

The diversity of pension plans and their accounting liabilities

March 2015

Dr. Tomoyuki Kubo*

Senior Researcher

**The Institute of Strategic Solutions for Pension Management (ISSOPM)
(Certified Pension Actuary, Kubo Research Institute)**

Postal address: Takada 3-41-8-804, Toshima-ku, Tokyo. Japan171-0033

Tel: +81-50-5548-1122 E-mail: kubonenkin@company.email.ne.jp

* The author was the chairperson of the Retirement Benefit Accounting Project Team in ISSOPM (Apr. 2013 – Mar, 2015) and this paper is inspired by and partly owed to the project discussions.

Executive Summary

Since the accounting standard for pension plans was established in 1985 as FAS87 “Employers’ Accounting for Pensions”, the various type of pension plans has been developed such as Cash Balance plans. Even under such situation, the basic concept of FAS87 that is based on the Projected Benefit Obligation method has been maintained by passing through the reconstruction of International Accounting Standard IAS19 “Employee Benefits”.

This paper examines the diversity of pension plans and asserts that the use of the PBO method is not adequate for every type of pension plans, especially for the accumulated type of pension (and lump-sum) plans such as Cash Balance plans. Based on such a concept, I propose a new method for measuring the accumulated type of pension plans, that is, the Current Benefit Obligation (CBO) method. The CBO is the amount of the money in the case of hypothetical termination at the end of the fiscal year.

By using the CBO concept, accounting liabilities can be classified for various pension plans as follows:

Category		Plan design	Accounting liability
Defined Benefit	Traditional pension dominated type (Retirement Benefit)	Final salary	ABO
		Accumulated salary	ABO
		Average salary	ABO
		Flat amount	ABO
	Accumulated lump-sum dominated type (Termination Benefit)	Final salary	Max (CBO, ABO)
		Accumulated salary	Max (CBO, ABO)
		Average salary	Max (CBO, ABO)
		Flat amount	Max (CBO, ABO)
		Cash Balance	Max (CBO, ABO)
	Defined Contribution	Pure Defined Contribution	Accrued and unpaid contributions

Now is the time when we should consider the appropriate accounting treatment for various pension plans. The aim of this paper is to lead and encourage such studies.

At the beginning

There has emerged huge change in the corporate pension world. While Defined Benefit (DB) pension plans that were very popular have been decreasing, the shift into Defined Contribution (DC) plans from them has been accelerated especially in the United States and the United Kingdom. In addition, there have emerged many variations in DB plans. We can clearly see the influence of Pension Accounting behind the movement. However, the current accounting standards are based on the Projected Benefit Obligation (PBO) method for DB plans which has been introduced in US accounting standard FAS87 and has been succeeded to now internationally, the method cannot be properly applied to the diversity of pension plans above mentioned.

In this paper, I describe the overview of the diversity of pension plans (DBs and DCs), and propose a method of evaluating accounting liabilities for them. In this context, pension plans include lump-sum benefit plans when employees leave his employer.¹

1. Classification of Defined Benefit plans and Defined Contribution plans

At first we should examine the definitions of Defined Benefit plans and Defined Contribution plans. The US accounting standard FAS87 prescribes them as follows.

Chart-1 The definitions of DB plans and DC plans in FAS87

Category	Definition
Defined Benefit plans	one that defines an amount of pension benefit to be provided, usually as a function of one or more factors such as age, years of service, or compensation ²
Defined Contribution plans	a plan that provides pension benefits in return for services rendered, provides an individual account for each participant, and has terms that specify how contributions to the individual's account are to be determined rather than the amount of pension benefits the individual is to receive ³

On the other hand, the International Accounting Standard IAS19 "Employee benefits" prescribes them as follows.

¹ From this point of view, the terminology of "Retirement Benefit plans" is more adequate than pension plans. And multi-employer plans are out of scope of discussions in this paper.

² FAS87 "Employers' Accounting for Pensions", paragraph 11-12

³ FAS87, paragraph 63

Chart-2 The definitions of DB plans and DC plans in IAS19⁴

Category	Definition
Defined Benefit plans	post-employment benefit plans other than defined contribution plans.
Defined Contribution plans	post-employment benefit plans under which an entity pays fixed contributions into a separate entity (a fund) and will have no legal or constructive obligation to pay further contributions if the fund does not hold sufficient assets to pay all employee benefits relating to employee service in the current and prior periods

For these definitions, “The present accounting standards read as if defined contribution plans and defined benefit plans are different types of animal”, but “there is considerable movement into the middle ground between the traditional defined contribution and defined benefit plans where there is more sharing of risks between employers and employees,” so attempts have emerged to seek a way “by exploring the fundamentals that might be applicable to any type of benefit, starting by considering how to define the employer’s liability in any pension plan, and going on to consider principles for recognising and measuring assets and liabilities that arise from pension plans”.⁵

In those attempts, one should note the difference between benefits that are traditional pension dominated and are payable from retirement age among European countries and benefits that are from lump-sums at the termination and are popular among Asian countries including Japan. Both are classified as DB plans, but their structures are quite different. So, we start considering a scheme whose benefits are based on lump-sums at the employees’ termination.

2. Accounting liabilities for Termination Lump-sum Benefit plans

(1) Basic principle for Termination Lump-sum Benefit plans

First, consider a plan to provide Termination Lump-sums relating service period of an employee at his termination. These plans are often seen among countries with immature social security (pension) system. Even in Japan, on the process of the expansion of public pensions under high growth economy. Termination Lump-sum plans had been more reliable source for retired employees. Korea has struggled to develop public pensions and has currently mandatory Termination Lump-sum plans. Among Asian countries, this kind of Termination Lump-sum plans has been widely spread. The aim of these plans seems to supplement immature social security by

⁴ IAS19 “Employee Benefits”, paragraph 8

⁵ EFRAG “The Financial Reporting of Pensions”, pp. 20-22, ‘A spectrum of pension benefits’

employer-based protection.

Although one may think that lump-sum benefits are inferior to pension benefits from a view point of providing old-age income security, other protections beyond public pensions are generally insufficient among countries of developing economy with immature social security system. Under such situation, lump-sum benefits that can be used for various purposes may be better suitable for people. Also in those countries, population aging may not be at the serious stage and the priority for the nation may not be on the need of old-age income security.

Accounting liabilities for such lump-sum benefit plans should be simple as their nature. Since the money that each employee will receive in exchange of his service each year can be defined clearly, the accounting liability can be calculated as the accumulated sum of the amounts of the money when the employee hypothetically leaves his employer at the end of the fiscal year. This kind of concept was prevalent in Japan before the introduction of the Pension (Retirement Benefit) Accounting that has an aim to harmonize international accounting standards and the amounts to be paid at the hypothetical leave was called as “Necessary Benefit Amounts” at the end of the fiscal year.

(2) Consideration of the reason of leaving the employer

However, the treatment of “Necessary Benefit Amounts” as accounting liability may face two possible difficulties. One is under the situation where the employer sets different amounts for the lump-sum benefits depending on employees’ leaving reason. Many employers that provide lump-sum benefits often set different amounts for voluntary termination and involuntary termination (such as for mandatory retirement age or death). In countries that force employers to provide mandatory retirement lump-sum allowances, the benefits are usually based on involuntary termination and subject to some reduction on voluntary termination. A question in these cases is which amounts of “Necessary Benefit Amounts” (either for voluntary termination or involuntary termination) should be taken as the base of the accounting liabilities.

As a matter of fact, the same problem may be found in traditional European-type pension plans. The method to handle this in the US FAS87 is that the base is on involuntary termination and the difference of the amounts between involuntary termination and voluntary termination is treated as vesting issues. Even among the plans where different benefit amounts are specified for involuntary and voluntary termination, there are many that provide the same amounts after specified years of services. This method is called ‘Vesting’ since the action is like putting a vest little by little after passing service period.

Therefore, also in Lump-sum benefit plans, it should be adequate to consider

“Necessary Benefit Amounts” for involuntary (hypothetical) termination at the end of the fiscal year as the base for accounting liabilities.

(3) Consideration of the future timings of employees’ termination

Another point to be considered is whether the accounting liability should reflect future possible timings when employees may leave his employer after the end of fiscal year or not. In the case of financial valuations where contributions and actuarial liabilities are estimated, considering future possible timings of employees’ termination is generally reasonable and essential. However, the measurement of accounting liabilities even using actuarial techniques is not necessarily combined to the use of those timings and we should consider the issue from a viewpoint of accounting positions.

In the case not to include future termination timings, the accounting liability would be basically “Necessary Benefit Amounts” for involuntary termination themselves at the end of the fiscal year. In this case, the difference between the amounts and the benefits when the employee leaves voluntary afterwards would be accounted as profit or loss at the fiscal year of the termination occurred.

On the other hand, in the case to include future termination timings, the accounting liability might use “Necessary Benefit Amounts” for involuntary termination at the end of the fiscal year and be adjusted them to the normal retirement age and the timings and possibility of pre-retirement termination, by discounting benefits at those timings to the end of the fiscal year.

Although we could take future timings into consideration as above, we should concern that the base amounts themselves might become ambiguous. That is, the inclusion of future voluntary termination timings may combine to the considerations of benefits of those voluntary terminations. In the financial valuations, such considerations are reasonable and essential and the actuarial liabilities at present are to be calculated by considering future timings and amounts of benefits. Under this concept, it is not necessary to consider vesting treatments.

However, such position will be resulted in that the basic accounting concept of “liabilities accrued up to now” becomes ambiguous. There emerges risk to include future service periods that should be strictly excluded for accounting purposes. One example is that those who have skilled actuarial techniques may favor the straight-line method to evaluate accounting liability up to now, although the use of the method is only limited with no other alternatives in international accounting standards. That is, the straight line method would conveniently and automatically produce the up to the date part of future benefits, by using future termination timings with taking considerations of future service periods. The clear contrast of the straight-line method to the benefit formula method that is used for international

accounting standards can be seen in the fact that “the liability accrued to now” in the former method may result in the different value depending on future benefit levels even in the situation where benefits by now are the same. For accounting purposes, such influence of future benefit movements on “the liability accrued to now” is definitely inadequate and this seems to be the main reason for me why the straight-line method that had been proposed originally in the draft of IAS19 was rejected and the benefit formula method was ultimately adopted.

In addition, the measurement of liabilities by considering termination possibilities as a whole in the employer may violate a principle that liabilities should be calculated on individual employee basis. Of course, there are some actuarial assumptions such as mortality rates that are inevitably valued on group basis. However, there seems to be no definitive reasons to reflect variables that depend on the employer’s special nature and the future economical and management circumstance and predict the continuation of employees’ future services in the accounting liabilities.

Therefore, as a decision, accounting liabilities for lump-sum benefit plans should be based on “Necessary Benefit Amounts” for involuntary termination themselves at the end of the fiscal year, and the difference between the amounts and the benefits when the employee termination voluntary afterwards should be accounted as profit or loss at the fiscal year of the termination occurred. Hereafter, the term “Necessary Benefit Amounts” that are the amounts to be paid at the hypothetical termination is changed to a new term the “**CBO : Current Benefit Obligation**” for broadening its use area and the method to value accounting liabilities using the CBO is referred as the **CBO method**.

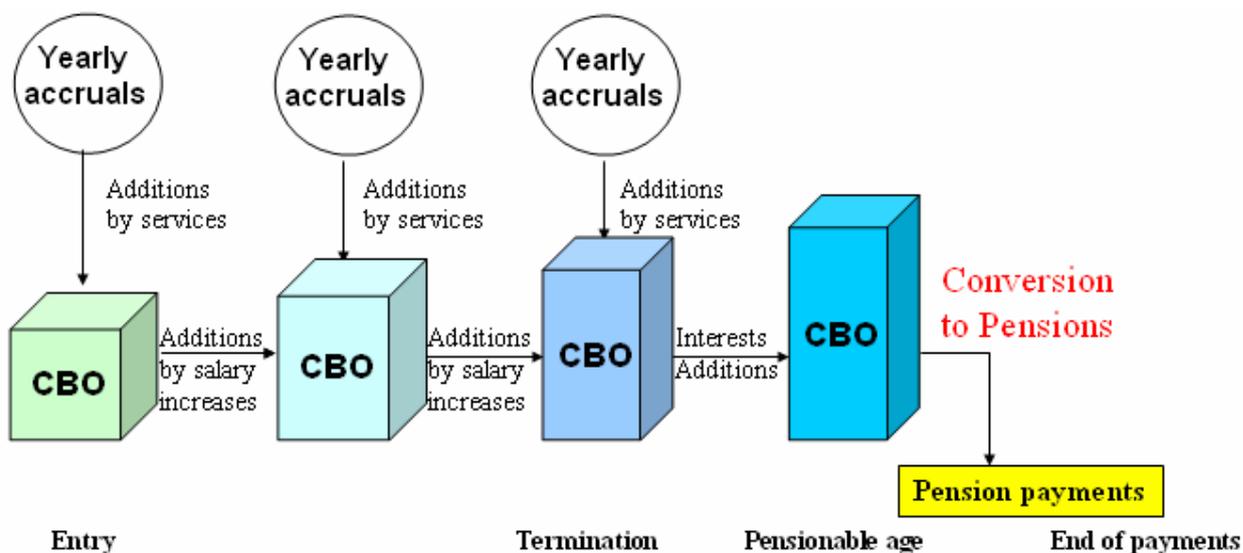
3. Accounting liabilities for Termination Benefit plans

(1) The definition of Termination Benefit plans

Next, consider plans under which benefits are based on lump-sums at the termination of employees and they are transformed into future pension payments. In this paper, these plans are called as “**Termination Benefit plans**” together with lump-sum benefit plans. Or, they may be called as “**Defined Accumulation (DA) Plans**” by their nature. Termination Benefit plans are the plans under which benefits are specified as lump-sums at the time of employee terminations and payments are made by lump-sums or delayed pensions.

As lump-sum payments were already discussed, consider (delayed) pension payments in this chapter. It is important to refer interests after termination to pensionable age and interests during payments. Those are shown in Chart-3.

Chart-3 The structure of pension payments in Termination Benefit plans



How can we think about accounting liabilities for these plans? There are some plans under which benefits are only lump-sums for those who terminate with less than specified years of services even though benefits are generally transformed into pensions. For those lump-sum parts, the treatments already mentioned can be applied. We should focus on treatments where (terminated) employees have an option to receive benefits by pensions in stead of original lump-sums.⁶

In this case, the economic value should be determined by comparing interest rates after (hypothetical) termination and market discount rates. And it is reasonable to assume that employees should select more economically valuable choice if other conditions are the same. Therefore, it should be adequate to select as the accounting liability the higher of lump-sum amount at the point (that is CBO) or the present value of future pension payments (that is ABO: Accumulated Benefit Obligation).

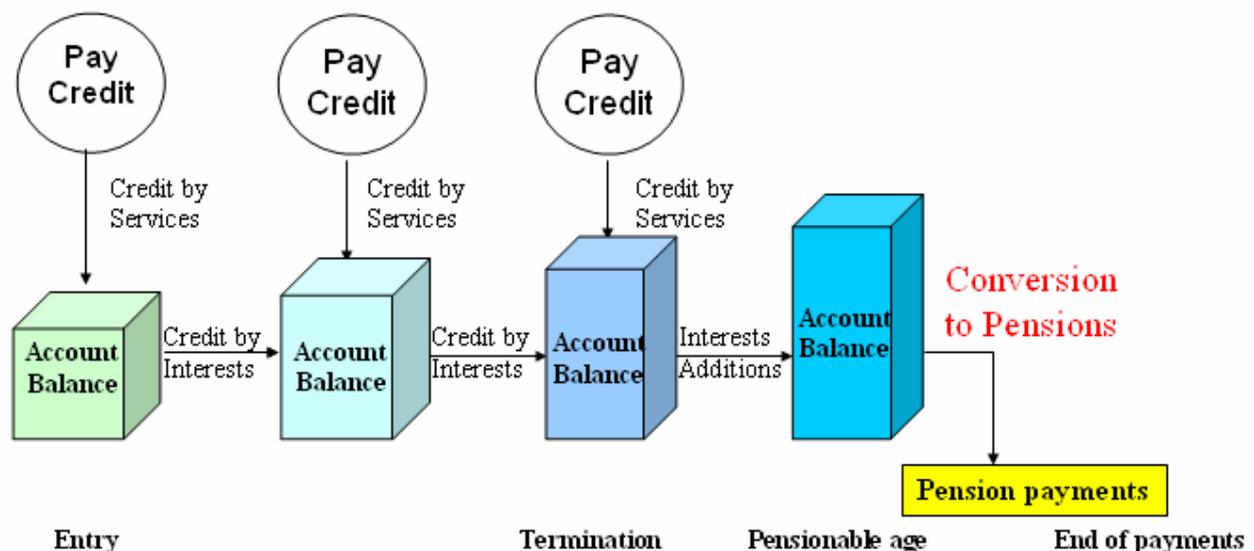
In order to evaluate the present value of future pension payments, it is necessary to select discount rates. I think that it should be adequate to use the yield curve with no arbitrage opportunity at the end of the fiscal year since it would lead to objective market-base results. Whether outside fund for these plans exists or not is irrelevant to measure economic value of such pension payments, therefore, it is certainly wrong that discount rates should be based on expected returns of the portfolio of relating pension assets.

⁶ There may be plans that provide only pensions, but many plans seem to allow an option to receive lump-sums in stead of pensions since original benefits are based on lump-sums.

(2) In a case of Cash Balance plans

By the way, the current pension accounting faces a serious problem to measure accounting liabilities for Cash Balance plans, since the PBO method cannot be easily applied to those plans. The real reason is that Cash Balance plans are not like traditional pension-dominated plans, but one of Termination Benefit plans. The structure of Cash Balance plans can be seen as in Chart-4.

Chart-4 The structure of Cash Balance plans



You can understand by comparing Chart-3 and Chart-4 that Termination Benefit plans and Cash Balance plans have fundamentally the same structure. Since Cash Balance plans are belonging to a category of Termination Benefit plans, there has emerged difficulty to apply the PBO method that was developed for traditional pension-dominated plans. If we understand that Cash Balance plans are ones of Termination Benefit plans, measuring the accounting liabilities is not difficult, the accounting liabilities for Cash Balance plans are the higher of lump-sum amounts at the point (CBO) or the present value of future pension payments (ABO) as discussed in the previous chapter.

(3) Time passing of relating services of employees and non-relating services

In a Cash Balance plan, different interest rates may be applied to (hypothetical) account balance of individual employees while active and after termination to pensionable age. How should we treat this difference?

A basic concept of pension accounting is that liabilities accrue in exchange of employees' services. From this, interests while active are considered as for future services and such interests after the end of the fiscal date should not be added to 'Liability accrued to the date'.

On the other hand, interests after hypothetical termination are not related to future services, so the interest rates after hypothetical termination should be taken into accounts for valuing the present value at the end of fiscal year of future pension payments. We can see the logic along this concept that inflation-related (mandatory) increases in UK corporate pensions after terminations should be included in accounting liabilities.

(4) Consideration of future salary increases

The PBO method for current pension accounting standards includes future salary increases to reach to accounting liabilities. How do we think future salary increases to Termination Benefit plans?

First, there are many types of salary-related plans, such as an accumulated salary plan, an average salary plan and a final salary plan. In an accumulated salary plan, specified percentage of yearly salary is directly reflected in benefits and those accumulated amounts at the end of the fiscal year cannot be influenced by future salary increases. Therefore, there is no reason to reflect future salary increases to 'Liability accrued to the date'. An Average salary plan can be transformed into an accumulated salary plan as below, so we can reach the same conclusion.

$\text{Average Salary} \times \text{Benefit rate} = (\text{Accumulated Salary} / \text{Years of Service}) \times \text{Benefit rate}$

So, it is only a final salary plan to be considered about future salary increases. In a final salary plan, benefits for past service period will be re-valued by salary increases as below.

$\begin{aligned} & (\text{Current Final Salary}) \times (\text{Current Accumulated Benefit rates}) \\ &= (\text{Current Final Salary}) \times \{ (\text{Current Accrued Benefit rate}) \\ & \quad + (\text{Last year Accumulated Benefit rates}) \} \\ &= (\text{Current Final Salary}) \times (\text{Current Accrued Benefit rate}) \\ & \quad + (\text{Current Final Salary}) \times (\text{Last year Accumulated Benefit rates}) \\ &= (\text{Current Final Salary}) \times (\text{Current Accrued Benefit rate}) \\ & \quad + (\text{Last year Final Salary}) \times (1 + \text{Salary Increase rate}) \times (\text{Last year Accumulated Benefit rates}) \\ &= (\text{Current Final Salary}) \times (\text{Current Accrued Benefit rate}) \\ & \quad + (\text{Last year Final Salary}) \times (\text{Last year Accumulated Benefit rates}) \\ & \quad + (\text{Last year Final Salary}) \times (\text{Salary Increase rate}) \times (\text{Last year Accumulated Benefit rates}) \end{aligned}$

It is obvious that the 1st item of the last equation above belongs to current year and the 2nd item belongs to last year. A question is whether the 3rd item belongs to current year or last year. Since in the PBO method the 3rd item is thought to belong

to current year, so future salary increases should be reflected in “the liability accrued to now.”

However, future salary increases will arise from future employee services. In the category of time passing of relating services of employees and non-relating services as mentioned in (3), future salary increases are definitely caused by time passing of relating services. Therefore, for measuring “the liability accrued to now”, the PBO method with future salary increases is not adequate and the ABO method should be selected.

There were discussions whether the PBO or the ABO would be more adequate for measuring accounting liabilities for pensions at the introduction of FAS87. The main reason of the selection of the PBO seems to be that accounting cost in a final salary plan may steeply increase under the ABO method (because of the 3rd item re-valuation above mentioned), according to some past literature⁷. Behind the scene, there was also a fact that the PBO method had been prevalent for contribution calculations. However, this kind of consideration has an aim to smoothing costs and is not adequate for an accounting purpose of proper presentation of financial status at the end of the fiscal year. Even in the past discussions, the ABO method should be adopted for an average salary plan or an accumulated salary plan and future salary increases should be excluded in those plans⁸.

The next chart shows the difference of the structure of an accumulated salary plan and a final salary plan relating future salary increases above mentioned.

Chart-5 The difference of the structure of an accumulated salary plan and a final salary plan

Accumulated salary plan		Final salary plan	
1st year benefit	2nd year benefit	Re-valuation by salary increases	2nd year benefit
		1st year benefit	

4. Accounting liabilities for Retirement Benefit plans

On the other hand, how should we think about accounting liabilities for traditional pension-dominated defined benefit plans? In this paper, those plans are referred as “Retirement Benefit plans”, since they are remarkable to have pension payments after retirement, not lump-sum benefits at the terminations.

For those Retirement Benefit plans, the lump-sum benefits at the end of the fiscal

⁷ Ross M. Skinner, “Pension Accounting – The problem of equating payments tomorrow with expenses today” (Clarkson Gordon, 1980) Chapter 6

⁸ *ibid.*

year are not usually specified⁹, and it is inevitable to measure the present value of future pension payments. This is why discounting methods were carefully examined at the introduction of FAS87 when the Retirement Benefit plans were prevalent.

There are no special considerations about measuring the present value of future pension payments to be added to the method for Termination Benefit plans already mentioned. While pension payments are projected in the future from the lump-sum benefit at the point and are discounted to measure their present value in Termination Benefit plans, pension payments that are directly specified are discounted to measure their present value in Retirement Benefit plans.

Although there was the PBO vs. ABO debate whether future salary increases should be considered or not at the introduction of FAS87 and the debate was revisited in the recent EFRAG Discussion Paper, the issue was already mentioned in the above 3(4).

5. Accounting liabilities for Defined Contribution plans

It is necessary to think about Defined Contribution plans to overview of the diversity of private pension plans. Defined Contribution plans are those under which employers have no further responsibilities about benefits once they contribute specified amounts of contributions.

For those plans, it seems to be sufficient that yearly contributions are treated as expenses and unpaid or delayed contributions are to be liabilities. Even so, there are many plans with vesting clauses under which a part of employer contributions may be forfeited in the case of voluntary termination. The treatment of those plans may be that yearly contributions as a whole are treated as expenses and the forfeited amounts are to be expenses of the fiscal year of the occurrence as discussed about vesting treatment in 2(2).

However, for such a plan under which specified years of services are required to participate it and some special contributions are granted at the time of the participation, those special contributions may be required to be accounted as expenses for service period before the participation.

6. Plans with some options

There have emerged plans with some kind of options beyond simple structure plans along with the diversification of pension plans both in Defined Benefit plans and Defined Contribution plans. For example, there are Cash Balance plans where interest credit rates are based on yields on government bonds, but with upper or/and lower limitations of such rates. Another example is basically a Defined Contribution plan, but with minimum guarantee of principles by the employer.

⁹ There seems to be a few plans with lump-sum options, but they are not common.

According to the current accounting category, a Defined Contribution plan with minimum guarantee of principles is not belonging to “Defined Contribution plans” because the employer has risk to result in additional liabilities. However, it is clearly inadequate to apply the discounting present value (PBO or ABO) method for such a plan

The concept of options has developed since 1980’s when the modern portfolio theory became popular. The basement of current accounting standards was before the developments, so it seems to be natural that there are not enough considerations about options in them. Future accounting for pensions should reflect the concept of options.

One direction may be to deal the option part separate from the basic pension part. For example, a Defined Contribution plan with minimum guarantee of principles can be treated firstly as a Defined Contribution plan and be added the valuation of the option part to it. That is, plans with options may be treated as below.

$$\text{Valuation of a plan with option} = \text{Valuation of a plan without option} + \text{Valuation of option}$$

For the valuation of options, option pricing theories such as one using Black-Scholes formula have been empirically and theoretically developed. However, they tend to set some propositions for future market movements, so there seem to be many things to be considered for them to be included in the measurements of accounting liabilities. For example, the accounting liability of a Defined Contribution plan with minimum guarantee of principles cannot be measured without considering accumulated asset side. Also, there is an issue such as that the guarantee of principles is only at the retirement or at any points of terminations in its plan design.

Even so, there is considerable diversification of pensions as seen in this paper, and such movement may be accelerated in the future. Accounting for pensions faces to seek adequate treatments for such diversification.

7. Summary of accounting liabilities for various pension plans

Finally, accounting liabilities for various pension plans are summarized as in Chart-6.

Chart-6 Accounting liabilities for various pension plans

Category		Plan design	Accounting liability
Defined Benefit	Traditional pension dominated type (Retirement Benefit)	Final salary	ABO
		Accumulated salary	ABO
		Average salary	ABO
		Flat amount	ABO
	Accumulated lump-sum dominated type (Termination Benefit)	Final salary	Max (CBO, ABO)
		Accumulated salary	Max (CBO, ABO)
		Average salary	Max (CBO, ABO)
		Flat amount	Max (CBO, ABO)
		Cash Balance	Max (CBO, ABO)
	Defined Contribution	Pure Defined Contribution	Accrued and unpaid contributions

References:

European Financial Reporting Advisory Group (EFRAG)/ Discussion Paper, “The Financial Reporting of Pensions” (2008) and its Feedback paper (2009)
 FAS87 “Employers’ Accounting for Pensions”
 IAS19 “Employee Benefits”
 The Institute of Strategic Solutions for Pension Management/ Project team on Accounting for Retirement Benefits/ Phase report “Recognition and Measurement of Pension Liability”(2014)
 Ross M. Skinner, “Pension Accounting – The problem of equating payments tomorrow with expenses today” (Clarkson Gordon, 1980)