, it was found the average price of 1m^2 of housing exposed to noise nuisance in the NOISE ZONE, lying in the vicinity of the DK5 national road - Wyszyńskiego St., is 3.4% lower than the price of apartments in the QUIET ZONE. This was confirmed by the constructed linear regression model, which indicated that there is a relationship between price and the floor area of an apartment as well as the acoustic zone. In comparison to the research conducted at the Błonie Housing Estate of the City of Bydgoszcz (SZOPIŃSKA, KRAJEWSKA, 2017), the results obtained do not coincide. In Błonie, slightly higher prices (on average by 2.18%) were obtained by premises located in the area with an increased noise level, however, this difference was not statistically significant. The currently presented case study referring to the areas located along the national road in the Bartodzieje Housing Estate of the City of Bydgoszcz, allows a different conclusion that noise is a feature significantly affecting the price of premises. However, the results obtained in each research area are not convincing enough to clearly define the relationship between communication noise and transaction prices. However, they can be an impulse for further research on other roads with high traffic (national and provincial). It is positive, however, that the existence of certain relationships is unquestionable, and therefore it is very purposeful to continue research in this field.

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