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Polish Residential Property Market During Economic Slowdown Exemplified by a Medium-Size Town

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Abstract

The main objective of this paper is to examine the dynamics of downward trends in the residential property prices exemplified by a medium-size city. A hypothesis is made that the dynamics of the decline of residential property prices in the times of crisis is much poorer in medium-size cities than in large urban agglomeration. The analysis deals with the West Pomeranian city of Koszalin with the population of 108,6 thousand. The study covers the quarters of 7 years between 2009 and 2015. The object of the study is a secondary market of residential property and cooperative ownership right to residential property. The analyses were conducted by means of mathematical statistics tools. The findings of the study on the residential property market in Koszalin are presented in reference to the data on residential property markets in 17 of Poland's largest cities. The data come from the Register of Property Prices and Value of the Municipal Surveying and Cartographic Documentation Centre in Koszalin Center and from the Database of Residential Property Prices of the Polish National Bank.

Keywords: real property market, residential property, market analysis

Introduction

The resurgence of the market economy in Poland in the 1990s resulted in the increased importance of the Polish real estate market, particularly of its residential segment. The relevance of the residential property market stems from the fact that in the market economy a dwelling, apart from its economic function (as a form of investment), plays a vital social role as it satisfies a principal, constitutionally granted human right to accommodation. The residential market is closely correlated with the economy, being its essential element. On the one hand, it influences macroeconomic variables by participating in the generation of the gross domestic product (GDP), contributing to the national wealth, creating jobs, providing tax revenue or encouraging investors to dust off their frozen capital. On the other hand, the processes taking place in the economy may drive up or slow down the growth of the residential estate market, primarily by modifying interest rates, changing the demand for residential space or making other forms of capital investments more or less attractive (Kucharska-Stasiak 2006, 96–102; Wiśniewska 2004, 65–84). Functioning and development of the (residential) property market is determined by many factors, the main ones being demographic, economic, financial, legal and political factors (Gawron 2011, 24; Kałkowski 2001; Kucharska-Stasiak, Załęczna, and Żelazowski 2012, 6). Such specific features of the residential property market as market failure, ineffectiveness, low flexibility of supply and demand and, first of all, its local character implicate the fact that the responsiveness of local markets to the external signals is diversified in terms of its promptness and scope.

The above indicated implication has become a rationale for this study, the purpose of which is to assess the effect of the global economic crisis that struck in August 2008, on the residential property market in Koszalin. The paper verifies the research hypothesis about the diversified impact of the economic slowdown on local residential property markets of different size (urban agglomerations and medium-size towns). The object of this study is the residential property market in Koszalin. The study covers the subsequent quarters between 2009 and 2015. The data come from the Register of Property Prices and Value (RCiWN) of the Municipal Surveying and Cartographic Documentation Centre in Koszalin Center and from the Database of Residential Property Prices (BaRN) of the Polish National Bank. The results obtained for the residential property market in Koszalin are juxtaposed with the data on Poland's 17 biggest cities. Statistical and econometric methods have been used to achieve the pursued objective.

1 Residential Property Market in Poland — Development Stages

The residential property market is understood as space where the demand for housing meets the supply, thus shaping property prices and creating the opportunity for making transactions (Łaszek 2006, 10). Since the revival of the Polish property market in the 1990s we have seen its subsequent development stages. Different authors use their own criteria to identify these stages (see also tab. 1):

- Kałkowski, when evaluating the opening balance at Poland's accession to the European Union, refers to two time intervals (transformation period of 1990–2004 and the time following Poland's accession).
- Henzel, referring to the domestic legal and economic changes, distinguishes four development stages on the Polish property market: 1989–1992, 1993–1995, 1996–1999, and the time after.
- Foryś takes into consideration phenomena that shaped the Polish market after 1989 and distinguishes three development stages: 1990–1997, 1998–2004 and the time after 2005).

The development stages on the residential property market overlap with the cycles in the Polish economy and, in connection with this economy, with the cycles on the real estate market (Foryś 2014, 212–213). The fluctuations in the economy trigger trend movements on this market and, vice versa, the changes on this market are the driver of changes in the economy. What is relevant for the market growth in the long run are cyclic trends and fluctuations (Kucharska-Stasiak 2005, 83).

Tab. 1. Development stages of the Polish real (residential) property market after 1989

Considering the opening balance at Poland's accession to the European Union according to Kałkowski	**Considering domestic legal and economic changes according to Henzel**	**Considering phenomena affecting the Polish market after 1989 according to Foryś**
• period of transformation: 1990–1999 — a decade of systemic transformation 2000–2004 — a period preceding Poland's accession to the EU • period following Poland's accession to the EU (from 2005 onwards)	• stage I (1989–1992) — time of intensive work on changing legal regulations and market institutionalisation • stage II (1993–1995) — outflow of capital to the securities market, weakness of the money market, oversupply of industrial property shortage of office space, inflow of foreign capital • stage III (1996–1999) — legislative changes, increased attractiveness of real property as capital investment • stage IV (from 2000 onwards) — emergence of mortgage banks and real property funds, decrease in transaction prices and rents, increased vacancy rate, process of adapting domestic property market to western markets	• period of adapting legal and organisational solutions to the requirements of a market economy (1990–1997) — ownership transformations in 1990–1994 followed by the period (1995–1997) of creating market mechanisms, incl. market institutions which ended with adoption of the Act of 21 August 1997 on real property management) • period of verifying the adopted solutions and of pre-accession actions (1998–2004) • period of convergence with international markets (from 2005)

Source: Own elaboration based on Foryś (2011, 12), Henzel (2007, 1–12), and Kałkowski (2007, 36–71)

2 The Nature of Volatility of the Residential Property Market

Similar to other markets and the economy in general, the residential property market is subject to volatility. In time series of variables describing this market we can single out the trend and the seasonal, random and cyclical fluctuations. The variables can be the supply, the demand and prices. However, due to the difficulty in estimating the supply and the demand, the most common subject of analyses are the residential property prices (Trojanek 2011, 361–363). The trend is an expression of long-term changes and can be characterized with a continued upward or downward tendency estimation over a period of time which is relatively long in comparison to the economic cycle. The real property market develops in accordance with the general economic trend, but the trends on this particular market can be shorter than the general economic ones and can occur locally at irregular intervals (specificity of local markets) (Kucharska-Stasiak 2005, 83–84). Seasonal fluctuations are the changes in economic activity throughout a calendar year, depending directly or indirectly on the season. They occur at regular intervals at least once a year (e.g., take on a seasonal character of the demand for rented accommodation in university towns). Random fluctuations are non-periodic movements in business activity being an effect of legislative or court decisions, strikes, floods or other natural disasters that are directly or indirectly reflected in economic processes. They cannot be predicted, hence no measures can be taken to prevent them and their consequences are hard to redress. The property market cycle is defined as recurring but irregular movements in the global revenue from all types of real property, also expressed by other property market indicators, and preceding or lagging behind the mean of all types of real estate (*Understanding the Property…* 1994, 9). It denotes tendencies in the supply, demand, prices and rates of return on property in relation to the deviations from their long-time trends or mean values (Baum 2001, 114). Between 1990 and 2009 the Polish property market saw two booms (1996–1999 and 2005–2008) and three recessions (1990–1995, 2000–2004 and 2009 until now). It can be clearly seen that the bear markets lasted twice as long as the bull markets. Yet, the power and direction of the mutual impact between the economy and the property market vary geographically (Foryś 2014, 212–213).

3 Analysis of Property Market Transactions in Koszalin

Koszalin is a county-status city located in Central Pomerania belonging to the Zachodniopomorskie Voivodship. It has a population of 108,6([1]) thousand and covers the area of 9 834 ha divided into 54 geodesic areas and 17 housing developments (fig. 1). In the light of the study on land use conditions and directions adopted in Koszalin, the city has been divided into the following functional and geographical areas:[2]

- city centre — the area encircled by a bypass, with high concentration of services of local and regional character as well as with a housing function
- industrial area in the western part of the city separated from the city centre by the railway, with prevailing industrial, storage and production functions as well as housing
- residential areas in the northern and western parts of Koszalin, with developments consisting of multi-family and single-family houses accompanied by service companies
- area to the south of the city centre with a combination of multi- and single-family housing developments (Osiedle Lechitów) with production, storage and infrastructure functions
- city outskirts (former villages) being prospective suburban area of family houses, the villages of Jamno and Łabusza annexed into the city limits on January 1, 2010, with modest tourist infrastructure and the capacity to become a leisure area and tourist attraction as well as a residential area, with predominantly single-family housing

1. [In the journal European practice of number notation is followed — for example, 36 333,33 (European style) = 36 333.33 (Canadian style) = 36,333.33 (US and British style). — Ed.]

2. See: Uchwała Nr XLVII/673/2014 Rady Miejskiej W Koszalinie z dnia 4 września 2014 r. w sprawie Studium uwarunkowań i kierunków zagospodarowania przestrzennego miasta Koszalina ze zmianami. [Resolution of the City Council in Koszalin], [@:] http://www.bip.koszalin.pl/?a=19613, page 23.

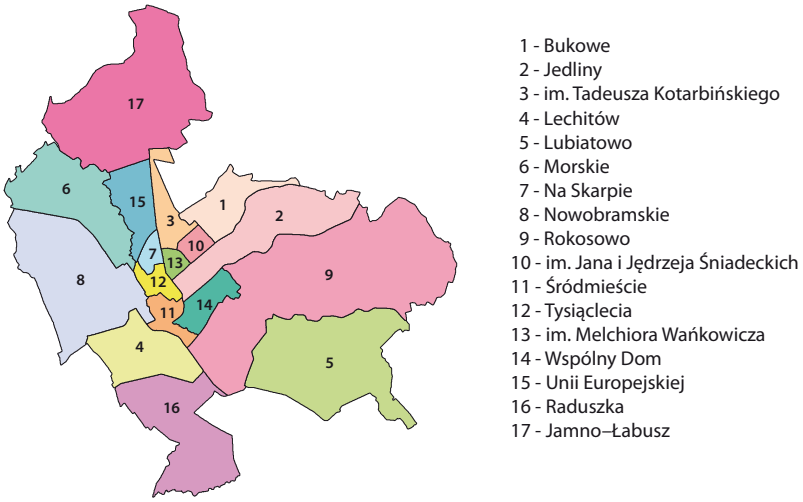

Fig. 1. Koszalin — housing developments

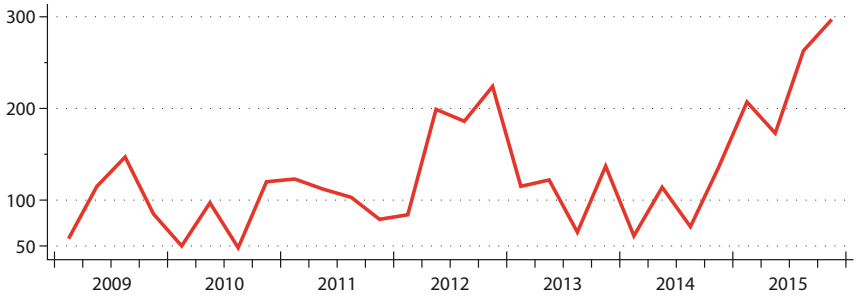

Fig. 2. Quarterly numbers of transactions on residential property market in Koszalin in 2009–2015

Source: Own study on the basis of RCiWN MODGiK in Koszalin

In the years of 2009–2015 the Koszalin secondary residential property market saw 3 650 transactions, with the leap from 405 in 2009 to 999 in 2015, which meant the increase by 147%. The low in the number of transactions (315) was hit in 2010, which accounted for a 22% drop in comparison to the previous year. The record year was 2015 with 999 sold properties — i.e., with the increase by 162% year to year (fig. 2).

In the analyzed period of time almost a half of the transactions (46,96% of the total number) concerned flats in three housing developments located in the central part of the city: Wspólny Dom (22,66% of transactions), Śródmieście (12,90%) and Tysiąclecia (11,40%). The least attractive were properties in the developments located in the outskirts of the city where old family houses prevailed: Lubiatowo (0,22% of transactions) and Jamno Łabusz (0,52%) (fig. 3). Between 2009 and 2015 the residential property market in Koszalin saw a decrease in the mean transaction price of 1 m^2 of floor area from PLN 3 744 in 2009 to PLN 3 701 in 2015, which is 1,14%. A similar tendency was reported on the property markets in 17 of the largest Polish cities, but the trend dynamics varied in individual cities (fig. 4). In order to find out if the residential property market in Koszalin (quarterly mean prices of 1 m^2) differ from the local markets in 17 of the largest Polish cities, we determined trend models for the Warszawa market in the next largest six cities (Gdańsk, Gdynia, Kraków, Łódź, Poznań, Wrocław) as well as in the ten remaining ones (Białystok, Bydgoszcz, Katowice, Kielce, Lublin, Olsztyn, Opole, Rzeszów, Szczecin, Zielona Góra). The expression denotes the quota value of the trend in one month. The expression denotes a theoretical price of 1 m^2 on the day of the first transaction in the analyzed sample.

The analysis of econometric models created for the above cities shows that the larger the city (the higher unit prices of 1 m^2), the deeper the drop in prices in the analyzed period. Moreover, the verification of hypotheses about the accuracy of structural parameters in individual models made us reject the hypothesis H_0: $a_i = 0$ in favour of the alternative hypothesis H_1: $a_i \neq 0$ stating that they were statistically significant. The estimated model parameters and the basic regression charac-

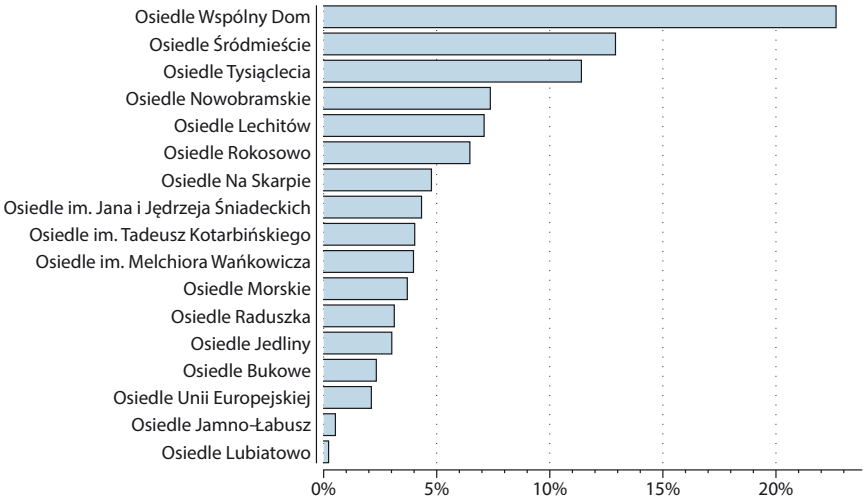

Fig. 3. Residential property transactions in housing developments in Koszalin in 2009–2015

Source: Own study on the basis of RCiWN MODGiK in Koszalin

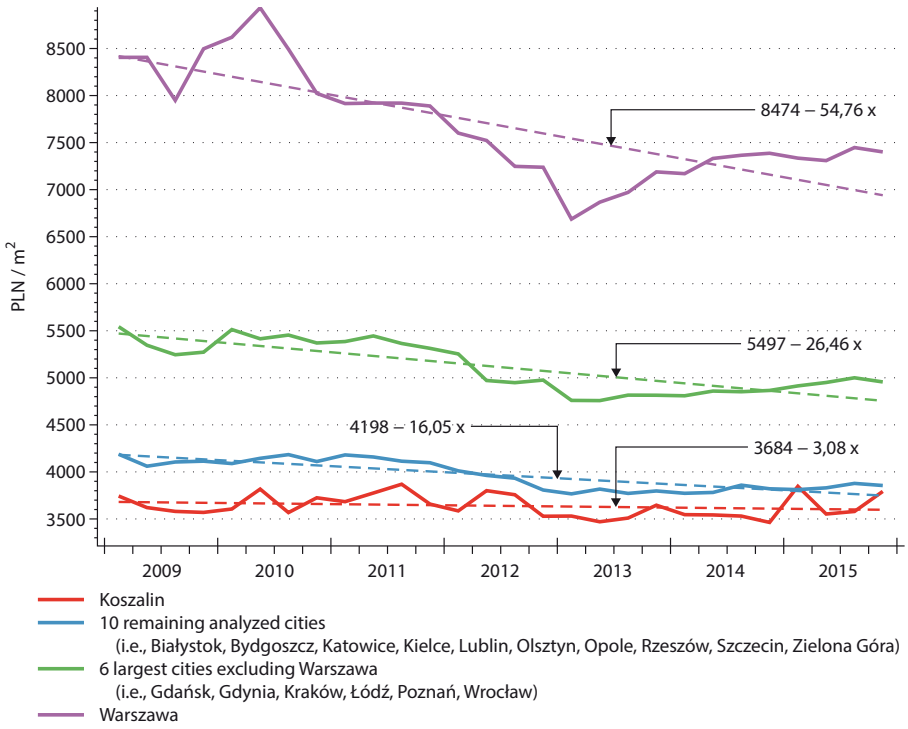

Fig. 4. Dynamics of mean residential property transactional prices on the secondary market

Source: Own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data (as published on 2016.04.14)

teristics for the analyzed cities and for Koszalin are shown in table 1. Seasonal fluctuations were not included in the considerations. The random component error (SER)[3] means that the quarterly mean price of 1 m^2 in the analyzed cities differs from the one calculated on the basis of the model by the average of +/– SER value (e.g., for Koszalin model—by PLN 119,64). The most significant drop in the residential property prices (represented by the slope of the trend line) was recorded on the Warszawa property market, followed by the six next largest cities (Gdańsk, Gdynia, Kraków, Łódź, Poznań, Wrocław). The Koszalin residential property market was declining at the slowest rate.

3. [Standard Error of the Regression is sometimes called the standard error of the estimate or the root mean squared error.—Ed.]

Tab. 2. Evaluation of trend parameters of transactional prices in Koszalin and in the selected cities

Variable	a_i	$Se(a_i)$	t-stat.	p-value	R^2	SER[a]	n
Regression for Warszawa							
constant	8 473,96	142,91	59,30	< 0,001	0,61	368,02	28
time	−54,76	8,61	−6,36	< 0,001			
Regression for the six large cities excluding Warszawa							
constant	5 497,06	60,33	91,12	< 0,001	0,67	155,35	28
time	−26,46	3,63	−7,29	< 0,001			
Regression for the ten remaining large cities							
constant	4 197,74	33,08	126,90	< 0,001	0,71	85,19	28
time	−16,05	1,99	−8,06	< 0,001			
Regression for Koszalin							
constant	3 683,85	46,46	79,29	< 0,001	0,04	119,64	28
time	−3,08	2,80	−1,10	0,281			

Source: Own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data (as published on 2016.04.14).
[a]Standard Error of the Regression

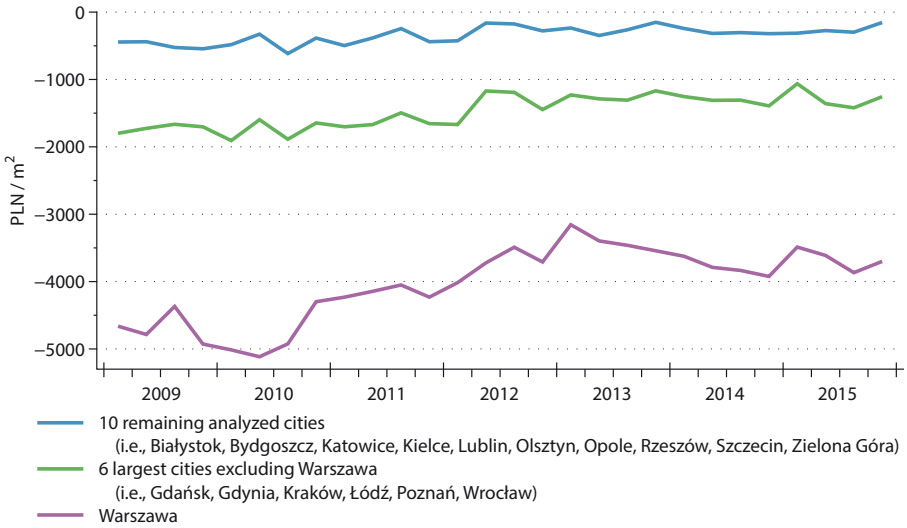

Fig. 5. Differences in the mean residential property selling prices in Koszalin in relation to other analyzed cities

Source: Own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data (as published on 2016.04.14)

There was a vast range of diversity of unit transactional prices in Koszalin and other cities under study. The greatest differences were reported in the initial phase of the bear market (fig. 5). In the analyzed period of time the quarterly mean transaction prices in Koszalin differed by 150–600 PLN/m^2 from the prices reported in ten largest cities, and by 1 100 –1 800 PLN/m^2 from the prices in six largest cities excluding Warszawa. In both cases, the biggest discrepancies were seen in the 3rd quarter of 2010, which could have meant that the Warszawa market responded faster to the signals of the economy than the remaining local markets. Noticeable differences resulted from the rate at which unit prices were changing as well as from the volume of the drop in prices in reference to the base period. Figure 6 shows indices with the fixed base of mean unit transaction prices of residential properties in Koszalin and in the remaining surveyed cities (1st quarter of 2009 = 100). The most significant fall in unit prices in relation to the 1st quarter of 2009 (over 20%) was seen in Warszawa, followed by six largest cities (approximately 14%) and ten large cities (up to 10%). In Koszalin the maximum price decrease in comparison to the 1st quarter of 2009 was reported in the 2nd quarter of 2013 (over 7%).

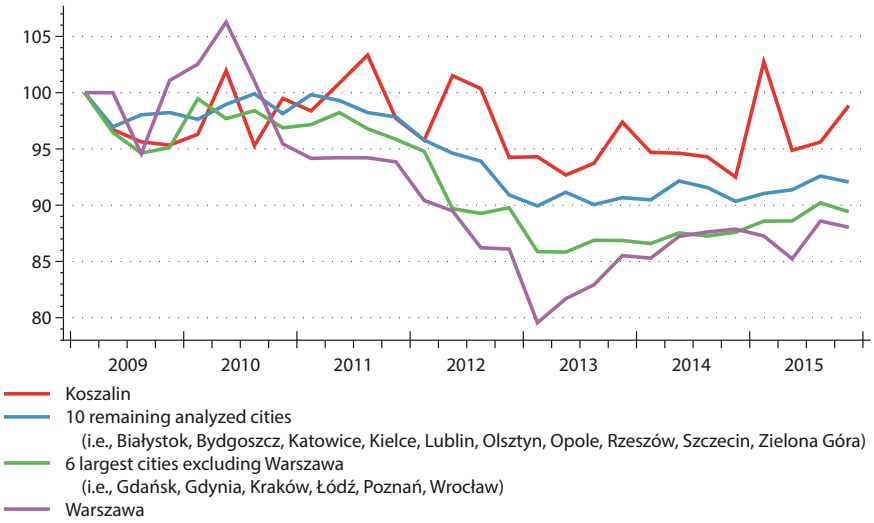

Fig. 6. Fixed bases of mean unit transaction prices in Koszalin and in other analyzed cities (1st quarter of 2009 = 100)

Source: Own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data (as published on 2016.04.14)

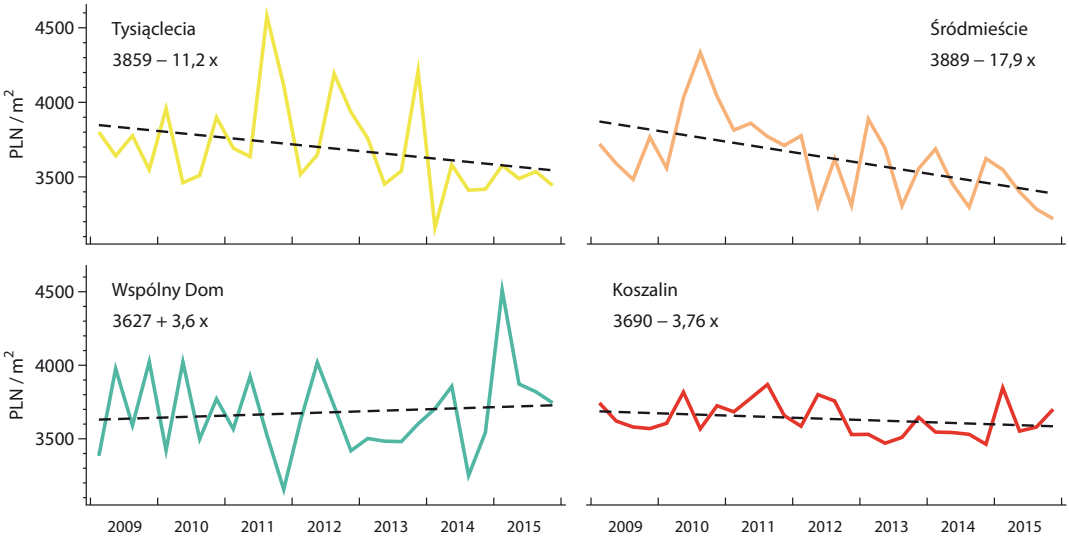

Fig. 7. Dynamics of mean selling prices on secondary residential property market in Koszalin and in three housing developments: Tysiąclecia, Śródmieście, Wspólny Dom (price of 1 m^2)

Source: Own study on the basis of RCiWN MODGiK in Koszalin

When analyzing in detail the local residential property market in Koszalin, we could see that the dynamics of price changes differed across the housing developments (fig. 7). The analyses of the housing developments in Koszalin indicated spatial diversification of the direction and dynamics of price changes on the secondary market. The prices dropped by as much as 13,5% in Śródmieście, followed by a 9,44% decline in Osiedle Tysiąclecia. While in Koszalin in general the price of 1 square meter fell by 1,14%, in Osiedle Wspólny Dom, an area where new investments are being carried out and which is positively perceived by the city residents, the unit prices rose by 10,67%. When looking at the results, we can conclude that throughout 2009–2015 the drop in prices was observed in each of the above analyzed cases. That price decline can be expressed in absolute figures representing the change in the prices of 1 m^2 in every analyzed quarter as well in relative terms in reference to mean prices on a given local property market. This measure can be expressed by means of the a_1/a_0 ratio. The analysis results are shown in the table 2. In medium-size cities the rate of price decrease over the period of the bear market is slower than in large cities, which has been confirmed by the results quoted above.

Tab. 3. Mean fall in unit transaction prices of residential property in Koszalin and in analyzed cities between 2009 and 2015

Cities	Mean fall in price of 1 m^2 over each quarter (in PLN)	Mean fall in price 1 m^2 over each quarter in relation to mean prices on given local (in %)
Warszawa	54,76	0,6
6 largest cities	26,64	0,5
10 remaining cities	16,05	0,4
Koszalin	3,76	0,1

Source: Own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data (as published on 2016.04.14)

Tab. 4. Coefficients of correlation between the residential property unit price and property size in Koszalin throughout 2009–2015

2009	2010	2011	2012	2013	2014	2015	Mean
−0,130	−0,153	−0,118	−0,039	−0,051	−0,210	−0,187	*−0,127*

Source: Own study on the basis of RCiWN MODGiK in Koszalin

As a part of the analyses we also examined the correlation between the price of 1 m2 of floor area and the residential property size. The coefficients of correlation between those values calculated on an annual basis are shown in table 3. All the above findings confirm the rule that the correlation between the quantity and the unit price is negative (i.e., the larger the floor area of the property, the lower the price of its 1 m^2). In the period of analysis that rate was volatile, but its mean value stayed at approximately −13%. This correlation is not stable. The better off the market participants, the more this correlation coefficient heads towards positive and increasingly bigger values, which we can clearly see when looking at the movement of this coefficient on a quarterly basis (fig. 8).

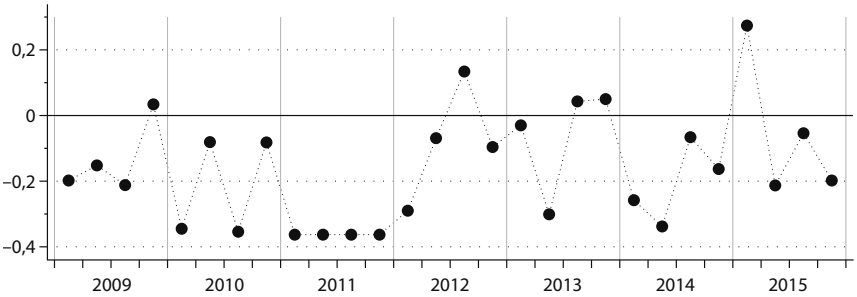

Fig. 8. Coefficients of correlation between the residential property unit price and property size in Koszalin in the years 2009–2015 (on a quarterly basis)

Source: Own study on the basis of RCiWN MODGiK in Koszalin

An interesting situation could be seen on the local residential property market in Koszalin in the first quarter of 2015. The observed correlation was positive, which means that the larger the property size, the higher the price of 1 m2. In this particular case it could have been the effect of including the secondary market into the government programme "Mieszkanie dla Młodych" (Home for the Young).

Additionally, the analysis covered the seasonal (quarterly) movements of unit prices. The calculations were made with reference to the whole city as well as to the Osiedle Wspólny Dom.

To this a regression model was constructed:

$$y_t = f(t) + \sum_{j=1}^{m} d_j \cdot Q_{jt} + U_t, \tag{1}$$

where:

$f(t)$ — the trend function,

Q_{jt} — the dummy variable adopting one in the j-th season and zero in the remaining seasons,
d_j — the parameter defining the intensity of the season component in the j-th season,
U_t — the random component.
Given the linear model:

$$\hat{y}_t = a_0 + a_1 \cdot t + \sum_{j=1}^{3} d_j \cdot Q_{jt}. \tag{2}$$

By the means of the least squares method, for the city of Koszalin we obtain:
$a_0 = 3\ 670{,}15$; $a_1 = -3{,}57$;
and the changes in individual quarters:
$d_1 = 25{,}00$; $d_2 = 34{,}00$; $d_3 = 11{,}13$.

For Osiedle Wspólny Dom we obtain:
$a_0 = 3\ 533{,}71$; $a_1 = 4{,}679$;
and the changes in individual quarters:
$d_1 = 78{,}60$; $d_2 = 279{,}96$; $d_3 = -48{,}20$.

We can see that at the beginning of the analysis the unit price of a residential property in Osiedle Wspólny Dom was lower that the respective price in the city of Koszalin. However, due to local factors, the trends in Osiedle Wspólny Dom were rising despite the general downward trend in Koszalin and on other local markets.

The analysis of quarterly fluctuations reveals that as a consequence of seasonality in Koszalin the price of 1 m^2 in the quarters 1–3 was slightly higher than the average, and in the 4th quarter it fell below the average. In Osiedle Wspólny Dom the prices were higher than the quarterly average to fall below it in the 3rd and 4th quarters.

Summary

The trends on the Koszalin residential property market (its condition in the times of the economic crisis) generally do not differ from the tendencies on the other analyzed local markets. Similar to other cities, in Koszalin the unit transaction prices of residential properties traded on the secondary market were falling, but the dynamics of the price movements were much poorer. In the 4th quarter of 2015 the mean price of 1 m^2 was PLN 3 701, which meant the decrease 1,14%, of in reference to the 1st quarter of 2009, while in the six largest cities excluding Warszawa the prices dropped by 10,59% and in the remaining ten cities — by 7,93%. Simultaneously, Warszawa saw the drop in prices by 11,96%.

The analyses conducted at the level of housing developments in Koszalin revealed spatial diversification of the direction and dynamics of price movements on the secondary market. While in Koszalin the prices of m2 of flats fell by 1,14%, in individual housing developments the price dynamics varied. The most significant downward movement was seen in Śródmieście where prices dwindled by 13,5%. On the other hand, in Osiedle Wspólny Dom, the part of the city where new investments are being carried out and which is positively perceived by the city residents, unit prices jumped by 10,67%.

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