

Financial management and protection of pension eligibility in corporate pensions in Japan

Tomoyuki Okochi,
Certified pension actuary,
Fellow of the Institute of Actuaries of Japan

Abstract

In Japan, there are two types of a defined benefit pension plan, such as the Employees' Pension Fund which includes the substitutional portion of the Employee Pension insurance, a public pension scheme, and the defined benefit corporate pension plans which are consist of "fund-types" and "contract-types". (There is also the Tax Qualified Pension Plan, but this type is due to be phased out by 2012.)

These two types of defined benefit plans are required to report a funding status in annually. And the report should has to have results on two bases:

1. an "ongoing" valuation, if liabilities exceed assets on this basis then additional contributions need to be made immediately.
2. a "discontinuance" valuation, if liabilities exceed assets on this basis then additional contributions need to be made immediately or the contribution schedule should be revised to increase contribution over a period of up to a decade. (There are two alternatives to satisfy this basis.)

The minimum funding reserve is valued as a value of the pension eligibility in a pension plan. Therefore, it is also used to distribute the pension assets among participants when the pension plan is terminated. However, there are some questions whether the minimum funding reserve is the best benchmark of measurement of pension eligibility because of its property and complexity of valuation.

Then, in this paper, it will be discussed what kind of standard is better for the protection of pension eligibility. And if a plan adopts another standard instead of the minimum funding reserve, it will be also discussed where should be paid attention actuarially in financial management of the pension plan.

Introduction

The minimum funding reserves are important liabilities of defined benefit pension plans in Japan, especially when the plan is terminated. Considering that the plan assets are divided among participants by minimum funding reserve, it is thought as value of pension eligibility. Actually, in the law about the corporate pension in Japan, there is only established about protection of pension eligibility, but there is not clear definition of pension eligibility. Therefore it can be considered that the minimum funding reserves give a substantial definition of pension eligibility.

And the plan should report a funding level every year to the Ministry of Health, Labor and Wellness. When the funding level is below the standards, it is required that contributions should be revaluated or the funding program should be altered to satisfy the required funding level within several years or over decade.

And when the plan terminates, it is necessary that the assets exceed the minimum funding reserve. However, in case that the cause of the plan termination is unavoidable such as sponsor's bankruptcy, the plan may be terminated with inferior plan assets to the minimum funding reserve.

Valuation methods of the minimum funding reserve

For valuating the minimum funding reserve, it is necessary to valuate the minimum preserved benefits for each participant. There are

two methods of valuating the minimum preserved benefits, and the plan should determine to adopt either of the two methods in advance. The two methods are as follows:

I. the method of using the standard retirement age

$$\text{minimum preserved benefits} = B1 \times p1$$

Where

B1: assumed retirement benefit if retiring on the standard retirement age

p1: ratio of enrollment periods from entry date until valuation date to whole periods from entry date until the standard retirement age

II. the method of using the benefit on the measurement date of valuation

$$\text{minimum preserved benefits} = B2 \times p2$$

Where

B2: assumed withdrawal benefits on the measurement date of valuation

p2: ratio of the plan determined reasonably by current age of each participant

Then, the minimum funding reserve is valuated by multiplication of minimum preserved benefits with the rate of present value of annuity, where assumed interest rate is determined by the plan sponsor based on the announcement of government and mortality table is specified by the law. The minimum funding reserve is valuated as a virtual market price of the liability. Consequently, the assumed interest rate and the assumed mortality table are very important for valuation and these are updated every year.

Is the minimum funding reserve the best method?

By introducing the minimum funding reserve into the financing of pension plans, it is improved to protect pension eligibility of participants. However there is a question whether the minimum funding reserve is the best method of protecting pension eligibility. That question comes from the following reasons:

1. the valuation methods of the minimum funding reserve is difficult to understand for participants and even for the plan sponsor because of its complexity. It is embarrassed that few people can understand what the basis of their receiving amount to receive is. (Why on earth are there two different methods of valuation?)
2. the minimum funding reserve is not valued in a real financial market. Then it is not clear for related parties whether the minimum funding reserve is adequate as a liability to assure, and whether it will be solvent.
3. Could the participants, who had received the distributed plan assets, have the opportunity to build the asset well in active period? Moreover is it certain whether retirees who have received full amount of the minimum funding reserve can receive full annuity in the future?

Considering the better standard for the protection of pension eligibility, it is necessary to meet these problems. In other words, the standard should be:

1. easy to understand for all stakeholders, not only for actuary but also participants and plan sponsors.
2. fair from a viewpoint of a third party such as market value.
3. solvent for all participants to receive full annuity in the

future.

Then, one of the solutions of those conditions is using a pension buy-out, because it is clear for participants and the plan sponsor to understand the valuating basis. And, of course, the pension buy-out is concerned with life insurance business and there can be transactions of liability on the market. (There is not yet a market dealing with the pension buy-out in Japan, however it is similar to deal with the amount of individual annuity sold by the life insurance companies.) Therefore, the pension buy-out is fairer than the minimum funding reserve for the participants and plan sponsors because the pension buy-out is observed from a third parties who have view point of the market. Furthermore, when the plan is unfavorably terminated, participants are guaranteed to receive full amount of annuity on the measurement date of valuation only if the plan assets are funded as well as the buy-out cost.

How much is the buy-out cost?

It is very interesting how much the buy-out cost is compared with the minimum funding reserve. There is a result of a trial calculation in the appendix Table 1, comparing the minimum funding reserve and the buy-out cost. The buy-out cost amounts about double as the minimum funding reserve. Then, it is as the appendix Table 2 that the difference is divided into the each variance of assumptions.

The largest variance between the minimum funding reserve and the buy-out cost comes from the changing the minimum preserved benefits to annuity amount on the measurement date. This derives from the plan's deferred interest rate of annuity. There is no influence of the deferred interest rate of annuity in the valuation of the minimum funding reserve, however the annuity amount is influenced directly by the deferred interest rate of annuity in the valuation of the buy-out cost. The higher the deferred interest rate of annuity is, the larger the influence to the buy-out cost is. It is possible to value the buy-out cost with no deferred annuity amount on the measurement date. In such

case, the variance between the minimum funding reserve and the buy-out cost become narrower, however here is using deferred annuity amount on the measurement date to emphasize the difference between the minimum funding reserve and the buy-out cost.

The second biggest variance comes from the changing the assumed interest rate. The assumed interest rate of the minimum funding reserve is originally from the subscription yield of the 30 years Japanese Governmental Bonds interest rate. On the other hand, the interest rate of the buy-out cost is determined by each life insurance company. Thus, it is natural that there is a difference about the assumed interest rate between the minimum funding reserve and the buy-out cost.

Sensitivity of the buy-out cost

The properties of the buy-out cost should be well known when it is used as a funding standard, and the sensitivity is one of them. Therefore, to grasp the sensitivity of the buy-out cost, several estimations is made with modified assumptions in the appendix Table 12. (Each figure shows the difference ratio from the assumptions of the buy-out cost as above. For example, the case 1 means that only the assumed interest rate is increased by 20% and the others are not changed.)

Then the results are described as the graph of the appendix Graph 1. The graph shows that the changing the assumed interest rate has the strongest influence to the buy-out cost. And the impact to the buy-out cost by changing the expected expense is the smallest. This is caused by the original expected expense which has smaller influence than the other assumptions. The higher the original expected expense, the bigger the impact to the valuation.

Next, to compare with the buy-out cost's sensitivity, the sensitivity of the minimum funding reserve is estimated by the

assumptions of the appendix Table 4. (Each figure has a same meaning of the Table 3.)

The results are described as the graph of the appendix Graph 2. The graph also shows that the changing the assumed interest rate has the strongest influence to the minimum funding reserve. However the gradient of the graph is steeper than the graph of the buy-out cost's sensitivity. This is brought by the original assumed interest rate which is higher than the buy-out cost.

However, the steepness of the assumed mortality table is almost the same with the buy-out cost. That is because the original assumed mortality table used in the valuation of the minimum funding reserve is lower than the buy-out cost's. If the assumed interest rate is the same between the minimum funding reserve and the buy-out cost, the sensitivity of the minimum funding reserve from the assumed mortality table is smaller than the buy-out cost's.

Conclusion

From the sensitivity estimation, the property of the buy-out cost as a liability is almost the same to the minimum funding reserve. Therefore it is enough to pay attention to the buy-out cost's assumptions changing as well as to the minimum funding reserve's assumptions changing.

However, it is a big problem that the buy-out cost is much bigger than the minimum funding reserve. If the buy-out cost is adopted for the liability of the corporate pension plans, a number of plans will be terminated by the lack of funding to the buy-out cost because every plan has a huge lack of funding with the minimum funding reserve by the recession. Therefore, it is impossible to fund up to the buy-out cost within several years or over decade even if the economy recovered. After all, the restriction for the pension plans should be for the protection of pension eligibility and be consent for the plan sponsors. It is meaningless that the strict restriction makes the

pension plan disappear. To avoid such a case, there is a need to modify a framework of the financial management; for example, allowing to amortize a lack of funding for more than 20 years or to fund certain proportion of the buy-out cost such as 80% in a view of going-concern. Under the accurate definition of the pension eligibility, the environment of the protection of the pension eligibility should be progressed.

Appendix

Table 1

Buy-out	Minimum funding reserve	Difference	Difference (%)
¥2,138 M	¥1,055M	¥1,083 M	+103%

<an object group of estimation>

Number of members: about 1,800 people
(It is supposed that there are only active participants)

Annuity type: lifetime annuity
(With 15 years income guaranteed)

Benefit basis: average salary of whole period
Deferred rate: 2.5%

Type of valuating the minimum preserved benefits:
using the standard retirement age (method I. in the section
of Valuation methods of the minimum funding reserve)

Standard retirement age 62 years old
Average age 42 years old
Average salary about ¥330,000

<assumptions of the buy-out cost>

Assumed interest rate 1.2%
(The average interest rate of major life insurance companies
in Japan)

Assumed mortality table standard mortality table of 2007

Expected expense (per 1 yen annuity)

Acquisition 0.025
Administrative 0.002 (before annuity started)
0.01 (after annuity started)

<assumptions of the minimum funding reserve>

Assumed interest rate	2.2%
Assumed mortality table	specified table by the law

Table 2

Minimum funding reserve	¥1,055M
Changing interest rate	+¥258M (¥1,313M)
Changing mortality table	+¥136M (¥1,449M)
Changing fund rate	+¥187M(¥1,636M)
Changing from minimum preserved benefits to annuity amount of the effective date	+¥502M(¥2,138 M)
Buy-out	¥2,138 M

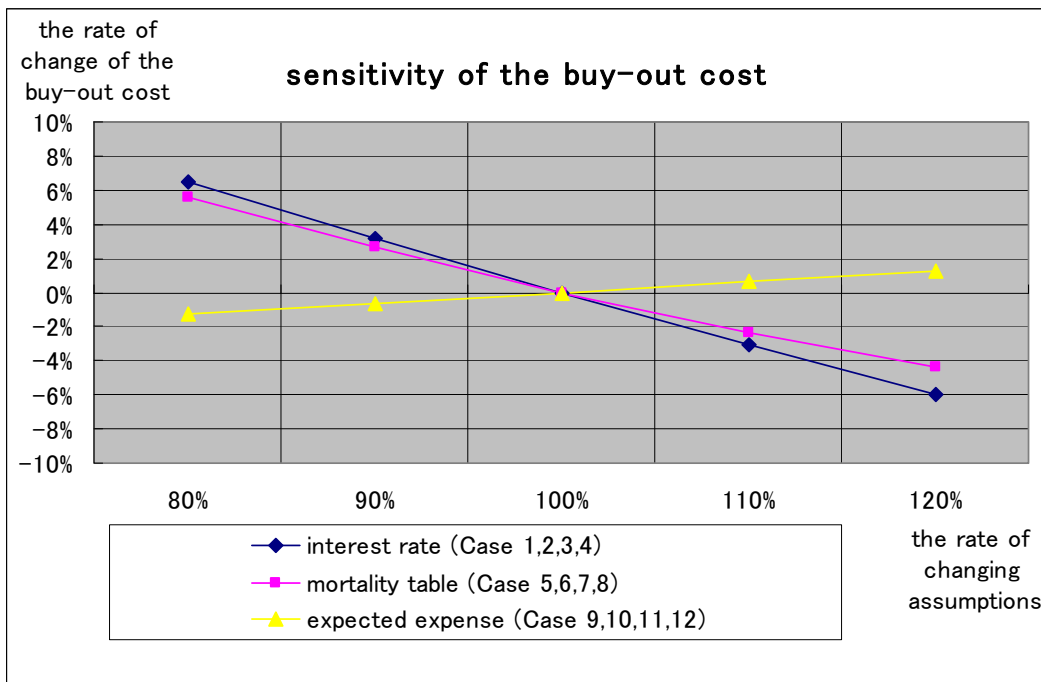
Table 3

Case	Assumed interest rate	Assumed mortality table	Expected expense
1	120%	100%	100%
2	110%	100%	100%
3	90%	100%	100%
4	80%	100%	100%
5	100%	120%	100%
6	100%	110%	100%
7	100%	90%	100%
8	100%	80%	100%
9	100%	100%	120%
10	100%	100%	110%
11	100%	100%	90%
12	100%	100%	80%

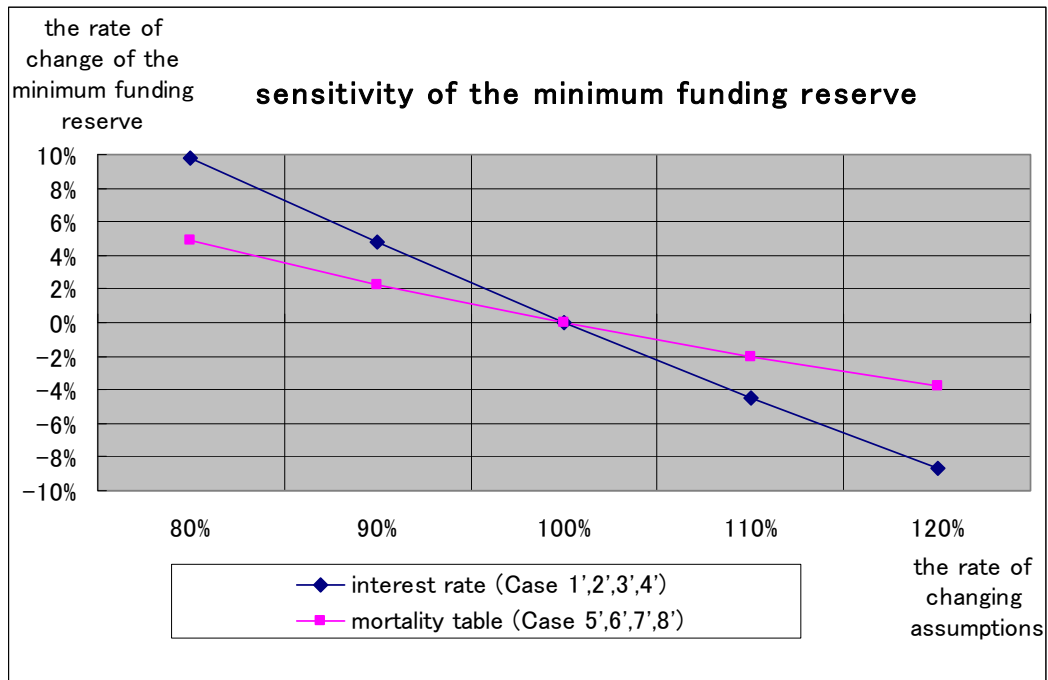
Table 4

Case	Assumed interest rate	Assumed mortality table
1'	120%	100%
2'	110%	100%
3'	90%	100%
4'	80%	100%
5'	100%	120%
6'	100%	110%
7'	100%	90%
8'	100%	80%

Graph 1



Graph 2



References

Shintaro Kitano (2008) "The role and background of buy-out in the English corporate pension" JARIP 2008/05 (in Japanese)

Tetsuya Kamiyama (2007) "The current state of the buy-out business in England" Nomura Institute of Capital Markets Research Report 2007 autumn (in Japanese)