OLSZTYN ECONOMIC JOURNAL
Abbrev.: Olszt. Econ. J., 2013, 8(4)

MODERN METHODS AND INSTRUMENTS FOR MANAGING LONGEVITY RISK IN PENSION PLANS

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K e y w o r d s: longevity risk, methods and instruments of longevity risk management, longevity SWAP-s, longevity bonds.

A b s t r a c t

Extending the average life span in every next generation is a positive phenomenon – the result of the progress of civilization in the area of working conditions, the level of medical care, etc. However, this process also entails certain risks. Such a threat which can be accurately predicted and calculated and thus also recognized in terms of risk (which can be managed by people) is the longevity risk, or in other words the risk of a longer than expected life expectancy. It applies both to individuals as well as whole generations (demographic cohorts).

The longevity risk threatens public pension systems as well as complementary and supplementary systems (individual and company run) as long as they guarantee payment of benefits for life.

The cognitive aim of this article is to present the theoretical and practical case studies of selected methods and longevity risk management instruments as well as an attempt to evaluate their effectiveness. The author attempts to address a question whether the use of certain instruments to manage longevity risk would not trigger yet another type of risk – the so-called counterparty risk. It poses threat to each party of a contract that the counterparty will not live up to its contractual obligations.

NOWOCZESNE METODY I INSTRUMENTY ZARZĄDZANIA RYZYKIEM DŁUGOWIECZNOŚCI W SYSTEMACH EMERYTALNYCH

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S ł o w a k l u c z o w e: ryzyko długowieczności, metody i instrumenty zarządzania ryzykiem długowieczności, SWAP-y długowiczności, obligacje długowiczności.

Abstrakt

Wydłużanie się w kolejnych pokoleniach średniego okresu trwania życia jest zjawiskiem pozytywnym, efektem postępu cywilizacyjnego w dziedzinie warunków pracy, poziomu opieki medycznej itp. Pociąga za sobą jednak także określone zagrożenia. Takim zagrożeniem dającym się w miarę precyzyjnie przewidzieć i skalkulować, a także ująć w kategoriach ryzyka, którym ludzie mogą zarządzać, jest m.in. ryzyko długowieczności, czy też, stosując inne tłumaczenie terminu angielskiego (*longevity risk*), ryzyko dłuższego niż oczekiwano trwania życia. Odnosi się ono zarówno do jednostek, jak i do całych roczników (kohort demograficznych).

Na ryzyko długowieczności narażone są publiczne systemy emerytalne, ale także systemy uzupełniające i dodatkowe (indywidualne i zakładowe), o ile gwarantują wypłatę świadczeń dożywotnich.

Celem poznawczym artykułu jest przedstawienie podstaw teoretycznych oraz praktycznych przykładów zastosowań wybranych metod i instrumentów zarządzania ryzykiem długowieczności, a także próba oceny ich skuteczności. Autor zamierza też odpowiedzieć na pytanie, czy wykorzystanie niektórych instrumentów zarządzania ryzykiem długowieczności nie spowoduje wystąpienia innego rodzaju ryzyka – tzw. ryzyka kontrahenta (*counter party risk*), polegającego na niewywiązaniu się w przyszłości z przyjętych zobowiązań drugiej strony kontraktu.

Introduction

The aim of this article is to present the methods and financial instruments used for managing the risk of longevity in public and supplementary pension plans. The starting point for the analysis will be to define longevity risk with reference to individuals and communities, and the consequences of this risk realization for social security systems – particularly the pension system. The author also intends to characterize the main financial methods and instruments for hedging longevity risk existing today and to describe the status of development and perspectives for this new, relatively poorly-developed segment of the financial market, where entities interested in transferring liabilities burdened with longevity risk (e.g. private pension funds – company-sponsored or acting for individual customers, private companies managing pension funds operating within public pension schemes, such as OFE in Poland, as well as insurance companies offering life annuities) meet with investors interested in purchasing those liabilities for commercial purposes (e.g. reinsurers, investment banks, other investors in financial markets).

In economically developed countries, subsequent generations are living, on average, for an increasingly longer period of time, and some persons within a given birth cohort live exceptionally long (longer than predicted on the basis of demographic estimations). As results from demographic research, in economically developed countries (using a simplification, this group includes countries included in the International Organisation for Economic Co-operation and Development), life expectancy has increased by two and a half years during a decade, and three months per year (VAUPEL 2013). In Poland (*Trwanie życia*... 2013), the life expectancy of men extended between 1992 and

2012 from 66.5 to 72.7 years (by 6.2 years), and for women in the corresponding period from 75.5 to 81.0 (by 5.5 years).

The fact that the average lifespan has been extended is, of course, a positive phenomenon. This process is the result of the progress of civilisation – improvement of work conditions, progress in technology, medicine and health care, improving the level of education, hygiene and a reduction in wars and military conflicts. However, extension of the average lifespan involves a series of economic, financial and social consequences, particularly the occurrence of longevity risk.

Longevity risk concerns both individuals and entire demographic birth cohorts. **Individual, specific longevity risk** involves a given person living longer than he/she is expected to, which results in total or partial exhaustion of the material resources gathered by this person for old age. Although it is desirable for a human being to live longer than expected, a long life in poverty or a significant lowering of living standards in old age makes it difficult, or almost impossible, to satisfy important life needs (e.g. purchase of medicines, participation in social and cultural life).

There also exists an **aggregate longevity risk** in that in a given generation (birth cohort) the average lifespan will be longer than anticipated. In other words, this is the risk of improper assessment of the future mortality rate trend (BARTKOWIAK 2011, pp. 22–24). Combined specific and aggregate longevity risk make up **total longevity risk** (BLAKE et al. 2010, p. 1–6)[1].

Longevity risk is becoming an increasingly important problem for social policy and a challenge for social security systems (particularly pension plans and health care systems) in economically-developed countries, including Poland. It imposes additional obligations on the state (the ultimate guarantor of the public pension plan and health care benefit payments), additional obligations. In addition, private finance institutions, e.g. pension funds (operating within additional or supplementary – individual or corporate – pension plans), insurance companies or trust funds offering life annuities are exposed to longevity risk.

The question arises as to **whether and how longevity risk can be managed**. Although the precise date of death for specific persons is not known, demographers try to determine the average lifespan for a given generation (birth cohort). It is always possible to make a mistake in this type of projection, but undoubtedly, this type of uncertainty as to future phenomena and states can be referred to as measurable uncertainty and satisfies a commonly-recognized definition of risk as formulated by F.H. Knight, according to whom risk is defined as measurable, quantifiable uncertainty (KNIGHT 2006).

[1] Pensions Institute in Cass Business School, City University in London headed by Prof. David Blake is one of leading longevity research centres in the world, co-organising cyclic international scientific conferences on this subject matter.

As in the case of other risk types, the risk of longevity can also be managed: risk level can be identified and appropriate methods and instruments for its reduction can be applied. At the same time, several basic questions of a theoretical nature and practical implications should be answered:

– Is it possible, at least partially, to transfer this risk from some entities to others?

– Whether, and to what extent, is this type of risk transfer safe and cost effective for the participating entities?

– What financial instruments or legal and institutional solutions should be applied with this end in view?

– Does there already exist a market in which selected longevity risk management methods and instruments are offered? If so, what is the existing development state of this market, and what are the factors stimulating and inhibiting its growth?

The aim of this study is to provide a contribution toward helping to answer the questions raised.

Scenarios in the market of instruments used for longevity risk transfer

The famous saying of Benjamin Franklin that in this world nothing can be said to be certain except for death and taxes has not lost its relevance. Although death is certain, its date is not known in advance. Practically each person (except for very wealthy ones) is exposed to specific longevity risk, thus the risk of exhausting assets accumulated for old age before the end of life.

In order to reduce this risk, apart from public pension plans, additional pension savings can be used, provided by private financial institutions – mainly insurance companies and pension funds. They co-operate with other financial institutions, e.g. reinsurance companies or trust funds, which offer the service of converting assets gathered in the pension fund or insurance capital fund into a stream of lifelong payments (annuity providers).

For example: the amount of a pension mainly depends on the assumptions of models estimating the length of life. If it is assumed in the pension plan in a given country that a citizen lives, on average, until the age of 75, and actually the average age extends to 77, then additional means will be needed for these two years for financing pension benefits. Appropriate financial reserves should be created in social security systems to provide for situations of this type, but generally, they are unsatisfactory (e.g. funds collected so far in the Fund of Demographic Reserve in Poland)[2]. On the basis of data provided by Artemis (a risk managing company) quoted by Łukasz Wróbel (a Noble Securities

financial analyst) "costs related to underestimation of 'longevity risk' in the British pension scheme amount to about 1 trillion pounds. Only in 2010, the liabilities of pension funds for this account increased by about 5 billion pounds" (WRÓBEL 2013). Longevity risk practically occurs in all pension plans or, more broadly speaking, social security systems in economically-developed countries, and it is becoming an increasingly serious problem both for state institutions managing social security systems and for private financial institutions.

Among private financial institutions, entities offering life annuity benefit are particularly exposed to aggregate longevity risk (BLAKE et al. 2006). From the moment of selling a life annuity to the end of the (irrevocable) contract, generally up to a dozen years pass. Institutions selling life annuities (e.g. an insurance company) assume specific forecasts concerning average lifespan and structures of the dying-out process. Extension of average life expectancy can be quite precisely estimated, but – as D. Stańko accurately observes – "standard deviation from the estimated mean grows at an increasing rate" (STAŃKO 2010, p. 194). Therefore, longevity risk for an annuity provider increases.

For instance: a life insurance company offering life annuities usually sells this financial service (product) for a standard price, taking into account, e.g. the age and the nature of work of the insured and life expectancy anticipated for a given birth cohort. If a sufficiently numerous group of people living extraordinary long emerges within the insurance risk community, then it may be the case that the insurance company will not achieve the assumed profit and will even suffer a loss that will have to be covered from reserve funds (actuarial reserves). The need to increase actuarial reserves for covering longevity risk results in increasing the prices of insurance services offered which, in turn, can decrease the demand for this type of services.

Pension funds are also exposed to longevity risk. At the same time, what is important is the structure (form, calculation method) of financial benefits offered by those entities. For example, company pension plans operating on the basis of defined benefit which offer fund participants lifelong benefits in an amount specified in advance (e.g. as a ratio of the last or the average remuneration from which the premiums to the pension plan were paid), may get into serious financial trouble, and even become insolvent, if more than the predicted number of participants of the pension plan live longer than average, and the financial assets gathered for them in the pension plan become

[2] N.B. financial means of the Demographic Reserve Fund have been withdrawn several times from this fund by the decision of the Minister of Finance, although they are gathered for the purpose of covering future liabilities if demographic situation deteriorates as a result of the progressive society aging process, which will happen in Poland already in 2020–2030, as follows from the demographic forecast of the Central Statistical Office.

exhausted. Annuity providers can also suffer losses. For example, an insurance company to which assets gathered in a company pension plan are transferred in return for appropriate remuneration and the obligation to pay life annuities to plan participants.

Therefore, it is no wonder that at least some of these entities are interested in longevity risk transfer, making up the demand side of the newly-established modern innovative financial instruments (generally against payment) by assuming all, or a part, of the longevity risk of other entities.

Government institutions, or more broadly: public institutions managing the public pension system or the health care system (e.g. Social Security Authorities (ZUS) or National Health Fund (NFZ) in Poland), can also be potential recipients of longevity risk transfer instruments in the future.

On the other hand, on the financial market there are (although relatively still scarcely) entities interested in accepting longevity risk against payment. They include, e.g. reinsurance companies, who will assume a part of the liabilities from the insurer or the pension plan in the case of realization of longevity risk. Some of them already offer a service consisting in granting a bank guarantee for pension funds, ensuring that they will pay annuity benefits for fund participants living extremely long. In return, reinsurance companies and banks assuming longevity risk take over the assets of the pension fund.

Until recently, pension funds and trust funds protected themselves from longevity risk by buying out – in return for the assets held – life annuities for pension plan participants in insurance companies or investment banks and those entities (annuity providers), in turn, shared against payment of a part of the risk with reinsurance companies. Thus, a transfer of investment risk as well as longevity risk took place. However, this is an expensive solution and not all pension funds or trust funds can afford it.

Additionally, limitations emerge on the side of annuity providers. The possibilities of assuming (absorbing) longevity risk by reinsurers or banks (in this case – investment banks) are limited. Therefore, the capital market becomes a kind of natural channel for longevity risk transfer and this, in turn, requires the application of appropriate financial instruments and attracting investors interested in their purchase.

Another class of stakeholders in longevity risk transfer consists of general investors, who will purchase financial instruments used for longevity risk transfer (LRT).

This role can be fulfilled by investment banks and other institutional investors. As in other financial market segments, some investors in the emerging market of LRT instruments are typical short-term profit-oriented speculators and some are long-term investors. An important role is also played

in this market by regulators (financial institutions) admitting LRT financial instruments for trading and financial analysts and demographers employed in financial institutions who prepare life expectancy tables for various populations when constructing longevity transfer risk instruments. Longevity indices already exist and are constantly updated and based on large demographic data sets, e.g. the special longevity index constructed by specialists from JP Morgan bank, known as LifeMetrics.

Most LRT financial instruments are derivatives and are characterized in more detail later in this article. They are sold for a price determined in advance, but their final clearing takes place in the future and depends on the value assumed by the underlying instruments (such an underlying instrument can be a listed share which will be sold or purchased in a half-year period, but it could also be the lifespan of a specified population, e.g. pension plan participants). Figuratively speaking, most LRT instruments are *de facto* bets on the lifespan of a given population. The basic problem in this market is the reliability of the entity which assumes the longevity risk. Will it fulfil liabilities assumed against persons living exceptionally long, for instance, in twenty or thirty years? Will this entity still exist at all?

A very serious **counterparty risk** emerges in the market of financial instruments used for longevity risk transfer. This is one of the serious limitations of this potentially highly promising new segment of the global financial market (e.g. pension funds on the global scale have at their disposal gigantic assets totalling about USD 23 trillion). For instance, pension funds (e.g. in company pension plans) which want to transfer longevity risk to another entity must be certain that in 20–30 years the purchaser will be able to handle it and deliver the agreement.

The global financial crisis of 2008–2009 forcibly showed that even the largest financial groups – such as the American insurer, AIG – can find themselves very quickly on the brink of bankruptcy. The same applies to the largest reinsurers or investment banks, i.e. possible partners in longevity risk transfer transactions. The example of Greece also shows that states as issuers of financial instruments are not always reliable and sometimes may not meet their financial obligations. State institutions assuming obligations to pay life annuities in return for taking over assets (e.g. payment of pensions from the capital pillar in Poland by ZUS) also does not provide an absolute guarantee that this institution will be able to meet its obligations in 20–30 years.

Selected longevity risk transfer instruments

Insurance and longevity SWAPs

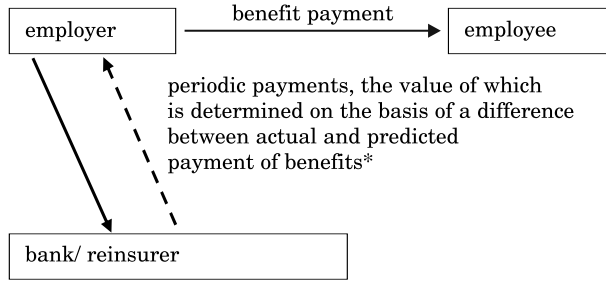
Some insurance companies, in return for payment of premiums, offer a financial service to pension funds in the form of **longevity risk insurance**. The insurance is paid if a given participant of the pension fund lives exceptionally long (exceeds the age limits specified in the insurance agreement). The pension fund pays an insurance premium agreed with the insurers in relation to all participants, while realization of longevity risk happens only in the case of some persons. Thus, the insurance risk community is established. A division of risk takes place which is appropriate for the risk management insurance method (within the insurance risk community) and the risk is transferred to the insurer. In this case, the entire longevity risk is assumed by one entity (the insurer). The insurance company may share at least a part of this risk with the reinsurer, but for the insured (pension fund) this is practically of no importance: the payment of benefits to the participants by the pension fund using this type of insurance for persons living exceptionally long is done exclusively by the insurance company. If longevity risk is not realized, i.e. none of the participants of the insured pension fund lives longer than the number of years specified in the insurance agreement, then, of course, the insurer will not be obliged to pay benefits. Just like other types of insurance, the premium is paid for the insurance coverage and is not refundable if no fortuitous event covered by the insurance (an indemnifiable accident) happens within the term of the agreement.

In the case of a **longevity SWAP**, a bilateral exchange of payment streams takes place, ensuring protection against higher than expected payments of pension benefits to persons living exceptionally long. In other words, longevity SWAP is the exchange of interest payments related to fluctuations of the longevity index. One party (e.g. an employee pension plan) makes regular payments to the other party (usually an investment bank or an insurer) on the basis of agreed assumptions (projections) of the mortality rate. In return, the other party to the contract (the bank or the insurer) will pay in subsequent years amounts based on actual mortality rates for a given group of participants in the pension plan. These are the so-called (mortality) index-based longevity swaps. It is also possible to enter into a longevity SWAP transaction based on the precise number of pension plan participants living to a specified year, and not on the predicted and the actual (averaged) mortality rate. This type of financial stream exchanges based on the real number of persons living to a certain age is known as bespoke (customized, tailored) longevity SWAP. "Customized" or "tailored" longevity SWAPs allow a 100% transfer of longev-

ity risk. Until now, they are the most-often applied and the most popular instrument of longevity risk management (LTR instrument). However, index-based SWAPs are more flexible, since it is easier to establish (on the basis of predicted and actually realized mortality rates in a given year) the amount of financial flows for both parties to the contract (SCHEUENSTUHL et al. 2012, pp. 18–19).

Agreed mutual payments (cash flows) can be made once a year or even once a month.

A diagram of such a transaction based on an employee pension plan periodically exchanging payment streams with a bank, an insurer or a reinsurer is presented in Figure 1.



* The difference between real and predicted payments of benefits from the employee pension plan to the employees – plan participants can be caused by longevity risk realization (some employees live exceptionally long).

Fig. 1. The structure of a longevity SWAP transaction illustrated with an example of the company pension plan

Source: Own work on the basis of *Longevity risk transfer markets...*, pp. 6–7.

For example, regular, fixed payments from the employee pension plan can be based on predicted life expectancy and the assumed mortality rate. Reverse payment streams (from the investment bank or the reinsurer) are of a varied nature, depending on the actual lifespan and the actual mortality rate for a given group (e.g. pension plan participants).

Mutual flows of fixed and variable payments within longevity SWAP transactions can be presented using the example of the pension plan and an institution offering coverage against this type of risk (hedge provider). A graphic illustration of those financial flows is presented in Figure 2, with amount examples in Table 1.

In this example, for the purpose of simplification, it was assumed that 100,000 employees participate in a company pension plan, who in the same month and year pass the age of 65 (1st January of a given year was assumed as

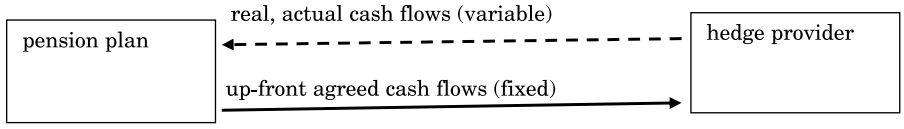


Fig. 2. A diagram of bilateral cash flows of fixed and variable amounts within longevity SWAPs
Source: Own work on the basis of: SCHEUENSTUHL et al. 2012, p. 19.

Table 1

Example of cash flows realized within longevity SWAPs (in GBP)

Date	Current payments of pension benefits	Agreed in advance (defined) fixed payment to the hedge provider	Payments to pension plan
01.02	1,000,000	950,000	50,000
01.03	950,000	930,000	20,000
01.04	900,000	910,000	–10,000
01.05	900,000	890,000	10,000

Source: SCHEUENSTUHL 2012, p. 19.

the initial date for calculating bilateral cash flows). Every month, the pension plan is obliged to pay the up-front determined amount of 10 pounds. Table 1 presents cash flows in four subsequent months, at the assumption that this pension plan uses the hedge against longevity risk in the form of SWAP transactions starting from 1st January of a given year. Both parties to the transaction assumed, on the basis of the population forecast, that out of 100,000 plan participants, 5,000 persons will die in the first month, 7,000 persons after two months, 9,100 after three months, and 10,100 after four months. The pension plan pays a fixed, determined in advance amount to the hedge provider, of 10 pounds x predicted number of plan participants in a given month. The other party of the SWAP is obliged to provide a payment of a varied amount, according to the actual number of plan participants in a given month (10 × actual number of plan participants).

Nobody died in the first month. The pension plan was therefore obliged to pay to its participants 100,000 pounds, receiving the missing 50,000 pounds (10 pounds × 5,000 persons living longer than assumed) from the hedge provider. 5,000 died in the next month, i.e. 2,000 less than assumed. Again, the missing 20,000 pounds for current payments was provided by the hedge institution. Between the third and the fourth month, more persons died than assumed (10,000 instead of 9,000). This time it was the hedge provider who obtained 10,000 pounds from the pension plan, etc. Therefore, longevity SWAP proved a useful financial instrument for transferring longevity risk, since each time when the number of plan participants lived longer than assumed, the plan

obtained additional funds from the other party of the contract (SCHEUENSTUHL et al. 2012, pp. 19–20).

Of course, real pension plans are not homogenous, with participants at various ages, which makes the longevity SWAP structure more complicated. Nevertheless, the idea of converting future streams of fixed payments into payments depending on the number of persons living to a certain age in a given population is maintained.

Longevity bonds

The possibilities of hedging against longevity risk using the insurance or reinsurance method (if the insurer wants to transfer a part of risk to the reinsurer) are limited. The idea of transferring longevity risk using the capital market emerged in the literature relatively not long ago. This, in turn, requires creating appropriate financial instruments. Besides the longevity SWAPS described above, it is also possible to use securities as protection from longevity risk.

D. Blake and W. Borrows put forward a proposal to create longevity bonds (also known as mortality bonds or survivor bonds) that would be indexed to mortality rate (BLAKE, BURROWS 2001, pp. 339–348). Purchasers of longevity bonds would receive payments in the form of interest coupons, the amount of which would be variable, depending on the number of persons in a given population surviving to a particular age. If the mortality rate in a given population is lower than assumed, coupon payments paid from a given bond would be higher. Thus, the purchaser of longevity bonds (e.g. a pension plan, an insurer) would be able to cover additional liabilities related to realization of longevity risk. However, this type of bond would entitle its holder only to payment of interest coupons, and not the principal. Of course, interest coupons in time would decrease, according to the actual mortality rate of a given birth cohort (e.g. a lower amount of persons live to the age of 75 than 65, 80 than 75, etc.). However, over time, since the need for benefit payments would be reduced (e.g. pensions for a given generation), the amounts needed for hedging against longevity risk would be respectively lower and the longevity bond would fulfil its task to a sufficient degree.

For instance, for a cohort of men aged 65, interest coupons starting from the age of 75 would be determined by the amount of the 65-year-olds who actually survive to the age of 75. The payments would continue until the end of the maturity, e.g. for 35 years (until reaching the age of 100 years). The last coupon from longevity bonds would contain a discounted value of all indices for surviving to the age of 100 years (see STAŃKO 2010, p. 195, BLAKE, BORROWS 2001, pp. 339–348).

Other methods and instruments hedging against longevity risk

Among other available and already used methods and instruments protecting against the risk longevity, one should mention **buy-outs –** bulk transactions of assets and liabilities of pension plans, and **buy-ins** – bulk transactions of liabilities burdened with longevity risk.

In the buy-out transaction type, the assets and liabilities of a pension plan are transferred to the insurer in return for a specified advance payment (an up-front premium). The insurer is obliged to pay and to assume full responsibility for annuity payments of benefits for pension plan participants, using assets transferred from the pension plan, and if necessary, the insurer;s own funds. On the other hand, in buy-in -type transactions, the sponsor of the pension plan (e.g. an employer in a company pension plan), in return for an initial payment, ensures receiving periodical payments from the insurer, equal to those that the pension plan is obliged to pay to its participants. If the benefits are paid for a longer period than assumed, the payments from the insurer will provide a hedge against realization of longevity risk (*Longevity risk transfer markets*... 2013, p. 5).

However, buy-outs of assets and liabilities of the pension plan by the insurer have certain limitations. Insurers and possibly indemnitors must comply with specific principles of prudence and their possibilities of longevity risk absorption are limited. Thus, the need to search for other financial instruments arises, for exchanging liabilities burdened with longevity risk for securities sold on the financial market (securitization), an example of which are the longevity bonds described above.

The existing status and perspectives of development for the market of instruments for hedging longevity risk (LRT)

Markets of financial instruments used for longevity risk transfer (LTR) are still relatively poorly-developed. Transactions are sporadically concluded in these markets and their value is relatively low in relation to the level of liabilities of private financial institutions and state institutions exposed to longevity risk.

The value of liabilities of pension funds and insurance companies offering annuities burdened with longevity risk amounted at the end of 2012 to between USD 15 and 25 trillion on a global scale (*Consultative documents on longevity risk*... 2013). However, the value of actual transactions with the use

of LTR instruments, which are still quite rarely applied financial innovations, makes up only a small portion of this amount. Great Britain has the most developed market in this field, but even there only 50 billion in pension fund liabilities with defined benefit[3] were protected in 2012 against longevity risk with the use of insurance or capital market instruments, while the total value of liabilities to participants of this type of pension plans reached 1 trillion British pounds. It is interesting that the USA – the country with the largest number of company pension plans with the world's largest assets and liabilities towards employees – has an LTR instrument market much less-developed than the British market. Only three major transactions were recorded outside Great Britain in 2012: two bulk buy-outs of assets and liabilities of pension funds and one longevity SWAP deal completed in the Netherlands. The value of the first two transactions was the equivalent of GBP 26 billion and the third transaction was GBP 7 billion (*Longevity risk transfer markets*... 2013, p. 18).

The question arises about the reasons for the under-development of the market for hedging longevity risk transactions in countries with developed financial markets, where many company pension plans and insurers offering life annuities (the financial institutions most interested in minimising this type of risk) operate. One of the reasons is the previously– mentioned counterparty risk, inseparably related to longevity risk transfer. Another reason is the cost of this type of transaction. For instance, pension funds in Chile (where the public pension plan has been completely privatized) were not interested in buy-outs of longevity bonds in a situation when the final guarantor of the annuity benefit payment (at least at the level of the minimum pension) for all fund participants is the state. Moreover, appropriate regulations are still lacking – both on the national and international level – to allow safe trade in this type of longevity risk transfer (LTR) instruments. Some financial experts are afraid that the development of the LTR instrument market will create new threats on the side of the speculative capital (as it was the case in the market of derivatives protecting against other types of risk – e.g. foreign currency risk, where the hedging function was dominated by speculation functions[4]. Let us add that in Poland no instruments at all are applied for hedging longevity risk.

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[3] Pension funds with defined benefit (DB) use the formula of calculating the benefit guaranteeing payment of the pension in the amount determined in advance in proportion to the last or the average (from the entire work period) remuneration. A DB fund with perpetual annuity is particularly exposed to longevity risk.

[4] Prof. David Blake, director of Pensions Institute in London and one of the leading researchers on the problem of longevity risk, during the international research conference "Longevity 7: Seventh International Longevity Risk and Capital Markets Solutions" organized in Frankfurt am Main (8-9.09.2011), mentioned the following anecdote. When he presented the idea of using longevity bonds as hedging against longevity risk on the meeting of actuaries (specialist in insurance mathematics) in Great Britain, one of the debaters compared the purchase of this instrument to. buying a place in a lifeboat on the Titanic.

To make it possible for the market of instruments for hedging longevity risk to develop on a larger scale, it is necessary to satisfy certain conditions:

– Development of international standards concerning the security of trading in LTR instruments, including specified prudence norms in this domain.

– Cooperation and constant exchange of information concerning LTR instruments by financial market regulators in individual states.

– Making a review of investment policies carried out by public and private institutions managing pension plans and state and private insurance companies as regards longevity risk recognition.

– Disseminating the knowledge of longevity risk in society through educational activities, which could lead to the growth of tendencies to accumulate additional pension savings (in order to avoid realization of specific longevity risk).

– Development of research concerning the processes of the demographic aging of societies, making it possible to improve tools for predicting life expectancy indices for the entire population and individual generations (birth cohorts).

There are many reasons to believe that due to a high exposure to longevity risk and potentially strong demand, the market of instruments for hedging longevity risk will grow first in the most developed financial markets (in Great Britain and other EU states and in the USA) and also gradually in other countries.

Translated by JOANNA JENSEN

Accepted for print 31.12.2013

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