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INVEST RISK BASED SUPERVISION

Abstract

After a significant number of plans sponsored by employers with defined benefit fell into crises due to incapacity to meet their contractual obligations and clear superannuation benefits agreed upon, the attention is increasingly being paid to the risk assessment based supervision. The supervision based on risk assessment is essentially based on the appraisal of synchronized management of assets and liabilities of pension funds. Supervision based on risk assessment implies determining the impacts of potential risks on the retirement plan in order to reduce and restrain them, which is provided by way of determining loss probabilities using financial indicators in the evaluation of diverse risks.

The supervision based on risk evaluation is the basic prerequisite for keeping and justifying trust and confidence in private retirement insurance, necessary for protecting the members of superannuation funds from material loss, as well as for realizing the aims set in all the countries which have gone through pension reforms, but also for the ones that are about to carry them out.

Key words: *supervision over private retirement insurance operations, professional plans, supervision based on risk assessment, management of assets and liabilities of superannuation funds.*

НАДЗОР ЗАСНОВАН НА ПРОЦЕНИ РИЗИКА

Апстракт

Након што је велики број планова спонзорисаних од стране послодаваца са дефинисаном надокнадом запао у кризу услед немогућности исплата уговором дефинисаних пензијских надокнада све већа пажња се поклања надзору заснованом на процени ризика. Суштина надзора заснованог на процени ризика базира се на оцени синхронизованог управљања активом и пасивом пензијских фондова. Надзор заснован на процени ризика састоји се у одређивању утицаја потенцијалних ризика на пензијски систем у циљу њиховог смањења, што се обезбеђује одређивањем вероватноће губитка уз коришћење финасијских индикатора у вредновању различитих ризика.

Надзор заснован на процени ризика представља основну претпоставку за очување поверења у приватно пензијско осигурање, за заштиту чланова пензијских фондова од материјалних губитака и за остварење свих циљева оних земаља које су спровеле пензијску реформу или им она тек предстоји.

Ključne reči: *penzijsko osiguranje sponzorisano od strane poslodavaca, nadzor zasnovan na proceni rizika, upravljanje aktivom i pasivom penzijskih fondova.*

The changed demographic characteristics (prolonged life expectancy of population, decreased fertility rate etc.), which have various implications to the living standard, public expenses, financial market, international monetary flows etc., have led to the intensive retirement insurance system reforms all over the world, by introduction of capitalized retirement systems.

In the case of systems that are functioning on the basis of capitalization pension fund assets are being invested and creating surplus value, so the yields from investments are significantly influencing the amount of pension benefits.

The private pensions, outlined as capital accumulation systems, appear as extraordinary significant participants in the capital market. According to the data for year 2006[1] the assets of pensions, expressed as percentage of total gross domestic product, show the following values: Iceland-132,7%; Netherlands 130%; Switzerland 122.1%; Australia 94.3%; France 71.3%, United States of America 73.7%; Great Britain 77.1%; Czech Republic 53.4%; Denmark 32.4 etc. The trend of growth of pensions' asssets at world level in the period from 2004 to 2006 is shown in the Table No. 1.

Table No. 1: Distribution of pensions assets expressed in millions of USD 2004-2006

	2004	2005	2006	Average growth rate 2004-2006
OECD countries	13,670,059	15,008,637	16,243,886	9.01%
Countries, which are not members of OECD	516,724	535,679	616,388	9.22%
G10 Group	12,700,087	13,801,613	14,831,847	8.07%
Euro Zone	1,143,070	1,324,623	1,475,517	13.62%
Asia	1,091,358	1,270,927	1,267,584	7.77%
Latin America	205,787	266,342	331,485	26.92%
BRIC countries	160,164	203,290	243,490	23.30%
World in total	14,186,783	15,544,316	16,860,274	9.02%

Source: OECD database, 2007

Recently, retirement systems are facing problems, which by its gravity exceed issues of demographic nature. Instability at the capital market and insufficient carefulness in management of assets of private pension funds led to loss of value of many of them. The 2000 year stock exchange collapse caused that major number of pension plans with defined benefit have shown insufficient level of capitalization and certain number of funds have been closed. The 2007 year mortgage loans crisis repeatedly shaken pension funds, which in major number of cases did not succeed to

[1] OECD (2007), *Pension market in focus*, No.4

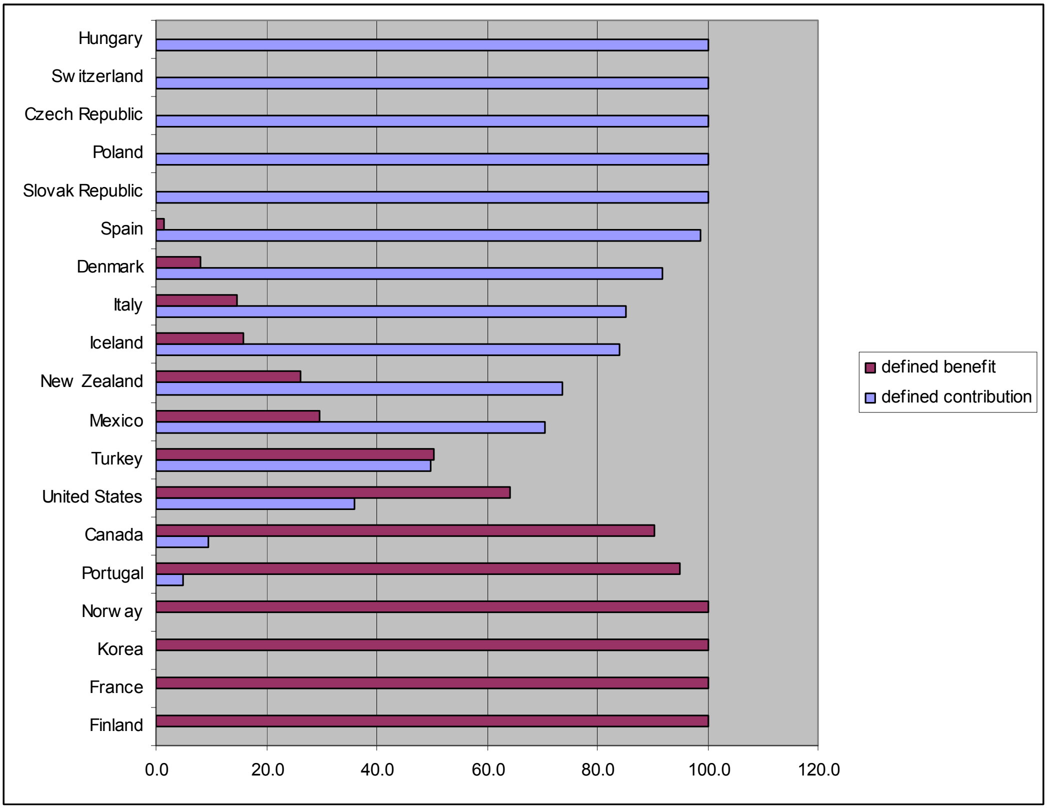
recover full level of capitalization from previous crisis and this has significantly shaken trust in private retirement insurance.

The plans with defined benefit relate to such agreements which are determining amount of pension benefit in advance. There are various bases for definition of benefit, for instance, average salary of employee during his entire working period or the basis is certain period in his employment period.

In case of plans with defined benefit, the employer usually appears in the role of plan sponsor i.e. he is bearing financial risk in case when accumulated funds are not sufficient for payment of pension benefit defined by the agreement. Unlike plans with defined benefit, in case of plans with defined contribution the amount of benefit is not determined in advance, but it depends on the amount of accumulated funds, while the financial risk is transferred from employer to the employee.

The plans with defined benefit are significantly present in many countries. The presence of plans with defined benefit in relation with the plans with defined contribution is shown on the picture No. 1.

Picture No. 1 Distribution of DB plans and DC plans



Source: OECD database, 2006

The following factors are influencing capitalization of funds based on plans with defined benefit (expressed through relation of present value of fund assets and present value of liabilities):

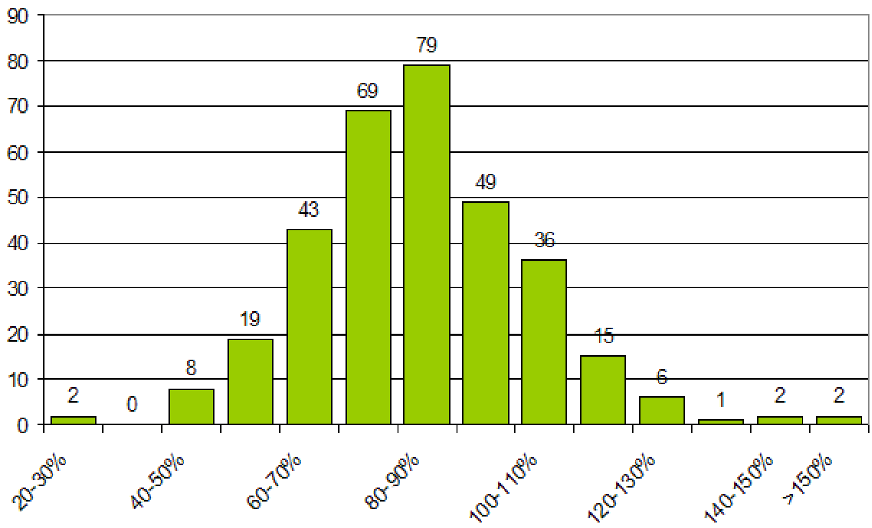
- Real salaries on which "replacement ratio" is directly depending (relation between retirement benefit and salary);
- Interest rate on which future liabilities are discounted;
- Life length i.e. mortality, which is inseparably linked with the sum of annuity, which are going to be paid from the fund;
- Yield on invested funds.

Insufficient capitalization of pension funds, based on plans with defined benefit has been noticed in the United States of America, Netherlands, Japan, Great Britain and other countries.

It is estimated that at the end of year 2000, the pension funds based on plans with defined benefit in Great Britain had deficit in the amount of even up to 300[2] billion pounds. The funds of some companies like for instance «The Grosary Chain Sainsbury» had capitalization level under 65%. The fund capitalization level of 100 biggest companies in Great Britain has decreased from 120% in 2001 to only 80% at the end of year 2002.

In the United States of America 25 funds of biggest companies have shown deficit in amount of 36 billion dollars during year 2003. The levels of funds capitalization based on plans with defined benefit in the same year are presented on the picture No. 2.

Picture No. 2 – Level of funds capitalization based on plans with defined benefit in the United States of America



Source: Wilshire Corporate funding Survey on Pension Funds, 2003.год.

[2] Pensions institute (2004), *Discussion Paper PI-0401*

192 pension funds based on plans with defined benefit have been closed from September 2003 to September 2004 in the United States of America and another 155 plans in the previous twelve months. The members of pension funds, based on plans with defined benefit, which do not exist any more, have been transferred to the fund “The Pension Benefit Guaranty Corporation” (State company for pension benefit guaranty).

Since the year 2001 the Swiss pension funds[3] capitalization level is constantly under 100%. The table No. 2 is presenting absolute amounts of total funds assets and discounted liabilities for the period from 2003 to 2005, expressed in millions of Swiss francs.

Table No. 2 – Deficit of plans with defined benefit in Switzerland

	31.12.2005.	31.12.2004.	31.12.2003.
«Defined benefit» liabilities at the end of year	20,972	20,225	18,216
Market value of assets at the end of year	20,229	18,575	17,619
Deficit	743	1 650	597

Source:
http://www.ubs.com/1/e/investors/annual_reporting2005/financial_report/0088.html

The value of fund assets depends on the portfolio structure and price movements at the capital market. Considering that funds assets mainly consisted of shares, the funds capitalization level mostly depended on its price at the capital market. The portfolio structure, expressed in percentages in relation to total fund assets in Japan was: 53,3% - shares, 31,5 - bonds, 15,2 - rest; in Netherlands: 49,5% - shares, 34,7% - bonds, 15,8 - rest; in Switzerland: 39% - shares, 35,9% - bonds, 25,1% - rest; in Great Britain: 63,5% - shares, 14,5% - bonds, 22% - rest; in United States of America: 59,8% - shares, 23,1% - bonds, 17,1% - rest.[4]

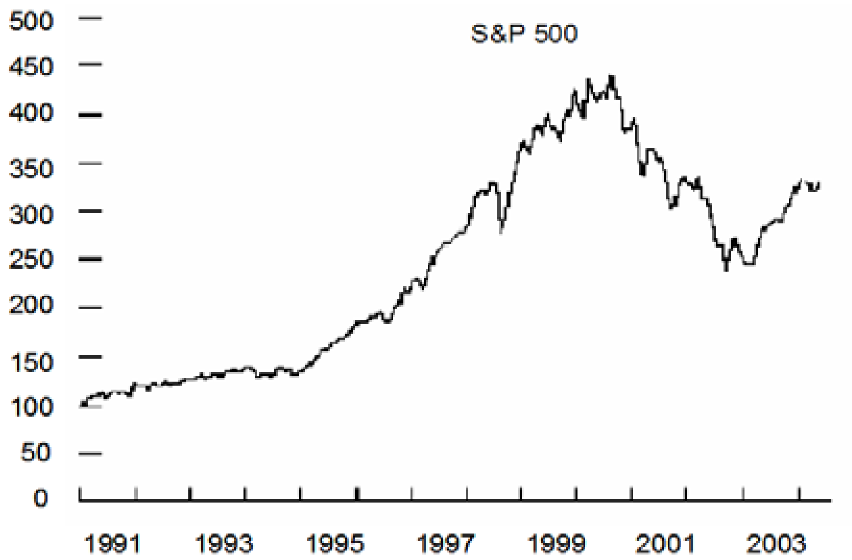
The drastic fall of shares after 2000 has led to impoverishment and insufficient capitalization of pension funds. The picture No. 3 has presented fall of value of shares of companies, which are within S&P500 index. The shares prices at the capital market were constantly growing (gradient is especially outstanding for the period from 1994 to 2000) but they were plunging down in the period from 2000 to 2002.

After 2002, a repeated mild growth of shares has been noticed, so in the middle of 2004, according to the analysts, the average S&P capitalization level of 500 companies amounted 86%, i.e. 4% more than it was in the year 2002.

[3] It is inteeresting to remark that in Switzerland employees are allocating 7-10% of salary, depending on length of working period, while employer is particating with 150-220% of sum, allocated by the employee.

[4] IMF (2004), *Global Financial Stability Report*, p. 81-120

Picture No. 3 – Movement of share prices of 500 biggest companies according to the «Standard and Poor's» estimate



Source: *Hewitt Associates; and Bloomberg L.P.*

Further, beside securities price movement, interest rate on which future liabilities are discounted also has a huge influence on capitalization of pensione funds based on plans with defined benefit.

The plan liabilities assessment and by this also the fund capitalization level, depend to a great extent on applied discount rate. The greater discount factor is used liabilities will be smaller and vice versa.

In Great Britain and United States of America a major number of trusts, which got used to constant growth of shares prices, have applied discount factor of 8-9%, which significantly lowered projected liabilities. The funds assets were impoverished by fall of shares prices and liabilities had disproportional increase.

Some countries have established guarantee funds for the purpose of protection of members of pension plans with defined benefit, like PBGC ("The Pension Benefit Guaranty Corporation") in the United States of America, "Pension Protection Fund" in Great Britain or "Guarantee Fund" in Switzerland.

Many questions in relation with investment policy have been opened due to the situation experienced by majority of plans with defined benefit around year 2000. The amount of applicable discount rates is established by law. Currently valid regulations in relation with application of discount rates in calculation of projected liabilities for certain number of countries is shown in the table No. 3.[5]

Table No. 3 – Discount rate set forth by legal regulations

Country	Discount rate
Belgium	Fixed (6%)
Canada	Market determined: long-term state bonds or highly-rated corporate bonds
France	Minimum of 3.5% or 60% of average yield on state bonds
Germany	Fixed (2.75%)
Italy	No special rule; it is determined by assessment
Japan	Market determined: long-term state bonds or highly-rated corporate bonds
Netherlands	Fixed (4%); soon to be replaced by market approach
Sweden	Different for old and new members (currently 2.75% for new members), but constantly changing
Switzerland	It is established on the basis of long-term securities with low risk or on the basis of yield from invested assets of pension funds decreased by guarantee rate (mostly because of risk of long life)
Great Britain	Market determined: corporate bonds
U.S.A.	Market determined: corporate bonds

Source : *Expert group for International Affair, 2005* .

We notice orientation towards market determination of discount rate. According to the opinion of Swiss experts implementation of discount rate of 4% is not justified because it is too high.[6]

There are tendencies that even liabilities are discounted according to the rate, which is lower than market-determined rate for evaluation of liabilities, for the purpose of recovery of "defined benefit" plans. Such practice is present in Great Britain where discount factor lower by 2-3% than market determined one is applied.

In January, 2006, the Organization for Economic Co-operation and Development has published "OECD Guidelines on Pension Fund Asset Management" as supplement to the "OECD Recommendation on Core Principles of Occupational Pension Regulation" of April, 2004. The Guidelines have been issued with the purpose to incite an efficient management of funds' means in order to provide expected pension benefits.

The Guidelines[7] set forth that personnel in charge of management of pension fund assets should behave according to the highest ethical and professional standards i.e.

[5] Bank for International Settlements (2005), *Ageing and pension system reform: Implications for Financial markets and Economic policies* , p. 26
[6] Frank J. Fabozzi, Sergio Focardi, Caroline Jonas (2004) *Can Modeling Help Deal with the Pension Fund Crisis?*, The Intertek Group, p.17
[7] OECD (2007), *OECD Guidlines on Pension Fund Asset Management*

to make investment decisions with care, skill, responsibility and diligence and in the best interest of their members, carefully monitoring and studying investment currents through the established risk control processes.

Risk control process relates to portfolio risk management for the purpose of providing appropriate relation of assets and liabilities. In that sense quantitative portfolio limitations which are disabling an adequate diversification or making obstacles to implementation of techniques of «asset liability matching» may be undesirable, while they have full justification in some cases, like for instance when they are limiting investments in securities, issued by the plan sponsor or related persons.

After major number of plans, sponsored by employers with defined benefit came into crisis due to impossibility of payment pension benefits defined by agreement, the increasingly more attention is dedicated to supervision based on risk assessment. The essence of supervision based on risk assessment is based on assessment of a synchronized management of assets and liabilities of pension funds. The supervision based on risk assessment consist of determination of influence of potential risks to pension system for the purpose of their decrease, which is provided by determination of loss probability with use of financial indicators in evaluation of various risks. In accordance with the Guidelines, determination of relation between assets and liabilities may include modern techniques but in the way which provides their transparency.

Conclusion

The supervision based on risk assessment represents the basic prerequisite for preserving confidence in pension systems, for protection pension fund members from material losses and for realization of goals of all countries, which have implemented pension reform or where it is forthcoming. An effective supervision should be based on risk assessment for the purpose of timely recognition of possible shortcomings of a pension system and quantification of its influence on stability of functioning of the system itself.

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7. Robert J. Vanderbei (1997), *Linear Programming: Foundations and Extensions*, Department of Operations Research and Financial Engineering, Princeton University, Princeton, NJ 08544; p.6.