Title: Funding Standards and Protection of Benefit Rights

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Abstract: In advanced countries in corporate pensions, minimum funding standards are introduced to protect pension rights. It was 1997 when the minimum funding standard for Employee Pension Funds was introduced in Japan. In this paper, I discuss the effectiveness of the minimum funding standard of Japan in terms of protection of benefit rights. Some argue that the current strict funding standard can be a major impediment to spread of defined benefit pension plans.

I believe the basic principle for protection of benefit rights is that participants should always be provided enough information about the funding situation of the plan to make relevant judgments. In such circumstance, more flexible funding standard can work well. I would like to propose a new funding standard that is based on agreement between a plan sponsor and participants.

Key Words: Defined Benefit Plan, Lump-sum Benefit, Funding Standard, Protection of Benefit Rights

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1. Minimum Funding Standard of Corporate Pension Plans in Japan

In 1997, a minimum funding standard (MFS), based on “At-Risk” liabilities, for Employee Pension Funds (EPF) was introduced on top of the existing funding standard based on “On-Going” actuarial liabilities in Japan. This new standard intends to provide more effective protection of the benefit rights in the case of plan termination.

The new Defined Benefit Corporate Pension Act (DBA) became effective in April, 2002 and a new framework for corporate pension plans was introduced to replace the existing Tax Qualified Pension Plan (TQPP) system. EPF’s were to be strengthened. Since the rules of TQPP said almost nothing about funding standard, the DBA aimed to provide a new framework of corporate pension plans instead of TQPP, which is governed by a funding standard like MFS for EPFs. An employer can establish one of two types of qualified pension plan under DBA, a rule-type Corporate Pension Plan (CPP) or a Corporate Pension Fund (CPF).

The DBA will eliminate favorable tax treatments for TQPPs as of Apr 1, 2012. This forces plan sponsors of TQPP to convert their TQPP into plans of other types by then and many plan sponsors of TQPP are expected to convert their TQPP into CPP.

I would like to discuss the MFS under DBA from now on, because the MFS under DBA is almost the same as the one for the supplemented parts (i.e. company-sponsoring part) of EPFs.

(1) Definition of Minimum Benefits under DBA

The MFS under the DBA is the present value of Minimum Benefits. The formula of the minimum benefits of each plan must be prescribed in the plan rule. The minimum benefits of inactive participants are simply their annuity or deferred annuity benefits.

The guideline shows two types of formulas for the minimum benefits for active participants.

Type A: To determine a normal retirement age.

The minimum benefit is such that the benefit is payable from the normal retirement age, and the amount is equal to an amount, which is calculated as if a participant leaves the plan at the normal retirement age assuming no salary increase, times a rate determined by years of participation. The rate is usually a ratio of the benefit accrual rate at the measurement date against the benefit accrual rate at the normal retirement age.

Type B: To use current benefit.

The benefit is such that the benefit is payable or eligible the next day after the measurement date, and the amount is equal to an amount, which is calculated as if a participant leaves the plan that day, times a rate determined by current age. The company can choose the way of determination of the rate. The followings are examples shown in the government announcement.

a) **1** for annuity and $\mathbf{1/(1 + d)^{(normal\ retirement\ age\ -\ current\ age)}}$ for lump sum, where d is discount rate

b) $\mathbf{1/(1 + s)^{(normal\ retirement\ age\ -\ current\ age)}}$, where s is salary increase rate.

c) To determine rates by age-group, for example 0.5 for age 20 to 24.

d) $\mathbf{1/(1 + r)^{(normal\ retirement\ age\ -\ current\ age)}}$, where r is interest credit rate. This can applied only to a cash balance plan,

MFS is the total of the present values of minimum benefits for each participant.

(2) Examples of Minimum Benefits

I show examples of minimum benefits calculation for an active participant.

[Example of Type A]

Plan A*:

A Final Pay Plan. Annuity is eligible with 15 years of service.
Lump Sum Benefit = Monthly Salary x A(T), where T is years of service
Annuity Benefit = Monthly Salary x B(T) x C(X), where X is age at resignation
Normal Retirement Age: 60

** Please see the Appendix 1 for the details of plan provision of Plan A.*

Participant X: Age 35, 10 years of service and monthly salary of 350,000 Yen.
Participant Y: Age 50, 25 years of service and monthly salary of 500,000 Yen.
A(10) = 6.5, A(35) = 44.6, B(25) = 2.442, B(35) = 3.9461, C(50) = 1.4802, C(60) = 1.

Minimum Benefit of X

= 350,000 x A(35) x {A(10) / A(35)} = 350,000 x A(10) = 2,275,000 Yen.
This is equal to the amount X would receive if X resigned the company at the date, i.e. a

walk-away benefit. Please note that the minimum benefit is payable at the normal retirement age, so MFS for X is much smaller than the walk-away benefit.

Minimum Benefit of Y

= 500,000 x B(35) x {B(25) / B(35)} x C(60) = 500,000 x B(25) = 1,221,000 Yen.

If Y resigned the company at the date, the annuity benefit would be;

Walk-Away benefit of Y

= 500,000 x B(25) x C(50) = 1,807,324 Yen.

The minimum benefit of Y is also much smaller than the benefit Y would receive if Y resigned the company at the date, because of discounting annuity that shouldn't be discounted.

If you apply it to Japanese typical plan, minimum benefits might be equal to or smaller than walk-away benefits, therefore MFS is always smaller than the walk-away benefit obligation.

I illustrate minimum benefits for a cash balance plan next.

[Example of Type B]

Plan B:

A Cash Balance Plan. Annuity is eligible with 15 years of service.
Interest Credit Rate = 2%
Lump Sum Benefit = Individual Balance at the resignation
Annuity Benefit = Individual Balance at resignation / Annuity Factor of discount rate of 2%
Normal Retirement Age: 60

Participant X: Age 35, 10 years of service and individual balance of 4,500,000 Yen.
Participant Y: Age 50, 25 years of service and individual balance of 15,000,000 Yen.
Annuity Factor of 15 years certain annuity payable from age 60 at age 50 is 10.62837.

Minimum Benefit of X

= 4,500,000 Yen / $1.02^{(60-35)}$ = 2,742,898 Yen

This is also equal to MFS and much smaller than the walk-away benefit because of discounting by interest credit rate from age 60 to the date.

Minimum Benefit of Y

= 15,000,000 Yen / 10.62837 / $1.02^{(60-50)}$ = 1,411,317 / 1.21899 = 1,157,776 Yen

This is also smaller than the walk-away benefit.

In this case, discount by interest credit rate is not compulsory, so you can put the walk-away benefits as minimum benefits. However, many plan sponsors apply such discount factors to their cash balance plans, probably in order to lower the MFS.

(3) Assumptions for MFS

The assumptions for MFS are determined in the regulations of DBA.

Discount Rate:

The base rate is determined based on the average of issuer's rates of 30-year government bonds issued in the past 5 years and announced by the government every year. The company is allowed to determine the discount rate for MFS in the range between 80% of the base rate and 120% of the base rate.

Discount rate for MFS since April, 2002

Measurement Date	Lower Limit	Base Rate	Upper Limit
April 1, 2002 to March 31, 2003	2.500%	2.500%	2.500%
April 1, 2003 to March 31, 2004	1.784%	2.230%	2.676%
April 1, 2004 to March 31, 2005	1.832%	2.290%	2.748%
April 1, 2005 to March 31, 2006	1.760%	2.200%	2.640%
April 1, 2006 to March 31, 2007	1.736%	2.170%	2.604%

Withdrawal Rate:

None.

Pre-retirement Death:

None.

Mortality after Retirement:

95% of the standard table for male and 92.5% for female. Difference of life expectancy and annuity factor (discount rate is 2.25%) from the standard table are shown below.

	Standard Mortality Table		Table for MFS	
	Male	Female	Male	Female
Life Expectancy at age 60	22.83 Years	28.71 Years	23.28 Years	29.38 Years
Life Expectancy at age 65	18.83 Years	24.22 Years	19.25 Years	24.86 Years

	Standard Mortality Table		Table for MFS	
	Male	Female	Male	Female
Annuity Factor at age 60	17.25548	20.63198	17.51474	20.97272
Annuity Factor at age 65	14.81625	18.17008	15.07797	18.52819

(4) Definition of MFS

The MFS is simply total of present values of minimum benefits.

(5) Funding of unfunded MFS

The DBA requires additional contributions if the plan assets are below the MFS. The funding valuation is required every year. There are two methods to calculate the additional contributions. One is the contributions to be determined by the degree of underfunding and another is the contributions to be determined by projection. A plan sponsor is allowed to choose one of two methods to meet the requirements. Plan sponsors may prefer the method 2 to the method 1 because it is more flexible and the additional contributions are more unlikely under the method 2.

Method 1: By the degree of underfunding

The period of amortization is determined by the degree of underfunding as follows.

The degree of underfunding	Minimum Amortization Period
Not less than 90% of the MFS *	15 Years
Less than 90%, but not less than 80% of the MFS	10 Years
Less than 80% of the MFS	5 Years

** As a transitional provision, funding of this portion is not required if the measurement date of the funding valuation is not later than March 31, 2007.*

Method 2: By projection

Step a) To make a projection to check funded status after certain period of 7* years.

** As a transitional provision, it should be 10 years if the measurement date of the funding valuation is not later than March 31, 2007.*

Step b) If the asset after the projection period is less than the MFS, the plan sponsor has to increase the contributions, say, by shortening the amortization period of

PSL or by set the special contribution rate.

These steps are to be repeated until the assets after the projection period exceed the MFS. The assumptions to be used for the projections should be as follows;

Interest rates for the assets: Not more than the discount rate used for the latest funding valuation.

Interest rates of the MFS: Not more than the maximum of the discount rate for MFS used for the latest funding valuation and the discount rate for MFS used for the next funding valuation.

2. Impact of MFS

The reform of the funding requirements for EPF in 1997 hit the financial status of the EPF from two directions.

One is the introduction of the MFS. Before 1997 reform the discount rates to be used for calculation of contribution rates and on-going actuarial liabilities were fixed at 5.5% by the regulations. The discount rates for the MFS should be determined based on the average of the issuer's yields of 20-year government bonds issued in the past 5 years. Those yields had hovered around 5% in 3 years from 1992, however they fell down to 3.4% at the end of 1996.

The discount rate for the MFS to be used for the funding valuation as of March 31, 1998 was as high as 4.75% reflecting the higher bond yields in early 1990s. However, it fell to 4% in 1999, 3.5% in 2000 and 3% in 2001. Many EPFs were still using relatively high discount rate of 5.5% for calculation of on-going actuarial liabilities. The MFS in these years were relatively very high when comparing with on-going actuarial liabilities for many EPFs.

Another point that hit EPFs was the change of the measurement method of the plan assets. Before the 1997 reform, book value was required and in fact used for the purpose of funding valuations. The book values of the stocks in the assets were much higher than the market values because of the collapse of Japanese heated stock market in 1990. Many EPFs had to recognize the unrecognized asset losses that were derived from difference between the market values and the book values of the assets.

Furthermore, for three years from 2000, all EPFs experienced negative return on their assets and had enormous deficits at the end of the period. It followed that some sponsors of EPFs terminated their EPFs, partly because they were required to increase the contributions to their EPFs in order to meet the MFS. It is ironical that, like the U.S.A and the U.K., measures taken for the protection of benefits rights led to termination of plans.

DBA will force plan sponsors of TQPP to convert their TQPP into one of the other types of plan by April 1, 2012. As of August 1, 2006, only less than 1000 companies have converted their TQPP into corporate pension plans under DBA. There is little doubt but the MFS under DBA is one of reasons plan sponsors of TQPP are reluctant to convert into plans under DBA. Most of them are still enjoying rather loose funding requirements of TQPP.

3. Effectiveness of MFS

How can you protect the right of benefits through the MFS? The concept of the MFS seems to be that if the plan asset is not less than the MFS the plan can pay the minimum benefits to active and inactive participants in the case of plan termination, and therefore the right of benefits of participants can be protected. Is this true?

What do the participants expect to be paid in the event of the plan termination? They naturally expect their walk-away (or termination) benefits (voluntary or involuntary), which should be calculated according to the plan rule as of the date of plan termination. For active participants, the minimum benefits usually are less than termination benefits in the case of annuity benefits. As I explained above, the minimum benefit for an employee with pensionable pay of 500,000 yen, 25 years of service and age of 50 under Plan A (Sample Plan) is 1,220,992 Yen, while the walk-away benefit is 1,807,367 Yen. The following chart shows these benefits under the Sample Plan (please see Appendix 1) assuming pensionable pay is 500,000 Yen.

Age	Years of Service	Walk-Away Benefits	Minimum Benefits
40	15	988,714	451,236
41	16	1,058,804	502,553
42	17	1,127,417	556,525
43	18	1,194,356	613,151
44	19	1,259,450	672,431
45	20	1,322,550	734,365
46	21	1,424,897	822,843
47	22	1,524,782	915,744
48	23	1,622,666	1,013,512
49	24	1,717,575	1,115,704
50	25	1,807,367	1,220,992
51	26	1,844,895	1,296,199
52	27	1,876,862	1,371,405
53	28	1,903,641	1,446,611
54	29	1,925,584	1,521,817
55	30	1,943,022	1,597,023
56	31	1,956,271	1,672,229
57	32	1,965,627	1,747,435
58	33	1,971,368	1,822,641
59	34	1,973,761	1,897,847
60	35	1,973,053	1,973,053

Regarding to lump-sum benefits, the amount could be the same for both minimum

benefits and walk-away benefits, but the timing of payment is not the same. The minimum benefits should be payable as of normal retirement age while the termination benefits are payable now. This difference makes MFS of lump-sum benefits smaller than the walk-away benefits. The following chart shows the difference between MFS and the walk-away benefits assuming the discount rate for MFS is 2.25%.

Age	Years of Service	Walk-Away Benefit	Minimum Funding Standard
25	0	0	0
26	1	0	0
27	2	600,000	287,913
28	3	900,000	441,587
29	4	1,200,000	602,030
30	5	1,500,000	769,470
31	6	1,800,000	944,140
32	7	2,100,000	1,126,280
33	8	2,400,000	1,316,139
34	9	2,700,000	1,513,971
35	10	3,250,000	1,863,376
36	11	3,575,000	2,095,832
37	12	3,900,000	2,337,805
38	13	4,225,000	2,589,606
39	14	4,550,000	2,851,555
40	15	5,100,000	3,268,164

You find that the right of benefits for active participants, which should be protected through MFS, is very limited. The MFS is actually only 50% to 65% of the walk-away benefits that is the fundamental promise the employer made.

How about inactive participants? Their minimum benefits are their annuity benefits. The amounts are the same and the timing of payments is the same. They should be happy to hear this. You have to consider who will pay their payments after plan termination. The mortality table used is a bit more conservative than the standard mortality table, but I think it is not enough conservative for an insurance company to take over the liabilities.

The plan sponsors are allowed to choose the discount rate from the range announced in the official instructions. A discount rate at the choice of a plan sponsor could be much higher than a risk free rate. The MFS for inactive participants can not be a price of their liabilities such that a insurance company can undertake them.

4. New Framework of Funding Requirement

I would like to propose a new framework of funding requirement based on the walk-away benefits.

(1) Funding policy should be determined between labor and management

As I discussed above, the MFS is less than the walk-away benefits in the event of termination, although the walk-away benefits are what active participants expect to be paid. Even if the plan assets exceed the MFS, the walk-away benefits are not guaranteed for active participants. Furthermore it is virtually impossible for active participants to know the amount of payment in the event of plan termination under the current framework of MFS.

Before proceeding to the next step, I return to a question at the very beginning. Why do we need funding requirement assuming plan termination? Do we need the plan to be prepared for insolvency by a corporate bankruptcy? Some might say, “we do not need such requirements because our company will never go under”. For these people, funding requirements at-risk have no significance. It is true that as long as the company exists, the job continues and the plan continues to exists, there are nothing to worry about payment from the plan.

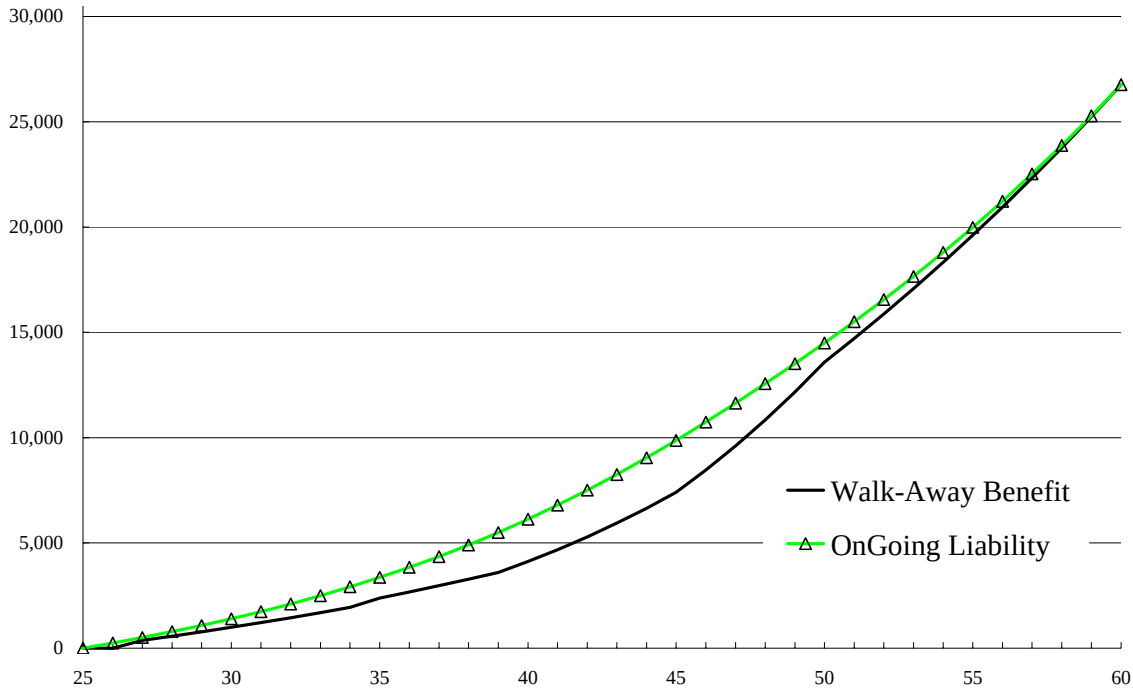
If a low risk of bankruptcy is the agreed perception between labor and management, do they need strict funding requirements like current MFS? The answer is NO. Active participants and employers should negotiate for the security of their future retirement benefits. If they think that probability of bankruptcy is very low, 50% of the walk-away benefits might be high enough for them as an agreed minimum funding standard.

My assertion here is that the funding policy, such as minimum funding level, of a funded plan should be determined by negotiation between the participants and the plan sponsor. It is purely a issue between labor and management.

(2) Elimination of Two-layer Structure of Funding Requirements

The current funding requirements of DBA have a two-layer structure. One is the MFS and another is "On-going" liability. The on-going actuarial liability is usually calculated using a conservative entry age normal cost method. The contribution rates should be determined based on the on-going liability. The plan sponsor should be required to compensate unfunded portion in terms of both "On-going" liabilities and MFS.

Funding based on the entry age normal cost method can be too conservative and might lead to overfunding in the term of the walk-away benefit. The following chart shows On-going liabilities and the walk-away benefits of a participant who joins the sample plan at age 25 and retires at age 60. The discount rate for the on-going liabilities is 4%.



The excess of funding over walk-away benefits is a good news for the participant, but might be unacceptable for the employer. If the employer wants to terminate the DB plan and transfer the plan assets to a new DC plan, all the assets should be transferred across even if it exceeds the walk-away benefits. Currently, the surplus could be benefits that the employer has not expected to pay.

We do not need such a two-layer structure. The on-going actuarial liabilities should be considered as a funding target, but not a funding standard.

(3) Funding Requirements based on the Walk-Away Benefits

Funding target for active participants does not need to exceed the Walk-Away Benefit Obligation (WABO). WABO can work well as a funding target. The minimum funding requirements should be also based on WABO and set through negotiation between labor and management.

For example, the minimum funding requirements could be as follows.

1. The primary funding target is WABO.
2. The contribution rates can be calculated using Entry Age Normal or Projected Unit Credit.
3. If the plan assets become below 50% of WABO, the amount below 50% of WABO should be funded immediately.
4. If the plan assets become below 75% of WABO, the portion between 50% and 75% of WABO should be funded in 5 years.

In this example, the funding level always keeps at least 50% of WABO and may be more than 75% of WABO. The funding target should be 100% of WABO, but even in the case the employer cannot meet the funding target by some business reason or other unexpected event, the minimum funding requirements can be cleared. The employer no longer worry about the pressure from strict funding requirements.

However, in some cases, WABO does not represent the responsibility an employer owes to employees related to their retirement benefits. As I indicated in my paper for ICA2006, the Modified WABO (please see the Appendix 3 for details) can represent all the liabilities the employer owes.

Please note that these funding standards are set only for liabilities of active participants. Liabilities of inactive participants should be measured using rather conservative assumptions. After DBA, a plan sponsor is allowed to change the annuity benefit amount based on an objective basis, such as government bond yield, after commencement of

payment (please see Appendix 2). If you determine the discount rates for inactive participants based on the same basis, the liabilities for inactive participants can be rather stable.

(4) Prerequisite Condition for the new Framework

Generally, the plan sponsors are better informed than participants. It is natural because they are responsible for the plan operation and finance. In the new framework, the funding policy including the minimum funding standard is negotiated between plan sponsor and participant. It means that not only the plan sponsors, but also the participants should be responsible for the plan operation and finance.

Under the current framework, the plan sponsors are supervised by the government. However, in the new framework, the government does not need to supervise any plans as a principle. The pension plans should be governed by pension committees comprised of representatives from management, active and inactive participants. The pension committee should be well informed in order to make the relevant judgment related to the plan operation, for example, contribution rates, investment policy, funding policy and so on. Each party should have a budget to employ their own advisers (e.g. actuaries).

I strongly believe that here is a basic principle for protection of benefit rights. Both active and inactive participants are well informed about the plan financial situation. They have enough knowledge to make a relevant decision based on the information. If necessary, they can demand the plan sponsor to take necessary actions, such as increase of contributions, change of investment strategy and so on. This is a basic structure of protection of benefits rights.

In the new framework, the role of actuaries is very important. The actuaries have to provide necessary information at a good timing in a proper way. The information should be understandable for both plan sponsors and participants.

I believe the benefits rights can be protected by plan sponsor and participants who are well informed by professional actuaries.

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BIBLIOGRAPHY

IPPOLITO, A.R. (1997)
Pension Plans and Employee Performance, Chicago

KUBO, T. (1999)
Restructuring of Retirement Benefit Plan(Taishoku-Kyufu-seido no Kozo-Kaikaku), Tokyo

IMAFUKU, A. (2000)
Accounting for Retirement Benefits(Nekin no Kaikei Gaku), Tokyo

National Association of Pension Funds (2004)
Accounting for Pensions, London

Lohmann, L. J. (2005)
The Missing Asset, Tokyo

Fujii, Y. (2006)
Sustainable Pension (by The Society for Pension Study of Japan), Chapter 10 Protection of Rights in Corporate Pension (Kigyounenkin ni okeru Jukyuken-Hogo), Tokyo

MATSUBARA, R. (2006)
How we can keep employers in the DB world in Japan?, (ICA2006 in Paris)

Appendix 1. Plan Provision of Sample Plan ~ Plan A

Eligibility	Regular Employees.
Eligibility for Benefit	
Annuity (Termination, Retirement)	15 years of service.
Lump Sum (Retirement, Pre-retirement Death)	1 year of service
Lump Sum (Voluntary Termination)	2 years of service
Benefit Amount	
Annuity	Pensionable Salary at resignation times Multiple determined by the years of service (Table B) times Multiple determined by age (Table C). Payment form is 15 years certain annuity. An employee can choose a Lump-sum option
Lump Sum	Pensionable Salary at resignation times Multiple determined by the years of service (Table A)
Calculation of years of service	From hire to resignation
Pensionable Salary	Monthly Base Salary

Table A

Years of Service	Retirement, Pre-retirement Death	Voluntary
1	1.00	0.00
2	2.00	1.20
3	3.00	1.80
4	4.00	2.40
5	5.00	3.00
6	6.00	3.60
7	7.00	4.20
8	8.00	4.80
9	9.00	5.40
10	10.00	6.50
11	11.00	7.15
12	12.00	7.80
13	13.00	8.45
14	14.00	9.10
15	15.00	10.20
16	16.00	11.36
17	17.00	12.58
18	18.00	13.86
19	19.00	15.20
20	20.00	16.60
21	21.50	18.60
22	23.00	20.70
23	24.50	22.91
24	26.00	25.22
25	27.60	27.60
26	29.30	29.30
27	31.00	31.00
28	32.70	32.70
29	34.40	34.40
30	36.10	36.10
31	37.80	37.80
32	39.50	39.50
33	41.20	41.20
34	42.90	42.90
35	44.60	44.60

Multiples of Table B = Multiples of Table A / 11.30228

Table B

Years of Service	Retirement, Pre-retirement Death	Voluntary
15	1.3272	0.9025
16	1.4156	1.0051
17	1.5041	1.1130
18	1.5926	1.2263
19	1.6811	1.3449
20	1.7696	1.4687
21	1.9023	1.6457
22	2.0350	1.8315
23	2.1677	2.0270
24	2.3004	2.2314
25	2.4420	2.4420
26	2.5924	2.5924
27	2.7428	2.7428
28	2.8932	2.8932
29	3.0436	3.0436
30	3.1940	3.1940
31	3.3445	3.3445
32	3.4949	3.4949
33	3.6453	3.6453
34	3.7957	3.7957
35	3.9461	3.9461

Table C

Age	Retirement, Pre-retirement Death
35	2.6658
36	2.5633
37	2.4647
38	2.3699
39	2.2788
40	2.1911
41	2.1068
42	2.0258
43	1.9479
44	1.8730
45	1.8009
46	1.7317
47	1.6651
48	1.6010
49	1.5395
50	1.4802
51	1.4233
52	1.3686
53	1.3159
54	1.2653
55	1.2167
56	1.1699
57	1.1249
58	1.0816
59	1.0400
60	1.0000

Table B:

Years of Service	Retirement, Pre-retirement Death	Voluntary
15	1.3272	0.9025
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20	1.7696	1.4687
21	1.9023	1.6457
22	2.0350	1.8315
23	2.1677	2.0270
24	2.3004	2.2314
25	2.4420	2.4420
26	2.5924	2.5924
27	2.7428	2.7428
28	2.8932	2.8932
29	3.0436	3.0436
30	3.1940	3.1940
31	3.3445	3.3445
32	3.4949	3.4949
33	3.6453	3.6453
34	3.7957	3.7957
35	3.9461	3.9461

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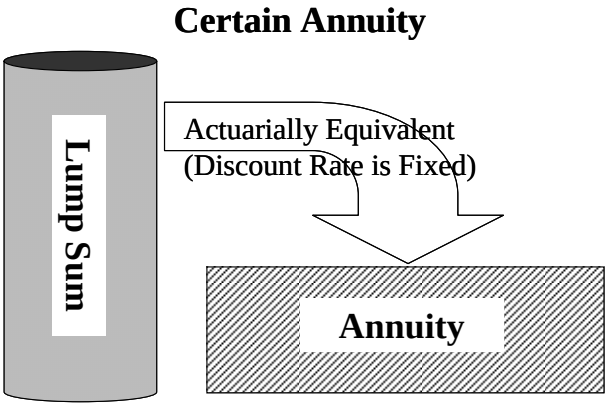
46	1.7317
47	1.6651
48	1.6010
49	1.5395
50	1.4802
51	1.4233
52	1.3686
53	1.3159
54	1.2653
55	1.2167
56	1.1699
57	1.1249
58	1.0816
59	1.0400
60	1.0000

Appendix 2. Typical plan design of corporate pension plan in Japan

Before the development of TQPP and EPF, Retirement Allowance Plans (RAP) was common mainly among large companies and is still legal today. A RAP provides only lump-sum benefits and is financed by a book reserve. A typical RAP has a final salary related formula such that the lump-sum is equal to the pensionable pay at the termination/retirement times the multiple determined by years of service. It has usually two schedules in its benefit formula, i.e. for voluntary termination and involuntary termination/retirement. The benefit curves for voluntary and involuntary termination converge after certain years of service in many cases, while some plans have benefit curves that never converge.

After the introduction of TQPP and EPF, corporate pension plans in Japan have developed based on the existing RAP. The RAP is a basic promise for retirement benefits and a TQPP or an EPF is used as a funding vehicle of the RAP.

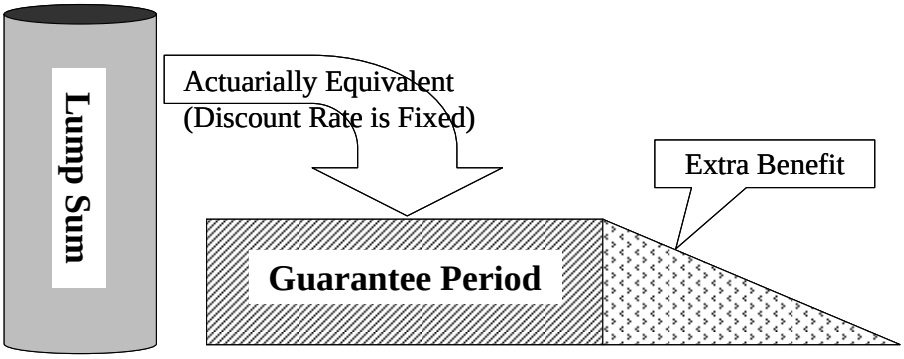
The regulations for TQPP require that a TQPP provides annuity benefits, but not require life annuities. It is one of specific features of TQPP that many TQPP provide only certain annuities. Another main characteristic is that most TQPP provide lump-sum benefit as their primary option. In many cases, the “normal form” benefit of TQPP is a lump-sum benefit and annuity benefits, actuarially equal to the lump-sum benefit, are optional forms.



In the case of EPF, all EPF are required to provide life annuities. In order to accomplish the basic promise of RAP, many EPF provide life annuities with guaranteed

period, the amount of which is determined so that the present value of the benefits for the guaranteed period is equal to the lump-sum benefit prescribed in the underlying RAP rule.

Life Annuity with Guarantee Period



When one designs a TQPP or an EPF, it is necessary to convert lump-sum benefits into annuity benefits. A typical discount rate for the design purpose had been 5.5% for a long time, because the discount rate for funding valuations had been fixed at 5.5% for EPF and between 5% and 6% for TQPP due to the regulations. Even after the regulation of the discount rates was relaxed in 1997, many companies have continuously used the high discount rate of 5.5% for the design purpose, since lowering the discount rate for conversion reduces the size of annuity benefits.

Summarizing typical pension plan design in Japan;

- The main benefit is a lump sum benefit.
- An annuity benefit option is available.
- The amount of the annuity benefits is determined so that the present value of the benefit for the guarantee period is equal to the lump sum benefit.

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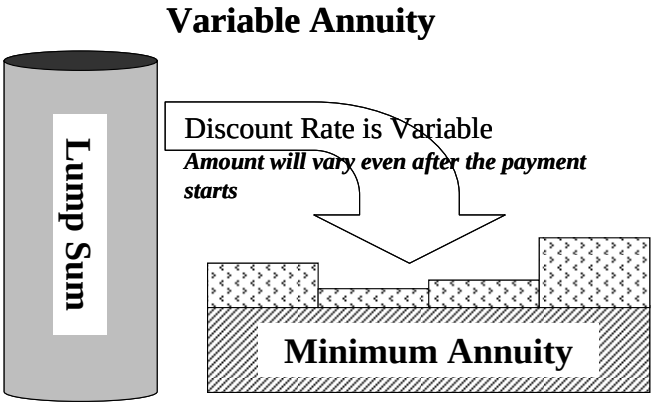
The DBCPA allows companies to revalue the annuity benefits according to the updated discount rate assumptions for conversion of lump-sum benefits to annuity benefits, even after the payment of annuity starts. This means that companies can keep the difference between the present value of the annuity benefits and the value of the underlying lump-sum

benefits small. In this case, the issue of the annuity valuations is not so material. We have to take care only the benefits after the guarantee period.



Appendix 3. Modified Walk-Away Benefit Obligation (WABO)

Walk-Away Benefit Obligation (WABO) at time t can be defined as follows.

WABO = VBC(t) x S(t),

where

VBC(t): Voluntary Benefit Coefficient at time t;

S(t): Pensionable Salary at time t.

There are two technical issues on WABO. Usually, there are two benefit curves in many Japanese plans. For voluntary resignation, the benefits are calculated based on the voluntary benefit table, and for normal retirement, the benefits are calculated based on the involuntary benefit table. In this case, WABO might underestimate the obligations.

The other technical issue is the valuation of the annuity benefits which are provided as an option for lump-sum benefits. Even if a plan provides life and certain annuity as an option for lump-sum benefits, the present value of the certain annuity is equal to the lump-sum benefit. Benefits after ending certain annuity payments are additional benefits. Herein also, WABO might underestimate the obligations

Here, I would like to suggest modifying WABO. The Modified WABO (WABO_M) should be defined such that;

WABO_M = (WABO + (IVBC(t) - VBC(t)) x S(t) x PtoNR(t)) x AF(t) x PtoA(t),

where

AF(t): Annuity Factor for life and certain annuity at time t divided by Annuity Factor for certain annuity at time t;

PtoA(t): Provability to receive annuity benefits at time t;

IVBC(t): Involuntary Benefit Coefficient at time t;

PtoNR(t): Provability to reach normal retirement at time t.