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## Introduction

One of the fastest growing areas in the economic sciences is broadly defined area of finance, with particular emphasis on the financial markets, financial institutions and risk management. Real world challenges stimulate the development of new theories and methods. A large part of the theoretical research concerns the analysis of the risk of not only economic entities, but also households.

The first Wrocław Conference in Finance WROFIN was held in Wrocław between 22nd and 24th of September 2015. The participants of the conference were the leading representatives of academia, practitioners at corporate finance, financial and insurance markets. The conference is a continuation of the two long-standing conferences: INVEST (Financial Investments and Insurance) and ZAFIN (Financial Management – Theory and Practice).

The Conference constitutes a vibrant forum for presenting scientific ideas and results of new research in the areas of investment theory, financial markets, banking, corporate finance, insurance and risk management. Much emphasis is put on practical issues within the fields of finance and insurance. The conference was organized by Finance Management Institute of the Wrocław University of Economics. Scientific Committee of the conference consisted of prof. Diarmuid Bradley, prof. dr hab. Jan Czekaj, prof. dr hab. Andrzej Gospodarowicz, prof. dr hab. Krzysztof Jajuga, prof. dr hab. Adam Kopiński, prof. dr. Hermann Locarek-Junge, prof. dr hab. Monika Marcinkowska, prof. dr hab. Paweł Miłobędzki, prof. dr hab. Jan Monkiewicz, prof. dr Lucjan T. Orłowski, prof. dr hab. Stanisław Owsiak, prof. dr hab. Wanda Ronka-Chmielowiec, prof. dr hab. Jerzy Różański, prof. dr hab. Andrzej Sławiński, dr hab. Tomasz Słoński, prof. Karsten Staehr, prof. dr hab. Jerzy Węcławski, prof. dr hab. Małgorzata Zaleska and prof. dr hab. Dariusz Zarzecki. The Committee on Financial Sciences of Polish Academy of Sciences held the patronage of content and the Rector of the University of Economics in Wroclaw, Prof. Andrzej Gospodarowicz, held the honorary patronage.

The conference was attended by about 120 persons representing the academic, financial and insurance sector, including several people from abroad. During the conference 45 papers on finance and insurance, all in English, were presented. There were also 26 posters.

This publication contains 27 articles. They are listed in alphabetical order. The editors of the book on behalf of the authors and themselves express their deep gratitude to the reviewers of articles – Professors: Jacek Batóg, Joanna Bruzda, Katarzyna Byrka-Kita, Jerzy Dzieża, Teresa Famulska, Piotr Fiszeder, Jerzy Gajdka, Marek Gruszczyński, Magdalena Jerzemowska, Jarosław Kubiak, Tadeusz Kufel, Jacek Li-

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*Wanda Ronka-Chmielowiec, Krzysztof Jajuga*

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# UPDATING THE VALUE OF MORTGAGE COLLATERAL IN POLISH BANKS

# AKTUALIZACJA WARTOŚCI ZABEZPIECZENIA HIPOTECZNEGO W POLSKICH BANKACH

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**Abstract:** Polish banks closely monitor the value of their loan portfolios, their practices with respect to keeping stock of the value of mortgage collaterals raise certain doubts. Since banks have the ability to take stock of the current loan values, then what keeps them from taking stock of the current values of all corresponding collaterals, particularly in relation to high-value, long-term loans for real estate investments? This paper aims at presenting the idea of a mass revaluation of property and its potential for the banking sector. The author provides a brief analysis of the situation of the banking sector in terms of value and volume of loan portfolios, as well as in terms of other factors that may prove beneficial or detrimental to the idea of mass valuation in the banking sector. The results of the analysis are evidence to the size of the market, but also to the need to control its practices in response to the relatively frequent changes in the value of mortgage collateral.

**Keywords:** mass appraisal of real estate, mortgages, LTV, the value of real estate.

**Streszczenie:** Zmiany na polskim rynku kredytu mieszkaniowego a szczególnie hipotecznego, które nastąpiły w ostatnich 10-ciu latach skłaniają do pewnych refleksji. O ile bowiem wartość portfela kredytowego na bieżąco jest monitorowana przez banki o tyle sytuacja dotycząca wartości nieruchomości stanowiących zabezpieczenie tego portfela hipotecznego jest już zgoła odmienna. Rodzi się pytanie skoro banki na bieżąco monitorują dług hipoteczny dlaczego nie monitorują także jego zabezpieczenia, szczególnie w odniesieniu do wysokokwotowych, długoterminowych kredytów na inwestycję w nieruchomość. Prezentowany artykuł ma na celu przede wszystkim przedstawienie idei masowej wyceny nieruchomości oraz jej potencjału dla sektora bankowego. Ponadto w opracowaniu dokonana zostanie krótka analiza sytuacji sektora bankowego pod względem wartości i wolumenu portfeli kredytowych, a także pod względem innych czynników, które przemawiają zarówno za, jak i przeciw masowej wycenie w sektorze bankowym.

**Słowa kluczowe:** masowa wycena nieruchomości, kredyty hipoteczne, LTV, wartość nieruchomości.

## 1. Introduction

The reported growth in value and volume of mortgage loan portfolio in Polish banks over the last decade should be subject to close examination. Although Polish banks closely monitor the value of their loan portfolios, their practices with respect to keeping stock of the value of mortgage collaterals raise certain doubts.

Banking systems examine the value of real estate as the most important form of loan collateral on two occasions. The first examination is conducted as part of the loan application procedure. The other may be called for in response to loan repayment problems. This raises an important question: since banks have the ability to take stock of the current loan values, what keeps them from taking stock of the current values of all corresponding collaterals, despite the fact that loan warranties may be the only way to reclaim their investment in case of repayment problems?

Some banking experts and academic researchers insist that keeping track of current property values is costly, time-consuming, and requiring support from a team of certified property valuers. In addition, in line with a popular opinion based on the practices and trends observed on the local market, such monitoring procedures are regarded as uncalled for, since property values keep rising on a continuous rate. In view of the above, experts believe that the risk of depreciation in property values is marginal and would not affect the mechanism of mortgage collaterals in Polish banks.

At this point, it may be useful to ask a fundamental question: is this really a viable line of reasoning? Is it true that the process of monitoring the value of real estate used as loan collateral must necessarily be costly and toilsome? Is it viable to assume that the total value of properties kept as mortgage collateral by Polish banks will grow steadily in the foreseeable future? Should mass revaluation of loan collaterals behind Polish mortgage loans be regarded as a whimsical idea or an emerging necessity resulting from the growth of the local mortgage?

This paper aims to provide answers to the above questions and to substantiate the present need to re-examine the value of mortgage collaterals used in Polish banking sector. For this purpose, the author focuses on three key issues in this context: firstly – on the current situation on the Polish mortgage market, secondly – on concise characteristics of methods used for mass evaluation of real estate values that may be employed for our purpose, and thirdly – on some qualities of real estate in Poland that may be perceived as trivia, but serve as an early warning for the impending problems.

This paper, in the author's opinion, offers a valuable contribution to a wider in-depth discussion on the need and the rationale behind the postulated mass valuation of real estate used as collateral in Polish mortgage loan portfolio, and on potential methods of approaching the problem.

## 2. The present situation on the Polish mortgage loan market

The key issue in the context of mass valuation of mortgage collaterals is the volume and size of mortgage portfolio in Polish banking system. This aspect is important since the use of mass valuation of collaterals may only be justified if the potential set of mortgage loans targeted by the procedure is large enough and offers enough value to substantiate such an approach.

Based on ZBP[1] data, both total values and the number of new housing loans were analysed. Table 1 presents an overview of the results.

**Table 1.** The value and the number of new housing loans in the period between 2007 and the 2nd quarter of 2015

| Period | Value in bn PLN | Number |
|---|---|---|
| 2007 | 55.862 | 314 283 |
| 2008 | 57.128 | 286 761 |
| 2009 | 38.734 | 189 192 |
| 2010 | 48.66 | 230 361 |
| 2011 | 49.21 | 231 159 |
| 2012 | 39.108 | 196 557 |
| 2013 | 36.475 | 176 865 |
| 2014 | 36.834 | 174 087 |
| I – II kw 2015 | 19.036 | 88 673 |

Source: Author's own study, based on ZBP reports generated by the AMRON –SARFIN system.

As suggested by the above, the number of new loans granted year by year represented a sizeable increase in the total volume of mortgage loans currently in force within the Polish banking system. Taking into account the following:

- each new housing loan paid in PLN represents an average value increase of 209 356 PLN[2],
- an average value of a new loan granted in a foreign currency corresponds to 285 930 PLN,

it can be observed that the increase in the number of new loans year by year has a sizeable effect on the total value of mortgage portfolio held by Polish banks. It must be remembered at this point that virtually any new mortgage loan agreement represents another real estate added to the portfolio of collaterals held by the bank.

[1] Quarterly ZBP reports generated by AMRON_SARFIN system: https://zbp.pl/raporty/raport-amron-sarfin of 20.09.2015.

[2] This represents an average value of a mortgage loan granted by Polish banks in the period between April and June 2015, as reported by AMRON-SARFIN No. 2 of 2015.

In theory, this should correspond to a sizeable increase in the formal value of collateral portfolio held within the system. But is this really the case?

While the value of real estate held as collateral for new loans is fairly easy to establish since it is provided as part of the estimation procedures required with most mortgage loans, then the value of collaterals for existing loans granted anywhere between a year back and a decade back would be much harder to assess.

If we examine the number of active housing loans presently held by the Polish banking system, the associated risk seems overwhelming. It must be kept in mind that there is a real estate behind each and every such agreement – a property with a value established at a distant point in time and not updated ever since [Bywalec 2012, pp. 55-56].

Table 2 presents the number of property-secured loan agreements in force, in the period between 2002 and the 2nd quarter of 2015.

**Table 2.** The number of active housing loans and total debt of mortgage loans held by Polish banks, in the period between 2002 and the 2nd quarter of 2015

| Year | Number of active housing loans | Increase by | The total debt of mortgage loans in bn PLN |
|---|---|---|---|
| 2002 | 289 758.00 | | 20.3 |
| 2003 | 405 320.00 | 39.88% | 29.576 |
| 2004 | 521 398.00 | 28.64% | 35.807 |
| 2005 | 717 187.00 | 37.55% | 50.425 |
| 2006 | 945 484.00 | 31.83% | 77.706 |
| 2007 | 1 135 684.00 | 20.12% | 116.84 |
| 2008 | 1 302 600.00 | 14.70% | 192.612 |
| 2009 | 1 374 099.00 | 5.49% | 214.892 |
| 2010 | 1 448 828.00 | 5.44% | 263.642 |
| 2011 | 1 630 694.00 | 12.55% | 313.704 |
| 2012 | 1 731 593.00 | 6.19% | 316.331 |
| 2013 | 1 819 796.00 | 5.09% | 330.792 |
| 2014 | 1 896 779.00 | 4.23% | 350.354 |
| I Q 2015 | 1 915 359.00 | 0.98% | 365.036 |
| II Q 2015 | 1 945 287.00 | 1.56% | 374.039 |

Source: Author's own study, based on ZBP reports generated by the AMRON –SARFIN system.

Data presented in Tab.2 provides strong evidence for a continued incline in the number of active housing loans over the last 13 years. Interestingly enough, a marginal increase in the number of new loans was observed even in the period of 2008-2010 crisis. At present, based on the ZBP report for the 2nd quarter of 2015, the number of active housing loans nears the threshold of two million. After deducting

the data associated with new loans (entered into in 2015), the remaining volume represents ca. 1.8 million real estate properties which have not been valued for at least a year (best case scenario), sometimes even for the last 13 years running (worst case scenario).

If we approach this problem from the viewpoint of the need for a comprehensive revaluation of total mortgage collateral value held by Polish banks, the conclusions are clear. There is a pending need for such a revaluation, particularly in view of the steady incline in the value of mortgage portfolios, with no plans for any reduction or limitation of housing loan activities in the foreseeable future.

Furthermore, it is also important that the quality of housing loans, assessed mainly through the lens of the timeliness of their reimbursement, deteriorates. According to data from the system reports of AMRON-SARFIN [2015, p. 18] in the banking system they are found to increase the share of NPLs mortgages. In 2009 it was only 1.35% and in the third quarter of 2015, already 3.31%.

With such large and growing mortgage portfolios, it seems prudent for Polish banks to consider the idea of performing relatively frequent revaluations of real estate held as collateral for the housing loans. The more so, if we take into account the value of new loans and the total debt of mortgage loans reported by Polish banks.

## 3. Advantages and disadvantages of mass revaluation of mortgage collateral in Polish banks, in the context of potential applications on the local housing credit market

Banking practice provides numerous examples of real estate valuation, but the most typical application of this procedure is related to the property held as collateral. The analysis of Polish housing loans market, presented in the previous section, clearly shows that proper valuation of property is crucial for the performance of this particular segment of loan operations. And not only because of the banking industry's reported total debt, but also – or even most of all – because the property value determines the upper threshold of the housing credit options available to the client.

It is true, however, that complete revaluation of all collaterals held within the banking system would be quite expensive and problematic, particularly with regard to the increased demand for qualified property valuators. To avoid these problems, instead of individual revaluations, the banking system may choose to employ mass revaluation techniques.

In business practice so far, mass revaluation of real estate properties was used only in reference to property tax burden imposed on large estate [Adamczewski, Hopper 2009, pp. 23-25; Wolanin 2005, pp. 5-10]. The problems involved in the use of mass revaluation in the banking sector were seldom addressed in professional literature [Hozer, Kokot, Kuźmiński 2005, pp. 11-16; Ptaszyński 2014, pp. 14-19].

Before examining the potential usefulness of mass revaluation of collaterals in Polish banking practice, it may be useful to provide a definition of mass revaluation of property.

Mass revaluation of property is a procedure applied in scenarios that require time-constrained updates of large real estate portfolios, and is based on statistical instruments.

Since Polish legislature provides no legal definition of mass revaluation, one may adopt a synthetic approach based on provisions used in other countries [IAAO 2013; Kauko, d'Amato 2009]. In this approach, mass revaluation may be defined as a set of technical and organisational activities and calculation procedures designed to assess and document current values of real estate properties.

This type of revaluation is calculated for a specified date and covers a large number of properties [Downie, Robson 2007]. As such, it requires a number of analyses conducted on large data sets that identify and describe detailed characteristics of individual properties and of the real estate market at large. This type of revaluation necessitates the use of a standardised methodology, uniform categorisation of data and statistical testing/modelling. The effectiveness of revaluation procedures is related, first and foremost, to the quality, completeness, reliability and availability of up-to-date data sets, to proper organisation of monitoring systems, to proper design of instruments and to transparency of econometric methods used [Kuryj 2007, pp. 50-58].

Some of the benefits of mass revaluation of properties include:

1. The potential to revaluate any type of property. Since market analyses and value model designs are based on an unrestricted access to a complete record of real estate transactions in its full characteristics, a model of values designed for revaluation purposes may provide unified values for any type of property. It may also be used for revaluation of collaterals for other purposes, e.g. for securitisation procedures based on market characteristics of properties.

2. Time-efficient recalculation of large sets of real estate properties held as mortgage collateral. Market analyses and the design of the value model are performed prior to the valuation of a specific property; this means that the whole procedure is reduced to a mere application of the model to the set of identified characteristics – this can be done in a time-efficient manner.

3. Objective evaluation. By using a unified and objective system for describing various market characteristics of any and all property within the bank's portfolio of collaterals helps reduce the effect of human error in mass revaluation procedures.

4. System uniformity. This approach helps minimise the risk of evaluation bias typical for standard revaluation methods based on expert opinions of real estate valuators who may display preferential treatment of individual lenders, use non-uniform methodologies or draw their conclusions on the basis of different evaluation criteria.

5. System effectiveness. The postulated system offers simultaneous revaluation of complete portfolios attached to a given investment, and – as such – it may also be used for revaluation of specific property sets as needed for individual housing loan negotiations/decisions.

6. Real-time updates. The postulated process offers instantaneous revaluation of any property at any given time, without the need for tedious formal tender procedures.

The most important disadvantages of mass revaluation include the following:

1. The need for redesign and frequent updating of detailed real estate property databases.

2. The need to design and implement a set of dedicated IT solutions.

3. The steep cost involved in the system design.

4. The need for active monitoring of the market environment and of the factors that may impact property prices and values.

5. Mass calculation of values involves a relatively complex algorithm.

6. The system design phase requires the use of large databases of different types of properties.

## 4. General condition of Polish real estate properties

The value of the property is evaluated nowadays mainly through the location, surrounding infrastructure, and of course the size. However, the truth value of the property should be calculated, first and foremost, on the basis of the actual technical condition of the property and the construction technology. These last two features will mainly decide in the future on whether to real estate survives the coming years and if it will keep its value. If we approach the housing loan portfolios of Polish banks from the viewpoint of the technical condition of the properties held as collateral, the following observations come to mind:

1. Apartment blocks represent an overwhelming majority of housing loans granted; their construction is based on such methods as: concrete slabs, monolithic reinforced concrete, brick, or mixed-type construction.

2. The life-span of concrete slab buildings is estimated at 60-70 years. Some experts suggest that it may be up to 150 years, but only if the original design involved proper construction of node elements (floor and wall seams which are welded prior to concrete pouring) [Runkiewicz 2007].

3. Properties are not subject to regular technical reviews.

4. Craftsmanship errors. A good example here is the risk of elevation slabs falling off. This type of slab weighs ca. 500 kilos. As pointed out by Andrzej Dobrucki, chairman of the Polish Chamber of Construction Engineers, and based on results obtained in a study by the Construction Techniques Institute involving detailed examinations of 350 front slabs mounted on 31 apartment blocks located in various Polish cities, up to 90% of fixture elements used to mount the slabs to the front of the building are made of improper alloy. In addition, six out of ten such fixtures were

not even properly anchored. Some of the precast concrete buildings include stainless steel fixtures, which are prone to crumbling under load. Aluminium-based alloys, on the other hand, cannot be fixed properly and tend to slide off [Runkiewicz 2007].

Identified problems related to the condition of the technical part of the credited properties can certainly be reflected in their value in the future. Thus can affect the level of bank mortgage collateral established for such properties. Therefore, it seems necessary to take into consideration, in the process of updating the value of the property, the technological aspect, which is now actually marginalized.

## 5. Conclusions

In conclusion to the above, the author postulates the answers to questions posed in the introductory section. First, does the mass revaluation procedure really need to be that expensive and time-consuming for Polish banks? The answer is no, not necessarily. The mass real estate revaluation method, supported by suitable IT solutions adjusted to the specificity of the Polish market, has the potential of greatly facilitating the process, making it more effective, efficient and – most of all – decidedly less expensive.

Is it viable to assume that the present incline in the value of properties held as collateral by Polish banks will continue in the foreseeable future? There is no ready answer to this question. Indeed, over the last few years, the rising trend in the Polish real estate market has been notable. However, as suggested by the results of technical studies presented in the previous section, the prospect for a continued value increase in this segment is not so positive anymore if we examine it in the context of 20-30 years of maturity on loans secured by some property types. This applies particularly to loans secured by flats in old housing blocks built on outdated technologies and full of technical errors. Over the next 20 years, some of these buildings may start to crumble, posing a serious threat to their inhabitants.

Is mass revaluation of mortgage collateral portfolios a mere fancy or a necessity induced by the development of the housing loan market? In author's opinion, mass revaluation can already be perceived in terms of need, and will soon become a necessity for the Polish banking sector. Analysing the growth dynamics of mortgage portfolio value in the Polish banking sector, it may even be soon defined in terms of obligation. Why? Because, with very large mortgage portfolios and insufficient knowledge of the real values behind collaterals kept against housing loans, Polish banks may – over the next decade – face a serious risk to the security of their investments.

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