

Economics and Business Review

Volume 1 (15) Number 3 2015

CONTENTS

Introduction

Piotr Manikowski, W. Jean Kwon

ARTICLES

The changing architecture of the safety net in insurance worldwide: post-crisis developments

Jan Monkiewicz, Lech Gąsioriewicz, Marek Monkiewicz

The determinants of nonlife insurance penetration in selected countries from South Eastern Europe

Klime Poposki, Jordan Kjosevski, Zoran Stojanovski

Microeconomic and macroeconomic determinants of the profitability of the insurance sector in Macedonia

Tanja Drvoshanova-Eliskovska

Policyholder and insurance policy features as determinants of life insurance lapse – evidence from Croatia

Marijana Ćurak, Doris Podrug, Klime Poposki

Longevity risk and the design of the Polish pension system

Marek Szczepański

Polish farmers' perception of spring frost and the use of crop insurance against this phenomenon in Poland

Monika Kaczała, Dorota Wiśniewska

Insurance and risk management systems in Russia

Nadezda Kirillova

BOOK REVIEWS

Jeremy Rifkin, Zero Marginal Cost Society. The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism, Palgrave Macmillan, New York 2014 (Jan Polowczyk)

Andrzej Rzońca, Kryzys banków centralnych. Skutki stopy procentowej bliskiej zera [Central Banks Crisis. The Impact of Interest Rates Close to Zero], Wydawnictwo C.H. Beck, Warszawa 2014 (Tadeusz Kowalski)

Editorial Board

Ryszard Barczyk
Witold Jurek
Cezary Kochalski
Tadeusz Kowalski (Editor-in-Chief)
Henryk Mruk
Ida Musiałkowska
Jerzy Schroeder
Jacek Wallusch
Maciej Żukowski

International Editorial Advisory Board

Udo Broll – School of International Studies (ZIS), Technische Universität, Dresden
Wojciech Florkowski – University of Georgia, Griffin
Binam Ghimire – Northumbria University, Newcastle upon Tyne
Christopher J. Green – Loughborough University
John Hogan – Georgia State University, Atlanta
Bruce E. Kaufman – Georgia State University, Atlanta
Steve Letza – Corporate Governance Business School Bournemouth University
Victor Murinde – University of Birmingham
Hugh Scullion – National University of Ireland, Galway
Yochanan Shachmurove – The City College, City University of New York
Richard Sweeney – The McDonough School of Business, Georgetown University, Washington D.C.
Thomas Taylor – School of Business and Accountancy, Wake Forest University, Winston-Salem
Clas Wihlborg – Argyros School of Business and Economics, Chapman University, Orange
Jan Winiński – University of Information Technology and Management in Rzeszów
Habte G. Woldu – School of Management, The University of Texas at Dallas

Thematic Editors

Economics: *Ryszard Barczyk, Tadeusz Kowalski, Ida Musiałkowska, Jacek Wallusch, Maciej Żukowski* •
Econometrics: *Witold Jurek, Jacek Wallusch* • **Finance:** *Witold Jurek, Cezary Kochalski* • **Management and Marketing:** *Henryk Mruk, Cezary Kochalski, Ida Musiałkowska, Jerzy Schroeder* • **Statistics:** *Elżbieta Gołata, Krzysztof Szwarc*

Language Editor: *Owen Easteal* • **IT Editor:** *Piotr Stolarski*

© Copyright by Poznań University of Economics, Poznań 2015

Paper based publication

ISSN 2392-1641

POZNAŃ UNIVERSITY OF ECONOMICS PRESS
ul. Powstańców Wielkopolskich 16, 61-895 Poznań, Poland
phone +48 61 854 31 54, +48 61 854 31 55, fax +48 61 854 31 59
www.wydawnictwo-ue.pl, e-mail: wydawnictwo@ue.poznan.pl
postal address: al. Niepodległości 10, 61-875 Poznań, Poland

Printed and bound in Poland by:
Poznań University of Economics Print Shop

Circulation: 300 copies

Longevity risk and the design of the Polish pension system¹

*Marek Szczepański*²

Abstract: The aim of this article is an analysis of the design of the Polish pension system in its benefits phase (decumulation of the collected pension capital) in the context of longevity risk management. The object of the research involves both the public pension system (including the latest legal amendments related to the collection and payment of pension capital from pension funds) and supplementary pension schemes: occupational pension schemes, individual retirement accounts and individual accounts for retirement security. The main question which the author addresses is whether the current Polish pension system is more resistant to the risk of longevity in its present legal and institutional design than the previous Polish public pension scheme, based on PAYG financing method and a defined benefit formula for the calculation of pension benefits.

Keywords: the risk of a longer than expected life expectancy (longevity risk), average life expectancy, pension systems.

JEL codes: J11, J14.

Introduction

Over the last decades of the XXth and the first decade of the XXI century there have been unprecedented, and to some extent unexpected, increases in life expectancy [Cocco and Gomes 2001: 2]. The length of time people are expected to live in most OECD countries has increased by 25 to 30 years during the XXth century. This increase in life expectancy is the result of the progress of civilisation, improved working conditions, better medical care and lifestyle changes. But “improvements in mortality and life expectancy are uncertain. In this regard, longevity risk is associated with the risk that future mortality and life expectancy outcomes turn out differently from those expected” [Anatolin

¹ Article received 22 October 2014, accepted 3 August 2015.

Article prepared within the statutory research at the Faculty of Management Engineering of Poznań University of Technology.

² Poznań University of Technology, Faculty of Engineering Management, Strzelecka 11, 60-965 Poznań, Poland, marek.szczepanski@put.poznan.pl.

2007: 3]. Managing longevity risk became a global issue, approaches used in the EU countries and the USA are confronted with new, sometimes innovative ideas, implemented also in Asian countries [Roy 2012]. Scientists conducting research in the field of pension economics but also public institutions and providers of private financial service (banks, insurance companies, occupational pension schemes, asset management companies) are interested in institutional solutions (pension scheme design) as well as financial instruments which could help to manage the longevity risk, such as annuities, longevity-linked instruments, risk-sharing in Defined Contribution pension schemes, de-risking in Defined Benefit Schemes, etc. **This article focuses on the issues of managing longevity risk in the reformed pension system in Poland and in particular – the construction of public and supplementary pension systems and their ability to adapt to the challenges associated with longevity risk.**

The basis for further consideration is the proper definition of longevity risk, which is not the same as the demographic risk related to the ageing of the population.

What is this longevity risk, also defined as the risk of age length, Hull [2011: 82–88], and what is its essence? Longevity risk can be defined at both individual and aggregate levels.

Individual longevity risk (sometimes referred to as specific longevity risk) is based on the fact that a person lives longer than expected. Such a risk may be associated with the premature exhaustion of savings or improper distribution of investments in time [Stallard 2006; Pitacco et al. 2009]. Individual longevity risk, the presence of which can carry severe negative consequences for individuals, does not present any danger to the financial stability of pension systems. There is also **an aggregate longevity risk**, sometimes called the risk of trend, that affects the entire population. It consists of the fact that in a given population, the average life expectancy will be longer than expected. In other words it is the risk of incorrect estimates of future trends in mortality rate. Together both specific and aggregate longevity risks form **total longevity risk** [Blake Burrows 2001].

For pension systems the aggregate longevity risk is particularly important. The risk of longevity, which refers to the phase of paying out pension benefits (pension capital decumulation) affects both public pension systems as well as the supplementary pension schemes (occupational or individual) that provide benefits for life (annuities). The degree of vulnerability of pension systems to longevity risk depends on their structure, and especially the methods of financing and the pension formula utilised (method of calculating benefits).

Today in economically developed countries **demography risk** is associated with the process of demographic aging (population growth of old people in relation to the working generation and is associated inter alia with decreasing average fertility rates and increases in life expectancy). The demographic risk in the pension systems results from the need to finance current benefits paid

by the current income. Demographic risk particularly affects those pension systems which are wholly or predominantly based on generational contract (PAYG), or the financing of current pension benefits from current contributions or taxes obtained from the working generation. But also funded pension schemes are not completely immune to demographic risk.

Generally it can be stated that demographic risk arises from the fact that successive generations are living longer. Longevity risk relates to those individuals or demographic groups, which live longer than expected.

Without going into further details regarding the issues of the financing of pension systems, which already do not provide self-financing and require subsidies from the state budget in most economically developed countries, it is worth drawing attention to the fact that social security systems in relation to the increased demographic risk have and will continue to have serious problems in meeting their obligations to people who will continue to live longer on average, but who will not exceed the average life expectancy for a given age group in demographic forecasts. Meanwhile, in each demographic group a proportion of people live unusually long. This group is mostly affected by the risk of longevity.

1. Longevity risk in pension systems – a model approach

In an attempt to answer the question whether the structure of the pension system in Poland – with regard to recent statutory changes³ – provides adequate and sufficient protection against longevity risk, it is worth recalling the definition of social risk.

The risk of old age, like some other types of social risks (e.g. linked to child-birth) can be recognized not only as a threat, but also as an opportunity. The very fact of living up to the statutory retirement age and a long lifetime after passing that milestone is of course a good thing, like the birth of a child in a family. The risk of old age can be considered as a personal risk in addition to other types of social risks – such as the death of a breadwinner, an illness, disability, unemployment, maternity (and more precisely – its financial implications), accidents at work and occupational diseases [Mierzejewska 2005: 210].

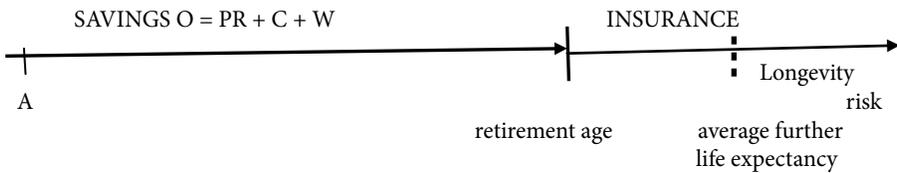
Social risk associated with old age refers to the possibility of a decreasing household income after the contractual threshold of old age, which is determined by the statutory age of retirement. In English literature the risk of old age is de-

³ An Act of 6 December 2013 amending certain acts in relation to the definition of principles for the payment of pensions from funds collected in open pension funds, *Journal of Laws* 2013, pos. 1717 introduced far-reaching changes in the structure of the public (base) pension system in Poland and drastically limited the participation of the second pillar (private pension funds) in total pension security in old age.

defined as “the risk of insufficient income during retirement” [Rejda 2001: 8] or “the risk of financial dependency in old age” [Vaughan and Vaughan 2001: 10].

In Poland, as in most European countries, the pension system involves the use of the insurance risk management method. The payment of benefits depends on pension contributions made equally by employees and employers during their working lives. This applies to the occupational (public) pension system. In separate pension systems for the armed forces, judges and prosecutors, pensions are financed by a supply method from general taxes.

For the management of longevity risk it is particularly important to properly define the risks of old age covered by pension security. In Polish literature this is aptly illustrated by a model of Tadeusz Szumlicz (see Figure).



- A – adoption of occupational activity
- O – total retirement savings
- PR + C + W – the possible forms of retirement savings
(pension rights + pension capital + wealth)

Old age risk characteristics

Source: Based on: [Szumlicz 2005: 242]

Using a model approach to the risk of old age, the longevity risk can be placed in an individual’s third cycle of life. Considering unitary and individual terms (microeconomic level), the risk of old age in the first phase (accumulation) lies in the fact that a person does not gather sufficient retirement savings, and in the second phase (from the age of retirement until the end of the average life expectancy) that the accumulated savings provide too little income. In the third phase, for people living longer than expected, in addition to the risk of low income (e.g. low level of pension benefits offered by the public pension system) there still exists the risk of the partial or total exhaustion of any additional accumulated resources (e.g. in an individual or occupational pension plan, in other forms of savings, etc.), namely the implementation of individual longevity risk.

Individual longevity risk does not occur in pension systems providing benefits in the form of an annuity. In the case of life annuity, the funds in a participant’s account are converted to a series of lifetime benefits. If a participant dies, there is no inheritance, because at the moment of retiring the individual account is liquidated and the individual equity feeds the insurance fund [Otto

and Wiśniewski 2013: 23]. In contrast, the aggregate longevity risk (the risk of trend) begins to affect institutions paying out benefits for life and which also ensure the indexation of benefits.

If a public pension system, in addition to providing pensions in the form of an annuity made available another retirement product: guaranteed payment of benefits after retirement – decapitalizing an individual retirement account within a specified period such as 15 years (with the possibility of inheritance when a given person dies earlier), also the public system would cover the risk of the exhaustion of accumulated pension capital for people living longer than expected. Thus it would be possible to realize the individual longevity risk.

As a matter of fact the implementation of social risks is easier to cope with for wealthy and very wealthy individuals rather than people with lower incomes. Others, however, cannot be left alone with this type of threat posed to the resources of their households. This applies particularly to the elderly. Therefore most countries of the world have utilized (for more than a hundred years) social security systems which include pensions. The problem is that these can operate more or less effectively, provide full or only partial and insufficient protection against social risk and in this case – the risk against longevity associated with the risk of old age. This depends largely on the structure (legal and institutional solutions and methods of funding) of public supplementary pension systems as well as methods of forecasting further life expectancy, which form the basis for the calculation of the amount of pension benefit.

2. Longevity risk in the Polish pension system

The year 1999 marked the introduction of a comprehensive, systemic pension reform, one of its main objectives being the division of risk between the financial and the labour markets by introducing a three-pillar structure, and in particular, a second capital funded pillar and private pension funds (called “OFE”) operating within it. A mixed PAYG-funded scheme was created. In this scheme, the first pillar (administered by the Social Insurance Institution) is financed by current pension contributions of the working generation (the so-called generational contract) and the second pillar is composed of the pension savings of the working generations invested in the financial market. Contributions for a pension in Poland are relatively high and amount to 19.52% of gross income, of which the employer pays 9.76% and the remaining 9.76% by the employee.

In the accumulation phase of pension capital the accumulated capital is recorded in the form of pension benefits (the first individual retirement account in the Social Insurance Institution confirming the state’s commitment to pay future benefits, which will be financed by successive generations of workers) and financial capital (assets accumulated in pension funds, recorded in the

second individual account, with coverage in financial instruments of a specified market value purchased with part of the contributions transferred to the second pillar). Diversifying sources of future pension funding was supposed (according to the reform's creators) to reduce the risk to the long-term stability of the pension system.

Whilst the first pillar (PAYG) is more sensitive to the risk of demographics which increases with the ageing of the population (an increase in the number of people receiving pension benefits at retirement age in relation to the contributors of working age) the financed pillar is subject to different (demographically non-correlated) kinds of risk (including investment risk). Both the PAYG and the funded pillar are not immune to aggregate longevity risk.

A more comprehensive summary of the different types of risk in PAYG and fully funded pension schemes are presented in Table.

Comparison of the pay-as-you-go model and the fully funded one in terms of common types of risk

| | | |
|---------|---|--|
| Threats | <ul style="list-style-type: none"> - demographic risk - low level of occupational activity and high unemployment - moral risk manifesting itself in a tendency of a premature occupational deactivation in order to gain benefits - political risks associated with the unjustified redistribution of resources in order to gain political support of advantaged groups - longevity risk | <ul style="list-style-type: none"> - demographic risk - (less than that for PAYG) - capital market crisis - inadequate investment policy - high inflation - longevity risk |
|---------|---|--|

Source: Based on: [Jurek 2011: 7].

The second significant change was the replacement of the formula for calculating benefits – a transition from a defined benefit (DB) to a defined contribution system (DC), leading to the individualization of benefits (equivalence of benefits in relation to the contributions, a departure from the redistribution of income in a given generation of retirees).

Diversification, however, was not only to apply to the phase of capital accumulation, but also the phase of its consumption (decumulation), which carries the risk of longevity. According to the initial assumptions of the pension reform of 1999 the payment of benefits from capital accumulated in the second pillar of the pension system was to be dealt with by pension institutes (created especially for this purpose), which would not only pay benefits under the second pillar but also multiply the accumulated capital and invest it in the low risk financial instruments. However such pension institutions never came to existence. For 15 years the pension reform has not been completed because there was no legislation regarding the payment of pensions from the second

pillar. Only recently has enacted legislation been enacted (Act of 26 December 2013) to finally regulated this important issue. The payment of the total pension funds accumulated in the first and second pillar will lie in the hands of the Social Insurance Institution. A lifetime pension (annuity) will remain the only available product. What is more the funds accumulated in the second pillar in the phase of capital accumulation will be gradually transferred to the Social Insurance Institution 10 years before a person retires (these funds will cover the current payment of benefits for the previous generation of retirees) in exchange for pension rights recorded in a participant's account on a special sub-account valorized according to different regulations than the rights recorded in the first pillar.

Without going into any detailed evaluation of the new solution for the gradual transfer of pension capital from private pensions funds to the Social Insurance Institution (the so-called safety slide), which has been subjected to critical analysis in a separate study Szczepański [2013, p.168–170], it is worth formulating a few questions regarding the management of longevity risk:

- What are the advantages and disadvantages of entrusting all pension payments to one state institution (the Social Insurance Institution) from the point of view of managing longevity risk? Will it increase or rather decrease the safety of payments? Will an alternative solution – to create a competitive solution on the market of pension payments – be more risky and more expensive for retirees?
- Is the selected retirement product – a lifetime pension correct from the point of view of managing longevity risk?
- Is the use of tables later of life expectancy common to both men and women (so called unisex tables) for the calculation of pension benefits in the new, reformed pension system the right solution?
- What were the alternative solutions?

Entrusting all pension payments from the first and the second pillar to a state institution (the Social Insurance Institution) means the elimination of the competition mechanism, which could occur in the phase of benefit payments if the benefits of the second pillar were to be paid out by specialized institutions (pension institutes) or non-specialized financial institutions, which would deal with this in addition to other tasks (private pension funds, life insurance companies, investment funds and other entities). However is competition necessary in the phase of payments? Would the maintenance of the process of benefit payments from the second pillar by competing private financial institutions result in an excessive cost of such maintenance? Undoubtedly the advantage of ceding all payments to one institution (in this case the Social Insurance Institution having years of experience and an appropriate basis for the payment of pension benefits) makes it possible to link payments from the first and the second pillar and utilize the economies of scale to reduce the unit cost of pension payments. Finally, it is the state that remains responsible for

the security and continuity of pension benefits, so using a specialized state institution for this purpose seems to be the right solution.

Government experts, in order to justify the recent changes in the public pension system, explicitly state that only the state is able to take on the demographic risk, including – longevity risk: “as the only entity able to deal with the demographic risk is the state. Thus, the issue of payment of benefits accumulated in private pension funds should also be linked to the interests of public finances” [MPiPS 2013: 5]. However the examples of insurance companies that pay annuities and have already developed a method of spreading risk within the insurance community risk, demonstrates that the state monopoly regarding the payment of pensions, although still present in most countries, does not have to be the only acceptable solution.

Merging pension payments from the first and the second pillar into one state institution does not increase the aggregate longevity risk, as the risk is spread over a much larger number of participants in the pension system than would be in the case of entrusting payments to multiple operators serving smaller groups of retirees. To a large extent longevity risk affecting the people of a given year of beneficiaries (the demographic cohort) reduces the risk of a shorter than expected life span of other retirees receiving pensions. It is known that in every age group there are people living less than the average life expectancy, as well as people living longer than expected. It is difficult to assume that these two groups will always balance one another. The risk of longevity cannot be completely eliminated and the state (directly or indirectly) must take responsibility for the elderly for whom the benefits of the public pension system are often the main or sole source of income.

An alternative solution worth considering would be to create a separate state pension institution, which would take over the assets of pension funds and invest them in the financial market and pay out benefits from the second pillar. According to the author it would be a better solution and it would retain the diversification of risk and comply with the key idea of the pension reform of 1999 – “security through diversity”. The original concept of the payments from the second pillar was proposed by W. Otto and M. Wiśniewski who believe that this task should be delegated to common pension associations (private financial institutions managing private pension funds) that would create two sub-funds: of Lifetime Capital Pensions and of Guaranteed Lifetime Capital Pensions. The retirees would have the choice of a PTE – General Pension Society and one of the two pension products: pension annuity or pension annuity with a guaranteed payment period (for example, until they reach the age of 77 years). This second pension would be lower, but it would be possible to inherit it, if the retiree’s death occurred within the warranty period [Otto and Wiśniewski 2013: 24–25].

As for the additional voluntary pension systems functioning under the third pillar, neither in the system of group savings for additional pension in the work-

place (occupational pension systems – PPE, available since 1999), nor in individual systems (individual retirement accounts – IKE, operating since 2004, or individual accounts of retirement security – IKZE, since 2011 onwards) is there any product offered in the form of a retirement annuity. Legal regulations for occupational pension plans (Law of 20 April 2004, Art. 42), IKE and IKZE (The Act of 20 April 2004, Art. 34) provide that the payment of money may take place at once or in instalments after a retiree reaches the age of 60 years (occupational pension plans or individual retirement accounts) or 65 years (in individual accounts of retirement security). Any payment of instalments will last until the depletion of savings accumulated in occupational pension plans, IRA or in individual accounts of retirement security and not in the form of benefits payable for life. There is quite a realistic scenario according to which a person saving for retirement will receive an additional one-time payment at the age of 60 or 65 years of age and by living unusually long this person will deplete this additional fund and in the last phase of life his or her standard of living (based solely on funding from the public pension system) will be significantly lower. Such a structure of payments from the third pillar of the pension system in Poland does not protect against longevity risk.

During the presidential campaign, and after the presidential election in Poland (May 2015), there are projects of far-reaching changes in the public pension system in Poland, for example – to allow retirement after 40 years of payment of pension contributions for men and 35 years for women as well as changes in the formula for calculating pensions from the defined benefit formula (defined contribution, DC) to the formula with a defined benefit (defined benefit, DB). Such solutions can significantly increase the aggregate longevity risk in the public pension system. For example a large group could retire at the age of 58 (workers who began their professional career at the age of 18) and then receive pension benefits over 25 years or longer. Ensuring continuity of payments without increasing pension contributions would mean a significant reduction in pensions. Taking into account the low level of participation in additional pension schemes Poland (only approximately 2.2% of employees are covered by occupational pension schemes, only 5.2% of people of working age saves on the IKE and 3.2% saves for IKZE – at the end of 2014 r., according to Komisja Nadzoru Finansowego [Polish Financial Supervision Authority]). This could lead to poverty in the last decades of their lives because of an expected decrease of pension benefits paid out from public pension system.

Conclusions and recommendations

Both solutions with multiple entities or with one entity paying out pension benefits from the public pension system in Poland have their advantages and disadvantages. The author agrees that “there is no simple answer to the ques-

tion whether the payment of benefits should be addressed by one centralized institution or by many competing entities. Both solutions have their pros and cons” [KNUiFE 2004: 8].

Also the fact that the latest statutory amendments have selected only one pension product: a lifetime annuity benefit in the Polish public pension scheme seems satisfactory.

In contrast the obvious drawback of previously introduced changes to the public pension system in Poland is the occurrence of actuarial risk which may directly cause an increase in longevity risk.

Public pensions schemes with a defined benefit formula are more sensitive to longevity risk. Reverting to the pension system prior to 1999, based almost exclusively on the PAYG financing method and the DB formula would mean a significant increase in longevity risk and increase risks of damage to long-term sustainability of the pension system. This would mean an increase in systemic risk of the whole pension system in Poland – in both the short and long term.

The purpose of the payment of benefits should be to ensure an optimal level of life for beneficiaries continued throughout the duration of life. The right solution to this problem requires the development of an algorithm and parameters to determine the optimal value of benefits. Actuarial risk is associated with the adoption of poorly estimated parameters (e.g. the longer life expectancy in terms of months for a given demographic age group as the basis for the calculation of benefits in the new pension scheme). When pension payments are made directly from the accumulated capital the pensioner begins to bear a risk. Above the minimum guaranteed by the state the level of benefits is determined by the amount of capital held and by a legally defined algorithm to determine the scope of the provision. The adoption of the algorithm, which in the sphere of assumptions departs from reality, can cause two kinds of results.

A too slow decumulation of capital in the population reduces the beneficiaries’ level of consumption and causes the transfer of non-consumed pension capital to the next generation. On the other hand, a too high payout level may end up with prematurely depleted capital and result in the realization of longevity risk. The problem then is a decline in living standards of pensioners and a burden for the state because of payments of minimal guaranteed pensions [KNUiFE 2004: 78].

Therefore the necessary missing link in the pension scheme is to create an institution of national actuary which will be properly able to accurately forecast demographic trends and an to make an appropriate calculation of base pension benefits on the basis of further life expectancy. This will enable a more effective management of both demographic and longevity risks.

Additional pension systems (occupational pension systems, individual retirement accounts, individual accounts of retirement security) do not protect the savers against longevity risk as they do not offer annuities. In many countries a widely used solution is to buy an annuity at the commencement of the

withdrawal of accumulated additional pension capital. However in Poland a life insurance with perpetuity payments is very poorly developed and their availability is limited.

Nevertheless accumulating additional pension capital may be useful for those people who live longer than expected – at least some of them will be able to take advantage of this capital during old age if the size of the additional savings is significant enough and does not get consumed before. As there are no additional systems in Poland with defined benefits such as the occupational pension schemes in Western Europe or the U.S., aggregate longevity risk does not affect those employers who offer pension schemes.

References

- Anatolin, P., 2007, *Longevity Risk and Private Pensions*, OECD Working Paper on Insurance and Private Pensions, no. 3.
- Blake, D., Burrows, W., 2001, *The Case of Longevity Bonds: Helping to Hedge Mortality Risk*, *Journal of Risk and Insurance*, no. 68 (2): 339–348.
- Cocco, J.F., Gomes, F.J., 2011, *Longevity Risk, Retirement Savings, and Financial Innovation*, Netspar Discussion Papers, <http://faculty.london.edu/fgomes/cg.pdf> [access: 15.06.2015].
- Hull, J.C., 2011, *Zarządzanie ryzykiem instytucji finansowych*, Wydawnictwa Profesjonalne PWN, Warszawa.
- Jurek, Ł., 2011, *Rekonstrukcja wieku emerytalnego w dobie demograficznego starzenia*, *Polityka Społeczna*, nr specjalny, cz. I: 22–25.
- KNUiFE, 2004, *Wyplata emerytur z II filara nowego system emerytalnego*, Warszawa.
- Mierzejewska, M., 2005, *Egzemplifikacja ryzyk gospodarstwa domowego*, w: Szumlicz, T. (red.), *Społeczne aspekty ubezpieczenia*, Szkoła Główna Handlowa w Warszawie: 209–221.
- MPiPS, 2013, *Uzasadnienie do projektu ustawy o zmianie niektórych ustaw w związku z określeniem zasad wypłaty emerytur ze środków zgromadzonych w otwartych funduszach emerytalnych*, Ministerstwo Pracy i Polityki Społecznej, Warszawa, 10 października, <http://www.mpips.gov.pl> [access: 20.10.2013].
- OECD Statistics, <http://stats.oecd.org> [access: 16.01.2014].
- Otto, W., Wiśniewski, M., 2013, *Emerytury kapitałowe: mechanizm ekonomiczny*, w: Chybalski, F., Marcinkiewicz, E. (red.), *Współczesne zabezpieczenie emerytalne. Wybrane aspekty ekonomiczne, finansowe i demograficzne*, Wydawnictwo Politechniki Łódzkiej, Łódź: 23–41.
- Pitacco, E., Denuit, M., Haberman, S., Olivieri, A., 2009, *Modelling Longevity Dynamics for Pensions and Annuity Business*, Oxford University Press, New York.
- Rejda, G.E., 2001, *Principles of Risk Management and Insurance*, Addison Wesley-Longman, New York.
- Stallard, E.L., 2006, *Demographic Issues in Longevity Risk Analysis*, *The Journal of Risk and Insurance*, vol. 73, no. 4: 575–609.
- Szczepański, M., 2013, „Bezpieczeństwo dzięki zrównoważeniu” – wstępna ocena proponowanych zmian, in: Szczepański, M. (ed.), *Reformowanie systemów emerytalnych*

- porównania i oceny. *Pension Reforms – Comparison and Evaluation*, Publishing House of Poznań University of Technology, Poznań: 147–175.
- Szumlicz, T., 2005, *Ubezpieczenie społeczne. Teoria dla praktyki*, Oficyna Wydawnicza Branta, Bydgoszcz–Warszawa.
- UNFE, 2004, *Wypłata emerytur z II filara nowego systemu emerytalnego*, Urząd Komisji Nadzoru Ubezpieczeń i Funduszy Emerytalnych, Warszawa.
- Ustawa z dnia 20 kwietnia 2004 r. o indywidualnych kontach emerytalnych oraz indywidualnych kontach zabezpieczenia emerytalnego, Dz.U., nr 116, poz. 1205 z późn. zm.
- Ustawa z dnia 20 kwietnia 2004 r. o pracowniczych programach emerytalnych, Dz.U., poz. 1207.
- Ustawa z dnia 6 grudnia 2013 r. o zmianie niektórych ustaw w związku z określeniem zasad wypłaty emerytur ze środków zgromadzonych w otwartych funduszach emerytalnych, Dz.U., poz. 1717.
- Vaughan, E.J., Vaughan, T.M., 2001, *Essentials of Risk Management and Insurance*, Wiley, New York.
- World Bank Statistic, <http://www.data.worldbank.org> [access: 16.01.2014].

Aims and Scope

Economics and Business Review is the successor to the Poznań University of Economics Review which was published by the Poznań University of Economics Press in 2001–2014. The Economics and Business Review is a quarterly journal focusing on theoretical and applied research work in the fields of economics, management and finance. The Review welcomes the submission of articles for publication dealing with micro, mezzo and macro issues. All texts are double-blind assessed by independent reviewers prior to acceptance.

Notes for Contributors

1. Articles submitted for publication in the Economics and Business Review should contain original, unpublished work not submitted for publication elsewhere.
2. Manuscripts intended for publication should be written in English and edited in Word and sent to: review@ue.poznan.pl. Authors should upload two versions of their manuscript. One should be a complete text, while in the second all document information identifying the author(s) should be removed from files to allow them to be sent to anonymous referees.
3. The manuscripts are to be typewritten in 12' font in A4 paper format and be left-aligned. Pages should be numbered.
4. The papers submitted should have an abstract of not more than 100 words, keywords and the Journal of Economic Literature classification code.
5. Acknowledgements and references to grants, affiliation, postal and e-mail addresses, etc. should appear as a separate footnote to the author's name^{a,b,etc} and should not be included in the main list of footnotes.
6. Footnotes should be listed consecutively throughout the text in Arabic numerals. Cross-references should refer to particular section numbers: e.g.: See Section 1.4.
7. Quoted texts of more than 40 words should be separated from the main body by a four-spaced indentation of the margin as a block.
8. Mathematical notations should meet the following guidelines:
 - symbols representing variables should be italicized,
 - avoid symbols above letters and use acceptable alternatives (Y^*) where possible,
 - where mathematical formulae are set out and numbered these numbers should be placed against the right margin as... (1),
 - before submitting the final manuscript, check the layout of all mathematical formulae carefully (including alignments, centring length of fraction lines and type, size and closure of brackets, etc.),
 - where it would assist referees authors should provide supplementary mathematical notes on the derivation of equations.
9. References in the text should be indicated by the author's name, date of publication and the page number where appropriate, e.g. Acemoglu and Robinson [2012], Hicks [1965a, 1965b]. References should be listed at the end of the article in the style of the following examples:

Acemoglu, D., Robinson, J.A., 2012, *Why Nations Fail. The Origins of Power, Prosperity and Poverty*, Profile Books, London.

Kalecki, M., 1943, *Political Aspects of Full Employment*, The Political Quarterly, vol. XIV, no. 4: 322–331.

Simon, H.A., 1976, *From Substantive to Procedural Rationality*, in: Latsis, S.J. (ed.), *Method and Appraisal in Economics*, Cambridge University Press, Cambridge: 15–30.
10. Copyrights will be established in the name of the E&BR publisher, namely the Poznań University of Economics Press.

More information and advice on the suitability and formats of manuscripts can be obtained from:

Economics and Business Review

al. Niepodległości 10

61-875 Poznań

Poland

e-mail: review@ue.poznan.pl

www.puereview.ue.poznan.pl

Subscription

Economics and Business Review (E&BR) is published quarterly and is the successor to the Poznań University of Economics Review. The E&BR is published by the Poznań University of Economics Press.

E&BR is listed in ProQuest, EBSCO, and BazEkon.

Subscription rates for the print version of the E&BR: institutions: 1 year – €50.00; individuals: 1 year – €25.00. Single copies: institutions – €15.00; individuals – €10.00. The E&BR on-line edition is free of charge.

Correspondence with regard to subscriptions should be addressed to: Księgarnia Uniwersytetu Ekonomicznego w Poznaniu, ul. Powstańców Wielkopolskich 16, 61-895 Poznań, Poland, fax: +48 61 8543147; e-mail: info@ksiegarnia-ue.pl.

Payments for subscriptions or single copies should be made in Euros to Księgarnia Uniwersytetu Ekonomicznego w Poznaniu by bank transfer to account No.: 96 1090 1476 0000 0000 4703 1245.