

## **CZECH SYSTEM OF PENSION FUNDS: THE RISKS IT IS FACING**

This article aims to describe how Czech system of supplementary pension insurance works, what risks it is facing, how Czech actuaries assessed these risks, and what solutions they propose to mitigate them.

### **Czech system of pension funds**

The beginning of the Czech system of pension funds is dating back to 1994 when Pension Funds Act (No. 42/1994 Coll.) was introduced. The law allowed establishing of private-owned defined-contribution pension schemes providing so called supplementary pension insurance.

Supplementary pension insurance is a standardised vehicle offering clients a possibility of accumulating money during their working lives and later receiving benefits additional to their state retirement pension. Participation in system is purely voluntary and creates a supplement to the compulsory state pension system operating on pays-as-you-go basis. Government encourages people to join the system by tax relief on fund contributions and also by providing an additional state contribution.

In the Czech Republic, companies providing supplementary pension insurance are generally called pension funds, and the pension schemes are usually referred to as pension plans.

As a result of limitations given by the law and by the regulator, all pension funds provide similar products. Each pension fund usually includes several pension plans which differ by retirement terms and level of guarantees. New contracts always follow the most recent pension plan; older policies keep following the conditions that were in force at the moment of their issue.

The law prescribes strict rules how the pension funds distribute their profits. Maximum 10% of profit may be paid out to the fund's shareholders, and at least 5% of profit must be retained in fund's reserve fund – a pool of money protecting the fund against adverse development. The rest of profit has to be returned to the fund in form of profit sharing.

If pension fund has a loss, it has to be offset by release of the reserve fund.

The law also strictly regulates investment strategy of the pension funds. As a result, funds' investment portfolios usually comprise from high quality bonds and smaller portion of deposits.

Pension funds market in the Czech Republic went through the two phases over last ten years – boom and consolidation. Initially, there grew up a large number of funds – at one moment as much as forty pension funds were operating in the market. Later on, funds tended to merge, and bigger ones were taking over their less successful competitors.

At the moment, eight large and two small pension funds are present in the market. The total number of participants is higher than 3 million – approximately 50% of working population – and funds' overall assets under management are 74 billion CZK.

## **Guarantees and options included in pension plans**

Pension plans terms usually include number of guarantees and options. The most important are:

- Guarantee of technical interest rate
- Guarantee of using population life tables
- Guarantee of covering expenses from excess investment income
- Option to choose the benefit type (annuity vs. lump sum)
- Option to increase contributions

Generally, older pension plans contain more guarantees than the newer ones.

### **Guarantee of technical interest rate**

Some pension plans guarantee the technical interest rate that will be used when calculating the pension. In addition, when in savings phase, fund value cannot decrease – i.e. there is a 0% guarantee on fund value. This rule effectively prevents pension funds from investing in equity markets.

Over last few years, the level of interest rates in the Czech Republic changed dramatically. In 1990s, interest rates were fairly above 10%, while at the present time, long-term government bond yields are below 4%. Hence, the importance of interest rate guarantees is now much higher than ever before.

### **Guarantee of using population life tables**

Czech Statistical Offices issues every year life tables for the country's population. Most of pension funds guarantee in their plans that they are going to use these population life tables for purpose of calculating the pension. This means that pension funds are fully exposed to the risk that mortality experienced in their portfolio will be considerably lower than mortality of the whole population – mortality selection.

### **Guarantee of covering expenses from excess investment income**

The law does not allow pension funds to apply any explicit charges or deductions respective to fund's expenses. Hence, funds can cover their expenses only from investment income earned above the level of interest rate guarantees.

### **Option to choose type of benefit**

In Czech system, client can at the point of maturity choose between annuity and lump sum payment. If we assume reasonable policyholders' behaviour, this option boosts the risk of mortality selection.

### **Option to increase contributions**

Participants of the pension funds can freely adjust their contributions both up and down. This poses additional threat to the fund as clients may increase fund value that is subject to previously described guarantees.

## Model of the system

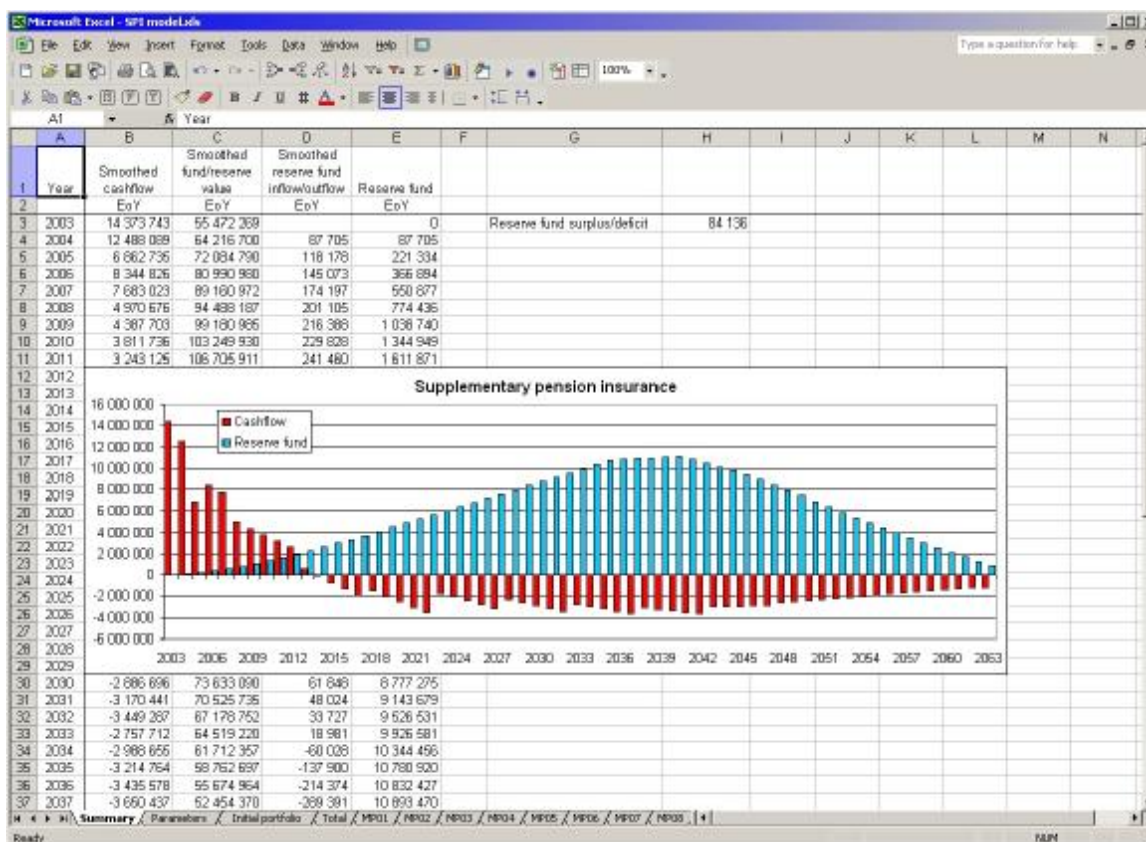
In 2003, guarantees and options embedded in pension plans got into focus of the IFRS workgroup of the Czech Society of Actuaries. The workgroup – despite its name – works on various topics related to the local accounting, IFRS, and Solvency II.

The workgroup developed an Excel model of the whole pension funds system that enabled modelling various aspects impacting the funds, namely:

- Investment returns and Inflation
- Mortality selection and mortality improvements
- Policyholders' behaviour (lapses, exercising of annuity option)
- Expenses
- Profit allocation

The model also allowed for simulating some of the measures that were later proposed in order to reduce the risk.

As the pension business is of an extremely long-term nature, it was necessary to examine results in very long projection horizon – we were looking at the time span of 60 years. For such a long projection, there is an extreme uncertainty about underlying assumptions. Hence, our goal was to find out how the system behaves under various scenarios of future development rather than establish one best-estimate projection.



Picture 1: Supplementary pension insurance model

Results showed that that the main source of risk are annuities while contracts in savings phase carry minimum risk. The model helped us to identify three main risk drivers:

- Portfolio vs. Population mortality
- Technical interest rate and Expenses vs. Investment income
- Number of annuities

Portfolio mortality significantly lower than population means for pension fund large recurring losses. Similar is also the impact of low-interest rate environment when investment return is not sufficient to cover both interest rate guarantee and expenses. Low number of annuities may mean release of risk – loss-generating annuities simply do not emerge at all.

It may happen that adverse development of one risk driver is compensated with favourable behaviour of other one. Worst-case scenarios are those when two or more risk drivers turn in 'wrong' direction at the same time.

## **Proposed solution**

Using the outcome of the model, the IFRS workgroup proposed several steps aiming to reduce the risk embedded in existing pension plans:

- Higher funding of the reserve fund
- Allocation of the investment income on reserve fund directly to the reserve fund
- Using selection life tables for purpose of calculating the pensions
- Separate profit sharing for each pension plan
- Reducing guarantees included in new pension plans

### **Higher funding of the reserve fund**

Increased inflows into the reserve fund enable creating a buffer that will be used to finance future losses arising from annuities. It is important to start soon enough and to create sufficient reserve fund because in most cases, when the pension fund starts to generate losses it will never turn to profits again.

Our simulations show that for the worst-case scenario about 30% of profits should be redirected to the reserve fund.

### **Allocation of the investment income on reserve fund directly to the reserve fund**

Under the current legislation, investment income on the reserve fund goes to the overall profit, and only a small portion of it is allocated back to the reserve fund. This effectively means gradual devaluation of the reserve fund.

If the reserve fund was separated from the rest of the fund, it would result in much faster growth of its volume.

### **Using selection life tables for purpose of calculating the pensions**

Using the life tables adjusted for selection – even if not in a full extent – would significantly reduce the losses coming from the annuity payments.

The model shows that if we used both separate reserve fund and selection life tables, even in the worst-case scenario it would be sufficient to pay 10% to 15% of fund's profits to the reserve fund.

## **Separate profit sharing for each pension plan**

Separate profit sharing calculation for each pension plan should prevent the system from cross-financing of the older pension plans with high level of guarantees on the expense of the newer ones. In practice, it would mean that the older plans would allocate bigger part of their profits the reserve fund, hence providing lower profit sharing. This mechanism would also motivate policyholders to switch from the old to newer pension plans.

Except of the separation of the reserve fund and the separate profit sharing for different pension plans, other proposals are could be implemented within the current legal framework. Czech society of actuaries presented and discussed the model outcomes with the government bodies that are in charge of setting legal and regulatory environment in the Czech Republic.

## **Conclusions**

The analysis confirmed that the annuity guarantees and options may have major impact on financial stability of pension funds system. However, it is possible to adopt simple measures to diminish or avoid the risks.

The results also suggest that if we wanted to design a pension system that would be sustainable in long-term horizon, it should provide only a minimum level of guarantees related to the calculation of pensions. Only such system will be enough flexible to cope with adverse development in mortality and interest rates.