

The Actuarial Profession
making financial sense of the future

Pensions, benefits and social security colloquium 2011 Wojciech Otto



Fees and capital requirements For Open Pension Funds in Poland

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Pension debate in Poland triggered off by financial crisis

Before the end of year 2010

- Focus on efficiency and security of Open Pension Funds (OFE)
 - In October 2010 the team of experts:
 - Marek Góra (team leader), Agnieszka Chłoń-Domińczak, Wojciech Otto, Dariusz Stańko, and Michał Szymański
 - Presented the Report: **Security through diversity. Improving efficiency of Open Pension Funds. Proposals of amendments.** (in Polish)

At the end of year 2010

- Debate shifted to budget deficit and public debt problems

Finally, since May 2011

- 2/3 of contributions redirected from OFE to NDC pillar I.

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Major changes proposed in the Report

- Replacement of unique fund by sub-funds with risk profiles suited to follow the life-cycle of participants
- Replacement of endogenous benchmark (weighted average rate of return of all OFEs) by exogenous benchmarks
- Redesign of fees/penalties charged/paid by PTE (company managing OFE)
- Introduction of capital requirements adequate to risk borne by PTE
- Suppression of acquisition (both primary and secondary markets)

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Sub-funds run by PTE and related benchmarks

Benchmarks for proposed sub-funds A, B and C

- 60% domestic, and 15% foreign stocks, and 25% bonds (A)
- 35% domestic stocks, and 65% bonds (B)
- 7.5% domestic stocks, and 92.5% bonds (C)

Default life-cycle plan:

- young participant contributes to A
- since the age of 55 gradually converts assets from A to C
 - Sub-fund B is a continuator of the existing unique fund
 - to dwindle within a decade or two as a result of gradual transfer of assets to A or C

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Making PTE to follow benchmarks: How strong incentives should be?

Incentives to follow benchmarks should be strong enough:

- to ensure that PTE's investment strategies are in accordance with risk profiles assumed for sub-funds A, B and C
 - otherwise, the life-cycle scheme of reallocation makes no sense

On the other hand:

- large market share of investors having their hands tied leaves too much room for making easy money by other players
- enforcing PTE to replicate benchmarks removes responsibility for performance from PTE to authority/mechanism determining the structure of benchmark in detail

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Making PTE to follow benchmarks: Conclusions

- extra returns due to **moderate departures** from benchmark portfolio should be rewarded
- extra losses due to **large departures** from benchmark portfolio should be penalized

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Fees and penalties related to benchmarks proposed in the Report

Each year the actual rate of return (AR) is compared with benchmark rate (BR), and with satisfactory rate (SR)

- Compared rates are based on 1-year period for subfund C, and on 3-years period (without annualization) for sub-funds A and B

Satisfactory rates of return are defined separately:

$$SR = \min\{BR; 90\%BR\} - 10\% \quad (A)$$

$$SR = \min\{BR; 95\%BR\} - 5\% \quad (B)$$

$$SR = \min\{BR; 98.25\%BR\} - 1.25\% \quad (C)$$

Finally, fees and penalties are given by following formulas:

$$\text{Penalty} = 20\% \max\{SR-AR; 0\} \text{ NetAssets} \quad (\text{all sub-funds})$$

$$\text{Fee} = 5\% \min\{3\%; \max[AR-BR; 0]\} \text{ NetAssets} \quad (A)$$

$$\text{Fee} = 5\% \min\{2\%; \max[AR-BR; 0]\} \text{ NetAssets} \quad (B)$$

$$\text{Fee} = 5\% \min\{0.6\%; \max[AR-BR; 0]\} \text{ NetAssets} \quad (C)$$

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Capital requirements proposed in the Report

Each month for each sub-fund two levels of capital requirements are to be calculated:

- Minimum Capital Requirement (MCR)
- Solvency Margin: $SM = 2 \text{ MCR}$

Supervisor's actions should be triggered:

- when free assets of PTE fall below capital requirements aggregated over sub-funds A, B and C:
 - mild intervention when only SM is violated
 - severe actions when also MCR is violated

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Calculating MCR

- Sub-funds differ by minimum level of MCR:

$$\text{MCR} = 0.4\% \frac{(\text{MCR1} + \text{MCR2})}{\text{NetAssets}} \quad (\text{A})$$

$$\text{MCR} = 0.3\% \frac{(\text{MCR1} + \text{MCR2})}{\text{NetAssets}} \quad (\text{B})$$

$$\text{MCR} = 0.2\% \frac{(\text{MCR1} + \text{MCR2})}{\text{NetAssets}} \quad (\text{C})$$

MCR1 represents expected (at a given accounting date) deficit/excess of AR over SR at nearest settlement dates

- under the assumption that AR and BR will move parallelly from now till nearest settlement dates

MCR2 represents risk stemming from:

- possible divergence of AR and BR from now till nearest settlement dates

Calculating MCR1

For sub-fund C:

- At the end of year (just after fee/penalty has been settled):

$$\text{MCR1} = 0$$

- At the end of each of next 11 months:

$$\text{MCR1} = 20\% \max\{\text{SR} - \text{AR}; 0\} - 10\% \max\{\text{AR} - \text{SR}; 0\}$$

– where AR and SR are calculated over time elapsed from the beginning of year

MCR1 formulae for sub-funds A and B:

- Are based on the same idea
- Are more complicated in detail due to setting fees/penalties each year on a basis rates of return over 3-years periods

Calculating MCR1 Details for sub-funds A and B

- At the end of each month the formula reads:
 - $MCR1 = 20\% \quad (\max\{SR1-AR1; 0\} + \max\{SR2-AR2; 0\})$
 - when $AR1 < SR1$ or $AR2 < SR2$;
 - $MCR1 = -10\% \quad \min\{AR1-SR1; AR2-SR2\}$
 - when both differences $AR1-SR1$ and $AR2-SR2$ are non-negative;
- AR1 and SR1 are calculated over elapsed part of the 36-months period that ends at the nearest settlement date
- AR2 and SR2 are calculated over elapsed part of the 36-months period that ends at the next settlement date
 - if $SR1 > AR1$ then the penalty expected at the nearest settlement date is accounted for when calculating AR2

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MCR2 as a measure of risk of deviations of AR from BR (the same formula for each sub-fund)

- MCR2 is calculated at the end of month t recursively:

$$MCR2_t = \max\{20\% \quad |AR_t - BR_t|; 0.95 \quad MCR2_{t-1}\}$$

– where AR_t and BR_t denote rates of return over month t

MCR2 as a measure of risk has the following properties:

- when $0.2 \times |AR_t - BR_t|$ are i.i.d. MCR2 fluctuates around the quantile of order 95% of this variable
- the above property is surprisingly robust under a range of reasonable distributions of the variable $0.2 \times |AR_t - BR_t|$
- MCR2 decreases by $\frac{1}{4}$ within 6 months, and by $\frac{1}{2}$ within a year in response to replacing the active strategy by the passive one
- response of MCR2 to an opposite change is much quicker

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Interplay of components of MCR

- Minimum level of MCR defines the basic level of active strategy
- Above the basic level higher expected returns entail higher capital requirements (and related cost of capital), however:
 - Good results in recent periods reduce MCR1, and so make room for a more active strategy without rising cost of capital
 - Poor results increase MCR1, and so PTE is motivated to restructure portfolio towards the benchmark, unless free assets are well in excess of capital requirements
- Transparent and frequently monitored solvency requirements make the supervision relatively easy and efficient

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Fees unrelated to benchmarks Proposed change: introduction of HWM

In exchange of a reduction of rates of fixed commission on assets a new variable fee (High-Water Mark) is proposed:

- Charged at 2% of the excess of the value of the Participation Unit (PU) over its previously attained maximum, times the number of PUs in the sub-fund
- Each year the „previous maximum” is inflated by CPI

The proposal is motivated by the lesson drawn from the public debate

- temporary coincidences of high profits of PTE with heavy losses of OFE's members have to be avoided
- what matters is real, not nominal value of pension savings

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Other factors influencing incentives for active management

Construction of fees/penalties has been tested:

- Under the assumption that PTEs maximise expected fees less penalties in relation to capital with some risk aversion
 - This means neglecting the impact of investment performance on attracting new members, which is justified by:
 - Evidence that so far the main factor driving members to choose a given OFE is its sales force
 - Suppression of acquisition coming in effect as of 1 January 2012 may change a lot in this respect
 - Calibration of fees/penalties needs reconsidering

Open issues

The most fundamental economic issue

- Is there value added from active management of OFEs' assets
 - If yes, does the proposed system produce well-balanced incentives?

The most important political issue

- how to stop politician's advances in using OFE's assets for reducing the disclosed part of the public debt

The most interesting technical issue

- Properties of the process $Y_t = \max\{X_t; w Y_{t-1}\}$, $0 < w < 1$
 - under various assumptions about the exogenous positive process $X_0, X_1, X_2, X_3, \dots$
 - Enhancing desirable properties by generalizations of the basic version of the process

Questions or comments?

- Immediate questions and comments are encouraged
- After the Colloquium please use the address:
 - wotto@wne.uw.edu.pl