

# Funding Standards of Corporate Pension in Japan

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## **Abstract:**

In this, the first decade of the 2000's, the environment around corporate pensions in Japan has been changing dramatically. In response, firms have become more sensitive to the risk that their defined benefit pension plans carry. Thus, funding standards play an important role as a function of risk measurement. This paper will introduce funding standards in Japan and discuss the points of contention.

## **1. Funding Standards of Corporate Pensions in Japan**

This article is a brief review of the Funding Standards of the Defined-Benefit Corporate Pension Plan, representative of corporate pension plans in Japan. For the Defined-Benefit Corporate Pension Plan, each business owner needs to verify at the end of each business year that they satisfy the three points of the Funding Standards.

### **1.1. Funding Requirements for Continuance**

The Funding Requirements for Continuance is a verification if pension plans hold the necessary reserves at the present that with future contributions will cover future benefits.

If the difference between the Actuarial Reserve and the pension assets is more than the Allowable Deficiency Carried Forward, an actuarial revaluation, requiring additional contributions such that the shortfall is eliminated in 3 to 20 years, shall be implemented. The Actuarial Reserve and the Allowable Deficiency Carried Forward are calculated by the formula as stated below.

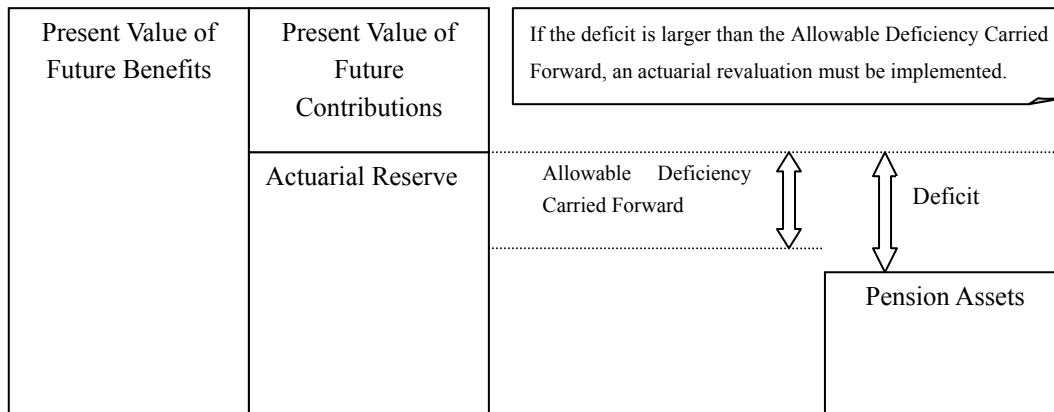
Actuarial Reserve = Present Value of Future Benefits - Present Value of Future Contributions

Allowable Deficiency Carried Forward=

- i) Present value of Normal Cost for the next 20 years  $\times$  fixed rate of less than 15%
- ii) Actuarial Reserve  $\times$  fixed rate of less than 15%
- iii) Either i) or ii) whichever is smaller

For the Funding Requirements for Continuance, the rate the business owners originally set, based on an expected rate of return on plan assets, shall be used as the discount rate to calculate the present value.

**Figure 1** Funding Requirements for Continuance



## 1.2. Discontinuance Funding Requirements

The Discontinuance Funding Requirements is a verification whether a pension plan holds the necessary reserves should the pension plan be terminated at that time.

If the pension assets are below the Minimum Funding Requirement<sup>1</sup> (present value of assumed future benefits of subscribers and pensioners according to the past enrollment period), it will be necessary to secure additional pension assets equal to the amount of the Minimum Funding Requirement using one of the methods listed below. However, if the ratio of pension assets to Minimum Funding Requirement is more than 90%<sup>2</sup> and for 2 of the last 3 years more than 100%<sup>3</sup> of the ratio of pension assets to Minimum Funding Requirement was contributed, additional contributions are not necessary.

- (1) Provide a funding level Restoration Plan to make the pension assets exceed the Minimum Funding Requirement within 7 years<sup>4</sup>.
- (2) Set the amount of necessary contributions for a maximum of 15 years according to the ratio of pension reserve to Minimum Funding Requirement.
  - Below than 80%: extinguish within 5 years
  - Amount corresponding to 80 – 90%: extinguish within 10 years
  - Amount corresponding to 90% – 100%: extinguish within 15 years<sup>5</sup>

For Discontinuance Funding Requirements, a fixed rate, specified in advance, to be within 80% to 120% of average earning yields of 30-year government bonds for 5 years, shall be used for the discount rate to calculate the Minimum Funding Requirement.

<sup>1</sup> 90% of the Minimum Funding Requirement until March 2012

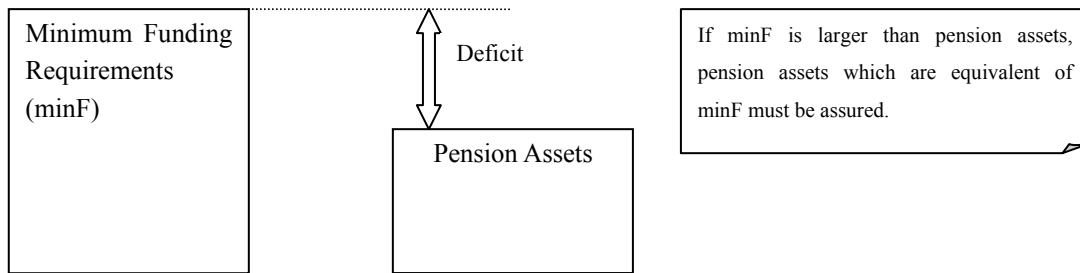
<sup>2</sup> 80% until March 2012

<sup>3</sup> 90% until March 2012

<sup>4</sup> 10 years until March 2012

<sup>5</sup> The extinguishment will not be obligatory until March 2012.

**Figure 2** Discontinuance Funding Requirements



### 1.3. Maximum Funding Standard

For the Defined-Benefit Corporate Pension Plan, contributions to a Corporate Pension shall be counted as an expense at the time it is contributed in order to receive a tax reduction. The Maximum Funding Standard is the verification that the amount of pension assets do not exceed the amount allowed as an expense. If pension assets are over 150% of the larger one of the amounts listed below, the Contribution Holiday shall be implemented based on the excess amount as the standard.

- (1) The subtraction amount of the present value of future normal costs from the present value of future benefits (The discount rate to calculate the present value is the Minimum Assumed Interest Rate.)
- (2) Minimum Funding Requirement

## 2. Several Points of Contention Concerning Funding Standards

There are many issues concerning funding standards. However, several points of contention are listed here from a perspective based on the relationship between the discount rate used for the liability assessment and fiscal management.

### 2.1. Discount Rate Used for Funding Requirements for Continuance

First, it should be mentioned that the discount rate used for Funding Requirements for Continuance is set based on the expected rate of return on plan assets. Of course, it does not mean that the expected rate of return on plan assets is equivalent to the discount rate. There is a sense that it is dependent on the initiative of business owners to decide how much of the risk premium to reflect in the discount rate. Therefore, if the expected rate of return on plan assets is used as the discount rate for Funding Requirements for Continuance, only the level of funding and contributions, premised on a future return yield as planned, would be verified, and the size of risk associated with a fluctuation in the return rate on plan assets would not be reflected. Because the pension investment is premised to be long term, funding rules driven by short-term fluctuations of the investment environment is not desirable. However, we believe that adding the stability of a plan associated with the fluctuation of risk premium to the financial verification process will enable us to verify finances more accurately.

### 2.2. Discount Rate Used for Discontinuance Funding Requirements

As mentioned previously, the fixed rate, specified in advance to be within 80 – 120% of average earning yields of 30-year government bonds for 5 years, shall be used for the discount rate to calculate the Minimum Funding Requirement. In order to verify the Discontinuance Funding Requirements, it would

be reasonable to use bond yields maturing in the same time frame to average the outlay of pension liabilities. The dependence on a business owner's risk tolerance will be decreased.

However, we have to question why the asset investment yield on a simulation can be the discount rate of The Funding Requirements for Continuance in order to make a funding Restoration Plan when the Discontinuance Funding Requirements is not met.

This problem causes a discrepancy between pension plans with similar funding levels for Discontinuance Funding Requirements. Although one pension plan, which sets the discount rate of The Funding Requirements for Continuance low with high contributions, requires extraordinary contributions, another plan, which sets their discount rate of The Funding Requirements for Continuance high, does not need to contribute the additional contributions because future restoration can be expected. We believe this is not an ideal result from the perspective of the Discontinuance Funding Requirements' purpose.

### **2.3. Relationships with Accounting Standard**

We would like to mention as our third point that the funding requirements of a pension financial management is different from the Accounting Standard for Retirement Benefits.

Since a new accounting standard was adopted for corporate pensions and retirement benefits in 2000, any deficiency of pension funding must appear on a company's financial statement, elevating its importance for management.

However, because the funding standards of pension finance and the accounting standards for corporate pension have different verification systems, there are cases where sound companies with adequate funding requirements of pension finance needed to report their reserve allowance in their accounting. As a result, there are companies that had to revise their pension plan or to make additional contributions.

The underlying cause of this imbalance is the fact that pension finance, premised on continuous implementation, and corporate pension accounting, which looks at one's financial status at a given point in time, are based on different ideas. The method for setting the discount rate is one of the factors. The discount rate for corporate accounting is set based on the yields of long-term bonds, which are stable. Therefore a lower discount rate than the Funding Requirements for Continuance often occurs.

Should it happen that the discount rate on the accounting standard is set lower than that of the Funding Requirements for Continuance, liabilities using the accounting standard will be larger than that of a pension financed with the same liability assessment. On the other hand, because the contributions of pension plan are set according to the liabilities calculated based on the discount rate of the Funding Requirements for Continuance, a company still needs to report an accounting reserve allowance even if the funding level of pension finance reaches 100%.

### **2.4. Calculation Samples**

The following introduces the calculation affecting the risk of asset management on the funding level as mentioned in 2.1.

#### **2.4.1. Conditions and Methods**

For calculating the distributions of funding levels of last 10 years, we set the assumptions listed below.

- (1) The funding level at the reference date of calculation is 100%.
- (2) We assumed two scenarios. Case 1 is a situation with low risk low return. Case 2 uses a high risk high return scenario. The expected rate of return on plan assets is used as an equivalent of the discount rate for Funding Requirements for Continuance. The discount rate, the expected rate of

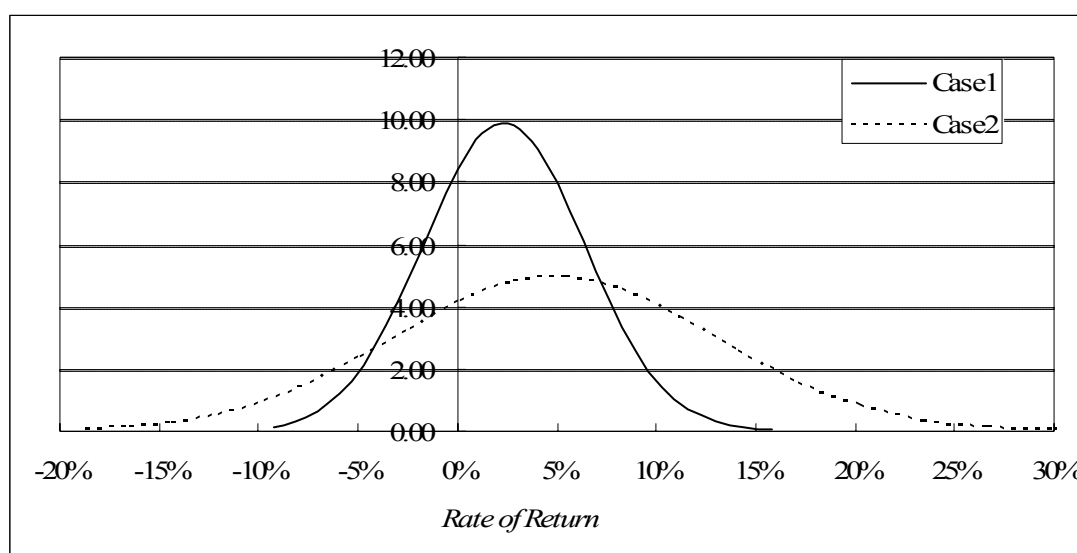
return on plan assets and management risk (standard deviation of the expected rate of return on plan assets) for both scenarios are indicated in Table 1.

**Table 1** Expected rate of return on plan assets (Exp), discount rate for Funding Requirements for Continuance (D/R) and standard deviation of Exp (SD)

	Exp	D/R	SD
Case1	2.50%	2.50%	4.00%
Case2	5.50%	5.50%	8.00%

(3) The expected rate of return on plan assets is expected to have a normal distribution as shown in Figure 3. However, we simplified the calculation by taking a multinomial probabilistic distribution as shown in Table 2.

**Figure 3** Probability Density Function



**Table 2** Probability Distribution

Case 1				Case 2			
Rate of Return	Probability	Rate of Return	Probability	Rate of Return	Probability	Rate of Return	Probability
-9.26%	0.0017	3.76%	0.1180	-18.66%	0.0014	8.29%	0.1284
-8.15%	0.0037	5.03%	0.1017	-16.52%	0.0031	11.15%	0.1063
-7.02%	0.0075	6.32%	0.0790	-14.32%	0.0063	14.08%	0.0767
-5.88%	0.0142	7.62%	0.0551	-12.07%	0.0122	17.10%	0.0477
-4.73%	0.0247	8.95%	0.0344	-9.75%	0.0222	20.19%	0.0252
-3.56%	0.0399	10.28%	0.0191	-7.37%	0.0374	23.37%	0.0112
-2.38%	0.0594	11.64%	0.0094	-4.93%	0.0583	26.64%	0.0042
-1.18%	0.0815	13.01%	0.0041	-2.43%	0.0835	29.99%	0.0013
0.03%	0.1026	14.39%	0.0016	0.15%	0.1090	33.43%	0.0003
1.26%	0.1181	15.80%	0.0005	2.79%	0.1288	36.96%	0.0001
2.50%	0.1239			5.50%	0.1364		

(4) All the parameters excluding the expected rate of return on plan assets shift according to the actuarial assumptions.

(5) The pension plan has matured enough to reach a steady state. It satisfies the formula below.

$$F \times i = C \times \sqrt{1+i}$$

$F$  : pension assets

$C$  : cashflow(= benefits – contributions)

$i$  : discount rate

(6) The Allowable Deficiency Carried Forward is equal to 15% of the Actuarial Reserve.

### 2.4.2. Calculation Result

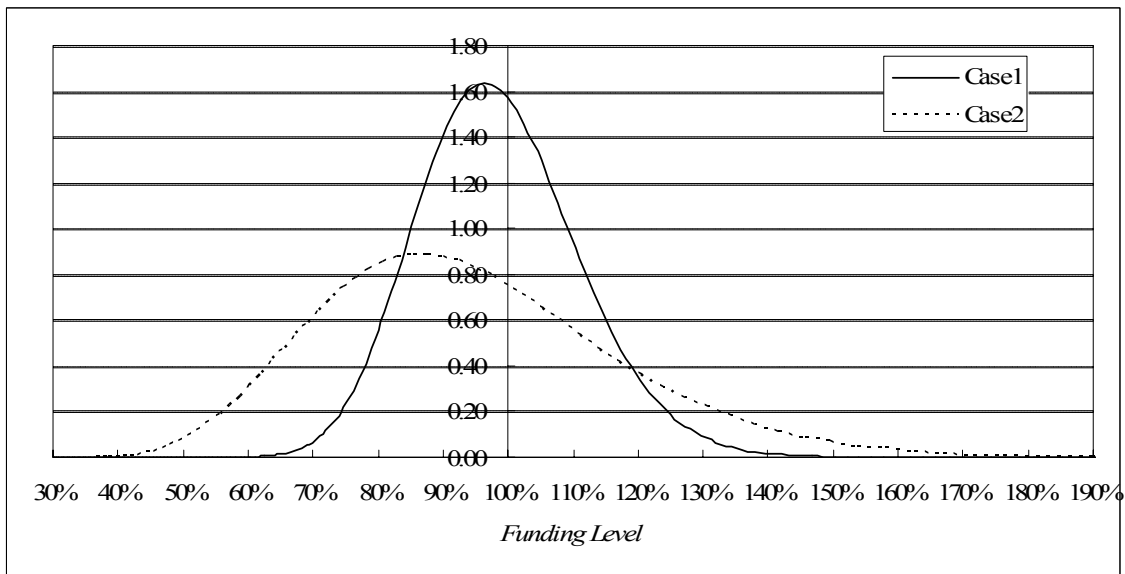
Using the assumptions above, Figure 4 shows the results of the calculation of the probability of the funding level after 10 years. After 10 years, the probability that additional contributions will be required is 12.5% for Case 1, and 36.2 % for Case 2.

Figure 5 shows the results of calculating the probability that funding will not be short at the end of every year in the future. The probability of never being short of funding for 10 years is 82.5% for Case 1, and 49.9% for Case 2.

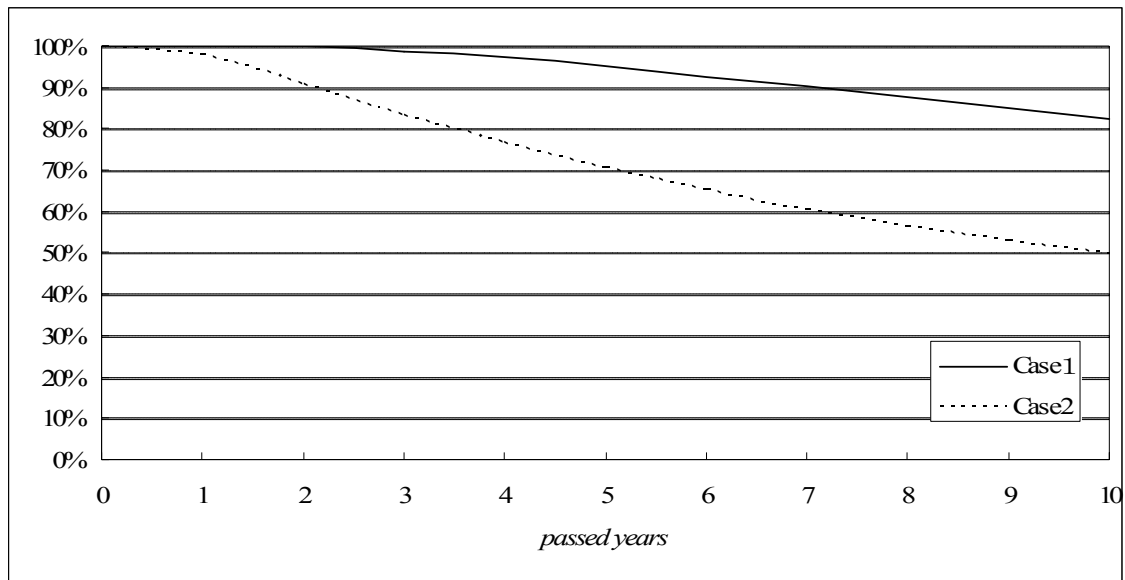
The results suggest how big an influence asset management risk has on the pension plan.

Our assumptions are dramatic in as much that fluctuations of the actuarial assumptions, other than return yield, have not been considered in this assessment as our purpose is to analyze the influence of return yield fluctuation. To apply similar calculations to a future prediction of an actual pension plan, the calculation should be based on actual conditions, for example taking liability shifts into account, and using ALM (Asset-Liability Management) simulation techniques.

**Figure 4** Probability of the Funding Level after 10 years



**Figure 5** Probability not in Conflict with the Funding Standard of the Funding Requirements for Continuance



### 3. Personal Viewpoint

Although it is not easy to find an answer for the contentions listed in Chapter 2, we would like to make a few brief personal observations.

#### 3.1. The Funding Standard Based on Risk Level

First, regarding the Funding Requirements for Continuance, the idea that the required Funding Standard level changes depending on the management risk level is natural from the perspective of pension protection. Generally, a tradeoff relationship is formed between risk and return. For example, one could consider a pension plan with high-risk asset management requires higher risk tolerance than a pension plan with stable asset management. Therefore, it would be reasonable to have some kind of protection against future risk.

#### 3.2. The Application of Protection Measures

The methods listed below are concrete examples of protection measures.

- (1) Run a simulation for a given term for each pension assets and pension liability, calculating future probability of funding conditions. As assumptions of the calculation, take into consideration the risks caused by the fluctuation of actuarial assumptions, such as the return rate on plan assets.
- (2) If there is a high probability that the funding level will be lower than the fixed level as standard, additional contribution risk will be determined to be high. Appropriate measures to protect the contributions should be taken in case of a future decrease of the funding.
- (3) The results of (1) are also used for the pension assets simulation for the Restoration Plan when the Discontinuance Funding Requirements is not met.

The protection measures explained above are a general outline. To verify the details of measures, it is preferable that a method to apply risks other than asset management risk is considered (maturity of a pension plan, ability of pension plan to adapt to interest risk, and influence of actuarial assumptions other

than the return rate of plan assets) as well as defining the co-relation function of each parameter. Details of those issues remain as challenges for the future.

In addition, one should consider that the introduction of risk dependent funding standards can reinforce the measures for business owners.

Measures to induce funding are also necessary to prevent the introduction of new funding standards from interfering with the free management of corporate pensions, due to business owners' excessive emphasis on inhibiting risks, or lowering incentives for corporate pensions.

Some effective solutions for such problems would be to permit the setting of contribution rates to allow funding levels to be maintained at more than 100%, or to increase the flexibility of contribution methods.

### **3.3. Relationships to Accounting Standards**

As explained above, the intentions and purpose of the accounting standard of retirement benefits are different from that of pension finance and therefore difficult to harmonize. Harmonization is made all the more difficult with different entities establishing standards for corporate accounting and pension finance. The only clear solution would be a comprehensive negotiation between labor and management about their pension plan including risk allocation. However, with the introduction of the funding standards as suggested above, funding standards dependent on asset management risk would oblige companies to hold the appropriate funding for the risk the employees accept. One can expect a reduction in the disparity between both sides.

## **4. Roles of the Pension Actuary**

Business owners became more sensitive to risks caused by corporate pensions as the result of drastic changes in the environment of the Japanese corporate pension plan in the last several years. Therefore, there are heavy obligations on the pension actuary, as the specialist, to verify not only the financial conditions of corporate pensions, but also the risk assessment, including the overview of future finances with considerations toward the financial burden of business owners.

### ***Reference***

(1) Mitsubishi Trust and Banking Corporation (2002), "New Dictionary of Pension Terminology", Diamond, Inc.