

Przemysław BUZAŁEK\*

 <https://orcid.org/0000-0001-9587-6141>

Iwona D. CZECHOWSKA\*\*

 <https://orcid.org/0000-0002-8051-5324>

## CONSEQUENCES OF ELDERLY PEOPLE'S FINANCIAL DECISIONS OF ILLUSTRATED BY THE EXAMPLE OF CAPITAL RELEASE BY MEANS OF REVERSE MORTGAGE

### Abstract

**Background:** Effective functioning requires households to take financial decisions. It is essential that these decisions are rational. It was indicated in the empirical studies that customers are sometimes unable to take decisions requiring mathematical calculations and economic evaluations. Customers from the 60+ age group are considered elderly people who need financial support. Such a possibility can be offered by reverse mortgage. The main objective of the paper is to assess consequences of financial decisions made by elderly people illustrated by the example of capital release by means of reverse mortgage, and to indicate whether such mechanisms are efficient and provide an appropriate level of financial support.

**Research purpose:** The main objective of this study was to assess consequences of financial decisions of elderly people illustrated by the case of capital release by means of reverse mortgage, as well as to indicate whether such mechanisms are efficient and ensure an appropriate level of support life.

**Methods:** The authors make an attempt to evaluate to what extent values of monthly payments obtained for the period of ten years from reverse mortgage in such Polish cities as Warsaw, Cracow, Gdansk, Poznan, Wroclaw, Lodz might ensure an achievement of minimum subsistence level. As the hypothesis for empirical verification, it was assumed that potential ten-year monthly payments obtained within *equity release* in a form of reverse mortgage ensures an achievement of minimum subsistence level for one-person pensioner households. In order to calculate estimated

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\* Master of Finance and Accounting at the Faculty of Economics and Sociology, University of Lodz; e-mail: [pbuzalek@gmail.com](mailto:pbuzalek@gmail.com)

\*\* Professor, University of Lodz, Faculty of Economics and Sociology, Institute of Finance, Department of Central Banking and Financial Intermediation; e-mail: [dorota.czechowska@uni.lodz.pl](mailto:dorota.czechowska@uni.lodz.pl)

payments from reverse mortgage, an account of terminated allowance was used. To make the assessment, the potential amounts of reverse mortgage benefits were compared with the indicator of minimum subsistence calculated in 2018 for one-person pensioner household in a property located in a city of above 500 thousand residents.

**Conclusions:** The results obtained show that reverse mortgage is a service that works best as an instrument supporting a household budget with additional money, not its basis. It can be concluded that regardless of whether a senior citizen (a woman or a man) is 65 or 75, they will obtain a benefit within the framework of ten-year reverse mortgage in an amount exceeding a minimum subsistence figure if they possess a property of the area of 60 square meters in Warsaw, Cracow or Gdansk. Besides, a level of minimum subsistence will be achieved in case of a woman signing a contract at the age of 75 and living in Wrocław as well as in case of a man between 71–75 with a property in Poznań and a man between 68–75 with a property in Wrocław. However, regardless of a senior's age (between 65–75) and gender, a minimum subsistence level will not be exceeded if a flat is located in Łódź.

**Keywords:** financial decisions, reverse mortgage, elderly person, minimum subsistence figure.

**JEL classification:** J14, G21, D14

## 1. Introduction

Conscious and effective functioning in the contemporary world requires households to take numerous decisions connected, among others, with financial services. It is essential that they are rational decisions<sup>1</sup>. According to the assumptions of behavioral economics used in finance, within the framework of which taking decisions is analyzed, an assumption of neoclassical economics concerning rationality of made decisions in the context of achieving self-interest was rejected<sup>2</sup>. According to the assumptions of behavioral economics it is important that decisions are not made under the influence of emotions because consequences of such decisions might bring problems in the future<sup>3</sup>. In empirical studies on behavioral finance it was indicated that customers are often unable to make de-

<sup>1</sup> **A. Tversky, D. Kahneman**, *Availability: a heuristic for judging frequency and probability*, *Cognitive Psychology* 1973/5 (2), p. 24; **P. Slovic, B. Fischhoff, S. Lichtenstein, B. Corrigan, B. Combs**, *Preference for insuring against probable small losses: insurance implications*, *Journal of Risk and Insurance* 1977/44 (2), pp. 237–258; **J. Von Neumann, O. Morgenstern**, *Theory of Games and Economic Behaviour*, Princeton University Press, 1944.

<sup>2</sup> **J. Von Neumann, O. Morgenstern**, *Theory...*

<sup>3</sup> **P. Muller, S. Devnani, R. Heys, J. Suter**, *Consume protection aspects of financial services*, European Parliament, Directorate – General for Internal Policies 2014; **I.D. Czechowska, W. Zatoń**, *Problemy klientów usług finansowych oraz ich uwarunkowania*, *Bank i Kredyt* 2018/49 (3), pp. 289–320.

cisions requiring mathematical calculations<sup>4</sup> and economic evaluations<sup>5</sup>. What has impact on customers' financial decisions are service providers and trust these customers place in them<sup>6</sup>. Trust is an effect of financial market regulations that provided customers with rights strengthening their economic interest and the ethical actions of financial institutions.

Customers over 60 are considered elderly people and old age as a subject of interest for economics appears in so-called *silver economy* dealing with social and economic aspects of that process<sup>7</sup>. One of the problems that appear in seniors' life (and resulting decisions that may be made to minimize the problem) is a need for financial support. Such a possibility is offered by reverse mortgages. This service ensures protection of legal and economic interest of beneficiaries by fulfilling information requirements by creditors, the right to withdraw from the agreement, the right to early repayment as well as termination of loan agreement in legally authorized cases<sup>8</sup>. In practice, assessing the efficiency of such an instrument is not possible because banks do not offer reverse mortgages<sup>9</sup>. Having taken the abovementioned constraints resulting from the functioning of financial market into consideration, the main objective of this study was to assess consequences of elderly people's financial decisions illustrated by the case of capital release by means of reverse mortgage, as well as to indicate whether such mechanisms are efficient and ensure an appropriate level of support/life. As the exemplification, the authors will make an attempt to evaluate to what extent values of monthly payments obtained over the period of ten years from reverse mortgage that retired seniors might get in the main Polish cities (Warsaw, Cracow, Gdansk, Poznan, Wroclaw, Lodz), could ensure

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<sup>4</sup> **J. Hastings, B. Madrian, W.L. Skimmyhorn**, *Financial literacy, financial education, and economic outcomes*, Annual Review of Economics 2013/5 (1), pp. 347–373.

<sup>5</sup> **M. Bazerman, D.A. Moore**, *Judgment in Managerial Decision Making*, John Wiley & Sons, Inc., New Jersey 2008.

<sup>6</sup> **B. Świecka**, *Konsument na rynku finansowych*, in: **G. Rosa** (ed.), *Konsument na rynku usług*, C.H. Beck, Warszawa 2015; **E. Radziszewski**, *Bank jako instytucja zaufania publicznego: gwarancje prawne i instytucjonalne*, Komisja Nadzoru Finansowego, Warszawa 2013.

<sup>7</sup> **I.D. Czechowska**, *Ograniczenia w dostępie do usług bankowych klientów 60+ w perspektywie zrównoważonych finansów*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2013, p. 311.

<sup>8</sup> **M. Paleczna**, *Mechanizm ochrony konsumenta seniora w regulacji o odwróconym kredycie hipotecznym*, Rozprawy Ubezpieczeniowe. Konsument na rynku usług finansowych 2019/32, pp. 16–28.

<sup>9</sup> <https://alebank.pl/odwrocony-kredyt-hipoteczny-i-ryzyko-wizerunkowe-banku/>; accessed 10.02.2020.

an achievement of minimum subsistence level. As the hypothesis to be empirically verified, it was assumed that potential ten-year monthly payments obtained within *equity release* in a form of reverse mortgage ensures an achievement of minimum subsistence level for one-person pensioner households.

## 2. Reverse mortgage as *equity release* service

The term *equity release* covers services/products enabling to convert capital accumulated in a real property into liquid financial means that may mainly be used by elderly people to improve their standard of life. Functioning of this type of products in a given market can be a solution for people who have not accumulated sufficient means to protect their old age while working, and who have a title to real estate. *Equity release* products are meant especially for single senior citizens who administer their property on their own, bear relatively high costs of maintenance and have no financial support from relatives, who might ultimately take over a property in the future<sup>10</sup>.

According to the European Commission's requirements such a service can be qualified as *equity release* if it meets the following conditions<sup>11</sup>:

- is offered as a financial service,
- provides a source of liquidity for the future,
- guarantees a right for lifelong residence in a property,
- repayment is based only on a property value.

The above assumptions are met, among others, by a reverse mortgage that is a credit model of *equity release*<sup>12</sup>.

Reverse mortgage consists of payments made by a creditor for a borrower (a property owner) of a specified amount of money (once or in tranches) and the bank's acceptance of a lack of credit repayment before a borrower's death<sup>13</sup>.

<sup>10</sup> P. Kowalczyk-Rólczyńska, *Equity release – ryzyko i jego determinanty*, in: E. Rutkowska-Tomaszewska (ed.), „Odwrócona hipoteka” jako nowa usługa na rynku finansowym, C.H. Beck, Warszawa 2017, pp. 67–68; Y.K. Tse, *Modeling reverse mortgages*, Asia Pacific Journal of Management 1995/12/2, p. 79.

<sup>11</sup> U. Reifner, S. Clerc-Renaud, E.F. Pérez-Carillo, A. Tiffe, M. Knobloch, *Study on Equity Release Schemes in the EU. Part I: General Report*, Institut für Finanzdienstleistungen e. V., Hamburg 2009.

<sup>12</sup> M. Solarz, *Odwrócony kredyt hipoteczny jako instrument inkluzyjnego systemu finansowego*, *Przedsiębiorczość i Zarządzanie* 2015/16, p. 225.

<sup>13</sup> Ustawa z 23 października 2014 o odwróconym kredycie hipotecznym (Dz.U. z 2016, poz. 786) – further referred to as: u.o.k.h

Interest accumulated during a loan period is added to the amount of credit and increase outstanding balance. The borrower remains the property owner until the maturity and is entitled to live there until the time of death. Loan repayment is generally made from an amount obtained from property sale as it is a collateral, or by heirs when they decide to take over the property and a borrower does not breach any terms of an agreement during the loan period. If, as a result of selling a property by a creditor there happens to be a surplus between an amount obtained after selling and a debt, it will be transferred to the heirs. In the opposite situation, i.e. if the amount of debt is higher than property value, heirs are not obliged to complement the deficient amount for a lending institution. Discrepancy between the date of concluding a loan agreement and release of funds, and a moment of transfer of rights to property causes that the product must be subject to appropriate legal restrictions<sup>14</sup>.

In describing reverse mortgages, it must be mentioned that they differ from standard mortgages mainly in that in this situation the bank grants credit up to the market value of a property (e.g. a flat) and repayment is made through taking ownership, whereas in a typical mortgage loan repayment is made in money. Additionally, a standard mortgage is usually taken to buy a flat (which is mortgaged), whereas in case of reverse mortgage the situation is the opposite – we own a flat and a bank acquires a right to take it over after an owner's death, paying a certain amount of market value during the owner's life, either once or in tranches. Establishing a mortgage in case of reverse mortgage serves as a bank's guarantee to take a property over, whereas in a standard mortgage it is a collateral of repayment<sup>15</sup>.

### 3. Advantages and disadvantage of reverse mortgage

Reverse mortgage, as every financial service, has its advantages and disadvantages. In this part of the article they will be described from a borrower's point of view.

The main advantage of a reverse mortgage is that it allows obtaining of additional financial means by unfreezing money accumulated by a borrower in a property in a convenient form (one-time payment, monthly tranches) without

<sup>14</sup> **M. Willmann**, *Odwrócony kredyt hipoteczny jako źródło uposażenia emerytalnego*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu 2016/426, Wrocław, pp. 155–156.

<sup>15</sup> **R. Czerniawski**, *Odwrócona hipoteka. Poradnik dla osób starszych*, Rzecznik Praw Obywatelskich, Warszawa 2014, pp. 5–6.

a need to make current repayments. There are no imposed constraints in the form of minimum age, specific health condition, or amount of income. Credit worthiness is not analyzed: what a bank checks is only credit history. What should be added here, financial means obtained from a borrower's property within the framework of reverse mortgage are not subject to taxation and can be used for any purpose. It means that reverse mortgage can prove useful when, among others, a borrower is in a difficult financial situation, e.g. has unpaid debts and is not able to settle them in any other way due to a lack of credit worthiness. However, the most common situation is that reverse mortgage supports a household budget with additional funds by complementing the pension system<sup>16</sup>.

Another advantage of *equity release* service is that, throughout the whole loan agreement, a borrower remains a property owner and has a life-long right to live there. It is connected with the fact that a provider of funds in a reverse mortgage acquires the right to a property only after a borrower's death unless potential heirs decide to repay it<sup>17</sup>. So, it can be stated that reverse mortgage is a good solution, especially for people who do not have any heirs, or due to other reasons, do not want to leave their property to them after death.

The most important disadvantage of reverse mortgage is that a borrower does not obtain an amount equal to 100% of property value from the creditor. It must be mentioned that there is a risk that the calculated value of property may be lower than its market value. It is estimated that a senior may obtain between 30 to 70% of property value, which restricts the amount received via tranche or diminishes one-time payment for a customer. Besides, a borrower is obliged to carry out current repairs in a property at their own expense, and to settle various payments connected with the property. Depending on the form of the reverse mortgage agreement, a borrower may be charged with payments concerning property valuation, considering an application, insurance premium, initial commission calculated from property value<sup>18</sup>.

<sup>16</sup> **Z. Pawelczyk**, *Odwrócony kredyt hipoteczny – konstrukcja ustawy w kontekście pozostałych usług finansowych adresowanych do osób starszych*, Nowy Przegląd Notarialny 2015/2, pp. 31–33; <http://odwroconahipoteka.pl/baza-wiedzy/odwrocona-hipoteka-plusy-i-minusy/>; accessed 22.03.2020.

<sup>17</sup> **E. Rutkowska-Tomaszewska**, *Odwrócony kredyt hipoteczny – lekarstwo na ubóstwo emerytów (seniorów, osób starszych)?*, in: **J. Blicharz, L. Klat-Wertelecka, E. Rutkowska-Tomaszewska** (eds.), *Ubóstwo w Polsce*, Uniwersytet Wrocławski, Wrocław 2014, pp. 169–170.

<sup>18</sup> **B. Sielicka**, *Odwrócona hipoteka jako innowacja na rynku kredytów hipotecznych w Polsce*, in: **M. Kalasińska, B. Póltorak** (eds.), *Innowacje finansowe na rynku nieruchomości w czasach kryzysu*, Uniwersytet Ekonomiczny we Wrocławiu, Wrocław 2011, p. 69.

A list of basic advantages and disadvantages of reverse mortgage is presented in Table 1, whereas disadvantages of this product from a creditor's point of view are described in a more detailed way in Part 3 of this paper.

TABLE 1: *Advantages and disadvantages of reverse mortgage*

Advantages for a client	Disadvantages for a client and for a bank
<ul style="list-style-type: none"> <li>• Transformation of capital accumulated in property into liquid financial means</li> <li>• Additional source of income for any purpose</li> <li>• Complementation of pension system</li> <li>• No taxation</li> <li>• Credit worthiness irrelevant</li> <li>• Guaranteed life-long residence</li> <li>• Property in hands of a borrower until a time of death</li> <li>• Freedom to use property (possibility to register, to rent)</li> <li>• Safety – service provider, bank controlled by KNF, reporting obligations, e.g. information form</li> </ul>	<ul style="list-style-type: none"> <li>• Obtaining only 30–70% of property value</li> <li>• Risk of property valuation below market value</li> <li>• Bearing costs connected with using property and loan contract costs</li> <li>• Risk of investment</li> <li>• Risk of longevity</li> <li>• Risk of decrease in value</li> <li>• Risk of withdrawal from a contract within 30 days. No compensation</li> </ul>

Source: own study based on <http://odwroconahipoteka.pl/baza-wiedzy/odwrocona-hipoteka-plusy-i-minusy/>; accessed 22.03.2020; **B., Sielicka**, *Odwrócona hipoteka jako innowacja na rynku kredytów hipotecznych w Polsce*, in: **M. Kalasińska, B. Półtorak** (eds.), *Innowacje finansowe na rynku nieruchomości w czasach kryzysu*, Uniwersytet Ekonomiczny we Wrocławiu, Wrocław 2011, p. 69; **I. Szczepańska-Kulik, P. Russel**, *Ocena funkcjonowania w Polsce przepisów ustawy o odwróconym kredycie hipotecznym*, *Zeszyty Prawnicze BAS 2017/3 (55)*, pp. 37–48; **M. Paleczna**, *Mechanizm ochrony konsumenta seniora w regulacji o odwróconym kredycie hipotecznym*, *Rozprawy Ubezpieczeniowe. Konsument na rynku usług finansowych 2019/32*, pp. 16–28.

#### 4. Barriers to the development of reverse mortgages in Poland

Adopting the act on reverse mortgage was to be an answer to a growing demographic problem in Poland and dilemmas connected with ensuring a suitable level of life for retired people. So far (April 2020) no bank in Poland has decided to introduce reverse mortgage to their product offer. Lack of banks' interest in reverse mortgage contracts could be explained with excessive risk and adverse regulations of the abovementioned act, which in most cases favor borrowers<sup>19</sup>.

<sup>19</sup> **E. Kowalewska**, *Odwrócony kredyt hipoteczny – fikcja czy realna szansa na lepsze życie seniora?*, *Przedsiębiorczość i Zarządzanie 2017/18*, pp. 123–125; **I. Szczepańska-Kulik, P. Russel**, *Ocena...*, p. 45.

Banks, first of all, are worried about making a methodological mistake (e.g. related to determination of an amount of reverse mortgage or a risk of longevity<sup>20</sup>), which over years may cause losses in their capital. Besides, what is of crucial importance is the fact that banks do not have experience in taking properties over after borrowers' death, management of these properties, as well as their subsequent sale. The situation is additionally complicated by the fact that there are no specialized products in the insurance market that would insure settlements of reverse mortgage (e.g. in case of partial satisfaction of bank's claims due to a decrease of property value)<sup>21</sup>.

One of the most important types of risks that accompanies reverse mortgage is that of increasing life expectancy, also referred to as longevity risk. It lies in the fact that maturity of payments for banks can be delayed related to accepted assumptions due to a longer length of borrower's life than previously expected<sup>22</sup>. As the legislator anticipated that payment of loan happens after the borrower's death (unless earlier withdrawal from a loan agreement was concluded), the date of selling a property by a bank is not known and is an element of uncertainty. Besides, the legislator has not determined a period of paying benefits from a reverse mortgage agreement, which means that there is a possibility of a situation when a borrower has lived for a predicted period of time and thus has used the whole loan amount. Such a situation would result in a lowered standard of living for the borrowers and it would make difficult for them to manage and maintain the property in an unimpaired condition, which would be negative for the bank<sup>23</sup>. According to Helena Ciepła, such a situation should be regulated by agreement in such a way that a bank could calculate the agreed-upon interest that would be funded from the remaining part of property<sup>24</sup>.

Another risk related to reverse mortgage is a legal risk. It concerns changes in legal regulations stipulating the functioning of this product as well as the other legal acts it is related to (e.g. the Banking law, the Act on Land Register and Mortgage, the Consumer Credit Act). It is necessary that these acts ensure cohesion and rationality in terms of individual regulations and that they eliminate

<sup>20</sup> M. Szczepański, *Ryzyko długowieczności*, Polityka Społeczna 2012/5–6.

<sup>21</sup> T. Czech, *Odwrócony kredyt hipoteczny. Komentarz*, LEX a Wolters Kluwer Business, Warszawa 2015, p. 24.

<sup>22</sup> Y. Chen, Q. Wu, *Research on Risk of Implementing Housing Reverse Mortgages in China*, International Journal of Business and Social Science 2014/5/9, p. 79.

<sup>23</sup> I. Szczepańska-Kulik, P. Russel, *Ocena...*, pp. 41–42.

<sup>24</sup> H. Ciepła, *Odwrócony kredyt hipoteczny jako nowy rodzaj umowy w systemie prawnym od 15.12.2014 r.*, Rejent 2015/8 (292), p. 53.



a risk of collision in order for reverse mortgage to function properly<sup>25</sup>. Because reverse mortgage is a long-term product, legal status that is binding at the moment of signing an agreement with a borrower is more or less beneficial for both parties and remains effective until the end of the agreement. Changing legal conditions may have a significant impact on supply on the *equity release* product (depending on for which party the law is more beneficial)<sup>26</sup>.

Another risk that accompanies reverse mortgage is property price risk. Decrease in property market value will adversely affect the product's profitability. Materialization of that risk for a bank may mean a situation in which funds from selling a property will be lower than the value of paid benefits. Additionally, risk of property price can be divided into specific risk and systematic risk. Specific risk concerns a property itself, e.g. its condition, size, location. Systematic risk results from a situation in the real estate market, which, in turn, depends on numerous factors including, among others, economic, demographic, legal-financial, political and cultural ones<sup>27</sup>.

A type of risk that is worth mentioning is the interest rate risk. Payments of benefits within a reverse mortgage framework, to a large extent, apart from a property value and borrower's age, depend on the interest rate. Adoption of a variable interest rate by a bank will create either a positive or negative aspect of that risk. Generally, in view of interest rate risk a probability of non-payment of loan at the time of maturity is increasing. Such a situation is possible due to a growing pace of accruing interest from credit balance than expected i.e. when an increase in interest rates takes place<sup>28</sup>. However, for a bank, an increase in interest rates may be a positive option if an increase in property prices is proportional or faster in relation to the value of capitalized debt<sup>29</sup>.

If any bank in Poland decided to introduce reverse mortgage to its product offer, it is not certain whether there would be any interest among consumers in such a product. Barriers to the development of reverse mortgage in Poland can be also found in a demand side. These barriers are mainly connected with cultural factors. In Poland, properties are generally transferred to children or

<sup>25</sup> **M. Buszko**, *Ryzyko odwróconych kredytów hipotecznych – perspektywa instytucji kredytujących*, Zarządzanie i Finanse 2013/1/1, p. 65.

<sup>26</sup> **E. Poprawska, P. Kowalczyk**, *Odwrócona hipoteka (reverse mortgage)*, in: **A. Szelałowska** (ed.), *Współczesna bankowość hipoteczna*, CeDeWu, Warszawa 2010, p. 91.

<sup>27</sup> **P. Kowalczyk-Rólczyńska**, *Equity...*, p. 75.

<sup>28</sup> **D. Alai, H. Chen, D. Cho, K. Hanewald, M. Sherris**, *Developing Equity Release Markets: Risk Analysis for Reverse Mortgages and Home Reversions*, ARC Centre of Excellence in Population Ageing Research, Working Paper 2013/01, p. 9.

<sup>29</sup> **M. Buszko**, *Ryzyko...*, p. 69.

grandchildren. It is often the case that family members (children) count on inheritance from parents and treat it as a kind of remuneration for looking after elderly parents or providing financial support. It is hard to imagine that in such a situation an elderly person might decide to take advantage of reverse mortgage and risk worsening of relations with relatives. But it is not out of the question that in the future such barriers will be of minor importance in Poland due to decreasing fertility, a rise of a number of single people as well as weakening of family bonds similar to the Western societies<sup>30</sup>.

Another limitation for the development of reverse mortgage in Poland can be the fact that it is not the only option of release of value accumulated in property. For single people, a more profitable option might be selling a property and buying a smaller one or located in a less attractive area. Such an operation enables not only obtaining a difference between values of these properties but at the same time it is attractive for someone who is not emotionally related to a current place of residence<sup>31</sup>.

## 5. Minimum subsistence figure as an indicator informing about a standard of living and possibilities of satisfying needs in a household

Potential changes observed in living conditions of households resulting from a decision of using reverse mortgage may improve the income situation of the society. It is necessary to strive for improvement of the quality of life, which is connected with a social dimension<sup>32</sup>. In practice, taking into consideration the fact that a large part of households border on minimum subsistence<sup>33</sup> as the reference point, it is worth examining an economic security as a priority of functioning. Economic security will be expressed by the possibility to implement standards necessary for life, normal activities and habits<sup>34</sup>. Apart from economic

<sup>30</sup> **T. Kowalak**, *Kluczowe czynniki ograniczające popyt na odwróconą hipotekę w Polsce*, Studia Ekonomiczne Uniwersytet Ekonomiczny w Katowicach 2012/106, Katowice, p. 315.

<sup>31</sup> *Ibidem*, p. 314.

<sup>32</sup> **A. Pfaller**, *Social Democracy in the Globalized Post-industrial Society*, *International Politics and Society* 2000/2, pp. 160–175.

<sup>33</sup> **J. Stanisławska, A. Kozera, R. Głowicka-Wołoszyn**, *Zmiany w poziomie i strukturze wydatków polskich gospodarstw domowych o różnej sytuacji dochodowej w aspekcie zrównoważonej konsumpcji*, *Handel Wewnętrzny* 2018/3 (374).

<sup>34</sup> **M. Gębska**, *Bezpieczeństwo ekonomiczne gospodarstw domowych w Polsce na podstawie wskaźnika minimum socjalnego i minimum egzystencji*, *Doctrina Studia Społeczno-Polityczne* 2017/14; **P. Townsend**, *Poverty in the United Kingdom*, London 1979, p. 31.

security there also emerges financial security especially relevant for the *silver economy* generation. Financial security is associated with making rational decisions that have long-term social-economic consequences influencing standards of living<sup>35</sup>. Within the framework of various indicators of living standards and possibilities of meeting needs in a household, one can distinguish, among others, a minimum subsistence figure used in Poland since 1981<sup>36</sup>, which is an indicator of household maintenance endangered by a risk of poverty<sup>37</sup>. This indicator sets a limit of costs measuring a minimum decent standard of living. To calculate this social indicator by means of the basket of goods method, considered factors include costs of goods and services indispensable for life and household maintenance at a low level. The range and level of meeting needs according to this model should provide such living conditions so that at every stage of human development reproduction of their vital powers and keeping social bonds could be guaranteed<sup>38</sup>. Baskets are calculated in value terms (costs of purchasing goods and services) and in quantitative terms (recommended standard consumption of basic goods and services). One of the elements of basket and minimum subsistence are costs of flat maintenance. The indicator is calculated for six types of working households and two types of pensioner households (one and two-person households). In case of that indicator it is vital, from the point of view of this study, to check whether citizens/households can reach or exceed a minimum social subsistence that is a limit of expenses measuring a minimum decent standard of living, sufficient at every stage of biological development<sup>39</sup>. Exceeding that level would mean a possibility to settle liabilities and unexpected costs, raising a low average income level for elderly people.

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<sup>35</sup> **E. Wierzbicka**, *Znaczenie edukacji ekonomicznej dla bezpieczeństwa finansowego seniorów*, Rozprawy Ubezpieczeniowe. Konsument na rynku usług finansowych 2019/33, pp. 33–52.

<sup>36</sup> **P. Zwiech**, *Eliminacja nierówności społeczno-ekonomicznych jako cel polityki spójności*, Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach 2017/310, Katowice, p. 133.

<sup>37</sup> <http://www.ipiss.com.pl>; accessed 13.04.2020.

<sup>38</sup> *Ibidem*.

<sup>39</sup> **M. Szczepkowski**, *Kwota wolna od podatku w Polsce w kontekście minimum egzystencji i minimum socjalnego*, Prace naukowe Uniwersytetu Ekonomicznego we Wrocławiu 2017/488, Wrocław, p. 247.

## 6. Minimum subsistence figure and estimated amounts of ten-year payments from reverse mortgages

### 6.1. Description of the study

The authors' own study consists of checking and assessing whether payments from reverse mortgages would ensure life with minimum subsistence for senior citizens. In order to achieve this, the subject of the conducted analysis included potential amounts of payments of ten-year benefits, calculated by the authors within the framework of another study<sup>40</sup>, paid monthly to people signing a credit contract at an age between 65 to 75, who own a residential property in one of the following cities in Poland: Warsaw, Cracow, Gdansk, Poznan, Wroclaw and Lodz.

In order to calculate estimated payments from reverse mortgage, an account of terminated allowance was used, in particular aided with the following formula<sup>41</sup>:

$$R = \frac{\alpha \cdot W_r}{\left[ \frac{N_x - N_{x+n}}{D_x} \right]}$$

where:

$R$  – amount of annual benefit paid at the beginning of every year,  
 $\alpha \cdot W_r$  – amount of granted reverse mortgage that is a part of market value of property at the time of signing the agreement,

$D_x = v^x l_x$  – discounted number of people that reached the age of  $x$ ,

$N_x = \sum_{t=0}^{\infty} D_{x+t}$  (in practice the aggregation does not go to infinity but to a maximum age included in life expectancy tables<sup>42</sup>).

<sup>40</sup> See more: **P. Buzalek, I.D. Czechowska**, *Effect of Capital Conversion in the Form of a Reverse Mortgage on Benefits for Senior Citizens in Major Cities of Poland*, *Journal of Finance and Financial Law* 2020/1 (25).

<sup>41</sup> **S. Wieteska**, *Zastosowanie rachunku życiowych do kalkulacji świadczeń w hipotece odwróconej*, in: **A.S. Barczak, S. Barczak** (eds.), *Metody matematyczne, ekonometryczne i komputerowe w finansach i ubezpieczeniach*, Uniwersytet Ekonomiczny w Katowicach, Katowice 2011, pp. 260–261; **S.G. Kellison**, *The Theory of Interest*, McGraw-Hill, New York 2009, p. 80.

<sup>42</sup> **W. Zgliczyńska**, *Odwrócona hipoteka jako jedna z możliwości zwiększania przychodów emerytów*, *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Współczesne Problemy Ekonomiczne. Globalizacja. Liberalizacja. Etyka* 2014/9, p. 243.

Based on the data presented in the literature as the value of 30% was adopted. A relatively low level of results from the fact that banks, apart from calculated interest and other costs, would have to take into consideration the fact that a dramatic drop in property value, serving as collateral may occur<sup>43</sup>. The calculations were based on a discount rate of 2.87%, announced in January 2019<sup>44</sup>.

In order to make estimations, the Life Expectancy Tables of Poland for 2017, published by the Central Statistical Office (GUS) were used. Based on the estimations for an average life expectancy, it was assumed that the calculations of payments for harmonization will be conducted for the period of ten years for all age groups.

In their estimating the authors also used the data from transaction price bases of residential properties on the secondary market in selected cities in the fourth quarter of 2018, prepared in the NBP Department of Economic Analyses. On this basis, average transaction prices of residential properties were calculated, depending on location and property area. The results are presented in Table 2.

TABLE 2: *Average transaction prices of residential properties in selected cities in Poland in the fourth quarter in 2018*

Cities	Average transaction price for one square meter (in PLN)	Average transaction price of residential properties (in PLN)				
		30 m <sup>2</sup>	40 m <sup>2</sup>	50 m <sup>2</sup>	60 m <sup>2</sup>	70 m <sup>2</sup>
Warsaw	8 259	247 770	330 360	412 950	495 540	578 130
Cracow	6 849	205 470	273 960	342 450	410 940	479 430
Gdansk	7 499	224 970	299 960	374 950	449 940	524 930
Poznan	5 937	178 110	237 480	296 850	356 220	415 590
Wroclaw	6 191	185 730	247 640	309 550	371 460	433 370
Lodz	4 465	133 950	178 600	223 250	267 900	312 550

S o u r c e: own study based on Departament Analiz Ekonomicznych NBP, Baza cen nieruchomości mieszkaniowych BaRN, [http://www.nbp.pl/publikacje/rynek\\_nieruchomosci/ceny\\_mieszkan.xls?v=2018q2](http://www.nbp.pl/publikacje/rynek_nieruchomosci/ceny_mieszkan.xls?v=2018q2); accessed 18.04.2019.

<sup>43</sup> **B. Meluch**, *Odwrócona hipoteka – model kredytowy czy model sprzedażowy? Czy polski senior będzie mógł wzmocnić swój budżet?*, in: **E. Rutkowska-Tomaszewska** (ed.), *„Odwrócona hipoteka” jako nowa usługa na rynku finansowym*, C.H. Beck, Warszawa 2017, p. 7; **T. Czech**, *Odwrócony...*, p. 96.

<sup>44</sup> [https://www.uokik.gov.pl/stopa\\_referencyjna\\_i\\_archiwum.php](https://www.uokik.gov.pl/stopa_referencyjna_i_archiwum.php); accessed 18.04.2019.

Taking the above into consideration as a reference point, the authors used an indicator of minimum subsistence figure for one-person pensioner household in a property located in a city of above 500 thousand residents. In 2018 it amounted to 1206,08 per month<sup>45</sup>. In order to guarantee that the indicator of minimum subsistence is reliable, it was decided that the analysis would be narrowed to one-person pensioner households living in flats of average size (i.e. about 60 square meters)<sup>46</sup>. Since it could be regarded as misuse to apply the same level of minimum subsistence indicator in case of a person owning a flat of an area of 30 and 70 square meters, at least due to large discrepancies in maintenance costs of such properties.

## 6.2. Presentation of the results of the study

Tables 3 and 4 present information about the proportion of a monthly minimum subsistence (PLN 1206,08) in an amount of a potential monthly benefit paid for 10 years from reverse mortgage to a person signing a credit contract at a given age and possessing a residential property in a specific city. Every result above 100.00% indicates exceeding a minimum subsistence and confirms that a senior citizen would be able to secure themselves a minimum decent standard of living thanks to a reverse mortgage.

TABLE 3: *Proportion of minimum subsistence in an amount of monthly benefit paid to a woman for 10 years from reverse mortgage (in %)*

Age	City					
	Warsaw	Cracow	Gdansk	Poznan	Wroclaw	Lodz
1	2	3	4	5	6	7
65	122,96	101,98	111,68	88,39	92,20	66,50
66	123,54	102,48	112,18	88,80	92,61	66,83
67	124,20	102,98	112,76	89,30	93,11	67,16
68	124,95	103,64	113,43	89,80	93,61	67,57
69	125,70	104,30	114,17	90,38	94,27	67,99
70	126,69	105,05	115,00	91,04	94,94	68,49

<sup>45</sup> **IPiSS**, *Minimum socjalne w układzie przestrzennym w 2018 r. Komentarz do danych*, Warszawa 2019, p. 7.

<sup>46</sup> In 2018 an average flat area of one-person pensioner household was 59,75 m<sup>2</sup>. See more in: *Sytuacja osób starszych w Polsce w 2018 r.*, GUS, Warszawa 2020, p. 41.

1	2	3	4	5	6	7
71	127,69	105,88	116,00	91,78	95,76	69,07
72	128,93	106,96	117,07	92,70	96,68	69,73
73	130,42	108,12	118,40	93,77	97,75	70,48
74	132,08	109,53	119,98	94,94	99,00	71,39
75	134,07	111,19	121,80	96,43	100,49	72,47

S o u r c e: own study based on **P. Buzalek, I.D. Czechowska**, *Effect...*; **IPiSS**, *Minimum...*, p. 7.

The information presented in Table 3 shows that ten-year benefits from reverse mortgage would secure income exceeding a minimum subsistence for women signing a credit contract:

- at the age of 65–75 from Warsaw, Cracow and Gdansk,
- at the age of 75 from Wroclaw.

In the case of women at the age between 65–75, who own a flat in Lodz or Poznan, amounts of obtained benefits would not secure an achievement of a minimum subsistence level. It is connected with the fact that values of residential properties of the area of 60 square meters significantly differ, depending on a location, which considerably influences an amount of paid benefit. For example, in the fourth quarter of 2018 an average transaction price of a flat of 60 square meters located in Warsaw amounted to PLN 495 540, in Cracow – PLN 410 940, in Gdansk – PLN 449 940, in Poznan – PLN 356 220, on Wroclaw – PLN 371 460, in Lodz – PLN 267 900<sup>47</sup>.

TABLE 4: *Proportion of minimum subsistence in an amount of monthly benefit paid to a man for 10 years from reverse mortgage (in %)*

Age	City					
	Warsaw	Cracow	Gdansk	Poznan	Wroclaw	Lodz
1	2	3	4	5	6	7
65	131,17	108,78	119,06	94,27	98,34	70,89
66	132,25	109,69	120,06	95,02	99,16	71,47
67	133,41	110,61	121,14	95,85	99,99	72,13
68	134,65	111,68	122,30	96,76	100,91	72,80

<sup>47</sup> See more in: Departament Analiz Ekonomicznych NBP, Baza cen nieruchomości mieszkaniowych BaRN, [https://www.nbp.pl/publikacje/rynek\\_nieruchomosci/ceny\\_mieszkan.xls?v=2018q2](https://www.nbp.pl/publikacje/rynek_nieruchomosci/ceny_mieszkan.xls?v=2018q2); accessed 8.04.2020.

TABLE 4 (cont.)

1	2	3	4	5	6	7
69	136,06	112,84	123,54	97,75	101,98	73,54
70	137,55	114,09	124,95	98,92	103,14	74,37
71	139,38	115,58	126,53	100,16	104,47	75,37
72	141,28	117,16	128,27	101,57	105,96	76,36
73	143,52	119,06	130,34	103,14	107,62	77,61
74	146,01	121,14	132,58	104,97	109,45	78,93
75	148,91	123,46	135,15	107,04	111,60	80,51

Source: own study based on P. Buzalek, I.D. Czechowska, *Effect...*; IPiSS, *Minimum...*, p. 7.

The information presented in Table 3 shows that ten-year benefits from reverse mortgage would secure income exceeding a minimum subsistence for men signing a credit contract:

- at the age of 65–75 from Warsaw, Cracow and Gdansk,
- at the age of 71–75 from Poznan,
- at the age of 68–75 from Wroclaw.

In case of men at the age of 65–75, who own a flat in Lodz, amounts of obtained benefits would not guarantee exceeding a minimum subsistence level. As it was mentioned above, it is connected with the fact that values of residential properties in Lodz are definitely worth less than flats located in other cities. Taking into consideration an indicator of minimum subsistence, benefits from reverse mortgage would better support men. Higher benefits for men result from the fact that assumed average life expectancy of men is shorter than women, and theoretically a bank has to wait less for regaining a lent amount of credit together with accrued interest<sup>48</sup>.

## 7. Conclusion

Reverse mortgage is a financial service enabling the gain of financial means by „unfreezing” money accumulated by a borrower in a property, e.g. in a form of monthly benefits obtained from a creditor for an agreed period of time. It is a good solution, especially for senior citizens living alone, who do not ob-

<sup>48</sup> P. Buzalek, I.D. Czechowska, *Effect...*, pp. 24–25.



tain any financial support from relatives and have nobody to whom to leave a property as a legacy.

Having conducted the study, it can be concluded that regardless of whether a senior citizen (a woman or a man) is 65 or 75, they will obtain a benefit within the framework of a ten-year reverse mortgage in an amount exceeding a minimum subsistence figure if they possess a property of the area of 60 square meters in Warsaw, Cracow or Gdansk. Besides, a level of minimum subsistence will be achieved in case of a woman signing a contract at the age of 75 and living in Wroclaw as well as in case of a man between 71–75 with a property in Poznan and a man between 68–75 with a property in Wroclaw. However, regardless of a senior's age (between 65–75) and gender, a minimum subsistence level will not be exceeded if a flat is located in Lodz. Thereby, the hypothesis assumed in the introduction and concerning the achievement of minimum subsistence for one-person pensioner household in case of ten-year monthly benefits from reverse mortgage was proven false. In light of the obtained results, one can claim that a reverse mortgage is a service that works best as an instrument supporting a household budget with additional money, not its basis.

Summing up, it is worth noting that in the study the authors used the same indicator of minimum subsistence figure for all cities. Yet, in practice it is simplification as costs of property maintenance are different in Lodz or Warsaw. It indicates that exceeding minimum subsistence thanks to reverse mortgage in case of one-person pensioner households in Warsaw, Cracow or Gdansk would necessarily mean an increased comfort of life of senior citizens from these cities.

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Przemysław BUZAŁEK, Iwona D. CZECHOWSKA

**KONSEKWENCJE DECYZJI FINANSOWYCH OSÓB STARSZYCH NA PRZYKŁADZIE UWOLNIENIA KAPITAŁU ZA POMOCĄ ODWRÓCONEGO KREDYTU HIPOTECZNEGO****Abstrakt**

**Przedmiot badań:** Efektywne funkcjonowanie wymaga od gospodarstw domowych podejmowania decyzji finansowych. Ważne jest, aby były to decyzje racjonalne. W badaniach empirycznych wykazano, że klienci bywają niezdolni do podejmowania decyzji wymagających obliczeń matematycznych i ewaluacji ekonomicznych. Klienci w wieku (60+) zaliczani do grupy osób starszych wykazują potrzebę wsparcia finansowego. Taką możliwość daje im odwrócony kredyt hipoteczny.

**Cel badawczy:** Głównym celem opracowania jest ocena konsekwencji decyzji finansowych osób starszych na przykładzie uwolnienia kapitału za pomocą odwróconego kredytu hipotecznego oraz wskazanie, czy mechanizmy te są skuteczne i zapewniają odpowiedni poziom wsparcia.

**Metoda badawcza:** Autorzy podejmują próbę oszacowania, w jakim stopniu wartości miesięcznych świadczeń wypłacanych przez okres 10 lat z tytułu odwróconego kredytu hipotecznego, które mogliby otrzymywać seniorzy w wieku emerytalnym, w głównych miastach w Polsce (Warszawa, Kraków, Gdańsk, Poznań, Wrocław, Łódź) zapewniałyby osiągnięcie poziomu minimum socjalnego. Jako hipotezę podlegającą empirycznej weryfikacji przyjęto, że potencjalne 10-letnie świadczenie wypłacane co miesiąc w ramach *equity release* w postaci odwróconego kredytu hipotecznego zapewnia osiągnięcie poziomu minimum socjalnego dla jednoosobowych gospodarstw emeryckich. Do wyliczenia szacunkowych wysokości świadczeń z tytułu odwróconego kredytu hipotecznego wykorzystano rachunek rent życiowych terminowych. Żeby osiągnąć cel badania, porównano wskaźnik minimum socjalnego dla jednoosobowych gospodarstw emeryckich z roku 2018 z potencjalnymi wartościami świadczeń, dla jednoosobowego gospodarstwa domowego emeryta w nieruchomości położonej w mieście powyżej 500 tys. mieszkańców.

**Wyniki:** Uzyskane wyniki pozwalają stwierdzić, że odwrócony kredyt hipoteczny najlepiej sprawdza się jako instrument wspierający budżet domowy, a niestanowiący jego podstawę. Z badania wynika, że bez względu na to, czy senior (kobieta i mężczyzna) ma 65 czy 75 lat, to uzyska świadczenie w ramach 10-letniego odwróconego kredytu hipotecznego w wysokości przekraczającej poziom minimum socjalnego, jeżeli posiada nieruchomość mieszkaniową o powierzchni 60 m<sup>2</sup> w: Warszawie, Krakowie lub Gdańsku. Poziom minimum socjalnego zostanie osiągnięty w przypadku kobiety przystępującej do umowy w wieku 75 lat i zamieszkałej we Wrocławiu, a także w przypadku mężczyzny, który jest w wieku od 71 do 75 lat i posiada mieszkanie w Poznaniu, oraz mężczyzny w przedziale wiekowym 68–75 lat z nieruchomością mieszkaniową we Wrocławiu. Natomiast bez względu na wiek seniora (65–75 lat) i jego płeć poziom minimum socjalnego nie zostanie przekroczony, gdy mieszkanie zlokalizowane jest w Łodzi.

**Słowa kluczowe:** decyzje finansowe, odwrócona hipoteka, osoby starsze, minimum socjalne.