# Effect of the Economic Crisis on Housing Market in Poland

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**Abstract**

The housing market is an important part of the economy and stays with her in close connection. On the one hand, affects macroeconomic variables by participating in the creation of gross domestic product (GDP), the share of the resource (national wealth), creating jobs, providing tax revenues, or providing the opportunity to unfreeze the capital. On the other hand, the phenomena and processes occurring in the economy can affect stimulating or inhibiting effect on the development of the housing market, in particular by: changes in interest rates on loans, changes in demand for surface or changes in the attractiveness of other capital investments. The publication is devoted to the issues of the impact of the economic crisis (started in Poland in 2009) on the housing market in Poland. 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 study covers the quarters of 7.5 years between 2009 and 2016 (I. half) – 30 quarters. 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 Polish largest cities.  presented the results of analyzes are part of the research conducted by the authors on the real estate market and its functioning.

**Keywords:** Housing market, economic crisis, market analysis

**Introduction**

The resurgence of market economy in Poland in the 1990s resulted in the increased importance of the Polish real property market, particularly of its residential segment.  The residential market  is closely correlated with the economy, being its essential element [Case 2000; Hilbers et al. 2001]. 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   [Ball 1998; Kucharska-Stasiak  2016]. Functioning and development of the (residential) property market is determined by many factors, the main ones being demographic, economic, financial, legal and political factors [Schmitz et al. 2001; Aron et al. 2006; Kałkowski 2003]. 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 housing market in Poland. The object of this study is the residential property market in largest cities in Poland. 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 analysis deals with the West Pomeranian city of Koszalin with the population of 108.6 thousand. The study covers the subsequent quarters between 2009 and 2016 (I. half). The data come from RCiWN (the Register of Property Prices and Value) of the Municipal Surveying and Cartographic Documentation Centre in Koszalin Center and from BaRN (the Database of Residential Property Prices) of the Polish National Bank.

**Development Stages of Housing Market in Poland**

Since the revival of the Polish real property market in the 1990s  we have seen its subsequent development stages. Different authors use their own criteria to identify these stages  (Table 1).

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 property market [Foryś 2013]. The fluctuations in the economy trigger trend movements on the real property market and, vice versa, the changes on this market are the driver of changes in the economy [DiPasquale 1996]. What is relevant for the market growth in the long run are cyclic trends and fluctuations [Rottke et al. 2003]. Similarly 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 [Dehesh et al.1997]. 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].

**Table 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 L. Kałkowski | Considering domestic legal and economic changes according to H. Henzel | Considering phenomena affecting Polish market after 1989 according to I. Foryś |
|---|---|---|
| a) period of transformation: 1990-1999 – a decade of systemic transformation, 2000-2004 – a period preceding Poland's accession to the EU; b) period following Poland's accession to the EU (from 2005 onwards). | a) stage I (1989-1992) – time of intensive work on changing legal regulations and market institutionalisation; b) 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; c) stage III (1996-1999) – legislative changes, increased attractiveness of real property as capital investment; d) 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. | a) period of adapting legal and organisational solutions to the requirements of 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); b) period of verifying the adopted solutions and of pre-accession actions (1998–2004); c) period of convergence with international markets (from 2005). |

*Source: own elaboration based on [Kałkowski 2007, 36-71; Henzel 2007, 1–12; Foryś 2011, 12].*

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) [Quigley 1999; Kucharska-Stasiak 2016]. 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 real property market indicators, and preceding or lagging behind the mean of all types of real property [Key et al. 1994]. 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].

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 2013].

**Analysis of Housing Market in Poland**

Koszalin is a county-status city located in Central Pomerania belonging to the West Pomeranian Province. It has the population of 108.6 thousand and covers the area of 9 834 ha divided into 17 housing developments. In the years of 2009-2016 (I. half) the Koszalin secondary residential property market saw 3901 transactions. 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.1).
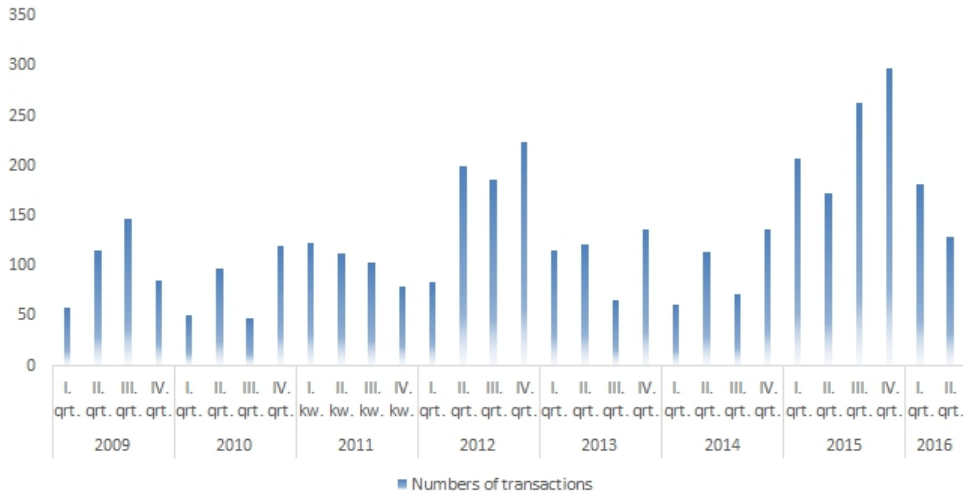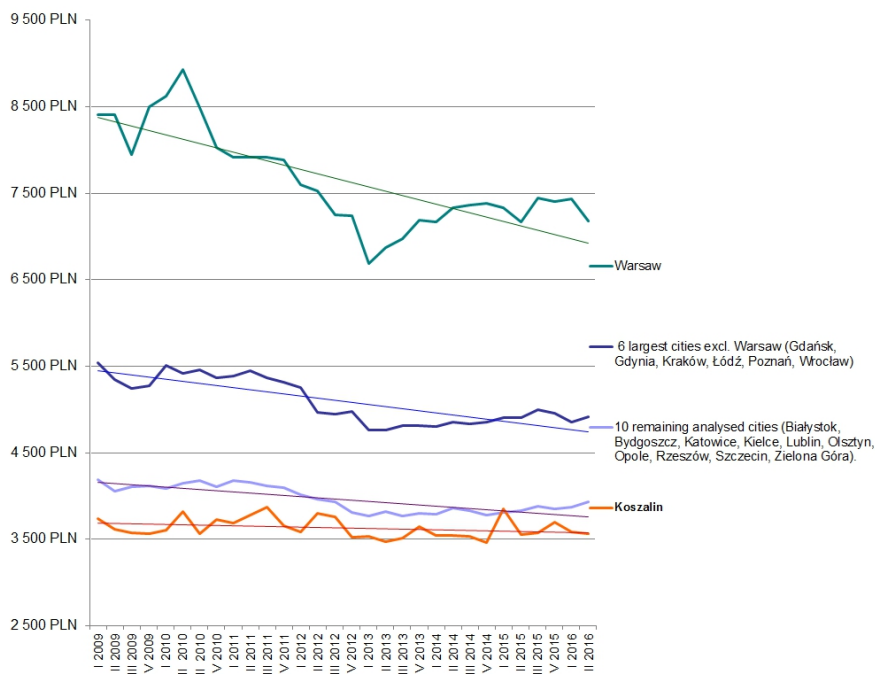


**Fig. 1.** Quarterly numbers of transactions on residential property market in Koszalin in 2009-2016 (I. half)
*Source: own study on the basis of RCiWN MODGiK in Koszalin.*

In the analysed period of time almost a half of transactions (46.96% of the total number) concerned flats in three housing developments located in the central part of the city. The least attractive were properties in the

developments located in the outskirts of the city where old family houses prevailed.

Between 2009 and 2016 (I. half) the residential property market in Koszalin saw a decrease in the mean transaction price of 1m$^2$ of floor area from PLN 3 744 in I. qrt. 2009 to PLN 3 570 in II. Qrt. 2016, that is of - 4.64%. Similar tendency was reported on the property markets in 17 largest Polish cities, but the trend dynamics varied in individual cities (Fig. 2).



**Fig. 2.** Dynamics of mean residential property transactional prices  on the secondary market (m$^2$)
*Source: own study on the basis of  RCiWN MODGiK in Koszalin and the Polish National Bank data. (www.nbp.pl).*

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 largest Polish cities, we determined trend models for the Warsaw 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):

    o      Warsaw

$$\hat{y} = a_0 + a_1 t = 8423.79 - 49.91t \quad (1),$$

    o      6 largest cities

$$\hat{y} = a_0 + a_1 t = 5477.41 - 24.60t \quad (2),$$

    o      10 remaining large cities

$$\hat{y} = a_0 + a_1 t = 4175.36 - 13.77t \quad (3),$$

     ○      Koszalin

$$\hat{y} = a_0 + a_1 t = 3690.40 - 3.76t \text{ (4)}.$$

The expression $a_1$ denotes the quota value of the trend in one month. The expression $a_0$ denotes a theoretical price of 1 m$^2$ on the day of the first transaction in the analysed 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 analysed 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 characteristics for the analysed cities and for Koszalin are shown in Table 1. Seasonal fluctuations were not included in the considerations.

Table 1. Evaluation of trend parameters of transactional prices in Koszalin and in the selected cities

| Specification | Parameter evaluation | Standard error | Student's $t$-test | $R^2$ | Random component error (PLN/m$^2$) | Number of observations |
|---|---|---|---|---|---|---|
| Warsaw | | | | | | |
| Absolute term | 8423.79 | 138.24 | 60.94 | 0.59 | 369.16 | 30 |
| Variable $t$ | -49.91 | 7.79 | -6.4 | | | |
| Six large cities excl. Warsaw | | | | | | |
| Absolute term | 5477.41 | 58.13 | 94.22 | 0.67 | 155.24 | 30 |
| Variable $t$ | -24.60 | 3.27 | -7.52 | | | |
| Ten remaining large cities | | | | | | |
| Absolute term | 4175.36 | 34.17 | 122.38 | 0.65 | 91.11 | 30 |
| Variable $t$ | -13.77 | 1.92 | -7.16 | | | |
| Koszalin | | | | | | |
| Absolute term | 3690.40 | 41.49 | 87.80 | 0.08 | 110.80 | 30 |
| variable $t$ | -3.76 | 2.34 | -1.85 | | | |

*Source: own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data. (www.nbp.pl).*

The random component error means that the quarterly mean price of 1 m$^2$ in the analysed cities differs from the one calculated on the basis of the model by the average of +/- $s_u$ (in Koszalin - by PLN 110.80). The most significant drop in the residential property prices (represented by the slope of the trend line) was recorded on the Warsaw property market, followed by six next largest cities (Gdańsk, Gdynia, Kraków, Łódź, Poznań, Wrocław). The Koszalin residential property market was declining at the slowest rate.

In the analysed 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 1100-1800 PLN/m$^2$ from the prices in six largest cities

excl. Warsaw. In both cases, the biggest discrepancies were seen in the 3rd quarter of 2010, which could have meant that the Warsaw 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. Fig. 3 shows indices with the fixed base of mean unit transaction prices of residential properties in Koszalin and in the remaining surveyed cities ($1^{st}$ quarter of 2009 = 100).
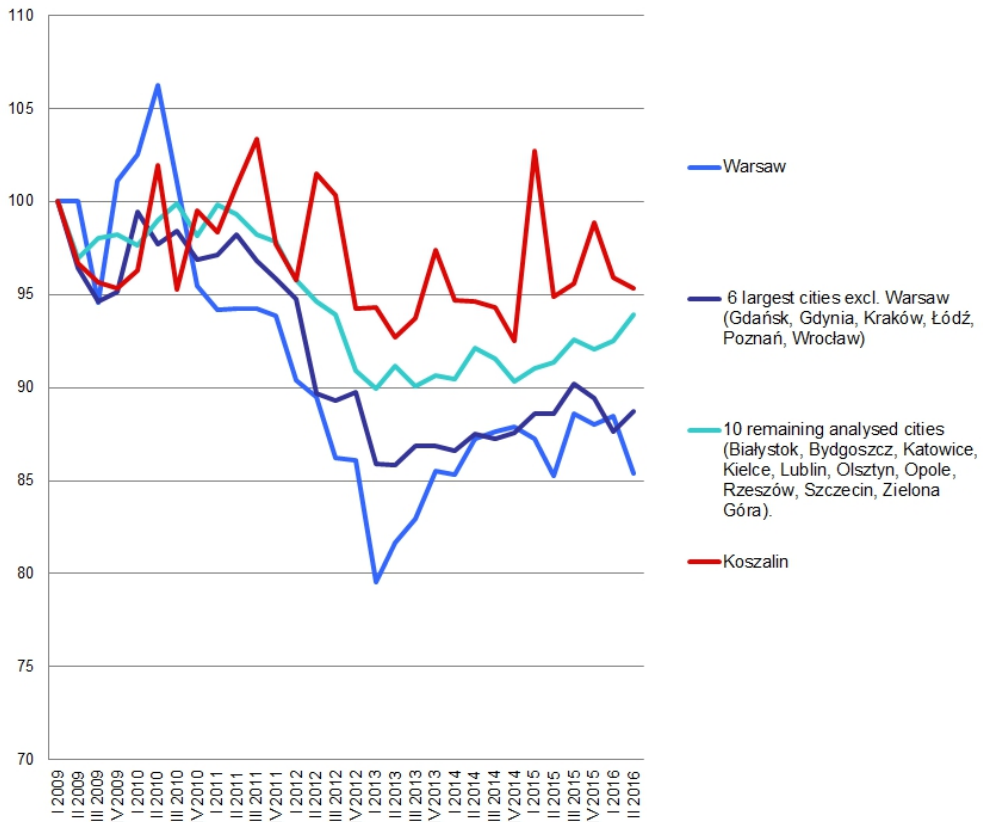


**Fig 3.** Fixed bases of mean unit transaction prices in Koszalin and in other analysed cities
($1^{st}$ quarter of 2009 = 100)
*Source: own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data. (www.nbp.pl).*

The most significant fall in unit prices in relation to the 1st quarter of 2009 (over 20%) was seen in Warsaw, followed by six largest cities (app. 14%) and ten large cities (up to 10%). In Koszalin the maximum price decrease in comparison to the $1^{st}$ quarter of 2009 was reported in the 2nd quarter of 2013 (over 7%).

When looking at the results, we can conclude that throughout 2009-2016 (I. half) the drop in prices was observed in each of the above analysed

cases. That price decline can be expressed in absolute figures representing the change in the prices of 1 m$^2$ in every analysed 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 $\frac{a_1}{a_0}$ ratio. The analysis results are shown in the table below.

Table 2. Mean fall in unit transaction prices of residential property in Koszalin and in analysed cities between 2009 and 2016 (I. half)

| 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 |
|---|---|---|
| Warsaw | 49.91 | 0.6% |
| 6 largest cities | 24.60 | 0.4% |
| 10 remaining cities | 13.77 | 0.3% |
| Koszalin | 3.76 | 0.1% |

*Source: own study on the basis of RCiWN MODGiK in Koszalin and the Polish National Bank data. (www.nbp.pl).*

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.

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.

**Conclusion**

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 analysed local markets. Similarly 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 was much poorer. In the 2th quarter of 2016 the mean price of 1 m$^2$ was PLN 3 570, which meant the decrease 4.64%, of in reference to the 1st quarter of 2009, while in six largest cities excluding Warsaw the prices dropped by 11.29% and in the remaining ten cities – by 6.06%. Simultaneously, Warsaw saw the drop in prices by 14.62%. Conducted analyzes allowed for a positive verification of the hypothesis 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.

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