

Does Debt Improve Housing Conditions? Evidence from Polish Households

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Abstract

The present paper is aimed at validating the role of debt in improving housing conditions in Poland. It is common knowledge that consumer debt, especially mortgage, is a major factor of quantitative and qualitative changes of living conditions of households. Housing conditions belong to most commonly investigated aggregative social data in many respects. Research on the role of indebtedness in changing housing conditions is a rather neglected area in this field. Recent significant increase in household debt is a good opportunity to investigate its relationship with household conditions. We use data from the household budget survey conducted by the Polish Central Statistical Office during the period 2005–2015. Using microlevel data, we assess various symptoms (diagnostic features) related to both flat size and quality. We have adopted the mathematical theory of fuzzy sets to construct a multidimensional index to examine housing conditions. Similar to the analysis of the risk of poverty, the hazard indicator for poor housing has been calculated for each household. On average, we have found improvement of housing conditions in Poland after accession to the European Union. As expected, our research demonstrates that indebted households are characterised by better quality of housing.

Keywords: *housing conditions, household, indebtedness*

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1 Introduction

Every human being aims first at the satisfaction of the need of protection against external factors and at ensuring their safety. The pursuance of such needs entails the necessity to guarantee shelter. This is the reason why flats have always been, in a more primitive or less primitive form, important resources for humans in the process of need satisfaction (consumption). Although civilisation progress has caused that households look at contemporary properties from a completely different perspective than they used to in the past (e.g. as a form of investment), the function of satisfying housing needs still remains most important.

The difficulty of satisfying housing needs results from considerable capital intensity and long duration of the manufacturing cycle. Poland has faced the problem of incomplete satisfaction of housing needs for a long time. Even though the initiation of economic

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transformation after 1989 allowed for establishing the foundations for a modern housing market, it brought no breakthrough or solution to the problem. A real boom in the housing market was triggered by Poland's accession to the European Union. The process was undoubtedly accelerated by increased availability of mortgages from financial institutions (Wałęga, 2015b). The purpose of the article is to assess changes in housing conditions of households in Poland during the period 2005–2015, in particular taking into account the influence of debt on the housing market. Research involved an attempt to verify a hypothesis that a boom in mortgages following the accession to the European Union had a positive impact on the satisfaction of housing needs of Polish people, both in quantitative and qualitative terms. The analyses used secondary data of the National Bank of Poland and unidentified individual data from the examination of household budgets in Poland carried out by the Central Statistical Office of Poland between 2005 and 2015.

2 Impact of the mortgage market on the housing market

The demand in the housing market is complex and depends on factors fundamental for this market (housing needs as a function of income and demographic changes as well as availability of mortgages), policy of the state (direct subsidies and regulations affecting risk level in the sector as well as costs and income of business entities) and speculations related to further expected increase in prices (Eickmeier and Hofmann, 2013).

The accession of Poland to the European Union has given an impulse to an increase in debts of households. A similar situation has occurred in almost all countries of average and low level of development (Greece, Ireland and Portugal), which joined the European Community. These countries witnessed a boom in mortgages, with an annual mortgage growth rate for the household sector amounting to a more than a dozen or even several dozen percent per annum during the first period after accession (Brzoza-Brzezina, 2005). The belief in long-term stability of economic development and structural reforms in the scope of regulations and institutions are incentives for incurring debts and investing in properties after the accession of Poland to the European Union (Backé, 2009). Research suggests that European integration is also associated with more predictable monetary and FX policy.

A possibility to use lower interest rates was another factor that encouraged households to increase debt to purchase properties after 2005. Due to a relatively free convergence of real percentage rates in the mortgage market in recently joined countries, there emerged pressure on the replacement of mortgages in a domestic currency with mortgages denominated in foreign currencies of lower exchange rates, especially during the early period. The pressure

risers with growing disparity in interest rates and greater share of foreign capital in the banking sector (due to easier access to cheaper refinancing sources in international financial markets). The accession to the EU structures has also strengthened consumer expectations as to the decrease in real interest rates.

Another undisputed factor which had a positive influence on both the mortgage market and the housing market in Poland after Poland joined the EU was an increase in real income of households and improved moods of consumers (Wałęga, 2015a). Research by Leszczyński and Olszewski (2017) also confirms the considerable influence of salaries, unemployment rate and interest rates on the Polish real estate market. An increase in income has not only boosted purchasing power of consumers but, most importantly, had a positive influence on credit worthiness and expanded the possibilities of household indebtedness.

Furthermore, social and cultural transformations, and especially changes in social perception of mortgages, also need to be emphasised. The taking of credit or loan facilities is no longer perceived in a negative way. Credit and loan facilities are treated as an instrument of inter-period consumption management. In this regard, Polish households become more and more similar to consumption patterns of highly developed countries where consumption, especially the purchase of flats, is financed with mortgages to a much greater extent than in Poland. The perception of real estate by households also changes (Widłak and Łaszek, 2016).

The real estate market is characterised by low flexibility in supply accompanied by simultaneous relatively long period of adaptation to market shocks (resulting to a large extent from technological, legal and institutional conditions). This entails consequences in case of sudden increased demand. During the first decade of the 21st century, the situation in the housing market in Poland was also affected by additional demand from people born in the periods of baby boom who wanted to satisfy their housing needs by having their own flat. Another group that contributed to the market situation in the early 21st century were foreign investors who pursued their purchase transactions on a mass scale after 2004, encouraged by relatively low prices of real estates in Poland. The first symptoms of a housing boom gave an additional impulse to increase mortgage debt. In fact, it was a self-perpetuating process which was not stopped until global economic slowdown after 2009.

When analysing the causes of boom in the market of loans to households and in the market of residential properties, one should take into account the state policy referring to the real estate market. During the period 2007–2013, it was a factor of cyclical phenomena in the real estate market in the scope of financial support for families (Wałęga, 2013).

Financial phenomena (increased debt of households on account of mortgages) have an influence on the real sphere (housing market) and on housing conditions of the population. The financial flow directed by households into the housing market includes accumulated funds (savings), and credit and loan facilities. Quantitative and qualitative improvement of housing resources should be the outcome of these investments.

3 Data and research method

A fuzzy approach has been used to evaluate housing conditions of indebted households and households having no debt; it has been relatively developed for the purposes of poverty analysis. The approach is based on the concept of fuzzy sets proposed by Zadeh in 1965 and developed for the purpose of analysing impoverishment of society by Cerioli Zani (1990), Cheli and Lemmi (1995) and Betti et al. (2015) as well as Verma et al. (2017).

With reference to the evaluation of the housing conditions of individual households and entire social groups, methods for the evaluation of poverty in the non-monetary dimension have been adopted (Ulman, 2016). This approach should specify symptoms of the risk of a poor housing conditions. These should be grouped into areas of assessment and finally aggregated into a single function of a risk of a poor housing conditions. Even though the proposed method has been originally used to assess poverty³ in the scope of housing conditions, it may be successfully used as a synthetic measure to enable the assessment of a housing conditions of households. The possibility of taking the poverty ratio into account in the quantitative and qualitative estimations is a significant advantage of this approach.

Indicators of a risk of poor housing conditions have been determined in a similar manner, as in case of poverty measurement. The starting point is the assessment of the degree of risk of poor housing conditions of i -th household as part of j -the symptom belonging to h -the area (Panek, 2011):

$$e_{hj,i} = \frac{1 - F(c_{hj,i})}{1 - F(1)}, h = 1, 2, \dots, m; j = 1, 2, \dots, k_h; i = 1, 2, \dots, n \quad (1)$$

where:

$F(c_{hj,i})$ – value of the distribution function of ranks of j -th variable (symptom of poor housing conditions) from h -th area of these conditions of i -th household,

³ It can be also find application of the fuzzy set approach to eg. quality of life measurement (Betti et al., 2016).

$F(1)$ – value of the distribution function of ranks of j -th variable from h -th area of poor housing conditions for rank equal to 1 (variant of j -th variable indicating higher ratio of a risk of poor housing conditions).

In the subsequent step, the assessment of the absence of risk of poor housing conditions is aggregated with the use of the following formula:

$$e_{h,i} = \frac{\sum_{j=1}^{k_h} w_{hj} (1 - e_{hj,i})}{\sum_{j=1}^{k_h} w_{hj}}. \quad (2)$$

Values w_{hj} (weight of j -th symptom of poor housing conditions from h -th area) are obtained using the following formula:

$$w_{hj} = \ln \frac{1}{\lambda(z_{hj})}, \quad (3)$$

where:

$$\lambda(z_{hj}) = \frac{1}{n} \sum_{i=1}^n \lambda_i(z_{hj}), \quad (4)$$

whereas $\lambda_i(z_{hj}) = (1 - F(c_{hj,i}))$.

The analysis of the housing conditions of Polish households was conducted based on individual data from the examination of household budgets carried out by the Central Statistical Office of Poland during the years 2005–2015. Full data sets cover from 34,767 to 37,427 observations of households for each year.

Individual data on household budgets enable cross-sectional analysis of characteristics describing the housing conditions of families considering its selected characteristics. Due to the need to have identical features in the analysed years, the following variables are proposed for the analysis: surface of a flat per person, number of persons per room, period during which the building was constructed, equipment of the flat: bathroom, flushed toilet, water supply system, hot water, intercom, use of garage, use of another house. Housing conditions have been analysed depending on the fact whether the household has a credit or loan facility and depending on the education level of the head of household and place of residence⁴.

⁴ For the purposes of research, it has been assumed that a household in debt is a household which meets at least one of the following conditions: it has taken a loan or mortgage, a bank loan, has a credit card or another bank loan, a loan or credit facility in a different institution, a money loan from a private individual or has repaid a principal instalment and/or interest on the aforementioned forms of debt during the analysed period.

4 Empirical results

Almost all conditions for increased demand in the residential market and resulting housing boom appeared after Poland joined the European Union. A considerable increase in long-term debt on account of housing loans and large numbers of purchasers (including foreign ones) had a double impact on the market situation. Firstly, thanks to a broader access to external funding, households could pursue their housing needs. This translated into stimulation of the construction sector. During the first three years after Poland joined the European Union, the speed of building new flats increased by even up to 40% (year by year).

Fig. 1 presents the situation in the domestic real estate market in terms of the dynamics of the number of flats under construction and the number of flats commissioned for use. A transmission of impulses from the mortgage market to the residential market is noticeable even though in this case the mechanism has a delay of 2–3 years.

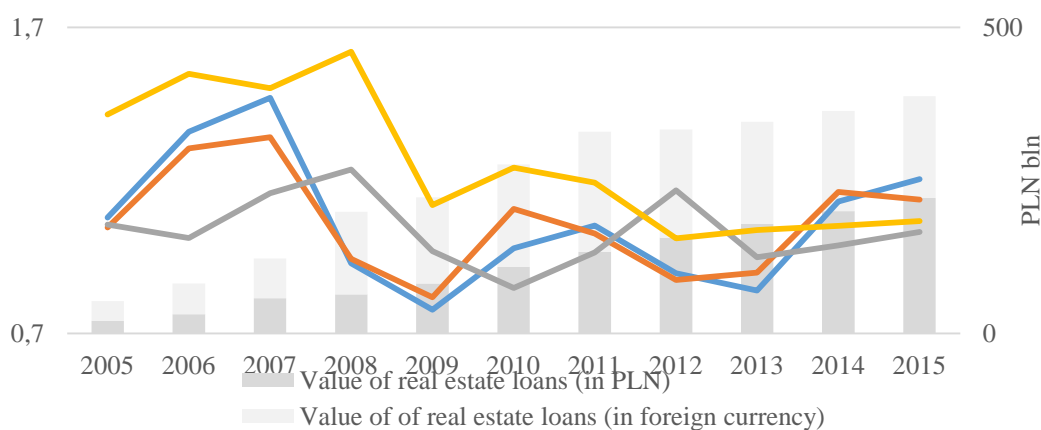


Fig. 1. Dynamics of flats under construction and dynamics of flats commissioned for use (previous year = 1) against the value of household debt on account of real estate loans in total (in PLN billion) during the years 2005–2015.

During the period of 2005–2015, housing conditions have generally improved (Table 1). On average, Poles (both those in debt and those who have no debts) live in larger and larger flats (both in absolute terms and in conversion into the surface of flat per capita). During the analysed years, the median of the size of flat rose from 60 sq m to 64 sq m in case of households which do not have a debt and from 59 sq m to 64 sq m for households which have debt. The above is consistent with macroeconomic data. Considerable diversification in terms of the housing conditions is also worth noting (measured by coefficient of variation CV). During the analysed period, also the number of rooms in leased flats increased and the ratio of the number of persons per room decreased.

Table 1. Selected characteristics of the housing conditions of households in Poland during the period 2005–2015.

Specification		Households with no debt				Households with debt			
		size of flat (m ²)	no. of rooms	area of the flat per person (m ²)	no. of persons per room	size of flat (m ²)	no. of rooms	area of the flat per person (m ²)	no. of persons per room
2005	AV	68.45	2.71	28.34	1.27	68.19	2.75	24.94	1.38
	ME	60.00	3.00	23.33	1.00	59.00	3.00	20.00	1.00
	CV	54.81	47.78	68.34	66.81	53.32	45.41	66.59	62.66
2007	AV	71.98	2.77	30.63	1.20	72.05	2.80	26.90	1.32
	ME	60.00	3.00	25.00	1.00	60.00	6.00	21.70	1.00
	CV	56.12	47.88	67.99	65.34	55.42	45.57	69.21	63.42
2009	AV	73.96	2.80	32.44	1.15	74.83	2.88	28.52	1.23
	ME	60.00	3.00	26.50	1.00	60.00	3.00	23.75	1.00
	CV	56.62	47.77	67.19	66.91	56.97	45.97	65.91	62.41
2012	AV	78.33	2.86	34.09	1.09	80.23	2.98	30.17	1.15
	ME	63.00	3.00	28.00	1.00	63.00	3.00	25.00	1.00
	CV	58.09	47.16	66.71	66.38	59.28	45.5	66.78	60.37
2015	AV	78.24	2.95	36.16	1.01	81.07	3.07	31.87	1.09
	ME	64.00	3.00	30.00	1.00	64.00	3.00	25.50	1.00
	CV	56.84	46.76	66.27	64.32	58.85	44.17	68.70	57.74

Note: AV – average; ME – median; CV – coefficient of variation.

When considering the housing conditions in terms of selected symptoms presented in Table 2, the results confirm varied threats to housing conditions due to the education level of reference person and place of residence. If the reference person in the household has higher education or if the household is located in a large city, it is characterised by the lowest risk of poor housing conditions. The higher the education level of the household head and the size of the location where the household lives, the more noticeable are improvements in housing conditions.

Table 2. Indicator of the lack of risk of poor housing conditions, considering the education level of reference person and class of locality in 2005 and in 2015.

Specification	2005	2015	2005	2015
	households with no debt		households with debt	
education of a reference person				
lower secondary or lower	50.14	63.02	49.73	63.08
basic vocational	56.26	68.41	56.13	69.07
upper secondary general	63.65	70.62	62.25	70.75
upper secondary vocational	63.77	71.30	62.87	71.48
tertiary	68.81	73.30	68.29	73.67
class of locality				
rural	53.68	67.59	54.66	69.57
towns below 100 thous.	61.31	70.03	61.47	70.99
cities 100-499 thous.	62.05	70.61	61.61	71.44
cities 500 thous. and over	62.97	71.30	63.15	72.18
total	58.66	69.18	59.31	70.75

During the analysed years, an increase may also be noted in the ratio of the absence of risk of poor housing conditions in each household category, both in the case of households in debt and those which are not in debt. When comparing households in debt and those that have no debt, it should be stated that in 2005 the former were in a slightly worse conditions in terms of housing conditions while in 2015 the indicators of the absence of a risk of poor conditions were higher. The findings indicate that differences in the risk of poor housing conditions of indebted and non-indebted households do not generally occur.

Conclusions

The conducted research suggests that during the period from 2005 to 2015 Poland has witnessed improved housing conditions, in both quantitative and qualitative terms. An average household in Poland has a greater average surface, number of rooms and surface in square metres per person. A boom in the mortgage market also had a positive impact on housing conditions, which expressed itself especially in an increase in the indicator of the absence of risk of a poor housing conditions. Based on this, it may be concluded that there has been an improvement in housing conditions not only in quantitative terms but also in the scope of the technical condition of flats and buildings. Well-educated persons in the largest

Polish cities may be treated as the main beneficiaries of the boom in the housing and mortgage markets.

However, considering the increase in the debt of households in Poland during the analysed period (estimated at a level of more than PLN 330 billion), it seems that changes in general housing conditions do not differ considerably from the conditions of households which are not in debt. For this reason, an evaluation of the impact of the mortgage boom on housing conditions is not so clearly positive. Potential benefits in the housing conditions which may only be obtained thanks to mortgages have been partly neutralised by an increase in prices in the real estate market. Prices in the primary and resale markets during the period before 2008 crisis rose by approx. 50% in the largest cities of Poland (in comparison to the period before accession to the European Union) and have not changed in subsequent years. This has made the prices of properties in Poland reach levels of other European countries. This was one of the most important sectors of Polish economy to undergo such speedy and deep real convergence. A permanent burden of loan repayment on household budgets was the consequence of increased debt of households in the years 2005–2015. Even though Polish households improved their housing conditions thanks to debts, the boom resulted in a still unresolved problem of mortgages denominated in foreign currencies and the exposure of households to FX risk which is a threat to their financial stability.

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References

- Backé, P. (2009). Credit Growth and Financial Deepening: Implications for Euro Adoption? In: *Raport na temat pełnego uczestnictwa Rzeczypospolitej Polskiej w trzecim etapie Unii Gospodarczej i Walutowej. Eseje zagranicznych i polskich ekonomistów*. Warszawa: Narodowy Bank Polski.
- Betti, G., Gagliard, F., Lemmi A. & Verma V. (2015). Comparative measures of multidimensional deprivation in the European Union. *Empirical Economics*, 3(49), 1071-1100.
- Betti, G., Soldi, R. & Talev, I. (2016). Fuzzy Multidimensional Indicators of Quality of Life: The Empirical Case of Macedon. *Social Indicators Research*, 1(127), 39-53.

- Brzoza-Brzezina, M. (2005). *Lending Booms in the New EU Member States. Will Euro Adoption Matter?* European Central Bank, Working Paper Series no. 543: 11–18.
- Ceroli, A. & Zani, S. (1990). A Fuzzy Approach to the Measurement of Poverty. In: C. Cheli, B. & Lemmi, A. (1995). A Totally Fuzzy and Relative Approach to the Multidimensional Analysis of Poverty. *Economic Notes*, 24(1), 115-134.
- Eickmeier, S. & Hofmann, B. (2013). Monetary Policy, Housing Booms, and Financial (Im)Balances. *Macroeconomic Dynamics*, 17, 830-860.
- Leszczyński, R. & Olszewski, K. (2017). An analysis of the primary and secondary housing market in Poland: evidence from the 17 largest cities. *Baltic Journal of Economics*, 17(2), 136-151.
- Panek, T. (2011). *Ubóstwo, wykluczenie społeczne i nierówności. Teoria i praktyka pomiaru*. Warszawa: Wyd. SGH.
- Ulman, P. (2016). Ocena zagrożenia złymi warunkami mieszkaniowymi w Polsce. *Studia i Prace WNEiZ US*, 44/2, 475-487.
- Verma, V., Betti, G. & Gagliardi, F. (2017). Fuzzy Measures of Longitudinal Poverty in a Comparative Perspective. *Social Indicators Research*, 130, 435-454.
- Wałęga, A. (2015a). *Spójność ekonomiczna gospodarstw domowych w Polsce. Analiza statystyczna*, Monografie: Prace Doktorskie nr 23, Kraków: Wydawnictwo Uniwersytetu ekonomicznego w Krakowie.
- Wałęga, G. (2013). *Kredytowanie gospodarstw domowych*, Warszawa: Polskie Wydawnictwo Ekonomiczne.
- Wałęga, G. (2015b). Zmiany w polityce kredytowej banków a zadłużenie polskich gospodarstw domowych. *Konsumpcja i Rozwój*, 1(10), 44-55.
- Widłak, M. & Łaszek, J. (2016). Milestones of Housing Finance in Poland. Milestones in European Housing Finance, 291.