



Topics in Calculation Unfunded PBOs of Japanese Private Pensions

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Abstract:

Various discussions about unfunded Projected Benefit Obligations (PBOs) have been aroused among regulators, accountants, certified pension actuaries and other practitioners since April 2000 when the new pension accounting rules were enforced in Japan. One of the themes of the discussion is the calculation of the unfunded PBOs of substitutional portion of Employees Pension Funds (EPFs), the typical Japanese private pensions. More debate will be provoked by the amendment of the Japanese pension laws.

Regarding the above argument, I suggested that an investor could beat the market by calculating Pension Obligations more rigorously than the PBOs under the rules stipulated in the accounting principles which are convinced by almost all market participants, in the paper presented for AFIR 2000 international colloquium. In this paper I present some ideas to calculate “rigorous” unfunded PBOs of Japanese private pensions.

Keywords:

pension, accounting, PBO, EPF, D9, IFRIC

1. Normative accounting and Descriptive accounting

Accounting principles are said to consider probable factors and not to consider possible factors because they are conservative to prevent window dressing. But from the viewpoints of investors to seek best estimate or rigorous description of company profit, it is worthwhile to consider possible factors using new variables and. In this paper, “normative accounting” and “descriptive accounting” are defined. Normative accounting is defined as the accounting according to the existing accounting principles, and descriptive accounting is defined as the accounting consistent with the observable characteristics of actual activity of companies including possible factors not necessarily complying with all the rules of existing accounting principles. Investors may earn profit from the market with above average performance if they describe more precisely the future company profit regardless of existing accounting principles, because the future company profit will be converged on the anticipation of the descriptive investors not on the anticipation based on the normative accountings. 3 examples are presented, all of which are very unique to Japan, but method and concept may be applied to other countries.

2. Valuation of the substitutional part of EPF

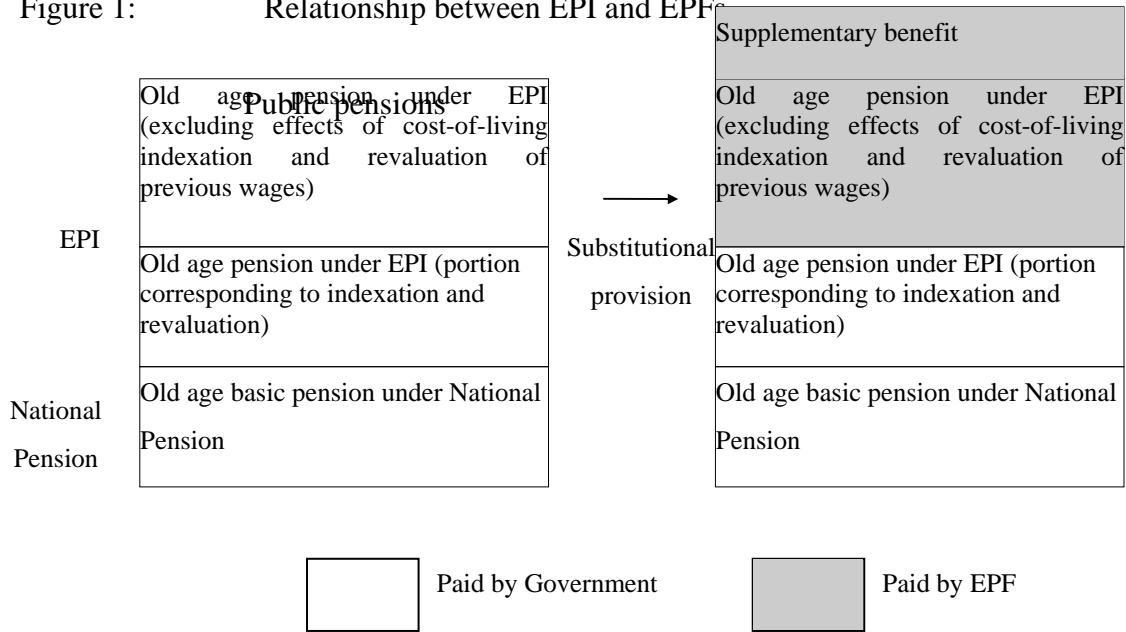
(1) Outline of EPF Scheme

The EPF, Employee’s Pension Fund, is a type of private pension in Japan created by the 1965 revision of the Employees’ Pension Insurance Act (EPIA). The following is the details of EPF scheme mostly based on the explanation in “Corporate Pension Plans in Japan 2004”(See Reference (1)).

An EPF is incorporated with private sector companies or a trade association or regional industrial association as the plan sponsor. The main feature of the scheme is that EPFs substitute for a portion of the old age pensions of the Government-run Employees’ Pension Insurance (EPI) excluding amounts corresponding to increases caused by revaluation of previous wages and cost-of-living indexation. In return, plan sponsors of EPFs are exempt from a portion of the EPI contributions payable to the Government to compensate for the costs of providing these substitutional benefits. In addition to the substitutional portion, each EPF is required to make its own supplementary benefit payments above certain level. Its annuity benefits are paid, in principle, for life. Advance funding is generally mandatory. Any excess investment

returns over assumed interest realized on assets invested can be used to improve the level of benefits.

Figure 1: Relationship between EPI and EPF



Each EPF is a special juridical person as provided under the EPIA, and legally independent from the sponsoring employer or employers. Due to the status as a juridical person, each EPF is granted special powers under public law, but is subject to special supervision and regulations of the Government.

(2) The difference between funding valuation and accounting

In the accounting practice, the substitutional portion of EPF is evaluated in the same way as other portion of EPF. However the amount stipulated by the Ministry of Health, Labour and Welfare to be surrendered to Pension Fund Association or Government Pension Investment fund upon termination or conversion to other private pension, is called Minimum Responsibility Reserve (hereinafter referred to MRR) and the MRR is less than PBO of substitutional portion under the current low interest rate in Japan.

The outline of the formula of MRR is as follows:

$$\text{MRR} = \text{MRR as of September 30, 1999} + \text{premium for substitutional portion}$$

- substitutional benefit + investment return according to the recent announced rate of return of Employee's pension

MRR as of September 30,1999

= The present value of future benefit corresponding to the accumulated salary as of September 30,1999 under the assumed interest rate 5.5%

= The accumulated salary as of September 30,1999 x 7.5/1000 x present value of pension for 1

The background for the above complex formulae is as follows. Originally, MRR was the present value of future benefit corresponding to the accumulated salary like the formula of MRR as of September 30,1999. This means that the EPF should earn 5.5% gains for the substitutional portion. In the past when Japan experienced high economic growth, the 5.5% return was not so difficult to achieve. But contemporary Japanese moderate economic growth makes it almost impossible to attain 5.5% return without huge risk. Government Pension also fails to earn 5.5% return:

Rate of Return of Government –run Welfare Pension Insurance

fiscal 1997	:	4.66%
fiscal 1998	:	4.15%
fiscal 1999	:	3.62%
fiscal 2000	:	3.22%
fiscal 2001	:	1.99%
fiscal 2002	:	0.21%

It is important for EPFs to maintain “financial neutrality” in the meaning that sponsoring companies neither have advantages nor disadvantages from having substitutional portion within their corporate pensions. To attain financial neutrality, the required rate of return of MRR should be equal to that of Government Pension. Therefore the financial neutrality leads the above formula using the rate of return of Government Pension.

Because investment return according to the recent announced rate of return of Government pension is less than 5.5% as shown above, the amount of MRR is less than the present value of substitutional benefit corresponding to the accumulated salary under the 5.5% assumed interest rate, therefore it is much smaller the PBO with usual discount rate at 2.0%~3.0% in Japan.

(Example)

MRR of EPF of company X:	45,789 million yen
PBO at discount rate 2.5% of substitutional portion of EPF of company X:	93,790 million yen

(2) Profit from termination or conversion

The difference between financial valuation (MRR) and accounting value (PBO) sometimes brings profit, when an EPF surrenders substitutional portion to Pension Fund Association or Government Pension Investment Fund upon termination or convergence to other corporate pension without substitutional portion. In other words EPF has an option.

In the above-mentioned example, upon termination or conversion, Pension Asset decreases the amount of MRR namely 45,789 million yen, whereas PBO at 2.5% discount rate decreases of 93,790 million yen. Therefore arises the profit of $48,001=93,790-45,789$ million yen. In the paper (2), I proposed PBO calculation should include possibility of termination of EPFs. In (2), I presented an example of diminished PBO to 93% by considering termination probability 1%, MRR/PBO ratio 60%, and average rate of withdrawal 1%. Namely descriptive PBO is less than normative PBO by 3%.

Recently Mr.Sasaki wrote a paper (3), which suggests investors might consider the above-mentioned option of EPF. He regressed company values against unfunded PBOs, liabilities with interest and so on. The company value is the market value of all stocks divided by total asset. He used 539 company data listed in the first section of Tokyo Stock Exchange. The period for analysis is 3 years from fiscal 2000 to fiscal 2002. He divided 539 companies into 2 groups, companies having substitutional portion and companies not having substitutional portion. As the result of the regression for the group with substitutional portion, the p value of unfunded PBOs was 0.002 in fiscal 2000 and 0.003 in fiscal 2001 whereas 0.239 in 2002, which illustrates that unfunded PBOs was statistically significant both in fiscal 2000 and in fiscal 2001, but they are not significant in fiscal 2002. Another analysis in (3) shows that investors consider the amount of PBOs of substitutional portion to be smaller than the normative amount of PBOs. The results suggest that investors might consider the profit arising from the

surrender of substitutional portion.

On October 1, the revision of Japanese Government Pension was enacted. In the revision, responsibility of an EPF for the substitutional portion is clarified to be MRR. Investors will attach more importance to MRR than before.

3. Unfunded PBO when pension asset comprises bond portfolio held up to expiration

In the Japanese pension regulation of the Ministry of Health, Labour, and Welfare, the book value evaluation is permitted for bond portfolio held up to expiration date. The regulation constitutes mainly 3 points. Firstly the rating is comparatively high and suitable for investment. Secondly, the book valued bond portfolio and other portfolio should be invested separately. Thirdly, the market value of pension assets should exceed pension reserve, that is the present value of future benefit deducted by the present value of future normal cost. If the purchased price is different from the redemption value, the difference is amortized every year.

On the other hand, employee's benefit accounting principles prescribes that the value of bond portfolio should be measured at market value regardless of holding policy. If a sponsoring company can be bought or sold at any time, the market value makes sense. But it is not descriptive to reflect market fluctuation at the closing date to the estimation of profit of a sponsoring company, especially when the company commands a stable position in the business world. Some companies have very profitable patents, or some companies hold huge share in the specific commodity market, or some companies have strong relationship with banks. These companies hardly bankrupt or they hardly become the targets of M&A. Suppose company A be one of those excellent companies and adopt cash balance pension plan, employee benefit plans with benefits that depend on future returns on assets. Therefore the duration, interest rate sensitivity, of PBO of company A pension plan is short. From the viewpoint of duration matching, the pension fund should invest in short term bond, and if the company seeks higher return, some portion of fund should be invested in stocks or alternatives. But company A dislikes investment risk and invests in maturity ladder portfolio of long-term bond, therefore the duration of asset is comparatively long. If the long-term interest rate rises, the decline of market value of asset is larger than the decline of PBO, therefore occurs accounting deficit. But the deficit is never realized unless company A is liquidated. Considering above situation, I propose the descriptive value of unfunded PBO as follows:

liquidation probability \times normative unfunded PBO

(Example)

The PBO of company Y is 50 billion yen and the duration of PBO is 2 years, the asset comprises bond portfolio of 50 billion yen and the duration is 5 years. In the case of 1% rise of interest rate, PBO changes to 49 billion yen whereas Bond portfolio becomes 47.6 billion yen. The normative unfunded PBO changed from 0 to $1.4 = 49.0 - 47.6$ billion yen. The descriptive unfunded PBO is $3\% \times 1.4 = 0.042$ billion yen.

The liquidation probability is affected by rating or sector. As for the bankruptcy you can use computer software to calculate bankruptcy probability, if you have ample financial data to input the software. Investors may consider quantitatively the bankruptcy probability and consider qualitatively the possibility of M&A, thus investors derive the liquidation probability.

4. Projected Benefit Obligations of Cash Balance Plan

The International Financial Reporting Interpretations Committee (IFRIC), the interpretative arm of the International Accounting Standards Board (IASB), released for public comment a draft interpretation D9 *Employee Benefit Plans with a Promised Return on Contributions or Notional Contributions* on July 8, 2004. D9 gives guidance on the accounting for cash balance plans. The proposal was open for public comment until 21 September 2004. Cash balance plans are widely introduced in the U.S. and European countries as well as Japan. But the defined benefit rules, International Accounting Standard 19 Employee Benefits did not define the specific rules to evaluate the obligations about the plans with benefits that depend on future returns on assets.

(a) D9 proposes that the liability for a benefit of a guarantee of a fixed return should be determined by projecting forward the contributions at the guaranteed fixed return to estimate the amount that will ultimately be paid. That amount should be discounted back to a present value using the high-quality corporate bond rate required by IAS19.

(b) D9 proposed that the liability for benefits depending on future asset returns should be determined by the value of the assets at the balance sheet date. D9 proposes that an estimate of the amount that will ultimately be paid should not be made.

(c) D9 proposed that the liability for a benefit that combines a guaranteed fixed return and the returns on future assets should be the higher of the liabilities for each separate

element.

If we calculate PBO with D9 of cash balance plans or plans partly introducing cash balance scheme, the resulting normative value is considerably different from descriptive value in the case of somewhat complicated plan currently existing in Japan.

(Example 1)

The pension plan of company A provides pension for life, the amount of which is notional assets at the balance sheet date divided by pension value of 20 years certain for 1. The assumed interest rate of the present value of 20 years certain depend upon the asset return. After the beginning of pension, the amount of pension is re-calculated every 5 years considering the notional asset balance at the beginning of pension and asset returns at the re-calculation date. Therefore the pension amount after 20 years is not determined at the beginning of the pension. The contribution of company A is both contribution to notional cash balance corresponding to pension 20 years certain, and contribution for the portion after 20 years. The balance after 20 years from the beginning of pension may be 0, therefore above (b) is impossible to apply. From the descriptive point of view, we must anticipate the amount of pension after 20 years, but the anticipation is not normatively admitted because D9 proposes that no estimate should be made of the amount that will ultimately be payable for benefits that depend on future returns on assets, because of the difficulty in estimating what asset returns in the future will be.

(Example 2)

The pension plan of company B provides pension, the amount of which is lump sum divided by pension value of 15 years certain for 1. The lump sum is determined by traditional formula such as final salary multiplied by lump sum rate according to years of service. Therefore notional cash balance does not exist. The pension amount is re-calculated every 3 years considering the lump sum and asset returns at the re-calculation date. Therefore the benefits depend on future assets returns. If the PBO of this pension is calculated according to D9, notional “balance” should be defined, because the PBO must be determined by the value of the notional balance.

If the PBO of this pension is calculated disregarding the balance, the future benefit of the plan must be forecasted, which violates the principles of D9 that no estimate should be made of the amount that will ultimately be payable for benefits that depend on future returns on assets.

From the normative as well as descriptive point of view, the use of assumed rate of revision to forecast future benefits is strongly recommended. The rate of revision is already adopted in Japanese standards. If D9 is approved, the difference between normative PBOs according to D9 and descriptive PBOs using assumed rate of revision is considerably large.

5. Conclusion

Investors should be descriptive rather than normative to anticipate the future profit of companies. For that purpose they should consider new variable or parameters such as liquidation probability.

6.Reference

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