International Actuarial Association
Association Actuarielle Internationale

Defined Benefit Pension Plan Funding and the Role of Actuaries

Educational Monograph

Pensions and Employee Benefits Committee

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This paper has been developed and approved by the Pensions and Employee Benefits Committee of the IAA

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Foreword

The Pension Unit at the OECD Financial Affairs Division welcomes the IAA's production of this very useful monograph. It is particularly timely as the OECD's Working Party on Private Pensions is simultaneously conducting its own work on DB pension arrangements: solvency and interest rates. There is considerable complementarity between these projects of the OECD and IAA and we are pleased that there has been cooperation between our organisations on their production.

The 2016 OECD Pensions Outlook highlighted the relative decline of DB pensions across the OECD. Growth in pension membership and assets is highest in DC pension arrangements, even in countries such as the Netherlands and the USA that have a strong legacy of DB occupational pension plans. Countries without such a legacy that have introduced new pension systems in recent decades have almost all chosen to introduce DC schemes rather than DB, while existing DB plans in a number of countries are choosing to close to new members, close to future accrual or secure some kind of insurance or buy-out of their obligations.

Despite this trend, DB pension plans still hold the bulk of occupational pension members and assets within the OECD. Furthermore, the number of DB beneficiaries is likely to remain high well into the future: there could be as many as three million DB pensioners entitled to receive benefits in the UK in 2060 despite the high rate of plan closures there. In Canada and the Netherlands, DB plans are still the main source of retirement finance. It is important therefore that the pension benefits that DB plans are expected and intended to provide remain secure.

The sustainability of DB pension plans may be under threat. Many plans were designed in an era of lower life expectancy and higher expected returns on assets, resulting in benefit promises that look generous today. The advent of ultra-low government bond yields has further increased the value of liabilities and lowered solvency levels. If employers have to make up these shortfalls then the cost of DB provision could become prohibitive; the problem is made worse by pension accounting rules that can introduce considerable volatility into corporate balance sheets. However if schemes can adjust their benefit structures in response to changing economic and demographic parameters, then the DB "promise" is lost.

In the face of these challenges, the funding of DB pension plans and the level of security they provide to pensioners is critical. Actuaries are central to the proper understanding of this question, providing key expertise to all parties involved in the provision of DB pension plans. The OECD is pleased to see the publication of this monograph which helpfully sets out the role of actuaries in the funding of DB pension plans and raises many difficult and challenging issues for governments and regulators alike, when designing systems for the funding or regulation of DB pension plans.

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1. Introduction

This monograph considers the funding of defined benefit (DB) pension plans and specifically the pre-funding of DB pension plans rather than pay-as-you-go systems. It looks at some of the key questions that arise when considering how pension plans are funded and the role of actuaries in helping to answer these questions. It looks too at some of the key drivers for different approaches to pension plan funding. It uses the term pension plan to refer to the legal entity or arrangement that is used to deliver the pension benefit. This monograph is educational rather than representing any form of guidance. Any proposals made are subject to the relevant actuary's judgement in the circumstances of a particular situation.

One of the main obstacles to the work of any international forum is language. Making sure that the basic terminology used is shared by all the members of a forum is a prerequisite to dialogue. This is particularly true in the area of private pensions. Therefore this monologue has relied heavily on the work of the OECD Working Party on Private Pensions which established a classification and glossary of private pension systems. These are reproduced in Appendix B.

The particular focus of this monograph is the actuarial issues and questions that arise in DB pension plan funding, but it is also intended to be of interest to those who are involved in the policy of designing systems for the funding or regulation of DB pension plans. It draws on examples of pension plan funding from around the world and therefore provides a reference for actuaries and others interested in comparing alternative approaches to pension plan funding.

The primary focus of this monograph is funded private sector pension plans. This monograph does not focus on issues raised by unfunded pension plans, although occasional reference is made to unfunded approaches to the provision of DB benefits. Additionally, while there are references and comparisons made to public sector pension plans (and in many countries very similar issues apply to the funding of public sector pension plans as apply to private sector pension plans) the issues discussed in this monograph mainly arise in the context of private sector pension plans. This monograph does not consider the particular issues that apply to social security plans or pension plans for government employees.

This monograph considers 9 key questions on pension plan funding and the role of the actuary in answering those questions :

- Is the funding objective clear and understood by all parties?
- Is the funding strategy consistent with the funding objective?
- How does the investment strategy interact with the funding strategy?
- How is the financial position of the pension plan expected to develop in the future?
- Are the actuarial assumptions reasonable and appropriate?
- Are the risks associated with the funding and investment strategies understood?
- What is the impact and likelihood of the continued support of the employer?
- What conflicts of interest exist?
- What information is provided to members?

A chapter is devoted to each of these questions and within each chapter supplementary questions are also addressed which develop the key issues that can arise. An earlier chapter (Chapter 2) looks more basically at DB pension plan design and the nature of the benefit promise that is being made to the employee and how firm is the guarantee that attaches to the promised employee benefit – is there any risk sharing between employer and employee?

A defined benefit (DB) pension provided by an employer to an employee represents an important and valuable part of the employment contract between employer and employee. The funding of that pension benefit can significantly affect the value of the benefit to the employee. Usually, the greater the funding, the more valuable is the benefit to the employee – as a higher level of funding may lead to the payment of a greater benefit, or increase the likelihood of the benefit being paid.

The funding of a pension benefit can also affect its cost to the employer – for example there is a real economic cost to an employer in providing assets to a pension plan to increase the likelihood of the benefit being paid. Moreover, a higher cost of pension benefit may result in the employer providing lower current wages or less valuable other employee benefits. But if the pension benefit is more valuable (because of the increased likelihood of it being paid) then the employee may be willing, or even prefer to accept lower wages.

DB funding strategies aim to achieve an appropriate balance between employers and employees in the funding of DB benefits, reflecting the benefits that are promised or guaranteed and benefits that are discretionary, or target benefits that may be dependent on external factors. Inevitably there are a number of trade-offs that exist in developing a pension funding strategy – particularly around the security of members' benefits and the costs associated with delivering security. These are explored in some detail in this monograph.

Purpose of Funding

Funding strategies vary considerably from country to country, by the nature of the benefits that are provided (including, for example, ancillary benefits such as life assurance) and the taxation and

regulatory structures that exist around the provision of those benefits. There are generally four main reasons that are used to justify the funding of DB pension plans:

1. **Benefit Security**
   Pension promises to employees may involve benefit payments over many decades in the future, but few companies exist that long. Funding creates assets which are available to secure the promised benefits and which are not subject to claims from the employer's creditors in the event of bankruptcy and are available to secure the promised benefits. Pension funding therefore increases the likelihood the employer's promise will be kept in part or in full. Funded pension promises will generally have greater credibility with employees increasing the value they place on the pension promise. This raises the fundamental issue (which is addressed later in this monograph) that statements from a pension plan that it is fully or 100% funded can have the potential to mislead if the assets held are not sufficient to ensure the delivery of 100% of the benefits in all circumstances.
2. **Tax Incentives**
   To encourage populations to save for their retirement and not rely on the Government to look after them in their old age, many countries offer significant tax incentives for the funding of pension plans. These tax incentives can apply to employers and/or employees; to pension contributions and/or benefits; or to certain investments held within the pension plan. To prevent abuse of these tax incentives, countries often place limits on tax-favoured pensions, such as specifying maximum benefits that plans may provide or limiting the assets that can be set aside on a tax-favoured basis to fund the promise.
3. **Regulation**
   Many countries have introduced regulations requiring pension plans to hold a prescribed level of assets against their liabilities or requiring employers to fund at least a prescribed amount each year, usually as part of consumer or worker protection legislation aimed at ensuring that a minimum level of security is provided for pension plan benefits. From time to time, the issue of intergenerational fairness also influences regulation.
4. **Cost and Cash Flow Management**
   A final reason for funding is to pay benefits from a pool of assets in a pension plan which is designed to avoid disrupting the underlying business (or other economic activity) by smoothing out cash flow requirements. This might also be seen as introducing some discipline into the payment for employment costs which might not otherwise materialise until many years after the employment has taken place.

It is also the case that an employer's requirement to prepare financial statements according to prescribed accounting rules means that those rules can significantly affect the employer's desired approach to funding its DB pension plan.

In some countries, DB pension plans are designed to provide a target level of benefits (rather than guaranteed benefits). The actual benefits paid out can be adjusted positively or negatively depending on the pension plan experience. In extreme circumstances this can become more akin to a defined

contribution (DC) plan, with the level of funding being a determinant of the benefits that are delivered – indeed the level of contributions may be entirely fixed and the benefits entirely variable according to experience.

Pension Plan Governance

The governance structure which exists to oversee the pension plan plays a very important part in the funding strategies that are adopted for DB pension plans. There are usually a number of different parties involved in any pension plan:

- Employer (separate consideration may be given to managers within the employer and owners or shareholders of the employer)
- Governing body (or party responsible for the oversight of the pension plan)
- Regulators (who may be independent from Government and legislators)
- Advisers (including lawyers, accountants, actuaries and investment specialists)
- Members (including employees, former employees and those in receipt of benefits under the pension plan)

Actuaries will often be involved in advising one or more of these parties. Particular care is needed in situations where the interests of the different parties are not aligned and conflicts exist. This monograph considers some of these issues in Chapter 2 and Chapter 10.

Investment Strategy

The investment strategy adopted by a pension plan can equally play a very important role in the funding strategy that is adopted. The interaction of the funding strategy and the investment strategy is considered in several parts of this monograph, in particular in Chapter 5.

Scope

This monograph is not a detailed actuarial text book on the running and funding of a DB pension plan. Rather it focuses on the high level principles of pension plan funding - it does this by asking a number of fundamental questions. Each chapter considers in turn a question on the operation and funding of a pension plan and looks at the issues which arise and the key lessons to be learned. Any deductions that may be made from these principles are subject to actuarial judgement on the particular circumstances arising.

It is intended to be educational rather than representing formal guidance and it is aimed at a wide audience of readers who are interested in the funding of DB pension plans – although some prior knowledge of the operation of pension plans is assumed. The monograph draws out the variety of practices and approaches that exist around the world today, highlighting the implications of those practices.

If there is an emphasis in this monograph, it is on the desirability of transparency of understanding (for all parties associated with a pension plan) of the implications of different funding objectives and strategies.

This monograph considers first the different types of DB benefits and pension plan structures which exist to deliver those benefits. Then the funding objective is considered and developed from the purpose(s) of funding the pension plan already mentioned. Having established a funding objective (and considered whether this is clearly understood by all the parties to the pension plan), the monograph then looks at the funding (and investment) strategy that is being followed in order to achieve the funding objective. Then fundamental questions around the future development of the pension plan and the risks (and conflicts) associated with the strategy being followed are considered in turn.

Throughout the monograph the role and expertise of the actuary in advising on and around the funding of the pension plan is explored and the importance of transparency is emphasised.

The monograph contains a number of case studies from around the world (detailed in the appendices) which draw out many of the issues involved in DB pension plan funding.

This monograph does not suggest that there is a "right" way to finance DB pension obligations. The case studies illustrate how different countries have approached the challenge of creating a regulatory framework for DB pensions and then delivering on those pension obligations. While there may not be a "right" way to go about financing DB pensions, where problems have arisen in the funding of pension plans it has usually been due to a combination of one or more of:

- Unaffordable levels of guarantees / promises to members attaching to DB benefits (and early / immediate vesting of benefits);
- Long duration promised benefits which do not have natural hedging investments;
- An inability to reduce promised benefits, even in extreme circumstances;
- High levels of mis-matched investment risk being run in assets backing guaranteed pension liabilities;
- Weak (or no) minimum funding requirements;
- Lack of adequate protection of members' benefits in the event of a failure of the employer;
- Poor governance and / or regulatory oversight;
- Lack of communication to members, or poor member information which does not explain the risks attaching to the delivery of their benefits.

Perhaps the biggest contributing factor to poor outcomes in DB plans arises from poor governance and a lack of transparency on the true cost of the pension promises that have been and are being made. This may have arisen because financial conditions, medical advances and the political environment can all change-sometimes radically. A regulatory and governance structure that may have worked well in a different era, works less well when the world and attitudes change.

2. DB Pension Plan Design and Regulatory Structure

So many challenges …

Governments have long recognised the importance of encouraging people to save for retirement. As longevity continues to improve, all countries are seeing an increase in the proportion of the population who have reached an age (retirement age) when they no longer wish or are able to be economically productive. Governments cannot sustainably afford to be the sole financial supporters of people in retirement so they need to encourage or mandate pension savings.

A challenge for individuals saving for retirement has always been knowing how much to save now to meet income needs in the future. DB pension plans have tried to overcome this by introducing target or defined benefits which provide individuals with greater certainty on their future income. DB pension plans have also helped pool some of the risks associated with long term saving for retirement. Not only are some of these risks transferred to the employer in a DB pension plan but also can be pooled between members.

A big challenge for DB pension plans is that financial guarantees can be expensive, particularly guarantees that extend a long way into the future. There is therefore a fundamental trade-off in DB pension plan design between affordability and delivering certainty.

If pension saving is not going to be compulsory then inevitably Governments have found that incentives (usually in the form of tax subsidies) are required to encourage people to defer consumption now and save for many years in the future. Because such incentives are expensive, Governments often introduce limits on such spending which can result in maximum limits being put on pension benefits or on pension funding.

Governments and regulators are also increasingly interested in consumer protection. If an employer makes a promise of a benefit to an employee, will the employer be able to deliver on this promise? As a result many Governments and regulators have introduced minimum funding rules and regulations, particularly for mandatory pension plans or pension plans that qualify for valuable [tax] incentives.

Minimum funding rules present challenges for employers, particularly as DB pension plans have grown relative to the size of the sponsoring employers. Where DB pensions are guaranteed and there is little flexibility to vary pensions promised then the problem of financing historic pension promises can be more acute and solutions more difficult, particularly if the cost of providing the promised benefit has increased over time, eg due to increasing life expectancy. In extreme cases, the burden of financing pension promises can and has driven employers into bankruptcy. If there are insufficient funds in the pension plan this can result in pension plan members being stripped of a significant part of their savings, possibly at the same time as they have also just lost their job.

If the promised benefit is not guaranteed and there is an element of risk attaching to the amount of the pension benefit being delivered, then a challenge for all parties to the pension plan is what level of benefits can the pension plan afford to deliver.

Irrespective of whether pension benefits are guaranteed or not, there is then the challenge of communicating with members on what benefits they can expect to receive. Where these benefits are guaranteed, what might happen in the event of a failure or insolvency of the employer and / or pension plan? Where these benefits are not guaranteed what benefit is expected to be delivered?

There is perhaps one over-arching challenge for governments and regulatory systems around the world – how to get the appropriate balance between potentially conflicting objectives of:

- Security;
- Affordability; and
- Adequacy

Two out of three of these objectives may be achievable, but often at the expense of the third. This can be seen from the drive in many countries, particularly the EU, to improve consumer protection legislation by increasing the security attaching to pension plan promises. This has resulted, in many countries, in a trend away from more generous DB provision to more affordable but potentially inadequate DC provision.

Solvency

Issues around the funding of DB pension plans and the security of members' benefits cannot be fully discussed without defining solvency and what it means for a pension plan to be solvent. In this monograph, solvency for a DB pension plan means that it has sufficient assets to meet all the guaranteed benefit obligations (the solvency liabilities) as a stand-alone entity, ie in the absence of any employer support. This might sometimes be described as the "risk free" value of the liabilities. Typically it means that the pension plan has sufficient assets to purchase contracts with an insurance company to deliver the benefits promised to members under the rules of the pension plan.

In some countries, there are "solvency funding targets" which are statutory minimum funding targets and do not necessarily equate to holding sufficient assets to meet the solvency liabilities as defined above. Where this is the case, it is highlighted in the text of this monograph.

DB Pension Structures

There are a number of key features of the structure and regulatory framework surrounding DB pension plans, each of which has the potential to produce different funding outcomes:

a. Nature of benefits
b. Taxation
c. Minimum / maximum funding regulations
d. Employer support
e. Pension guarantee funds

a) Nature of benefits

- **All benefits defined and guaranteed** with no possibility for the employer or governing body to vary any of the benefits. The extent to which a promise to provide a defined benefit is truly a guarantee varies from country to country and between public sector and private sector plans. In the extreme, governments have the power to alter public sector benefits and legislation may allow employers to alter private sector benefits.
- **Some of the benefits are defined and guaranteed and some of the benefits are discretionary.** Discretionary benefits may be dependent on the level of pension plan funding, or on investment outcomes. This category includes pension plans with some element of risk sharing or surplus distribution.
- **There are target benefits but the benefits delivered are entirely dependent on the funds that exist within the pension plan.** The pension plan may be defined benefit in the sense that there are defined target benefits but possibly it may be closer to a collective defined contribution plan, with the target benefits giving a basis for how the pension plan assets are allocated to individual members.

There are therefore two types of risk in a pension plan attaching to members' benefits:

a. Where benefits are guaranteed, the potential credit risk on the delivery of the benefits if the employer is unable (or unwilling) to maintain the necessary level of pension plan assets.
b. Where benefits are not guaranteed, the risk that either the assets will not be sufficient to deliver the target benefit or that the exercise of discretion (typically by the governing body) may not deliver the benefit expected.

It is sometimes suggested that there is an implied social contract between members of a pension plan and the employer, which governs the security of the benefits in a pension plan along the lines that:

- the employer did not set out to provide a guaranteed benefit, rather the pension promise was more of the nature of best endeavours; and
- the members have always understood that the benefit was not guaranteed and that there is some risk underlying the pension promise.

This may mean that a pension plan guarantee is generally accepted to be less secure than an insurance contract guarantee. However, communicating this additional risk to pension plan members is very difficult and there are not many examples of where this has been done successfully.

It can be the case that there is a tension between the amount of the pension benefit provided and the risk attaching to the delivery of the benefit. Affordability constraints may mean that if there are demands for reducing pension plan risk, this can result in employers not being able to afford an adequate level of benefits. However, pension plan risk is difficult for members to diversify and can be correlated with employment risk. Considerable care and transparent communication with members may therefore be required to explain the risks existing within the pension plan.

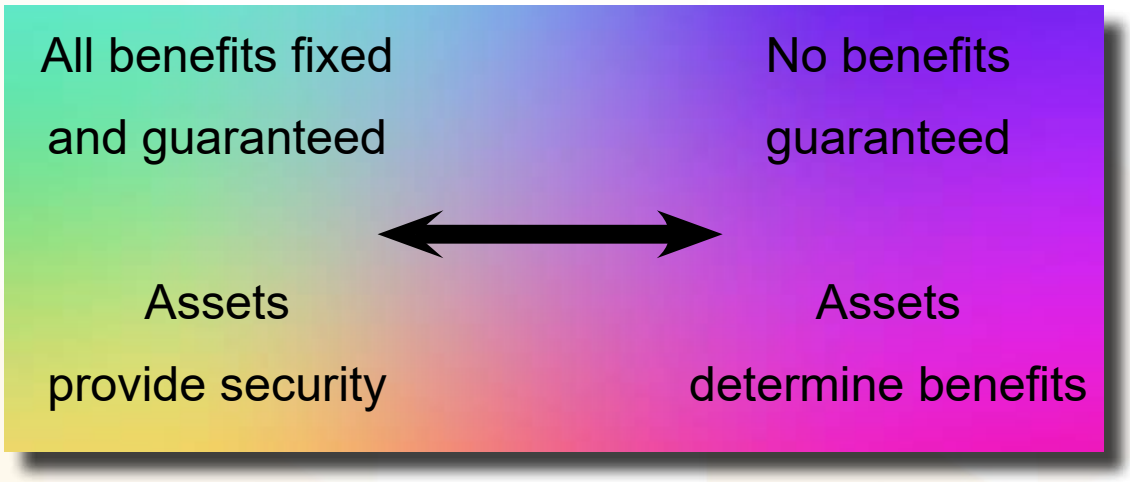
The different levels of guarantees applying in different countries and the impact of pension plan experience on members' benefits can mean that there are two very different views of pension plan assets:

- DB pension assets are collateral for pension promises;

  or

- DB pension assets are the determinant of the level of benefits that can be paid.

Graphically this might be presented as:



Which of the above is the prevailing view in a particular country will have a significant impact on the funding and investment strategies that are followed. In practice, most countries do not sit at one extreme and the framework is a subtle mixture of guaranteed benefits and discretionary benefits with assets playing both a role in providing security and determining the amount of some of the benefits. Additionally some countries have introduced insurance arrangements or pension guarantee funds to improve the security of pension benefits.

The range and type of benefits provided by the pension plan can also affect its funding and investment strategies. Where there is greater uncertainty (or longer duration) in the liability cash flows it is likely to be harder to construct asset portfolios which produce matching cash flows. This may result in greater risk in the funding and investment strategies. Member options in particular can be difficult to value (and

hence fund) and difficult to manage in the investment strategy. Different benefits can include:

- Pensions on retirement payable for life (with or without pension increases)
- Lump sums (in fixed or variable installments) payable at retirement
- Pensions and lump sums payable to spouses or dependents
- Options available to members to switch one form of benefit to another form of benefit (eg to transfer an amount of money in lieu of their benefit to another pension plan)

Different benefits (and the extent to which they are increased or index-linked) will result in the pension plan being exposed to different risks (eg longevity risks and inflationary risks) with varying durations. If the level of guarantees attaching to the pension plan benefits is high, then the funding and investment strategies have to be designed to deliver the guaranteed benefits. If the level of guarantees is low it allows more flexibility in the funding and investment strategies. Thus the varying features in the benefit design can mean that funding strategy is more problematic when guarantees and benefit risks are high and more straightforward when guarantees and benefit risks are low.

b) Taxation

In many countries there are tax incentives provided to pension plans which direct the nature of the benefits that are provided and encourage (or discourage) the funding of pension plans. In some circumstances they will be a key driver of funding strategy, in particular in some countries tax relief on pension plan contributions may be limited which typically results in a limit being applied (by the employer or governing body) to the funding strategy.

c) Minimum / maximum funding regulations

In many countries the funding objective and funding strategy are largely determined by regulations on minimum (and maximum) funding. Often there is a separate regulator which oversees the implementation of the legislation. It is the case in many countries that funding strategies are principally driven by minimum funding regulations. This is often because governing bodies do not have the power to demand higher levels of pension plan funding and employers are unwilling to commit to funding which is greater than required under regulations (which are designed to provide some form of security for members' benefits).

Maximum funding regulations typically exist when legislators are looking to cap the incentives or tax reliefs that may be available to pension plans.

The reluctance by employers to commit to more than the minimum required level of funding may be because pension plans are viewed as providing a cheap source of capital. Given that so many employers choose to run pension plan deficits rather than transfer this debt to the capital markets, it may be that this view is quite widespread. Employers may also be reluctant to commit more than the minimum level of funding if it means that it ties up capital that is inaccessible to the employer. However, a pension plan deficit may be viewed as an unsecured loan from the plan members to the sponsoring employer,

representing a risk that members cannot diversify. As such, members should logically demand a much higher price than the capital markets for bearing this risk. Therefore in a transparent market the reverse may be true and pension plans would not represent a cheap source of capital.

An important consideration with minimum (and maximum) funding regulations is that they may be driven by political considerations that are not linked to optimal outcomes for pension plans. A combination of employers wanting to reduce onerous funding commitments to pension plans and a Government looking for extra tax revenues can result in minimum funding regulations being relaxed resulting in members' benefit security being reduced. If there is not a transparent understanding of this loss of security, then employers get a reduction in their funding commitments, governments get an increase in their tax revenues and pension plan members may not notice that they are paying for it through a reduction in security and value of their benefits.

d) Employer support

If a pension plan is insolvent (ie with assets less than the value of the solvency liabilities) or may become insolvent in the future, the payment of the guaranteed benefits is dependent on the ongoing support and ability of the employer to stand behind the cost of the pension promises that have been made. This dependency is often described as the employer covenant and depends on both:

- the ability of the employer to make good current and future deficits; and
- the willingness of (or the power of the governing bodies to force) the employer to make good current and future deficits

This employer covenant represents an investment by members in the sponsoring employer. It is comparable to holding an unsecured loan in the sponsoring employer and, as such, it is a form of "self investment" (or employer-related investment). Self-investment (where there is no external insurance or pension guarantee fund) can be seen as undesirable for the following reasons:

- Current employees are dependent on the employer for their future earnings. In the event that the employer fails, they face the double jeopardy of losing their incomes and a part or all of their pensions.
- A pension plan deficit represents a concentrated investment for a member. If viewed as an unsecured loan to the sponsoring employer it potentially represents a large undiversified risk to the member.
- Governing bodies may be in a poor position to negotiate, because of the consequences for the members (and possibly themselves as individuals) if they were to take action that would otherwise be considered commercially sensible by a creditor (e.g. a bank).

On the other hand, there can be a trade-off between the sponsoring employer's contributions to fund pensions and the wages paid to current workers. If the employer were forced to fund the pension plan to a solvency level, then the employer might need to freeze hiring and pay levels, reduce wages, or perhaps even terminate the employments of a substantial number of employees. In effect, the "interest" on the unsecured loan to the sponsoring employer may be viewed as the wages currently paid that

would otherwise be diverted to fund the pension plan to a solvency level.

Employee members of the pension plan (and unions supporting them) may be willing to make this investment if they believe the employer has sufficient strength to deliver on the promise. However it is less obvious that former employees would have a similar view. This can result in significant tensions between different groups of plan members, particularly where employee members are outnumbered by former employees. It also makes it difficult for those who are acting in the interests of all members (either as principals or as advisers) if the interests of different groups of members can be very different.

The nature (and strength) of employer support is therefore a key part of the funding strategy. Moreover, except in certain circumstances (eg some Public Sector pension plans), the nature and strength of employer support can change from time to time. In the absence of external insurance or a pension guarantee fund, a system where a cash call is triggered by a financial deterioration in the sponsoring employer or the pension plan is likely to be very challenging for the employers. This possibly leads to the conclusion that strong employers should fully fund pension plans and weak employers should already have fully funded pension plans (and this is explored in later chapters of this monograph).

e) Pension guarantee funds

A number of countries operate such schemes which provide “back-stop” insurance protection of some or all of the benefits provided by a pension plan in the event of bankruptcy of the sponsoring employer. They serve to mitigate the diversification risk inherent in many pension plans - whereby members, particularly employee members, are highly exposed to the insolvency of the sponsoring employer and cannot properly diversify this risk. There are however moral hazard challenges for such schemes (which are problems for all insurance contracts). Governing bodies of pension plans may be tempted to take more risk because of the existence of a pension guarantee fund. Alternatively they may behave in ways which are contrary to the interests of the pension guarantee fund. Additionally, systemic risk can be an issue for such schemes – as bankruptcies tend to be correlated, both with each other and with pension plan underfunding.

There are also challenges in their investment strategies (where they maintain funded arrangements) and their approach to pricing and charging for the risks they are protecting against. Many of the assets which a pension guarantee fund might hold will have risks which are correlated with employer bankruptcy and pension plan underfunding risks. Then if the premium charged by the pension guarantee fund truly reflects the cost of the risk it is taking on, those employers least able to support their pension plan could be faced with crippling and unaffordable premiums.

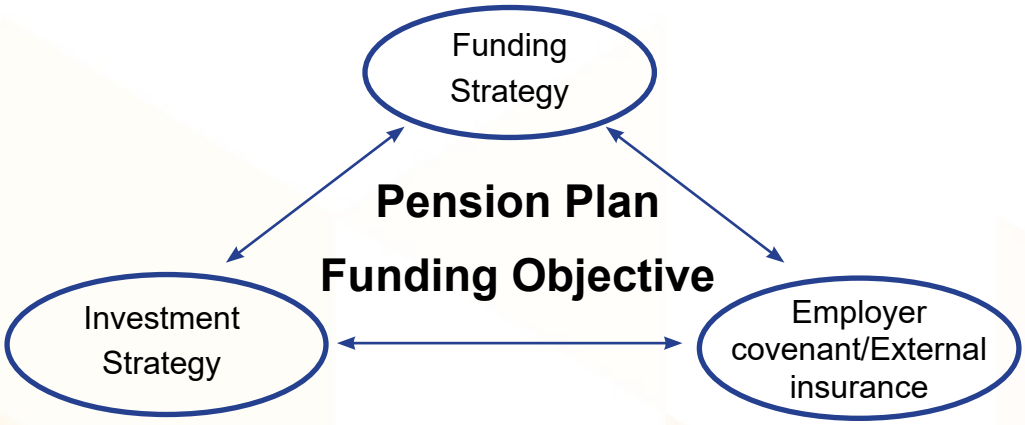
Investment strategy

Pension plan funding is closely linked to the investment strategy. Setting aside the risk from demographic factors (principally longevity and retirement age), appropriate bond investments are generally regarded as the best match for pension plan liabilities which are largely guaranteed. Hence in most cases the least risk portfolio is likely to be a portfolio of high quality bonds. It should be noted however that the

least risk does not mean risk free, and it is likely that in any least risk portfolio there will be residual duration and possibly inflation risk, as well as demographic risk.

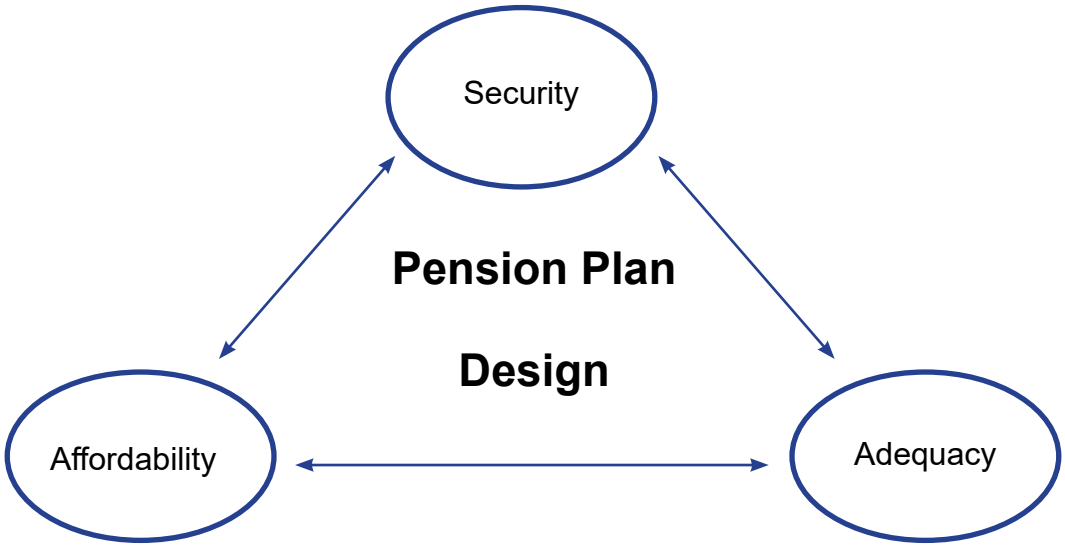
Many pension plans do not hold all their assets in high quality bonds. Rather it is commonly the case that pension plans invest their assets in a diversified portfolio of investments, often including equities and property assets. The purpose of such an investment strategy is to achieve a return which is greater than that which might be obtained from the least risk portfolio and hence produce a lower funding requirement, or higher benefits. Of course, this brings risk that the investments may not deliver the anticipated returns and more importantly, risk that assets in the pension plan could be insufficient to meet the promised benefits in the event of the sponsoring employer becoming insolvent.

While there is some variation from country to country (with variations in pension plan design and regulatory structure), there is therefore a critical tripartite relationship which comes together in the setting of the funding objective for any pension plan:



More risk within the investment strategy can mean a lower funding requirement but greater reliance on the employer covenant or external insurance (eg pension guarantee funds). Alternatively it can mean a higher funding requirement (to build sufficient reserves to mitigate the investment risk) and less reliance on the employer covenant.

This tripartite relationship reflects the similar relationship around pension plan design mentioned earlier in this chapter:



If the security of members' benefits is the prime consideration in the design and regulatory environment for DB pension plans this is likely to lead to much greater focus on lower risk bond-based investments. In turn this may also result in a higher cash funding requirement. As some countries have sought to increase guarantees and protection for members' benefits, many employers have responded by reducing the coverage of their DB plans or replacing them with lower cost (lower value) DC plans.

A key area of expertise of the actuary is to advise parties associated with the pension plan on the elements of these tripartite structures, highlight the risks that arise in any set of circumstances and possibly advise on the appropriate balance.

Where DB benefits are largely or wholly target benefits (which can be adjusted up or down) rather than guaranteed benefits, then the investment strategy has a crucial impact on the volatility in the amount of benefits that are paid to individual pension plan members. In such circumstances the governing body (or whoever is responsible for setting and implementing the investment strategy) faces a challenge to decide on the balance between:

- Higher risk assets that may deliver a higher return but with greater volatility,

  and

- Lower risk assets that are expected to give a lower return but with more certainty.

In such circumstances, a key area of expertise of the actuary is to advise on how the level of risk in the investment strategy will translate into volatility in the benefits that are paid to individual pension plan members.

Governance

The governance of a DB pension plan and how decisions are made in connection with the pension plan, particularly with regard to funding strategy and investment strategy, will generally have a significant impact on outcomes. Governance problems are most likely to arise where there are very different interests involved. It is therefore instructive to consider the key parties involved and their vested self-interests under different possible and probable scenarios.

Difficulties can arise when the upside scenarios do not balance the downside scenarios for a particular party or parties. For pension plan members there may be the added complication that different categories (or generations) of members may get different treatment in certain upside and/or downside scenarios i.e., benefit cuts and/or benefit improvements may be limited to a group of members, and current workers may end up funding — through lower current wages — the benefits promised to prior generations of workers.

These scenarios may result in the following positions of the different parties:

- Employers often want a lower funding requirement and hence greater investment risk to achieve higher returns (or reliance on the employer covenant).
- Shareholders or owners may not wish employers / company management to take inefficient risk in their pension plans and may prefer a lower risk investment strategy which does not effectively result in additional balance sheet leverage. However, many shareholders are also pension plan investment managers who favour (more remunerative) riskier investment strategies.
- Members may wish to see a higher funding requirement and lower investment risk to minimise the downside risks attaching to the payment of their benefits, but some (employed) members may not wish to see a higher funding requirement for fear that it may encourage the employer to reduce current wages or withdraw future benefits or even cut jobs.
- Regulators will generally seek to protect members' interests and / or ensure that members are aware of the risks that are attaching to the payment of their benefits. They may also be wanting to minimise systemic risk for pension guarantee funds.
- Governments must balance the needs of pension plans generally with wider economic concerns.
- Governing bodies are generally responsible (depending on the regulatory structure that exists within a country) for determining the appropriate balance between the interests of the various parties to the pension plan, particularly in the context of the funding and investment strategies. Governance problems can arise when there is considerable divergence of vested self-interests between employers and members (and, potentially, different categories or generations of members). This is explored further in Chapter 10.

Insurance promises vs Pension promises

Pension plans are fundamentally different from insurance companies although there are also many similarities. Pension promises (from a pension plan) are generally not regarded in the same way as insurance promises. With pension promises it is frequently expected that there are risks attaching to the delivery of the pension benefits dependent on the funding and investment strategy adopted in the pension plan. However these risks are often not understood by pension plan members and they are not always transparently communicated to pension plan members.

In an insurance company, the basis of the contract to deliver a benefit to an individual is normally insurance contract law. Where insurance benefits are defined and guaranteed, regulations will usually require the insurance company to deliver that benefit and hold sufficient assets (possibly in a segregated fund) at all times to ensure the delivery of that benefit.

In a pension plan, the governing body is responsible for ensuring the delivery of benefits to individuals. Those benefits will typically be determined initially by the employer and may be defined or guaranteed by the employer (but will not normally be subject to insurance contract law). The assets that are held within the pension plan will typically not be sufficient at all times to ensure the delivery of the defined benefit. Different rules and regulations apply in different countries, both to the level of assets that must be held within the pension plan (which will then affect the funding strategy of the pension plan) and to what happens in the event of an insolvency of the sponsoring employer. If there is an insufficiency of assets in the pension plan (possibly following the insolvency of the sponsoring employer), it may be that benefits can be reduced or there may be a third party (eg a pension guarantee fund) which is called upon to make good some or all of the insufficiency.

It is also the case in many countries that pension plans do not provide guaranteed benefits in the way that might be expected from an insurance company. Rather there are target defined pension benefits, which can be adjusted positively or negatively depending on the pension plan experience.

3. Is the funding objective clear and understood by all parties?

In the context of this monograph, funding refers to identifiable assets which are separately held in the legal entity represented by the pension plan. It does not include accounting reserves, contingent assets or the value of insolvency insurance that may exist to guarantee the payment of benefits, although the existence of any of these is likely to affect the amount of assets that are held in the pension plan.

The funding objective of a DB pension plan sets out the purpose of funding the pension plan and what the funding is intended to achieve. Typically it will also set out a target level of funding (and how that level of funding is assessed).

There are consequences of different funding targets:

> At one extreme, a demanding funding target (eg akin to insurance company solvency) may drive employers out of a voluntary system, or even drive employers into bankruptcy.
>
> At the other extreme, a weak funding target means some promised benefits may go unpaid under certain circumstances (unless fully supported through insurance or a pension guarantee fund or other means).

In most cases, the funding target will not be at one of these extremes but will be at an intermediate compromise point, balancing the conflicting demands of security of members' benefits and employer affordability.

Where funding is introduced it is usually to achieve one or more of a number of objectives:

a. Provide security for the delivery of promised benefits to pension plan members in the event that the employing entity is no longer able (or willing) to support the pension plan (NB it is unusual for a pension plan to have an objective of providing full and absolute security on the delivery of promised benefits, such an objective is more typical of an insurance arrangement);
b. Provide a financial discipline for the employing entity in providing for the cost of ongoing benefit accrual as it is incurred;
c. Provide a predictable cash flow requirement;

d. Determine the amount of benefit that is paid to members;
e. Have a secondary impact on members' benefits where surplus distribution can be used to increase benefits (eg increases to pensions) or vice versa in the event of a deficit;
f. Maximise tax efficiency;
g. Meet regulatory requirements.

These objectives are unlikely to be achievable simultaneously and in many countries the funding objective is not stated explicitly, beyond that it is whatever is needed to meet regulatory requirements. Whilst therefore it is difficult to generalise, it is typically the case that the funding objective will aim to achieve:

- some degree of security;
- some smoothing of cost / cash-flows; and
- some potential impact on the amount of members' benefits,

with the emphasis on each of these different elements often being driven by local regulatory requirements.

Full funding

The term full funding (or being fully funded) is commonly used around the world but can mean different things to different parties, across countries and within countries. There are dangers in using this term as it may be misinterpreted. In particular:

> A pension plan may be described as being fully funded against its funding objective because it has sufficient assets to meet its emerging liabilities on the assumption that the assets earn a certain investment return in the future. However this may not mean that the pension plan has sufficient assets to settle all the benefits today, eg in the event of an insolvency of the employer. In other words pension plan members cannot necessarily assume that because the pension plan is fully funded, this means that they will always get their benefits in full. Additionally, it does not mean that the employer will not face any demands for additional funding – eg if the governing body wishes to secure some of the pension plan liabilities with an insurance company.

In this monograph, we take the term, full funding, to mean the level of funding envisaged by the funding objective and is typically the target level of funding - although occasionally a pension plan will have a target level of funding which is more (or sometimes less) than 100% funding.

In particular, full funding does not usually imply that the pension plan has sufficient assets to cover its solvency liabilities (unless the funding objective is to achieve a solvency level of funding). As a consequence, there are a number of examples of pension plans that reported they were fully funded but had insufficient assets to meet promised benefits in the event of a failure or default of the employer.

Conflicts

A greater level of funding in a pension plan likely leads to greater security provided by the pension plan to members. Also, if a higher level of pension plan funding leads to higher benefits for members then again members will have a strong interest in seeing an increase in funding. But increased security and higher potential for future benefit increases may come at a cost to members currently employed by the sponsoring employer in terms of lower current wages (though this trade-off is rarely explicitly laid out outside the collective bargaining arena). Among members employed by the sponsor, there may not be agreement on the desired degree of pension security — and hence the acceptable level of wage sacrifice to achieve it. Long-service employees who have already earned substantial pension benefits may see greater value in security, while young and short-service employees may prefer current compensation over more secure promises of future benefits they will not receive for decades. The interests of former employees — whose only interest is security — may also conflict with employed members, whose current wages might be reduced to enable the employer to contribute greater amounts to the pension fund.

Employers will often wish to minimise the allocation of funding to pension plans as they will have many different demands on their cash-flow. Also, employers may not view the granting of additional benefits from surplus funds — when relevant — as a valid objective of sponsoring a pension plan.

There are therefore two overriding conflicting themes:

- It will often (but not always) be in pension plan members' interests for their pension plan to be as well funded as possible.
- It will often (but not always) be in employers' interests for pension plan funding to be minimised (particularly if refunds of surplus funds to employers are not permitted or are heavily taxed).

However, it should be noted that:

- In many countries, favourable tax rules support the full funding of pension plans and make it more tax efficient for companies to borrow from a bank than run a deficit in a pension plan.
- Pension plan members are generally unable to diversify the risk of the failure of their employer and therefore may not fully value the DB benefit provided by their employer where there is a risk of default (and it is inefficient for an employer to provide a benefit which costs the employer more than it is valued by employees)

Into this economic mix is then thrown the different regulatory requirements for pension plan funding that exist in countries around the world.

Actuaries have an important role to play in measuring and explaining key questions relating to the funding objective:

- **How much security does the funding objective imply for pension plan members in the event that the employer is no longer able (or willing) to support the pension plan?**
- **Does the funding objective allow the employer to defer (how much?) part of the cost of ongoing benefit accrual as it is incurred?**

- **What proportion of member benefits are directly impacted by the funding position of the pension plan?**
- **If the pension plan has a surplus can this be used (what proportion?) to increase benefits?**
- **If the pension plan has a deficit, who is responsible (and how) for financing the deficit?**
- **Does the funding objective meet or exceed (and, if so, by how much) regulatory requirements?**

Parties involved in setting or agreeing upon the funding of the pension plan will usually find their decision making easier if there is clarity on the answers to these questions. It is perhaps obvious to note that if the parties involved in setting the funding strategy are not clear on, or do not properly understand the funding objective, then it is unlikely that the funding strategy will be optimal.

Additionally, in terms of managing members' expectations (as well as being fair to members on what they should expect from their pension plan), transparency on these questions may be considered desirable. However, we observe (in many countries) that pension plans are often not transparent on some of these questions. This is most obviously the case in terms of the security attaching to the delivery of promised benefits. Pension plan members may believe that the delivery of a promised benefit is guaranteed and can be shocked to discover that their pension is at risk and may not be paid in full - or even at all. However, full transparency on this key question of security can be uncomfortable, both for employers and governing bodies (and even governments). It is notable that in a number of countries legislators are looking at improving pension plan transparency.

European proposals on regulatory structure

The European Insurance and Occupational Pensions Authority (EIOPA) oversees pensions regulation across the European Union. It had proposed introducing capital requirements for DB pension plans similar to the Solvency II regime that applies for European based insurance companies. This was driven by two key concerns:

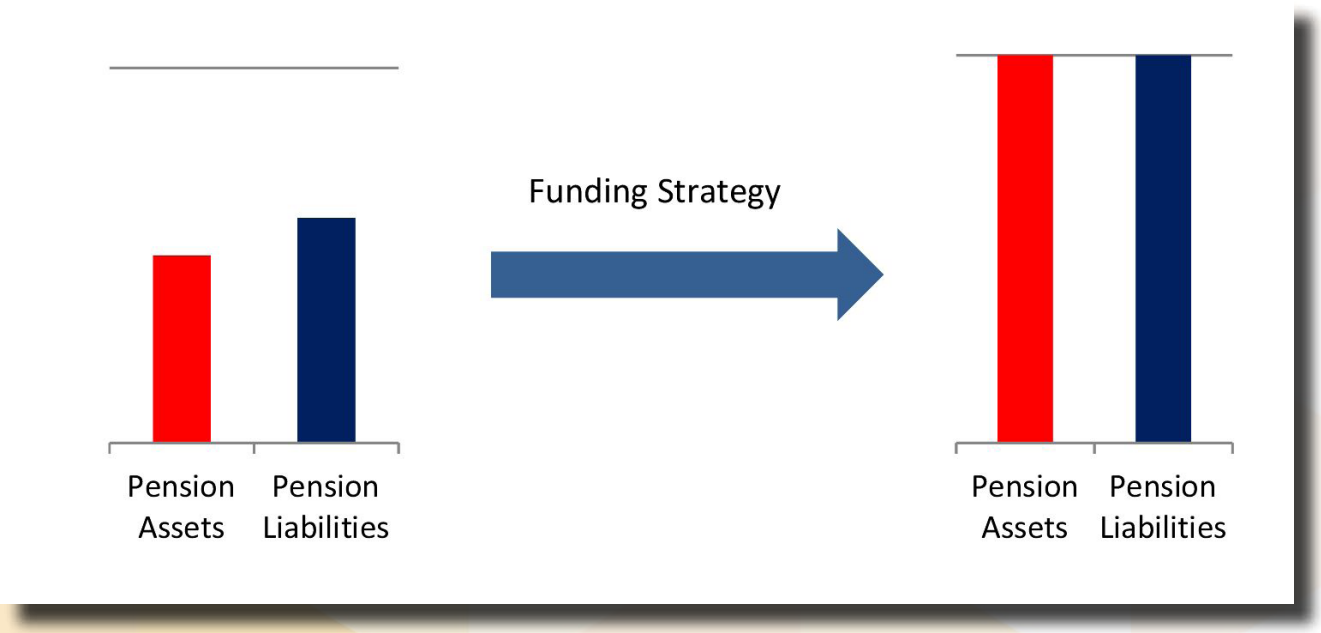
- Ensuring /creating a level regulatory "playing field" across Europe for different financial institutions offering similar [pension] products; and
- Consumer protection and ensuring that when a financial institution makes a "promise" to an individual it is able to deliver on that promise.

However, there were objections made to the introduction of European rules on capital requirements for pension schemes. The point was made that insurance and pensions are different, the nature of insurance promises and pension promises are different and they should be subject to different regulation. EIOPA has therefore turned its attention on to pension plan governance and member communication including the communication of the risks attached to pension "promises" – and this is the scope of the IORP II (Institution for Occupational Retirement Provision) directive.

4. Is the funding strategy consistent with the funding objective?

If the funding objective sets out what the funding of the pension plan is expected to achieve, then the funding strategy sets out how the funding is being managed to achieve the funding objective.

The funding objective will typically establish a target level of funding (in relation to a value placed on the pension plan liabilities). However, if the funding objective is not explicit or it is unclear then the target level of funding may be the subject of some debate between the various parties to the pension plan and may form part of the funding strategy. The funding strategy will then typically establish the planned journey to achieve or maintain the target level of funding. The graphic below illustrates this concept for a plan where the objective is to target holding assets equal to the pension liabilities.



Where a pension plan has already reached its target level of funding then the funding strategy will establish the plan forward to maintain the target level of funding.

This plan will likely include such matters as:

- Target level of funding
- Maintenance of target level of benefits (or possible adjustments to benefits)
- The cash funding required to achieve the target level of funding (including the funding contributions required to meet the ongoing accrual of pension benefits)
- The length of time required to achieve the target level of funding

Different funding strategies are possible to achieve the same ultimate funding objective. Typically such different strategies will be characterised by different levels of risk. So higher risk strategies are likely to result in lower contributions but a greater likelihood of deficits (and risk that members may not get their promised benefits in full) and more variability on the time needed to achieve the target level of funding. Lower risk strategies are likely to result in higher contributions but with a lower likelihood of deficits, and reduced volatility on the time taken to achieve the target level of funding.

The time taken to achieve the funding objective can vary considerably from less than 5 years to more than 30 years. Clearly the longer the time taken to reach the funding objective the greater is the risk that something could go wrong during this time. The funding strategy may include a formulaic approach to the length of time over which experience gains and losses may be amortised. Again the longer this time period the greater is the risk that will be run by the pension plan.

The key issue therefore, for the various parties who are responsible for setting the funding strategy, is what is the appropriate level of risk for the pension plan to take (having regard to the strength of the employer covenant and / or any insurance or pension guarantee funds that exist)? Where the funding strategy is largely determined by regulations it is still important for the governing bodies to ask about and understand the level of risk that is being run within the pension plan. Equally, the communication to pension plan members on this level of risk is a delicate and sometimes difficult issue for the governing body to consider.

It may be the case that within the funding strategy a pension plan may have a secondary target over and beyond simply achieving the funding objective. This may include full and final settlement of the pension plan liabilities, possibly with an insurance company. Such a secondary target is more likely within a pension plan which is no longer open to employee members and no longer providing any additional benefits to existing members (over and above those already promised). A pension plan in such a situation will have a limited life (albeit it could still be > 30 years) and the governing body will likely wish to plan beyond simply achieving the funding objective.

Actuaries have an important role to play in assisting understanding and advising on whether the funding strategy is consistent with the funding objective, and answer key questions on the funding strategy, including:

- **How much security for members' benefits does the funding strategy imply (both before and after the target level of funding is achieved)?**

- **What is the cost of ongoing benefit accrual? How much of this cost does the funding strategy require to be met as the benefit is accrued? How does this cost vary by the risk in the investment strategy and within the benefits?**
- **What is the likelihood that the funding strategy will deliver the targeted benefits (and any surplus distribution) for members and how many years will it take to reach full funding?**
- **Does the funding strategy meet or exceed (and if so by how much) regulatory requirements?**
- **Does the funding (and investment) strategy imply volatility in the cash funding requirement?**

5. How does the investment strategy interact with the funding strategy?

As has already been noted, the investment strategy is closely linked to the funding strategy. In particular, the level of risk that is taken in the investment strategy is likely to affect both the expected return on the pension plan investments and the contributions that are required under the funding strategy.

In this crucial interaction between funding strategies and investment strategies, there are broadly two types of assets:

a. Matching assets (typically bonds)
b. Growth assets (typically equities)

Matching assets are those investments which (demographic risks aside) are expected to deliver an income stream which most closely matches the cashflows from the pension plan liabilities. Investment in matching assets (in the least risk portfolio) will reduce volatility against the value of the liabilities. It is not the case that matching assets (or the least risk portfolio) means risk free assets. In addition, it is nearly impossible to achieve a perfect match of assets against liabilities because the duration of pension liabilities typically extends far beyond the maturity of bonds currently available in the market. Therefore, even matching assets carry “mismatch” default and reinvestment risk.

Growth assets are those investments (usually within a diversified portfolio) which are chosen not for their liability matching characteristics but for the expectation of higher investment returns than are available from matching assets, typically with greater risk.

In addition to the above simplistic categorization of investments into matching assets or growth assets, there are an increasing number of financial instruments that pension plans can acquire which provide some downside protection against a failure of the investments to deliver the performance required by the funding and investment strategies. Most pension plans have a combination of matching investments designed to provide some protection against adverse outcomes and growth assets designed to generate higher returns.

The introduction of risky assets in the investment strategy can lead to very different impacts on the funding strategy:

Scenario A

> More risky assets ➔ lower funding target (as funding strategy assumes higher investment returns will be achieved)

or Scenario B

> More risky assets ➔ higher funding target (as funding strategy requires maintenance of a particular level of security and hence assumes a need to include a risk buffer)

The more normal situation in most countries is Scenario A where growth assets are used to justify a lower funding target (through the use of a higher discount rate or assumed investment return) and hence lower contributions, accepting that this comes with higher risk of failure. This can sometimes result in Governments and / or regulators seeking to influence or restrict pension plan investments and investment strategy. This may be with the objective of seeking to reduce risk within pension plans generally eg through minimum investment in government bonds or maximum investment in equities. It may also be to encourage pension plans to invest in Government projects, eg infrastructure, to save the Government having to finance such investments.

The importance of this distinction between matching assets and growth assets is dependent on the nature of the pension plan benefits and hence its liabilities. If benefits are all defined and guaranteed then there is greater risk in the investment strategy in moving away from the least risk portfolio, ie there will be greater volatility between asset values and liability values, and an increased possibility of deficits in times of poor investment performance. If however, some (or all) benefits are discretionary or there are other mechanisms for risk sharing or adjusting benefits in light of investment performance, then the volatility of the assets versus the liabilities can be much reduced.

If the funding objective is to maintain assets which are always sufficient to guarantee with a high degree of certainty the delivery of members' promised benefits (and guaranteed benefits represent most or all of the benefits within the pension plan), then it will normally be appropriate for the investment strategy to be primarily based on matching assets. However this will often not be the case for two key reasons:

- The level of security attaching to members benefits is not absolutely certain (and will typically be less than in an insurance contract); and
- Some benefits may be discretionary (or some form of risk-sharing exists) and can increase or decrease depending on investment returns.

This highlights a fundamental problem in pension plans of asymmetry of risk and reward, ie the benefits of investing in risky (ie higher growth) assets may not accrue "fairly" to the party (or parties) bearing the risk of investment underperformance.

Asymmetry of risk and reward

Depending on who bears the risk of under or over performance in the investment strategy there can be asymmetries of risk and reward. This is particularly the case where risky assets are held against defined and guaranteed liabilities.

At one extreme

Employers bear some downside of investment losses (up to the level of losses they can afford) and get upside of all investment gains (usually in terms of reduction in funding contributions)

Members have downside risk of employer insolvency and/or benefit cuts and no upside possibility of benefit enhancements

➔ employers may be seen to have the benefit of this asymmetry of risk and reward

In this extreme scenario, employers have incentive to encourage a riskier investment strategy, because it reduces their cash funding requirement. Even some members (and unions) may be willing to support a higher risk investment strategy in this scenario if it means avoiding a cut in future service benefits. However, members (former employees) with only past service benefits should be much more interested in protecting their downside risks and hence be seeking a lower risk investment strategy.

At other extreme

Employers bear downside of all investment losses and get limited upside of investment gains

Members have no downside risks (eg benefits fully protected) and possibility of surplus distribution / benefit enhancements

➔ members my be seen to have the benefit of this asymmetry of risk and reward

In this alternate extreme scenario, employers should have no incentive to encourage a risky investment strategy. However, pension plan members may be quite happy to see a risky investment strategy which could lead to better benefits.

It is usually the difficult task of the governing body to decide on the investment strategy of the pension plan. It has to balance the different interests of employers and members, and those who benefit from risk taking and those who do not – which will typically be somewhere between the extreme scenarios presented above.

It could be noted that where employers have more downside risk than upside benefit from investment in risky assets (or even where they have a balance of upside benefit and downside risk) it is rarely the case that a pension plan is an efficient vehicle for an employer (or shareholders) to take investment risk. Pension debts may, in some circumstances, be more efficiently exchanged for debt in the capital markets and if the employer wants to take investment risk to reduce its employment (or other) costs it could likely do so more efficiently by investing in risky assets directly on its balance sheet (where it would have more direct control over the assets).

Where there is an insurance or pension guarantee fund in place it may be the case that it is bearing a large part of the downside risk. In some countries the cost of such insurance varies according to the risk being run in the pension plan investment strategy. However if the premium that is paid to the pension guarantee fund does not reflect the investment risk that is being run in the pension plan, then some asymmetry of risk and reward will apply there too.

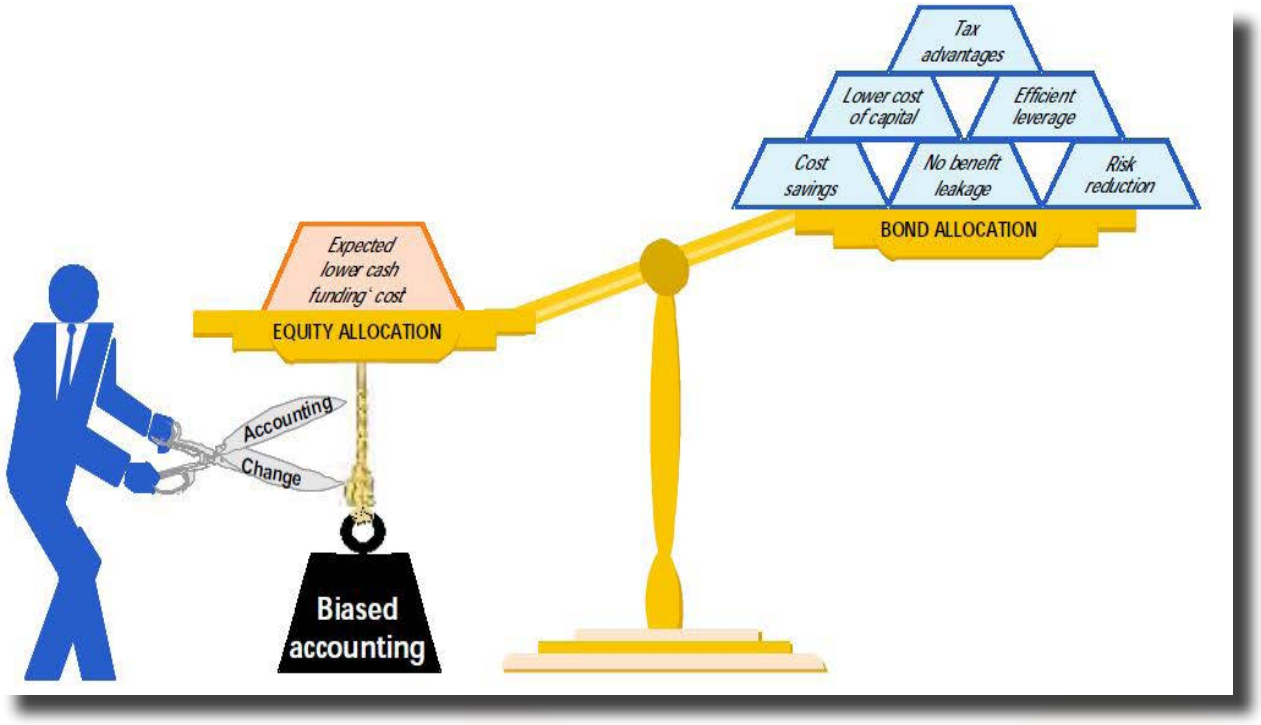
Even where there is some form of risk sharing or a large proportion of benefits are discretionary it will always be a challenge for the governing body (who is usually the party in charge of setting the investment strategy) to strike an appropriate balance between risk and reward. Almost inevitably there will be pension plan members for whom the potential reward of an uplift in their benefits (or a sharing in surplus) will not be matched by the downside risk of a reduction in benefits or, in the extreme, a default event caused by an insolvency of the employer. In particular, even within the same pension plan, different members are likely to be subject to different risks and potential rewards.

It is usually the case that the pursuit of an investment strategy with a higher level of risky assets will typically result in a lower, but also more volatile, funding requirement (except where a risk buffer is required in the funding objective for holding risky assets). This means that where this is the case, members have the additional risk (where there is a poor employer covenant) that a downside investment scenario could correspond with a difficult scenario (and possibly even insolvency) for the employer. However this concentration of risk is one which is very difficult for members to diversify and may therefore be inappropriate even where there are upside benefits to members.

It is often the case that a member's pension represents a core part of their financial income in retirement – potentially all coming from a single source. This situation arises particularly where an employee stays with the same employer for most of their working life. In such circumstances, this concentration of risk is even greater for pension plan members and strategies where their retirement income is put at risk have to be much more carefully questioned.

It is therefore both a difficult and a critically important issue for the appropriate level of risk to be set within the investment strategy and for this to be consistent with the overall funding objective. Equally it is only fair and reasonable that there is transparency to members on the investment risk that is being taken and the reasons for it.

Ironically, the party that often loses out from this asymmetry of risk and reward is the employer. The irony here is that it is often the employer that encourages a higher risk investment strategy in the hope of a lower funding requirement. However, even where all the upside benefit of higher investment performance falls to the employer (in the form of lower funding contributions), this is rarely an efficient strategy for an employer - for tax and other reasons. The same employer may just as easily get an equivalent risk and reward exposure (likely more efficiently and with greater control) by borrowing to invest in a portfolio of risky assets directly. The main reason why employers have historically encouraged risky investment strategies in pension plans is due to accounting standards which have given credit to investment returns in profit statements but without including an equivalent cost for the risk incurred. However, this is changing as accounting standards across the world adapt and improve. This issue was aptly illustrated in a 2003 UBS Investment Research paper on Pension Fund Asset Allocation:



The setting of the investment strategy and its integration with the funding strategy is therefore of crucial importance. Actuaries have an important role to play in advising and helping parties to understand some of the key questions relating to the interaction of the investment strategy and the funding strategy:

- **How do the risks and rewards arising from the investment strategy affect the various parties to the pension plan?**
- **How do risks in the investment strategy affect the volatility of the cash flows required under the funding strategy?**
- **Is there consistency between the investment strategy and the funding strategy? Are the investment returns anticipated in the funding strategy (which may be dictated by regulatory or minimum funding requirements) achievable within the reasonable likelihood anticipated in the investment strategy?**
- **Is the overall risk implied by the funding and investment strategies consistent with the pension plan's overall funding objective?**

6. How is the financial position of the pension plan expected to develop in the future?

A pension plan is a long term undertaking. It will usually be expected to be in place for many decades. Pension plans typically have periodic actuarial valuations. The actuarial valuation serves a number of purposes:

- Revisit whether the funding objective remains appropriate.
- Check whether the funding strategy and investment strategy are on course to deliver the funding objective.
- Determine whether any changes are needed to the funding objective, funding strategy or investment strategy – possibly as a result of changing legislative requirements.
- Assess if and how the funding of the pension plan should be amended in light of the latest financial information (including on the strength of the employer covenant).

If a funding strategy is going to achieve the funding objective it is important for the governing body of the pension plan to understand its current financial position and how the funding requirement is expected to develop in the future. This needs to cover:

a. How the funding position (ie the assets and liabilities) of the pension plan is expected to develop if the actuarial assumptions are borne out in actual experience; and

b. How the funding strategy will result in changes to the funding of the pension plan if the actuarial assumptions are not borne out in actual experience.

c. What level of security for members' benefits is provided by the current level of pension plan funding (generally assessed by considering the current solvency position).

d. What level of security for members' benefits is the funding strategy expected to deliver in future years, if the actuarial assumptions are borne out in actual experience (generally assessed by considering the expected development of the solvency position).

e. How members' benefits might be adjusted under future financial conditions.

The funding strategy can thus be tested to see if it is likely to deliver the security requirements (if any) within the funding objective – and hence whether any changes are needed to the funding strategy (or possibly the funding objective).

As the financing of a pension plan is a long term undertaking, it will often be necessary to look many years into the future to see how the funding of the pension plan is expected to develop and, for example, consider over what period the funding objective will be achieved.

It is possible that a funding strategy might be expected to meet the funding objective at some points in the future, but not at other times. It will then be for those responsible for the oversight of the pension plan to consider whether, in the light of such information, the funding strategy (or even the funding objective) needs amendment.

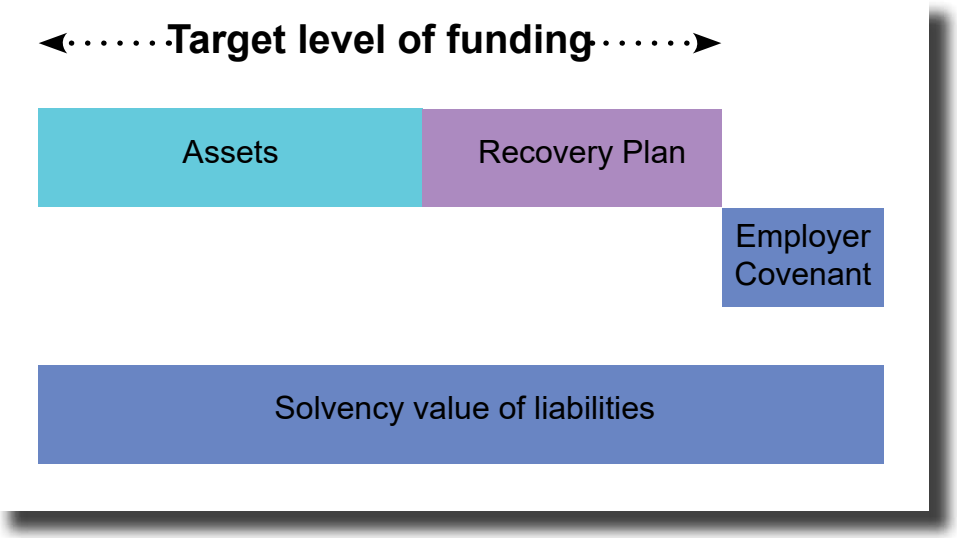
If a good understanding is to be achieved on the likely development of the financial position of the pension plan then the above questions can be tested against alternative financial and investment scenarios and possibly alternative experience with member elections, member options and demographic assumptions, including consideration of extreme scenarios.

The other key component here is the nature of the pension plan and whether:

a. The large majority of benefits are guaranteed, in which case the financial analysis may need to be integrated with consideration of the strength of the employer covenant (and the ability of the employer to continue to support the pension plan); or
b. The large majority of benefits are not guaranteed and will be adjusted in line with pension plan experience, in which case the financial analysis may need to consider how pension plan benefits may be adjusted.

a) Employer Covenant

Where the large majority of benefits are guaranteed then to the extent that the funding of the pension plan is less than solvency value of the pension plan liabilities, the pension plan is reliant on the strength of the employer covenant and / or external insurance (including a pension guarantee fund). It is very unusual for a numerical value to be put on the employer covenant. However, if the employer is expected to provide the necessary financial support for the pension plan to ensure that it is able to meet the promised benefits, then this implies a minimum value on the employer covenant which can be illustrated as:



In other words, the lower the target level of funding the more reliant the pension plan is on the financial resources of the employer to guarantee the delivery of the promised benefits. Conversely, if the funding objective is to achieve and maintain pension plan assets equal to the value of the solvency liabilities then the strength of the employer covenant is of less concern to the pension plan.

The development of the future financial position of the pension plan is important for considering whether the employer is going to be able to continue to provide the anticipated level of support for the pension plan. This may require not only a projection of the assets and expected solvency liabilities of the pension plan under the agreed funding strategy, but also consideration of the possible future growth (or shrinking) of the employer. Again it may be instructive to consider not only the future expected financial conditions but also alternative scenarios, including possible extreme scenarios. In this context it is important to note that the employer covenant is dynamic. It can change quickly and dramatically.

b) Adjusting benefits

If future experience is different from what was anticipated within the funding strategy (or there is a failure of the employer) then members' benefits may be adjusted. If this is the case, then a projection of the financial position of the pension plan (and consideration of the future of the employer) allows the following scenarios to be considered:

- When might pension plan members see an increase / decrease in their benefits?
- How might any increase / decrease in benefits affect different members (ie all members similarly or some members more significantly than other members)?
- What might be the size of any adjustment in members' benefits
- How would members' benefits be adjusted in the event of a failure of the employer?

By considering these questions (including under extreme scenarios) the ability of the funding strategy to deliver the funding objective can be tested (and amended if necessary). Additionally, this can help in member communications and managing members' expectations in terms of the likelihood and amount of benefits that will be delivered.

Development of future contributions

An understanding of the likely development of the contributions required under the funding strategy will enable consideration of:

a. Whether the funding contributions are likely to increase (or decrease) in the future, and hence meet any requirement within the funding objective for smoothed contributions

b. How the expected contributions compare to the likely growth of the employer and its ability to continue to meet the normal funding requirement

It can then assist the long term management of the pension plan to consider these questions under scenarios where the actuarial assumptions are borne out in actual experience and also scenarios where the actuarial assumptions are not borne out in actual experience, including stress testing for extreme events. This may be particularly relevant if the employer is in decline or if the mechanics of a regulatory funding requirement mean that it is likely or expected that funding contributions will need to increase (or decrease) in the future.

Actuaries have an important role to play in advising on some of the key questions associated with the future development of the financial position of the pension plan, including:

- **What is the likely growth of the assets and liabilities of the pension plan and how is this affected by any artificial constraints caused by the regulatory regime?**
- **What is the likely development of the pension plan asset and liability cash flows?**
- **How are the funding contributions expected to develop in the future, allowing for any constraints of the regulatory regime?**
- **What is the likely growth of the assets and solvency liabilities of the pension plan?**
- **How will possible changes in financial conditions (or demographic experience) affect the future funding requirement (including in extreme scenarios)?**
- **How will possible changes in financial conditions (or demographic experience) affect the future solvency liabilities (including in extreme scenarios)?**

7. Are the actuarial assumptions reasonable and appropriate?

Any assessment of the funding or financing of a pension obligation requires assumptions to be made about a number of financial and demographic factors, including:

- Rates of interest / investment returns / discount rates
- Rates of inflation (benefit increases)
- Rates of mortality

It may also need to consider other related factors such as:

- Future asset allocation
- Member behaviour (eg where members can exercise options)
- Future actions of the employer (eg its continuing willingness and ability to meet funding contributions)
- Future course of pension (or tax) legislation

There will likely be a range of assumptions which are appropriate ranging from assumptions that are most likely (or “best estimate”) through to assumptions where there is a high degree of caution or prudence built into the assumptions. Different assumptions will be appropriate for different purposes. Moreover, there will be an acceptable range of views on what is most likely or best estimate and also what is an appropriate margin for caution.

There are frequently challenges in setting actuarial assumptions to measure the funding objective. Firstly, there is likely to be a wide range of opinion on what is reasonable and appropriate given the funding objective and nature of the benefit promise. Then there is the equally tricky question of who sets the actuarial assumptions. Should it be the governing body, the actuary, the sponsoring employer, or someone else …? In many countries it may be that the main driver of the choice of actuarial assumptions is the regulators and regulations.

Pension Plan Funding

The range of appropriate assumptions is possibly best illustrated by considering a range of possible funding objectives / strategies.

a. At one extreme, where the funding objective (and investment strategy) is to maintain assets which are always sufficient to guarantee with a high degree of certainty the delivery of members' promised benefits then it will normally be appropriate to use actuarial assumptions which are likely to be achieved with a very high degree of probability (this may require the inclusion of margins)
b. At the other extreme, where the funding objective is simply to deliver targeted benefits with a reasonable likelihood then it may be appropriate to use "best estimate" assumptions.

Another situation where best estimate assumptions may be appropriate is where there is little or no likelihood of default on the promised benefits. This may be because there is an extremely strong employer standing behind the pension promises, or possibly because there is security of pension promises provided by insurance or other means.

It is unlikely to be appropriate to use actuarial assumptions that are less than 50% likely to be achieved. An exception to this may be where actuarial assumptions for pension plan funding purposes are prescribed by regulations. However it will still normally be appropriate for all parties to understand the implications of using the best estimate assumptions that are expected to be achieved and the impact of variability around these assumptions, for two important reasons:

a. Regulations can be changed
b. Parties involved in the oversight of the pension plan are likely to be interested in understanding the future financial position of the pension plan (as discussed in the previous sections) and whether there is a likelihood, or possibility, that the pension plan may not be able to pay the promised pension benefits.

Another situation where actuarial assumptions may be used that are less than 50% likely to be achieved occurs when there are incentives in the system (eg taxation) in a particular country to hold a level of pension plan assets which makes it unlikely that the pension plan will ever have a future surplus of assets over liabilities.

It will usually help consideration of the funding strategy for there to be an understanding of how experience may differ in the future from the assumptions adopted. This is likely to be the case whether or not the actuarial assumptions used are best estimate assumptions. It may be important to consider how much variation in experience is likely in the future and how robust is the mechanism for dealing with [adverse] deviations from assumptions.

The primary focus of this chapter is the appropriateness of the actuarial assumptions used in the funding of pension plans. However, it is also important to note that different actuarial assumptions may be appropriate for different purposes. In particular when looking at the cost (to the employer) or the value (to the employee) of the pension plan, different actuarial assumptions (from those used for pension plan funding) may be appropriate.

Economic cost to employers vs Cash funding cost

The employer's cash funding cost is not necessarily the same as the economic cost of the pension plan to the employer. This is because there may be risk attaching to the cash funding cost which has real economic cost to the employer. It is often the case that cash funding costs do not affect employers' underlying economic costs except:

a. to the extent that underfunding allows the shareholder (or taxpayer) the possibility of defaulting on benefit promises, or
b. if the pension plan represents a cheaper source of debt capital than other options, or
c. if members' benefits are likely to be varied according to the funding of the pension plan

If benefits are directly linked to investment (and possibly demographic) experience performance (i.e. the pension plan is essentially a DC plan) then, it may be the case that the economic cost of those benefits is just the cash funding cost. In such circumstances it will be appropriate to use actuarial assumptions for determining the economic cost to the employer which are largely identical to those used to determine the funding of the pension plan.

If the employer is responsible for underwriting deficits in the pension plan which cannot be passed on to pension plan members in the form of additional contributions or reductions in benefits, then this risk has economic cost which is additional to the funding cost of the pension plan. This additional economic cost can be determined by using actuarial assumptions for placing a value on the liabilities which reflect the guarantees which the employer is providing. These guarantees increase as employers are required (by regulation or otherwise) to hold assets in the pension plan as collateral against the pension promises they have made to employees. In particular, where employers are required to hold assets in the pension plan which are equal to the solvency value of the liabilities, then the economic cost to the employer of the pension plan is represented by the cost of the solvency liabilities.

If benefits are defined and guaranteed (and default options are low or negligible) then, broadly :

Economic cost = cost of matching DB liabilities with guaranteed investments

… provided such investments exist. Where they do not exist then assumptions are needed on the price of such theoretical investments as would be needed to match the liabilities.

This may be viewed as implying that in normal circumstances the economic cost to the employer of providing a guaranteed DB pension benefit should be assessed using actuarial assumptions which are certain to be achieved or likely to be achieved with a high degree of probability. Cash funding costs which assume higher investment returns from risky assets held against defined and guaranteed liabilities will typically understate true economic costs.

In some circumstances it may be cheaper to "borrow" from a pension plan (ie underfund) than borrow from a bank / markets and this can affect the assessment of the employer's economic cost. Similarly, if the cost of any insurance scheme or arrangement that exists to guarantee members' benefits is below the true market cost of such insurance (eg because of a Government subsidy) then this will affect the assessment of the employer's economic cost.

Agency costs can exist between company management and shareholders (or between government and taxpayers) to the extent that internal management models used to inform decision making or the accounting treatment of DB benefits show a recognition of cost which is below the economic cost. These agency costs can be exacerbated by underfunding / risky investment strategies which are sub-optimal from the perspective of the pension plan.

Economic value to employees vs Cash funding cost

Again, the value of the pension plan to the employee is not necessarily the same as the employer's cash funding cost for the particular benefits. This will be for several reasons (including member specific life expectancy) but in particular because there may be risk attaching to the delivery of the pension benefit which has real cost to the employee (particularly if this risk cannot be diversified).

As above, if benefits are linked to investment (and possibly demographic) experience then, broadly the economic value of those benefits may be considered to be just the amount of the cash funding (as for a DC plan).

If benefits are defined and guaranteed then, broadly:

> Economic value = value of matching guaranteed investment reduced by default risk

Where there is a risk of default arguably the value to the employee is further reduced due to inability to diversify that risk. This may be illustrated by an example:

> *If my life savings are tied up in a pension plan and the matching value of my benefit is worth $1m and if there is a default risk of 10% (ie there is a 10% risk that I will lose the entire pension benefit) then the theoretical value of my benefit might be 90% of $1m, ie $900,000. However if I cannot diversify (or buy insurance for) this default risk then such a high risk of default may be unacceptable. If I was able to trade this benefit and cash it in then I might be prepared to accept a value of $800,000. Hence in this case the economic value to me of this benefit is $800,000.*

However, it is also possible that the value to the employee is enhanced by the risk sharing opportunity offered by the pension plan, in particular the pooling of mortality / longevity risk.

Asymmetry of cost / value

When appropriate actuarial assumptions are chosen, it will often become apparent that the cost of a pension benefit to the employer is not the same as the value of that same benefit to the employee. This creates asymmetries of cost and value.

These asymmetries of cost and value exist particularly when there are default risks. Asymmetries often give rise to a temptation to mask default risks in assumption setting and in communications to members and other parties. This is done to minimise the consequences, possibly in terms of the economic or employee relations impact, of these asymmetries. However it can give rise to claims from pension plan members (or others) that they have been misled if risks are not transparently identified

and communicated.

Even where the actuarial assumptions are set by another party (or in legislation) actuaries have an important role to play in ensuring that their client understands the implications of the actuarial assumptions chosen and can assist in the transparent communication of the actuarial assumptions and the highlighting of risks contained therein.

8. Are the risks associated with the funding and investment strategies understood?

There are a number of key risks with a material likelihood of occurring, that most, if not all, pension plans face. Examples include

- Failure of the sponsoring employer (or material decline in the employer's ability to finance the pension plan) at a time when the assets in the pension plan are less than the value of the solvency liabilities
- Failure of the investment strategy to deliver the expected investment returns
- Demographic experience (in particular mortality) being very different from expected
- Inflation experience very different from expected
- Potential exercise of options under the pension plan (by members or others)
- Changes in regulations (eg introduction of or changes to an insurance guarantee plan)
- Significant change in benefits / liabilities caused by external event(s), eg a major redundancy exercise leading to enhanced benefits to members or earlier pay out of benefits

A challenge facing the design of funding and investment strategies in the light of these risks is that there are correlations between these risks which are not always easy to assess. So, for example, in a recessionary environment, there could be large scale redundancies, failures of employers, investment underperformance and an increase in the cost of any insurance guarantee arrangement. A financial crisis can trigger poor investment performance resulting in a decline in funding level and an increase in the contribution requirement just as the employer is least able to afford additional pension contributions. From a pension plan member's perspective there can therefore be a correlation between losing a job and also losing a large part of pension savings.

Additionally, there are numerous other risks (eg theft of assets) with a lower likelihood in a well-run and governed pension plan which could have a material impact on the financial position of the pension plan. There is also a moral hazard risk with any insurance or pension guarantee fund. Potentially pension plans are sometimes able to exploit the existence of a pension guarantee fund to take more risk within the pension plan to try to rescue it from a difficult situation in the knowledge that there is "back-stop" downside protection in the event of failure.

Different funding and investment strategies need to be more or less robust in their response to such risks and outcomes depending on the risk tolerance of the different parties to the pension plan. For example, a smoothing methodology in the calculation of the funding position may exacerbate the adverse impact of a prolonged investment underperformance and then a failure of the sponsoring employer – particularly if the smoothing mechanism reduces the transparency of the underlying risks within the pension plan. But this may not matter if the pension plan is not material in the context of the finances of the employer and there is negligible likelihood of a failure of the employer.

There are many different parties involved in a pension plan who need to have different levels of understanding about the risks affecting the pension plan:

- Governing bodies and those setting funding and investment strategies need an understanding of the risks within the strategies they are following so that they can judge whether these strategies are appropriate or need modifying;
- Employers need an understanding of the risks attached to the contributions to which they are committed so that they run their financial affairs and budgets properly and efficiently;
- Shareholders and suppliers of debt finance to employers need an understanding of the material risks to which they are exposed within their portfolios in order to make optimal decisions about portfolio design and allocations;
- Pension plan members need an understanding of the risks attached to the delivery of their benefits (or the amount of these benefits) so that they can make appropriate provision for their retirement;
- Providers of insurance and pension guarantee funds require an understanding of the risks they are underwriting so that they can price these arrangements correctly;
- Governments and regulators need an understanding of the overall systemic risks within pension plans generally so that they can make appropriate changes to rules and regulations.

The actuary is able to model the development of the financial position of the pension plan under numerous (including adverse) scenarios. By understanding how the pension plan will respond to an adverse outcome, those responsible for the oversight of the pension plan will be better able to judge whether the funding and investment strategies are appropriate (or need amendment) given the funding objective.

The subsequent challenge then is how these risks identified above can be assessed and communicated to all the different parties to enable them to make the optimal decisions they need to make. The quality and availability of risk information on pension plans varies considerably from country to country. Improvements in accounting standards have significantly improved the level of understanding of pension plan risks, but there are still many risks which are not transparent to the key parties involved.

Perhaps the most important party in this debate is the pension plan member. They are often the most significantly affected party and the party least able to manage the risks or even do anything about the risks attaching to their benefits. It is possibly for this reason that many countries have introduced and continue to introduce rules requiring the communication of pension plan financial information and risks to members.

Actuaries have an important role to play in helping their clients understand the risks associated with the funding and investment strategies and implications of "bad outcomes" particularly if these include the possible default on benefits and / or unexpected calls for further funding from the employer. Actuaries can also assist in the communication of these risks to pension plan members.

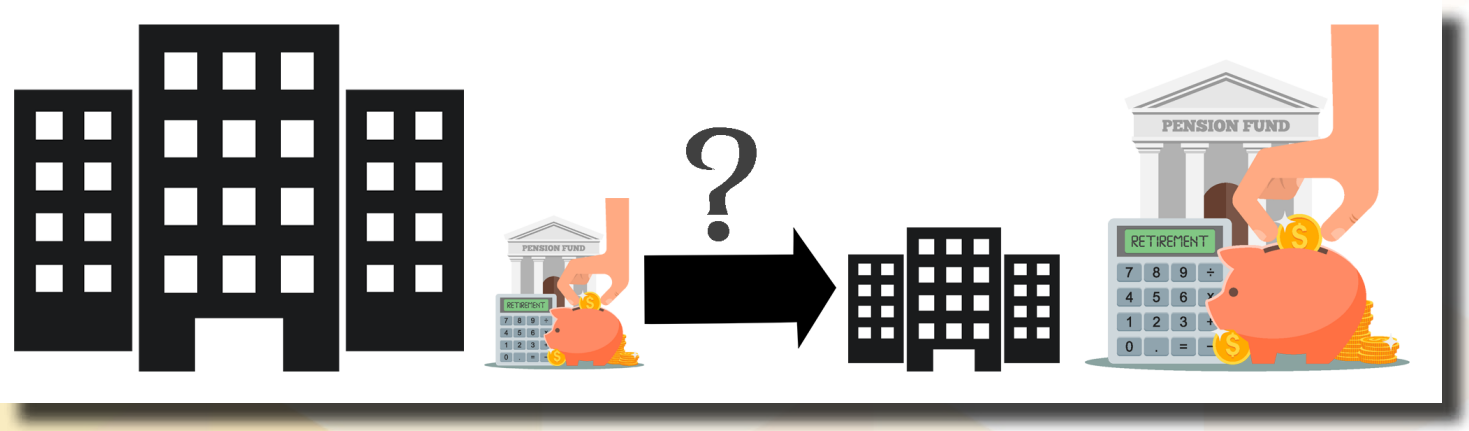
9. What is the impact and likelihood of the continued support of the employer?

The expected lifespan of most pension plans is much greater than the average lifespan of most corporate entities. Even public sector employers are not immune from the possibility of insolvency or dissolution. This means that a large number of pension plans will, with a high likelihood, have to face the possibility of managing the impact of the withdrawal of the employer's support.

It is also the case that the financing of a pension plan is a major commitment and in most cases it is difficult to achieve a large increase in pension plan funding, particularly if the need for a large increase in funding occurs at the same time as the employer is getting into financial difficulty.

Size of pension plan vs size of employer

When a pension plan is first established it is inevitably a relatively small financial entity in comparison to the employer. However, over time, a pension plan can be expected to grow significantly. Often a pension plan will grow much faster than the employer that is supporting it. Moreover a pension plan can continue to grow for many years even after an employer has gone into significant decline.



The ability of an employer to continue to support a pension plan may not be questioned when the size of the pension plan is very small in comparison to the employer. But if the employer starts to go into decline and the pension plan is still growing there could come a time when the financial risks represented by

the pension plan are too great to be borne by the employer. The actuary will not likely be in a position to project the growth (or decline) of the employer, but the actuary will be able to comment on the likely growth of the pension plan.

It is obviously sensible for the funding strategy and the investment strategy to have significant regard not only to the current relative size of the pension plan to the employer but also how this is likely to develop in the future.

Pension debt vs. Other corporate debt

A key factor in assessing the support of the employer to the pension plan is the extent to which any debt owed can be enforced by the governing body of the pension plan. A bank or other lender will normally ensure that it has powers to enforce a debt obligation owed to it by an employer. This will apply not only to the ongoing repayment terms but may extend to a charge or priority over assets in the event of an insolvency of the employer.

A pension plan and its governing body will likely have much less power to enforce any debt owed from an employer. The extent of any such powers that do exist will affect negotiations with the employer on funding and funding strategy, but may also affect how much risk the governing body may be willing to take in the management of the pension plan. It is therefore important for the governing body to understand not only its powers to enforce an ongoing debt obligation, but also its ability to recover assets in the event of an insolvency of the employer.

The existence and effect of insurance plans in some countries is also an important consideration when looking at the impact of a failure of the employer.

Role of the actuary

The actuary may not be best placed to assess the likelihood of the continued support of the employer, but the actuary will be able to advise on the impact of a withdrawal of the employer's support. In many countries the effect of the withdrawal of the employer's support can be significant and traumatic for the pension plan. It is therefore likely to be important for the governing body of the pension plan to have some regard to this possibility when setting the funding objective and the funding and investment strategies, and also to consider some contingency planning in the event that the employer's ability to continue to finance the pension plan starts to be called into question.

Actuaries will not necessarily have sufficient insight and knowledge on the likelihood of the continued support of the employer, but they still have an important role to play in highlighting the amount of the pension plan's reliance on the employer and the impact of the withdrawal of that employer support.

10. What conflicts of interest exist?

There are many conflicts of interest that can exist in the operation of a pension plan. These include:

- There is often a fundamental conflict between the employer's desire for lower pension plan funding and members' (and those responsible for the oversight of the pension plan) desire for higher pension plan funding.
- An individual responsible for the oversight of the pension plan may also be a representative of the employer, or a member of the pension plan, or both. Union members can be similarly conflicted.
- Different members of the pension plan may have different interests depending on how their benefits are affected by the existence of a surplus or a deficit in the pension plan funding.
- An employer may have more than one pension plan competing for limited funds.
- The actuary (or other advisers) may be simultaneously advising different parties with different interests.
- The actuary may have a statutory responsibility (eg whistleblowing) to a regulatory body which could conflict with his / her client responsibilities.
- Statutory bodies (eg regulators) will have interests and priorities which are often different for the parties directly involved in the employer or the pension plan.
- For agency reasons, the employers' interests may not always be aligned with those of the shareholders (in the private sector) or taxpayers (in the public sector).

The actuary can be well placed to understand the nature of many of these conflicts, which will often be linked to the financing of the pension plan and the risk of failure. The actuary is therefore generally able to advise on the nature and potential impact of the various conflicts of interest that exist.

Actuaries will often have specific and potentially conflicting roles:

- Advising their client(s), particularly where there is more than one [conflicted] client
- Duty to members (possibly within a general public interest responsibility)
- Duty to the profession (eg to maintain high standards of professionalism and integrity)

For conflicts of interest to be managed effectively and professionally they must be highlighted and transparent to all concerned.

Actuaries have an important role to play in helping their client understand the conflicts of interest that exist (and their possible impact) and in minimising their own conflicts as far as possible.

11. What information is provided to members?

For many pension plan members the value of their pension may be one of their largest assets and could represent their entire lifetime savings. It is therefore reasonable to expect that members will be given important information about their pension benefits. At a basic level it is perhaps important to ensure that the nature of the benefit promise is communicated to the member at the outset of the employment contract (and then regularly throughout employment and after employment ceases).

The basic information which members may need if they are to be able to make any assessment of the adequacy of their financial planning for retirement and the risks that might attach to their retirement plans, includes:

- The amount of their benefits and the terms of their payment
- The circumstances under which their benefits might be increased (or decreased)
- Any material risks that attach to the delivery of their benefits
- The impact of a failure of the employer on the benefits they expect to receive (including the resulting effect of any insurance scheme or arrangement)

This information may be essential if the member is going to be able to make sensible and optimal financial decisions and the actuary has a key role to play as part of a team that is charged with the preparation of this information.

However, it is unfortunate that the transparent communication to pension plan members of the risks attaching to their benefits is not always a priority for governing bodies or employers. Indeed they can often have strong disincentives not to be transparent about pension plan risks. For employers, it can reduce the perceived value that members attach to their employee benefits and hence to their overall remuneration. In extreme circumstances a transparent communication of risks may even encourage employees to withdraw their labour and work elsewhere. For governing bodies the highlighting of risks can potentially provoke pension plan members to raise concerns about the governance and the funding and investment strategies.

In many countries regulations require information to be given to members on the current funding level

of the pension plan and the plans in place that exist to get the pension plan up to full funding or up to its target funding level. However, as noted in chapter 3, this information can be dangerously misleading to members as it can imply that the pension plan has sufficient assets to provide benefits in full in all circumstances. For members to be able to get some understanding of the impact of the funding of the pension plan on the delivery of their benefits, it could be more helpful for members to be given information on:

a. the benefits they might expect to receive if the employer and the pension plan continue,
b. the benefits they might expect to receive if the employer withdrew its support for the pension plan or went into liquidation with immediate effect, and
c. how the benefits in (b) might be expected to change if the loss of employer support was at some point in the future

Actuaries have an important role to play in assisting on the communication to members of the risks (if any) attaching to the delivery of their benefits.

12. Conclusions

Actuaries have key responsibilities in the management of a pension plan:

1. Actuaries have an important role to play in explaining key questions relating to the funding objective:
   - How much security does the funding objective imply for pension plan members in the event that the employer is no longer able (or willing) to support the pension plan?
   - Does the funding objective allow the employer to defer (how much?) part of the cost of ongoing benefit accrual as it is incurred?
   - What proportion of member benefits are directly impacted by the funding position of the pension plan?
   - If the pension plan has a surplus can this be used (what proportion?) to increase benefits?
   - If the pension plan has a deficit, who is responsible (and how) for financing the deficit?
   - Does the funding objective meet or exceed (and, if so, by how much) regulatory requirements?

2. Actuaries have an important role to play in assisting understanding and advising on whether the funding strategy is consistent with the funding objective, and answer key questions on the funding strategy, including:
   - How much security for members' benefits does the funding strategy imply (both before and after the target level of funding is achieved)?
   - What is the cost of ongoing benefit accrual? How much of this cost does the funding strategy require to be met as the benefit is accrued? How does this cost vary by the risk in the investment strategy and within the benefits?
   - What is the likelihood that the funding strategy will deliver the targeted benefits (and any surplus distribution) for members and how many years will it take to reach full funding?
   - Does the funding strategy meet or exceed (and if so by how much) regulatory requirements?
   - Does the funding (and investment) strategy imply volatility in the cash funding requirement?

3. Actuaries have an important role to play in advising and helping parties to understand some of the key questions relating to the interaction of the investment strategy and the funding strategy:
   - How do the risks and rewards arising from the investment strategy affect the various parties to the pension plan?
   - How do risks in the investment strategy affect the volatility of the cash flows required under the funding strategy?
   - Is there consistency between the investment strategy and the funding strategy? Are the investment returns anticipated in the funding strategy (which may be dictated by regulatory or minimum funding requirements) achievable within the reasonable likelihood anticipated in the investment strategy?
   - Is the overall risk implied by the funding and investment strategies consistent with the pension plan's overall funding objective?
4. Actuaries have an important role to play in advising on some of the key questions associated with the future development of the financial position of the pension plan, including:
   - What is the likely growth of the assets and liabilities of the pension plan and how is this affected by any artificial constraints caused by the regulatory regime?
   - What is the likely development of the pension plan asset and liability cash flows?
   - How are the funding contributions expected to develop in the future, allowing for any constraints of the regulatory regime?
   - What is the likely growth of the assets and solvency liabilities of the pension plan?
   - How will possible changes in financial conditions (or demographic experience) affect the future funding requirement (including in extreme scenarios)?
   - How will possible changes in financial conditions (or demographic experience) affect the future solvency liabilities (including in extreme scenarios)?
5. Even where the actuarial assumptions are set by another party (or in legislation) actuaries have an important role to play in ensuring that their client understands the implications of the actuarial assumptions chosen and can assist in the transparent communication of the actuarial assumptions and the highlighting of risks contained therein.
6. Actuaries have an important role to play in helping their clients understand the risks associated with the funding and investment strategies and implications of "bad outcomes" particularly if these include the possible default on benefits and / or unexpected calls for further funding from the employer. Actuaries can also assist in the communication of these risks to pension plan members.
7. Whilst actuaries will not necessarily have sufficient insight and knowledge on the likelihood of the continued support of the employer, they still have an important role to play in highlighting the amount of the pension plan's reliance on the employer and the impact of the withdrawal of that employer support
8. Actuaries have an important role to play in helping their client understand the conflicts of interest that exist (and their possible impact) and in minimising their own conflicts as far as possible.

9. Actuaries have an important role to play in assisting with the communication to members of the risks (if any) attaching to the delivery of their benefits.

About the Authors

This monograph has been prepared by a subgroup of the Pensions and Employee Benefits Committee (PEBC) of the International Actuarial Association under the chairmanship of Charles Cowling. The PEBC wishes to thank all those who have assisted with the production of this monograph in particular, Charles Cowling, Heidi Rackley, Alf Gohdes, Masaaki Ono, Marius Du Toit, Esko Kivisaari, Jason Malone and Tonya Manning

This document has been approved for distribution by the Pensions and Employee Benefits Committee of the IAA and has not been subject to a vote by the Council of the IAA.

Appendix A - Quick View

Question	Australia	Canada	France	Germany	Ireland	Japan	Netherlands	South Africa	Sweden	UK	USA
What typically is the broad mix of pension plan benefits:											
a) Mainly fixed and guaranteed	A small proportion of the workforce, and of retirees, still enjoy legacy defined benefits that are mainly fixed and guaranteed.	Yes	Yes (except for indexation of benefits which is not guaranteed).	80%	Yes	Basically yes, but might be subject to disadvantageous amendments in the extremely serious situation.	Fixed but not guaranteed.	Benefits are largely fixed. However, pension increases are generally subject to affordability and hence not guaranteed.	Yes (except for indexation of benefits which is not guaranteed).	Yes	Yes
b) Largely discretionary or variable	Most retirement plans are defined contribution (accumulation) arrangements with a minimum level of contributions but variable investment performance.			20%							
What is the overall tax treatment for DB pension plans?	"The system can be characterised as TTE but subject to certain caps and restrictions.	Employer contributions are tax-deductible up to a certain limit determined by federal regulations. Investments earnings are tax-free. Participants will be taxed at collection of pension assets at retirement.	EET	EET	EET	E T(currently suspended) T(with generous deductions).	EET	Like any other fund in South Africa, DB pension plans are subject to the EET system.	ETT	EET but with the ability for members to take part of their retirement benefit as a tax free cash sum.	Employer contributions are tax deductible (within limits); mandatory member contributions are after-tax and, as a result, rare. Investment earnings on trust assets accumulate tax free. Members are taxed on the benefits they receive (subject to a recovery rule if the member made mandatory after-tax contributions).
Are there any other tax benefits or limits that affect the funding of DB pension plans?	Yes, there are also limits on contributions over and above the concessional caps.	Yes. Upper limits on benefits as well as contributions are set by the government on a yearly basis.	Yes	No	Not at present – there was a levy on pension assets from 2011 to 2015 as part of Ireland's "austerity measures".	No	Yes	Contributions can be deducted up to 27,5% of salary, subject to a maximum of R350 000 per annum. Contributions in excess of this limit will not receive favourable tax treatment.	No	Yes	Yes. The Internal Revenue Code (IRC) limits the level of compensation used in determining benefits and also limits the level of benefits that can be paid by a tax-qualified DB plan. The IRC also limits the amount of contributions employers may deduct, though since 2008, the limit is quite high and rarely a factor except in the first year or two of a new plan's existence.

Question	Australia	Canada	France	Germany	Ireland	Japan	Netherlands	South Africa	Sweden	UK	USA
Are there any minimum funding regulations?	Yes – there are minimum funding and solvency requirements, and defined benefit arrangements must be subject to ongoing actuarial control.	Yes. Minimums are determined by governments to ensure a minimum level of funding of the plans	For the sponsor company no but for the funding vehicle yes the insurance Code, the Code de la sécurité sociale and the Code de la Mutualité.	Yes (though not formulaic)	Yes	Yes	Yes	The value of assets must exceed the value of liabilities on the basis as decided upon by the valuator in conjunction with the trustees. There is a statutory limit of 3% on the risk premium that can be assumed for assets such as equity.	Not in legislation but normally included in collective contracts.	Yes	Yes
Are there any maximum funding regulations?	No	Yes	There is an old fiscal text that states that the sponsor company cannot pay contributions that will be deductible from the P&L account should the plan funding position be above the PBO.	Yes (implicit)	No – although in cases of extreme overfunding Revenue might require action to be taken	Yes	No	No	No, except that tax deductibility disappears.	No	Yes, the IRC has maximum tax-deduction rules; contributions in excess of the deduction limit are subject to an excise tax.
Is there regulatory oversight of pension plans and their funding?	Yes, by the Australian Prudential Regulatory Authority (APRA)	Yes	None on the company sponsor side provided it respects fiscal and social security rules but the funding vehicle Insurance company or when it will exist FRPS	Yes	Yes - Pensions Authority	Yes (MHLW and its Regional Bureaus)	Yes	Yes, all pension plans are subject to regulation by the Registrar and all plans are required to perform a valuation at least every 3 years, and submit the valuation report to the registrar.	Collective contracts normally regulate, and there are some regulations for pension foundations. Funding in insurance companies falls under insurance regulation.	Yes, the Pensions Regulator	Yes
Can members' benefits be reduced in extreme circumstances (other than employer insolvency)?	Accrued defined benefits cannot be reduced.	Yes. Special legislation has been introduced in rare instances but also occurs in the bankruptcy of employers with a pension plan that is not fully funded (below 100% funded)	It could under conditions. Indeed, a benefit can be instituted by referendum, by a collective agreement or by unilateral decision by the employer. So, if the benefit is not mentioned in the employment contract and the benefit has been instituted by unilateral decision, the employer can modify benefits. It is not a common practice.	Yes, by the pension fund; but the reduction must be assumed by the employer	Yes – by application to the Pensions Authority [Section 50 of Pensions Act 1990 as amended]	Yes	Yes	Yes, where a pension plan finds itself in an unsound financial position and there are no alternative remedies, benefits that have not yet accrued may be reduced.	No, except reduced indexation.	No	SE plans may not reduce members' accrued benefits. ME plans facing future insolvency may reduce benefits payable to nondisabled retirees under age 80 (with a phase-out between ages 75 and 80) to 110% of the PBGC-guaranteed amount if doing so is expected to avoid insolvency, the Treasury Department approves the suspension, and other conditions are met. As of December 31, 2016, the Treasury Department has approved only one application to suspend benefits, but it cannot proceed unless a member vote ratifies the suspension.

Question	Australia	Canada	France	Germany	Ireland	Japan	Netherlands	South Africa	Sweden	UK	USA
In the event of a withdrawal of employer support (e.g. through insolvency):											
a) Is the pension plan wound up?	Yes	Yes		Not necessarily	Yes	Yes	Normally yes but because fully funded not immediately	This depends on the rules of a plan, but generally, should the employer withdraw its participation for whatever reason, the plan would be liquidated. If the employer merges with another entity, the business of the plan may either be transferred to the plan of the new entity or it can be liquidated.	Various actions are possible; merger with or transferrals to other plans	Yes	SE plans are wound up if assets are sufficient to cover all benefits, and taken over by the PBGC otherwise. ME plans cover more than one employer and withdrawing employers may owe withdrawal liability; PBGC provides financial assistance to pay benefits after plan assets are exhausted, but plans generally are not wound up.
b) Can the pension plan call on other external funds?	No	Yes through governmental actions		Yes, if these exist	No – except in double insolvency situations where benefits will be topped up to minimum levels by the State	No	No	There is a statutory requirement that minimum benefits (as defined in the Act) must be paid, and should the assets be insufficient to cover this, the shortfall would be a debt against the employer.	No	Yes	PBGC attempts to recover assets from the sponsor (and other controlled group members) of a failed SE plan. ME plans assess withdrawal liability to employers, with payments often spread over 20 years.
c) Are members' benefits paid in full or cut back?	If there are insufficient assets benefits would be cut back, but the minimum funding regulations are intended to prevent this.	Will be dependent on the financial situation of the plan as well as the possibility to get assets from the employer	The pensions in force are paid by the Insurer so normally they are not at risk. As for the actives and the deferred they lose everything since benefits are not guaranteed prior to retirement, or they are paid up to the amount on the insurance contract.	They may be cut back	Benefits are cut back if there are insufficient assets in the plan to provide them	Benefits are cut back if there are insufficient assets in the plan to provide them.	Normally in full		Vested benefits will be paid	If there are insufficient assets in the pension plan, it may fall into the Pension Protection Funad and then benefits are cut back – typically to 80%-90%	They are paid up to PBGC maximums
What information on the financial positon of the pension plan is the actuary to the pension plan required to give to the pensions plan governing body as part of the actuarial valuation (or financial review) of the pension plan?											
a) Ongoing funding position	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
b) Funding position on best estimate assumptions	Yes	Yes			Yes	Yes	No		Yes	Yes	Discount rate and mortality assumptions are prescribed for SE plans; all other assumptions are best estimate. Yes for ME plans.
c) Funding position on solvency assumptions	Yes	Yes			Yes	Yes	Yes	Yes	Yes when funding in insurance, otherwise no	Yes	Not generally, but SE plans with large unfunded liabilities must report this information to PBGC in annual 4010 filings.

Question	Australia	Canada	France	Germany	Ireland	Japan	Netherlands	South Africa	Sweden	UK	USA
d) Contributions required to restore / maintain ongoing funding position	Yes	Yes			Yes	Yes	Part of the required recovery plan		Yes	Yes	Yes
e) Likely future development of funding position	Yes	Not in great detail but enough information is provided in an actuarial valuation in Canada to determine from an external point of view.			Yes	No	Part of the required recovery plan		Yes	Yes	No for SE plans, but many actuaries provide this information as a risk metric. ME plans actuaries must certify a 10-year projection of funding standards.
f) Frequency of providing this information	Every 3 years, or every 1 year if there are pensions in payment.	Annually to Triennial depending on jurisdiction and financial situation of plan.			Every 3 years	Annually	Every year	Every 3 years	Annually	Every 3 years	Annually
Is the governing body of the pension plan independent from the employer?	Yes, the Fund is held in a Trust. The Trust is typically governed by a corporate trustee.	Yes	Yes if the funding vehicle is an Insurer and for FRPS governance standards will apply.	Bipartite representation of members and sponsor	Trustee body must act in the interests of members but the Trustees are partly or wholly appointed by the employer.	Legally Yes in the case of fund type DBCP, and No in the case of contract type DBCP.	Yes	Yes, a pension plan is governed by an independent board of trustees. Member elected trustees must comprise at least 50% of the board.	No	Yes	Not for SE plans. ME plans are governed by a joint board of trustees with equal employer and union representation. But when carrying out fiduciary functions, both SE and ME plan trustees and administrators must act in the best interests of plan members, independent of their responsibilities to the employer. Independent trustees may be retained in connection with particular transactions, such as annuity buyouts.
Are the advisers to the pension plan independent from the employer?	In some circumstances the plan Trustee and employer will seek separate and independent advice, as a matter of good governance practice, but there is no requirement to do this. s information required to be given to members on:	Yes	Nomally yes	Theoretically yes	The advisers are not normally employees but advisers may also advise the employer on pension issues. Note actuaries are required to have protocols in place in this situation with both parties.	Yes	Yes, the individuals. Not specifically the organisation they are part of.	There is no statutory requirement that advisers should be independent.	Normally yes	Yes	Generally yes.

Question	Australia	Canada	France	Germany	Ireland	Japan	Netherlands	South Africa	Sweden	UK	USA
Is information required to be given to members on:											
a) their pension plan benefits	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes, plans must provide triennial benefit statements or annually notify members how they can obtain benefit statements
b) the financial position of the pension plan	Yes	Yes	No	Yes	indirectly – members are entitled to see the valuation report	Yes	Yes	Members are entitled to see the valuation report.	No	Yes - ongoing funding only	Yes, an annual funding notice must be provided that shows the current funded status of the plan
c) the risks attaching to the payment of their benefits	No	No	No	No	benefits indirectly – members are entitled to see the valuation report	No	No		No	No	Yes. The annual funding notice includes a summary of plan termination rules and plan benefits eligible to be guaranteed by PBGC (including the limitations on the guarantee and the circumstances under which those limitations apply).

Appendix A1

Case Studies – Australia

Key Issues

- The large majority of pension ("superannuation") arrangements are DC.
- A few historic legacy DB plans exist in the private sector largely providing lump sum benefits at retirement. Most of these are in multi-employer trusts with a professional trustee company acting as the Pension Plan Manager.
- In the public sector there are still a number of legacy DB plans. These are typically more generous than private sector plans and some include pension benefits.
- Regulatory oversight is provided by the Australian Prudential Regulatory Authority, which has a focus on governance and risk. There is heavy regulation and obligations on actuaries in relation to minimum funding. Deficits usually have to be financed over 3 years.
- Pension Guarantee Scheme – There is no Guarantee Scheme but the Government has power to award compensation in the event of loss due to misconduct and levy other plans to finance this conpensation.
- Some public sector plans are established by statute and sit outside the wider regulatory framework. They are still subject to actuarial control and disclosure requirements, but some are significantly underfunded, having historically been unfunded.

Private Sector

Typical DB benefit structure

Where defined benefits are provided in the private sector, they are almost always lump sums rather than pensions. The vast majority of Australian private sector employees are now in defined contribution arrangements, but some of these funds include, in sub-funds, closed groups of "grandfathered" members entitled to defined benefits or to minimum defined benefits payable in specific circumstances. Australia was one of the first countries to move towards closing defined benefit plans to new entrants, so it is not unusual for these sub-funds have been closed for 20 years or longer.

These remaining defined benefits typically accrue as lump sum retirement benefits at rates of the order of 15% to 20% of final average salary for each year of service or membership.

In addition to the lump sum nature of retirement benefits in Australia, another unusual feature is the high level of vesting on those lump sum benefits. Australian defined benefit and defined contribution arrangements are subject to a minimum Superannuation Guarantee under legislation. The Superannuation Guarantee minimum is fully vested which in practice means that there are many defined benefit plans where there is little difference between resignation and retirement benefits.

Australian superannuation funds (both defined benefit and defined contribution) typically include death and disability insurance cover.

It is difficult to identify a "typical" benefit structure, because in most of these cases the employer has chosen to continue to provide the defined benefits to a closed group until the last member retires, precisely because the benefits are complex and atypical. It is possible to terminate a defined benefit plan in Australia, however legal impediments mean that their closure to new members has been more common than complete termination.

Regulatory Framework

Private sector superannuation is provided through trust funds, which are required to be registered with and licenced by the Australian Prudential Regulatory Authority (APRA), the primary body responsible for regulation of private sector funds. All superannuation funds are heavily regulated under the statutory and regulatory framework in place, which includes Prudential Standards published by APRA. Much of APRA's focus is on governance and risk management, with the same requirements applying in relation to defined contribution funds and hybrid funds that include small closed groups of defined benefit members.

APRA's Prudential Standards require that defined benefit arrangements must be subject to ongoing actuarial control, and imposes obligations on actuaries in relation to the funding. These include requiring reporting to APRA in some circumstances – in particular if a fund is in an unsatisfactory financial position (which is defined as not having sufficient assets to meet vested benefits if all member were to resign). Where a fund is in an unsatisfactory financial position the trustee is required to develop a plan to return the fund to a satisfactory financial position, generally within three years.

Taxation System

Benefits paid on retirement after age 60 are tax free. However tax is payable on investment returns earned by the fund (at a concessional rate), and tax is payable by the Trustee on employer contributions to the fund (also at a concessional rate, subject to a cap), which are tax deductible to the employer. Member contributions are not tax deductible. Employer contributions above a cap lose their concessional tax treatment. However, the cap that applies to contributions to a defined benefit arrangement is "grandfathered" with reference to the benefits in force prior to the introduction of the cap.

Insurance / Protection System

There is no guarantee fund or insurance/protection, but the Government has a specific power to compensate superannuation fund members in the event of failure of a fund due to misconduct, and to levy the superannuation industry to fund this compensation.

Governance

All superannuation funds are trust funds licenced by APRA. Most defined benefit plans are in multi-employer trusts with a professional trustee company. There are a small number of corporate funds with equal employer and member representation on the trustee board. There are a number of Prudential Standards that fund trustees must comply with, including one relating to fund governance. The trustee of the trust is responsible under legislation for setting the plan investment strategy, but the employer is typically responsible for setting funding contributions.

Public Sector

Typical DB benefit structure

There are a small number of funds still in existence that provide defined benefits for employees in the public sector and government authorities, and some of these provide lifetime pensions. Only a very few are still open to new entrants, and new employees generally receive defined contributions. The DB benefit structures are typically rather more generous than in the private sector, and some of these funds have pensions in payment in respect of former employees who retired some time ago.

Regulatory Framework

Some public sector funds are subject to the same legislative and regulatory framework as private sector funds and are regulated by APRA, but some are established by statute and are outside that framework. Some of these have elected to comply with APRA's Prudential Standards on a voluntary basis. All public sector DB funds are subject to actuarial control, and some are significantly underfunded, after being historically unfunded.

Governance

Funds that are APRA regulated are subject to exactly the same Prudential Standards as private sector funds. Statutory funds are not, but are typically subject to requirements to publish reports as public entities and to scrutiny as part of the political process.

Appendix A2

Case Studies – Canada

Key Issues

- A pension committee, usually made up of employer and member representatives, typically takes the role of the Pension Plan Manager.
- DB plans in the public sector are common. Governance varies by province but member involvement is normal. Employers typically control benefits and contributions.
- Regulations vary by province but typically require minimum funding tests against two funding objectives – Solvency and Going Concern. Any deficits must be funded over prescribed periods. This has been 5 years for solvency and 15 years for going concern but temporary relief measures are currently in place, as a result of recent market conditions. Solvency requirements do not always apply in the public sector.
- Pension Guarantee Scheme – Only one province provides a guarantee system.
- Pension plan funding (including the funding of deficits) is often shared jointly by employers and employees.

Private Sector

Establishment of a Defined Benefit plan by an employer is voluntary in Canada. Approximately 12% of workers in the private sector participate in a DB plan which is well below the 30% coverage in the early 90's[1]. Plans are typically sponsored by a single employer but in some instances plans are established by a grouping of employers in Jointly-Sponsored Defined Benefit Plans (JSPPs).

DB plans typically provide:

- Benefits based on various formulae including:
    * A percent of final earnings multiplied by years of service
    * A flat dollar amount times years of service
- A level lifetime income generally commencing at age 65. Surviving spouse benefits or other death benefits are usually available on an actuarially equivalent basis.
- Early retirement benefits often available on a reduced basis.
- Single sum payments in lieu of lifetime income are increasingly available in many plans on an actuarially equivalent basis.

Regulatory Framework

Plans are subject to regulations in the legislation in which they are registered. Plans must respect certain minimum coverage rule as governed by the legislation under which they are registered, such as minimum vesting. Many provinces will require immediate vesting on benefits. The same framework will apply for minimum funding rules. In general, authorities will require that plans measure the present value of accrued benefits under two bases – Solvency and Going Concern.

Under the going concern basis, the present value of accrued benefits are measured with an ongoing approach with an interest rate that approximates the expected asset return on a long term basis. Actuaries will often build in some margins for adverse deviation within the assumptions.

Under the solvency basis, the accrued benefits are measured as if the plan would terminate and be wound-up on that day. The Canadian Institute of Actuaries publishes guidance on the assumptions to use for this basis. The assumptions are selected following a survey of the annuity market for benefits that would be transferred to an insurer following the termination and the current governmental bond market for benefits that would be paid in a lump sum.

If a deficiency on either basis exists, an amortization schedule will be established based on regulations in the legislation the plan is registered in. In general, any deficiencies are funded over a 15 year period on a going concern basis and 5 years under the solvency basis. Several relief measures have been put in place in the past decade that has modified the length of amortization to reflect the low rates and poor investment returns. It is common in Canada for employees to contribute to the funding of the plan.

In JSPP's, the employers and the members are jointly responsible for the governance of the plan, including all decisions about the terms and conditions of the plan, any amendments to the plan as

1 Statistics Canada

well as the funding requirements. Both employees and employers are responsible for the funding requirements and usually share equally the funding including any contributions for reducing the shortfall if any.

Public Sector

Approximately 83% of public sector workers are covered by a DB plan which is considerably higher coverage than the private sector. General structure of benefits is similar to the private sector but most benefits are based on a percent of final average earnings multiplied by years of service and the indexing of benefits for inflation is much more common in the public sector.

Regulatory Framework

The funding requirements are very similar to the private sector. Certain jurisdictions do not require funding under a solvency basis. The other major difference is the share of the employee contributions. It is common for employees to pay half of the accrual cost. There is an increasing trend in which the employees are asked to contribute a portion of the amortization of the deficit reduction contribution.

Governance

The governance structure of pension plans varies depending on the jurisdiction in which they are registered. The exact responsibilities of the pension committee and how the committee is appointed vary by jurisdiction. In one jurisdiction, the pension committee is required for all registered pension plans and must be represented by the employer, active and inactive participants. Ultimately, in most circumstances, the employer holds most of the decision making for benefits and contributions.

Taxation

For all plans, contributions made by employers and employees are exempt from current taxation. Investment income generated by the trust assets is exempt from taxation at all times. Benefits paid to participants from the trust are taxed as ordinary income.

Appendix A3

Case Studies – France

Key Issues

- No formulae minimum funding rules
- Pay as you go unfunded schemes that cover 1st and 2nd pillar pension provision for both private and public sector (with €300 billion in 2014) represent the bulk (98%)of the €306 billion of pensions paid each year in France. Supplementary funded schemes represent only 2% of the total of pensions paid.
- The 2nd pillar schemes, AGIRC and ARRCO, are facing financial difficulties. Benefit cuts have been introduced and further cuts are expected.
- Private Sector is a DC or savings accumulation environment
- Public Sector is a more generous DB environment. The pension promise amounts to 75% of base pay (which excludes premiums and indemnities that account for 20% to 25% of total pay)
- Pension Guarantee Scheme – Yes, the FGAP, but it only covers up to €70 000 per annum per individual
- Treasury consultation launched in October 2015 to consider the regulation of French pension plans - ("FRPS") in light of Solvency II coming into force on January 1st, 2016 and the expected adoption of IORP II in mid-2016. Key issue – should pensions be more like insurance? How do you create a level playing field between pension plans and equivalent insurance plan? What is the "right" balance

between higher risk / higher reward and lower risk / lower reward? A key technical issue is managing the transfers to FRPS. This consultation should be finalised in 2017 and the Insurance Code amended to take into account the final provisions of the FRPS.

- Governance: The French supervisor of banks and insurers is the ACPR. Before approving an FRPS the ACPR will assess its technical and financial means & the skills, reputation and experience of the management - a fit and proper approach.

Private Sector

French pension environment

There are many 1st Pillar pension plans in France. 67% of pensioners receive their pension from the general scheme (private sector), 20.3% from the régimes spéciaux[2] (16.6% correspond to the state civil service, the territorial and the hospital sector) 8.2% from the agricultural social security scheme and 3.9% from the self-employment schemes. Funded private sector DB pension plans in France are not material. According to the 2016 study from the Direction de la recherche, de l'évaluation et des statistiques (DREES) of the €306 billion of pensions paid in 2014, €300 billion was for the mandatory 1st and 2nd pillar pay as you go plans. The funded pension plans in the second pillar and private third pillar represented just €6.7 billion. On average these funded plans represent between 2.1% and 2.3% of pensions paid and 4.3% of the €283.8 billion of contributions paid in 2014.

Separate unfunded pension plans cover employees for the 1st and 2nd pillars. For salaried employees CNAV (Caisse Nationale d'Assurance Viellesse - The National Retirement Fund of Public Social Security) covers the 1st pillar and the ARRCO-AGIRC schemes cover the 2nd pillar. For certain employers and their salaried employees, special regimes and rules can apply for 1st and 2nd pillar pensions (includes Banque de France, CNIEG Electricity and Gas employees).

Historically, large reserves were accumulated in the AGIRC (for management employees) and ARRCO (for all employees) pension arrangements. But over the years due to a combination of demographic and financial factors these reserves have fallen significantly. An agreement was reached on 30th October 2015 to avoid AGIRC running out of reserves in 2018 and ARRCO running out of reserves in 2027 (they are not permitted to run into deficit). ARRCO and AGIRC will merge in 2019, pensions are frozen, and contributions are increased. The measures will not prevent future deficits so cost-of-living increases to

2 Régimes Spéciaux cover all State civil servants, magistrates and state workers; regions; departments and communes; public departments and communal establishments not having an industrial or commerical character; activities which entail affiliation to the insurance scheme for French seamen; mining enterprises and assimilated enterprises; the French national railway company; secondary and local interest railways and trainways; operations for the production, transmission and distribution of electricity and gas; the Bank of Finance; the National Theatre of the Opéra de Paris and the Comédie Française.

further pension reform is expected after the 2017 Presidential elections.

France has seen since five major pension reforms: 1993 Balladur, 2003 Fillon, 2010 Woerth, 2014 Touraine and the October 30th 2015 AGIRC-ARRCO agreement. These reforms have stabilised the cost of pensions to 14% of France's GDP and given France two records

- Pensioners enjoys a standard of living equal to 100-103% of employees, and
- French pensioners currently enjoy some of the longest pension durations averaging 23 years for men and 27 years for women.

But due to economic and demographic factors and in response to looming pension deficits, the future will not be so great for the next generations of pensioners. It is not sustainable for France to continue to commit 14% of GDP committed to pensions against 8% to 10% in many other countries.

Reforms will lower the level of pensions for future pensioners. Whereas the generation born in the 1940s got a pension of around 75% of final salary, this is expected to drop to 50% for those born in the 1990s. Management employees who currently get around 60% of their pension from AGIRC-ARRCO will be the hardest hit. A recent study from the Conseil d'Orientation des Retraites (COR) showed that the last October 30th 2015 reform of AGIRC-ARRCO will imply for those born in 1960 a 6% cut in pension for management employees and 3% cut for non-management employees that want to retire at the minimum legal retirement age and for those born in 1990 the cuts will be 10% and 6% respectively.

Regulatory Framework

The French insurance supervisor is the "Autorité de Contrôle Prudentiel et de Résolution (ACPR) - a member of the European Insurance and Occupational Pensions Authority (EIOPA). France (with Sweden) opted for the regulation of article 4 of the June 3, 2003 European Directive (2003/41/EC) and the Council allow them to run occupational retirement provision business of insurance companies (IORPs) with specific rules different from those of the Directive. In such case all assets and liabilities corresponding to such business must be ring fenced, managed and organised separately from the other activities of the insurer, without any possibility of transfer. The adoption of the Solvency II directive in November 2009 has had an impact on French IORPs – see section below on FRPS (Fonds de Retraite Professionnelle Supplémentaire).

Insurance / Protection System

The FGAP is an insurance protection system created in 1999. But it covers only up to €70 000 per annum per individual. The protection of the insured is one of the ACPR's statutory objectives.

Governance

The ACPR Regulator oversees the whole governance and regulation of insurers and therefore for insured pension products in France. Insured are provided with annual updates on the funding of their insured pension product except for DB article 39 contracts since they are 100% funded by the employer and there is no vesting prior to retirement for potential pensions beneficiaries.

Taxation System

Pension plans benefit from both fiscal and social security contributions within some limits.

Public Sector

Typical DB benefit structure

In recent years, the rules governing the retirement of civil servants have come close to those of the Régime Générale, for example, all retirement ages will be gradually increased by two years. But the DB calculation formula of the retirement pension for civil servants differs from that for private employees. At full rate it is generally 75% of the average of the last 6 months of base pay (this excluding ancillary remuneration i.e. premiums and indemnities which represent between 20% and 25% of total pay). As with the Régime Générale, it can be discounted when it is not collected at full rate or increased when civil servants retire late.

Regulatory Framework

There are two types of Public Sector Schemes (which are governed by separate regulations):

- Local Authority Schemes and civil servants from public hospitals (unfunded)
- Central Public Sector Schemes (unfunded)

In addition the funded DC scheme the “Régime Additionnel de la Fonction Publique” (RAFP) was created by a 2003 Law and implemented in 2005. Contributions to the RAFP are based on premiums to compensate for the exclusion of ancillary remuneration from the retirement formula, and capped at 20% of gross base remuneration.

Governance

The Local Authority and Public Hospital Scheme is governed by the Caisse Nationale de Retraite des agents des collectivités locales (CNRACL).

The Central Public Sector Scheme is governed by the Service des Retraites de L’État (SRE) under the authority of the Ministry of Finance and Public Accounts (DGFIP).

Fonds de Retraite Professionnelle Supplémentaire (FRPS)

In light of the introduction of Solvency II from 1st of January 2016 the French Treasury has launched a consultation on its impact on French IORPs. This consultation will consider the modification of the prudential requirement of IORPs (introduced by article 303 in the 25th November 2009/138/CE Solvency II Directive) in order to ensure a level playing field between IORPs and life insurance companies which carry occupational pension business (under the regulation of article 4 of the 2003/41/ EC IORP Directive) after the coming into force of the Solvency II Directive.

For life insurance companies which carry pension business, the possibility of extending the optional applications of IORP’s prudential requirement laid in article 17, to this ring fenced business will be

assessed. Transitional measures must allow a level playing field between all structures running pensions until an appropriate prudential regime for occupational retirement business has been found.

With the adoption of the Solvency II Directive an IORP under article 4 falls under Solvency I regulation up to 2019 and Solvency II regulation after 2019 unless a home member state choose to apply Solvency I to ensure a level playing field. The ACPR and the French Treasury are split between allowing rules closer to IORP I or IORP II drafts. Essentially this is a choice between investing in higher risk / higher returning assets or lower risk / lower return assets in order to protect the security of members' benefits – and learning the lessons of the shortfalls that UK, Irish and Dutch pension funds face.

Under French pension insurance regulations the insurer cannot come back to the plan sponsor of a DB plan to ask for additional contributions or reduce the pension once the pension has started to be paid. For DC plans once the premium is paid and invested in € the insurer must guarantee premiums invested plus a minimum interest rate which is a function of average yield on bonds with a certain rating over a given period.

The "Institut des Actuaires" has set up a task force that is to provide an answer to the French Treasury copied to the Secretariat General of the ACPR.

Transfers to FRPS are the main technical issue. On what basis will the liabilities and (more problematically) the assets of the pensions business be transferred from the general insurance portfolio to the FRPS? How to split unrealized capital gains or losses both on equities and bonds? How to take into account the tax and accounting provisions linked to investing and divesting?

Stress Tests: Another technical issue relates to the scope of the stress tests and how they must be conducted, mainly what market scenario must be retained, especially when markets have already gone down, i.e. the equity dampener that exists under Solvency II - over what horizon, 10 years or over 10 years must future premiums be taken into account.

Practical issues on the reporting and processes to be respected when transfers occur are being addressed : multiple transfer of similar pension schemes require a reporting for each transfer or one by family, how will apply the proportionality principle considering the difference of size between insurers, etc..

Governance of the FRPS: The ACPR (French supervisor) before delivering the approval to a FRPS will assess its technical and financial means & the skills, reputation and experience of the management. It is close to a "Fit and Proper" approach.

Appendix A4

Case Studies – Germany

Key Issues

- The large majority of current retirement benefits in payment (approx. 80%) are delivered by state benefits that are funded almost exclusively on a pay-as-you-go basis; approx. 10% is from individual and 10% from company pension plans.
- Although over half of company *pension plans* are provided by book reserved plans, i.e. plans that are covered only by a company's general assets, most companies have set aside insolvency-proof arrangements to cover these liabilities with financial securities; the average funding level on an IAS 19 basis of these arrangements is approx. 50%.
- Approximately 45% of company *pension plans* are provided through funded plans under the oversight of the German financial services authority, BaFin[1]. These plans are regulated similar to insurers – with some important exceptions.
- Solvency reserves (including reserves for self-insured risk benefits) must meet minimum requirements.
- BaFin monitors that actuarial valuation method and assumptions are consistent, including the discount rate and best estimate demographic assumptions.
- *Pension Guarantee Scheme:* The German Pensions-Sicherungs-Verein aG (PSV) stands as last guarantor for most types of company pension plans.
- Measures to correct surpluses or deficits require approval of BaFin, the directors of the fund and the appointed actuary.

1 Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin

Private Sector

General

Although similar to other countries' corporate pension regimes, there are a few elements of Germany's that are slightly different, but in important respects.

Firstly, the level of state benefit was initially designed to provide a level of earnings-related retirement income that was well above subsistence level. Company-run retirement arrangements today thus largely fill only a tertiary role in augmenting the state retirement benefit and privately organized personal savings. Over the population as a whole, only approx. 10% of total retirees' income currently comes from private sector company-sponsored arrangements, approx. 10% from private savings and the rest from state-run arrangements (or those substituting the state system, such as funds for the independent professions).

Secondly, of all funds currently accumulated in company-sponsored retirement arrangements, only about 45% is subject to regulation by the financial services authority, BaFin. This is because the German Pensions Act permit company-sponsored retirement arrangements to be delivered by five different tax-approved vehicles: promises delivered directly (also called "book reserved"), or via a support fund, insurance, Pensionskassen and/or Pensionsfonds. While the latter three vehicles are regulated, only the latter two are covered here. Well over half of company pensions are provided by book reserved arrangements under which the sponsoring employer either notionally sets unallocated internal company assets against its retirement obligations or specifically allocates ring-fenced financial instruments that are effectively restricted to pay only retirement benefits. About half of the non-regulated obligations are funded, typically not in a regular pattern but rather irregularly.

Finally, on the legal side, all company pension arrangements (regulated or not) are subject to a single Pensions Act, which has its roots in labour and not tax law. A very large body of literature and jurisprudence has developed around both these speciality areas. Company-run retirement arrangements that are regulated, additionally fall under many but not all provisions in the Insurance Supervisory Act and are therefore regulated similarly to insurers – with some important exceptions.

The following applies only to the Pensionskassen and Pensionsfonds pension plans.

Typical plan provisions

At the time of writing, as at the end of 2016, the German Pensions Act is in the process of being revised. A new feature expected to be introduced into the Act is an arrangement without any guarantees i.e. a true defined contribution (DC) arrangement.

Typically, although lump sum benefits are not unknown, an annuity benefit is granted to both the beneficiary and the surviving spouse. Payment of the benefit will commence upon early, normal, late or disability retirement or, for the surviving spouse or dependants, upon death of the member or the beneficiary.

Vesting occurs immediately for the employee-financed portion, whereas the employer-financed portion

is required to be vested, as a minimum, according to the prevailing conditions of the Pensions Act. These are currently the attainment of at least age 25 and 5 years' of company service.

For members, only a return of the in-service member's contributions is typically granted upon leaving service before attainment of the agreed vesting conditions. After fulfilment of the agreed vesting conditions, the benefits accrued are either transferred to another fund or upheld in the form of a deferred benefit payable after service termination upon early, normal, late, disability retirement or, for the surviving spouse or dependants, upon death of the member or beneficiary. The same conditions for payment apply for leavers as for continuing active members.

Benefits are calculated according to written "operating rules" of a pension fund. For funds providing "insurance-related" benefits, these documents contain the rules on how benefits are determined (either contribution-related or not), how contributions are calculated (if relevant), the actuarial valuation method of obligations for financial statement purposes, governance principles to the extent not contained in the regulatory framework, and other matters. Funds may also provide benefits granted in defined benefit plans that are "not-insurance-related", under which the operating rules typically primarily defines the benefits and secondarily describes the methodology for funding.

Regulatory Framework

The regulatory framework is based on principal legislation under which pension funds are registered with and regulated by the BaFin. This framework stipulates that a suitably qualified actuary be appointed to the fund (the appointed actuary). Subordinate regulation is issued by the legislator and the BaFin providing guidance on the interpretation of the principal legislation.

The primary purpose of the regulatory framework for pension funds is to ensure that the funds can meet future benefit payments as they fall due. The fund must submit annual financial statements and statutory actuarial valuations at least once every three years to the BaFin.

Each fund is a legal entity in its own right with its own set of operating rules.

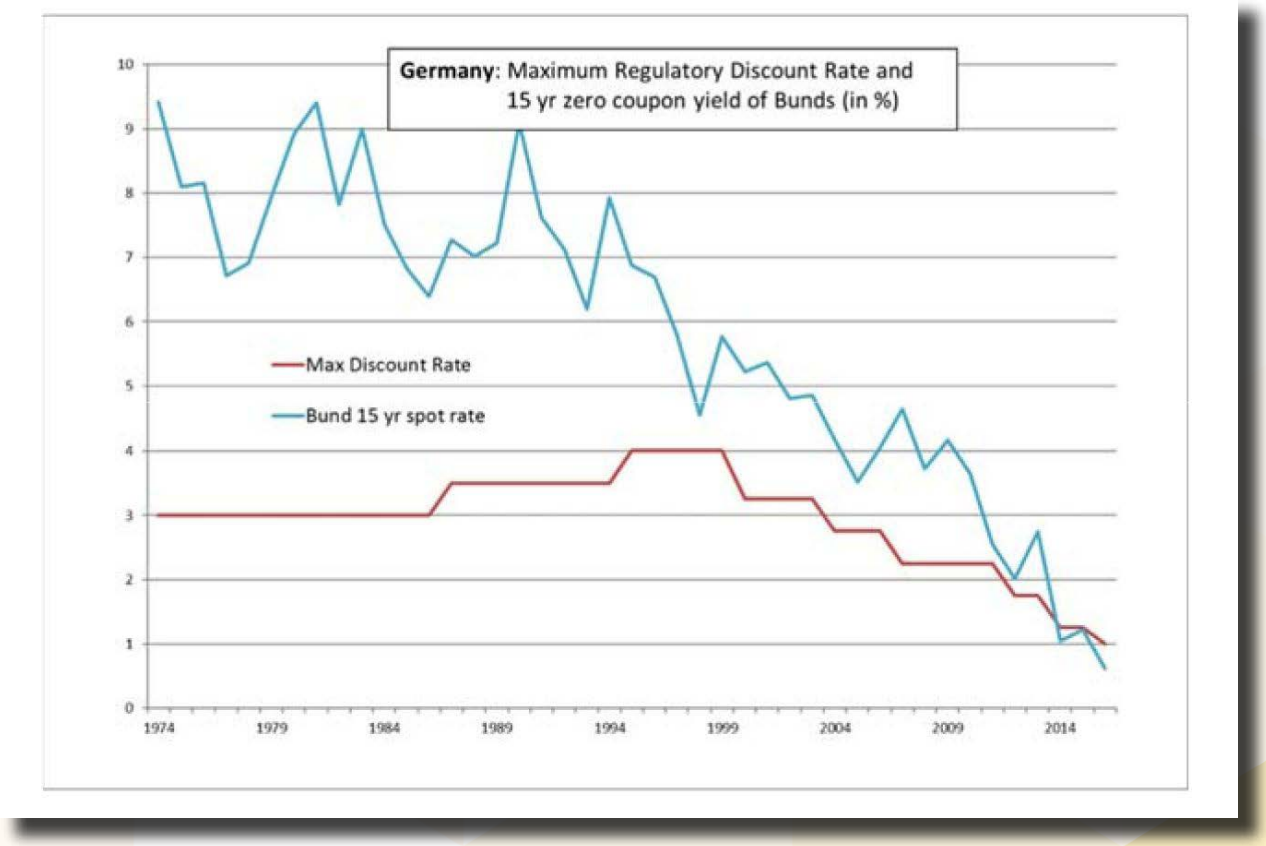
The BaFin issues guidance in terms of a consistent actuarial valuation method and basis in terms of which statutory actuarial valuation reports have to be prepared. This guidance includes the basis for determining the actuarial surplus in a fund. The appointed actuary determines the amount of surplus or deficit. After consultation with the appointed actuary, the fund's directors propose an appropriate distribution of surplus in the form of increased (or decreased) benefits or in the form of an allocation to reserves. The distribution of surplus is required to appropriately reflect the sources of the surplus if it is to be distributed to members and beneficiaries in the form of benefit increases or it is required to be applied to strengthen reserves.

The regulatory guidance requires that best-estimate (or better, tending towards being conservative) demographic assumptions be used in the determination of the obligations for financial statement purposes (technical reserves) and in translating contributions into deferred benefits, if appropriate. This means that assumptions are to be chosen that are realistic, depend on the nature of the relevant risks and obligations, and are guided by past experience, as modified by any knowledge or expectation of the future, including events which impact the expected experience.

The regulatory guidance also defines a maximum discount rate that the pension fund can use when determining its obligations for financial statement purposes (technical reserves) and, if appropriate, the discount rate used for translating contributions into deferred benefits. The pension fund can apply a lower rate if it so chooses but the rate is then fixed and, because of its use in determining the level of deferred benefit, is effectively a guaranteed return on investment on contributions made. Since the discount rate is specified in the initial operating rules required to be approved by the BaFin, this rate is designed to remain fixed for the term of the contract.

There is no actuarial valuation method prescribed for pension plans except that it must meet the principles established by the BaFin.

In principle, over any given year, investment returns have to earn at least the guaranteed discount rate, any losses from adverse demographic experience and any cost for administration and investment management. Any residual amount is essentially the actuarial surplus that can be distributed to members and beneficiaries in the form of benefit increases or to strengthening any contingency reserve and solvency requirements.



Since investment returns have come under increasing pressure since the global financial crisis 2007/8 (see chart above), the question is how pension funds can react to “make ends meet”. There are several measures that can be taken, the most important of which are:

- The discount rate can be reduced for new entrants only (thereby reducing the level of benefits for each given amount of contribution in comparison with the existing population) and the rate for the

existing population left unchanged; or

- according to the extent of the annual surplus available, the rate for the existing population can be reduced appropriately, thereby strengthening the technical reserves and lowering the target guaranteed interest rate; or
- if the terms of the operating rules allow, the benefits can be reduced; or
- if the sponsor is willing and able, he can provide additional contributions to the fund; or
- contingency reserves can be released into income to meet any deficits; or
- any excessively conservative assumptions can be changed to be more realistic; or
- other actions or combinations of the above can be effected.

Most of the above actions require the consent of the BaFin, the directors of the fund, the supervisory body and its appointed actuary. This makes the process not always practically expedient.

In his annual or triennial report the appointed actuary is required to assess whether the discount rate(s) used in determining the technical reserves are appropriate. In doing so, the actuary should consider this separately from the point of view of new entrants and of the existing population, taking special consideration of the expected investment return on the fund's assets as well as the expected future demographic experience.

The solvency reserve, which includes a risk reserve for self-insured risk benefits, must meet minimum levels prescribed in the regulatory framework. Contingency reserves may be accrued too, subject to approval of the BaFin.

If the balance sheet of a pension fund recognizes a deficit, a recovery plan must be submitted to the BaFin to restore financial soundness within a prescribed period.

Pension Guarantee Scheme

Founded in 1974, the Pensions-Sicherungs-Verein aG (PSV) guarantees benefits granted by employers as at the point of bankruptcy or discontinuation. It guarantees those promises financed directly by the sponsor, by Support Fund or by Pensionsfonds. Pensionskassen and direct insurance arrangements are deemed not to require such protection. The level of guarantee is defined in primary legislation and is capped in amount and quality. For example, indexation for pensions in payment is not granted. The average level of coverage (by value) is approx. 80%.

Governance

Funds are managed by directors that are subject to supervision by a separately appointed supervisory board or, alternatively, by the members' assembly. As in most continental European countries, trust law does not exist in Germany. The fiduciary duties of the directors are set out in the regulatory framework.

Public Sector

In some respects, the same rules apply as for the private sector. However, in one important respect public sector funds differ significantly from those of the private sector: civil servants' pensions are typically not funded at all, but are run on a pay-as-you-go basis. The pension arrangements of employees in the public sector are only funded at a level of a specified number, e.g. five, of future years. Also, they are subject to supervision by the federal or state governments and not by the BaFin.

Appendix A5

Case Studies – Ireland

Key Issues

- Pension Plans are established under trust and are managed by trustees who are independent of the employer
- The legislation governing pension plans is the Pensions Act 1990, and the regulator is the Pensions Authority
- The trustees appoint an actuary to certify compliance annually with the statutory funding standard, which is reported to the Pensions Authority
- If the actuary is unable to certify that a pension plan meets the statutory funding standard, a funding proposal (recovery plan) must be submitted to the Pensions Authority
- It is possible to reduce accrued benefits (with the approval of the Pensions Authority) if a pension plan does not meet the funding standard and is unaffordable
- There have been significant numbers of closures or restructuring of plans in recent years. Most plans have closed to new entrants, and a considerable number are closed to future accrual of benefits
- About 70% of pension plans met the funding standard at their last certfication date
- The long-term funding of the plan is determined by reference to actuarial valuations which are carried out at least every 3 years

Private Sector

Typical DB benefit structure

A pension plan is established under trust by a single employer or group of connected employers, with one acting as principal employer. Benefits are usually based on service and final salary e.g. a pension of 1/60th of final salary (perhaps averaged over the last 3 or 5 years) for each year of pensionable service. Many plans are integrated with the State Pension, either having an explicit offset from benefits or by a deduction from salary e.g. pensionable salary may be defined as salary less 1.5 times the State pension in a 1/60th accrual plan. The Plan rules define a normal retirement age (NRA), usually 65, and there are provisions which permit the member to take the pension early (voluntary or ill-health) or late, generally on actuarially neutral terms and subject to employer and/or trustee consent.

Members normally have an option to commute part of their pension for a lump sum at retirement. The rate of exchange may be set out in the rules of the plans e.g. €9 cash for each €1 p.a. pension or may be determined by the Trustees on actuarial advice. Pensions almost always carry a contingent spouse's pension (50% or 66.67% of the pension) payable on death after commencement of pension to a surviving spouse or civil partner. There is also commonly a guarantee that payment of pension at the full level will be made for a minimum period e.g. 5 years. Post retirement indexation of pensions may be guaranteed under the rules, or there may be a discretionary practice, although in recent years many plans have not granted discretionary increases, partly due to the low inflationary environment.

Members generally contribute to the plan whilst in employment – contributions are commonly in the range 3% to 6% of salary (or pensionable salary, if integrated). Members may also pay additional voluntary contributions (AVCs) to provide additional benefits, traditionally expressed as added years of service but in almost all plans, AVCs are now invested on a defined contribution basis, and the accumulated funds taken at retirement as (part of) the retirement lump sum, or transferred to an Approved Retirement Fund (ARF).

In most pension plans, the balance of cost of providing the benefits under the pension plan is met by the employer and this is determined based on triennial actuarial valuations: the rules of each plan will state who determines the amount to be paid – employer, trustees, actuary, agreement between two or all three. The employer has the right to terminate contributions at any time but this may lead to a requirement to make additional contributions, depending on the relevant provisions of the plan documents.

Plans also normally provide death in service benefits – a lump sum expressed as a multiple of salary (maximum 4 times) and a spouse's/partner's pension (typically 50% or 66.67% of the member's expected pension), as well as children's pensions payable until the child reaches age 18, or ceases full-time education.

On leaving, members who meet the preservation requirements (2 years' service) become entitled to preserved benefits payable from NRA, which must be revalued in the period between leaving and NRA in line with the change in the Consumer Prices Index (CPI), with a maximum of 4% increase in any year. They have the option to take a transfer value in lieu of their preserved benefits to their new

employer's plan or a personal pension (although the amount available for transfer may be reduced if the transferring plan does not meet the statutory funding requirements).

There have been significant numbers of closures or restructuring of plans in recent years, prompted by big increases in employer contribution requirements and the economic crisis. In particular, most plans have closed to new entrants, and a considerable number are closed to future accrual of benefits i.e. members accrued benefits (usually DC, but possibly career averaged DB) in respect of service after a certain date. The accrued benefits may retain the link to future salary increases, or may be linked to inflation. Accrued benefits have been reduced in some cases by application to the Pensions Authority – a common approach was to remove a guarantee of post retirement increases where this was written into the rules. In some cases, NRA has been increased to reflect recent and future increases in the State Pension Age (66 in 2014, 67 in 2021, 68 in 2028).

Regulatory Framework

Occupational pensions (DB and DC) are subject to the requirements of the Pensions Act 1990 as amended. The Pensions Authority is charged with the supervision of pension plans and in particular receives annual information from the scheme actuary on the position of the plan relative to the statutory funding standard.

The statutory funding standard requires a plan to have sufficient assets at the date of certification to provide for expenses of wind-up, purchase annuities for retirees and pay a standard transfer value (calculated based on assumptions determined by the Pensions Authority) for those not yet retired. Since 1 January 2016, a plan is also required to hold a risk reserve calculated on a basis set out in legislation which reflects the extent to which liabilities are backed by assets other than bonds and cash, and any duration mismatch between bond assets and plan liabilities. If a plan cannot meet the standard, the Trustees must submit to the Pensions Authority a funding proposal (recovery plan) designed to rectify the position over a period. About 70% of pension plans met the statutory funding standard at their last certification date.

The trustees must appoint an actuary (who holds a Scheme Actuary practising certificate issued by the Society of Actuaries in Ireland) to undertake the calculations and sign the required certificates.

Taxation System

Plans must obtain approval from Revenue in order for tax reliefs to apply, and in practice all plans do meet the requirements for approval e.g. maximum benefit limits of a pension of 2/3rds of final remuneration. This entitles members to tax relief (within specified limits) on their contributions to the plan, and exempts them from taxation on the employer contributions. Investment growth is essentially tax free, and on retirement a member may take a tax-free lump sum (within limits) and pension payments are taxed as income. A penal tax is charged if a member's lifetime pension is valued in excess of €2m.

Insurance / Protection System

The Government introduced legislation in 2012 which provides for a minimum level of benefits in cases of double insolvency i.e. employer and pension plan both insolvent. In general, this level is 50% of

accrued entitlements, but for pensioners this is increased to the lesser of 100% of benefits and €12,000 p.a. (with no allowance for future increases). If the plan's assets are insufficient to provide these benefits, the State will top them up to this minimum level.

Governance

Plans are managed by Trustees who are generally appointed by the employer, but in many cases some (up to 50%) may be nominated/elected by the Plan members. A growing number of plans now have an independent professional trustee, either as sole trustee or as one of the trustees (often appointed as Chair). Trustees have a number of obligations placed on them by the Pensions Act and the regulator, including preparation of an annual report and accounts, preparation of a Statement of Investment Policy Principles, regular actuarial valuations and certification etc. as well as the overriding requirements of trust law. Trustees are required to undergo appropriate training.

Public Sector

Typical DB benefit structure

The traditional public sector pension structure was a pension of 1/80th plus a lump sum of 3/80th of final salary for each year of service, with pension increases in retirement linked to the pay increases awarded to current employees. Public sector schemes are generally unfunded, as are some semi-state arrangements.

With effect from 1 January 2013, all new public servants must join a new career average scheme with pension increases in retirement in line with CPI. Retirement age for these members is set at State Pension Age, although members have the option to continue after that age.

Regulatory Framework

Public sector schemes are generally established by legislation and financial reviews are carried out periodically.

Governance

Public sector schemes are managed by relevant Government departments.

Appendix A6

Case Studies – Japan

Key Issues

- **Private Sector** Unfunded post-employment lump-sum allowance plans and funded pension plans are common
- Twin-track approach of going concern and discontinuance funding tests for funded pension plans. The responsible entity, sponsoring employer or pension fund, sets the actuarial assumptions for the going concern valuation and the funding schedule, on the advice of the actuary. Actuarial assumptions for the discontinuance valuation are largely prescribed by Government.
- Funded pension plans should be managed on the basis of the mutual consent between labour and management. Pension plans may be subject to disadvantageous amendment if certain criteria are met.
- Pension Guarantee Scheme - There is no insolvency protection for funded pension plans. Limited insurance applies to unfunded lump-sum plans.
- At the end of March 2014, the average funding ratio of Defined Benefit Corporate Pension (DBCP) plans was 115% on an ongoing basis, 110% on discontinuous basis, and 90% on Japanese GAAP basis.
- **Public Sector** Unfunded plans were in operation before October 2015. Funded occupational pension plans (cash balance design) were implemented for future service in October 2015. Transitional arrangements apply for pre October 2015 service.

Private Sector

Typical DB benefit structure

Particularly for smaller employers, an unfunded, post-employment lump-sum “allowance”. Main characteristic are:

- voluntary
- various benefit formulae - the most commonly seen are i) final pay plans, ii) point based plans, and iii) fixed Yen plans
- benefits are not vested during the term of employment
- benefits may be reduced or removed in case of serious misconduct

Defined Benefit Corporate Pension (DBCP) plans have developed as external funding vehicles usually by transferring all or part of pre-existing unfunded lump-sum allowance plans. The main characteristics are the same as for lump-sum allowances above, plus:

- Designed to provide an income for at least 5 years (large companies often provide an income for life with a guaranteed payment period, but usually the income is for a certain period only, typically 10, 15 or 20 years) but with a lump-sum option
- interest rates used to defer payments until pensionable age, to convert lump-sum to annuity and to revert it to lump-sum (lump-sum option) may be fixed or variable linked to market interest rates
- usually without indexation

Regulatory Framework

An employer can implement a Defined Benefit Corporate Pension (DBCP) plan by either obtaining a ministry acknowledgement to set up a DBCP plan provision (contract-type) or receiving a ministry approval to establish a DBCP Fund (fund-type). The DBCP law stipulates that the employer in the contract-type and the Pension Fund in the fund-type are the respective entities responsible for plan design and plan management (including investment of assets).

Although the actuarial function is usually outsourced for funded plans, the law provides that the responsible entity is accountable for the actuarial assumptions and funding schedule. Actuarial documents are signed by the Certified Pension Actuary and submitted to the ministry by the responsible entity. Actuarial standards of practice to engage in services concerning the funding of a DBCP are provided by the JSCPA (Japanese Society of Certified Pension Actuaries).

Actuarial valuations should be performed every year. Funding standards for DBCP plans are based on the twin-track approach of an ongoing test and a discontinuance test. The responsible entity should proactively set the actuarial assumptions and the funding schedule, taking advice from the actuary.

- Actuarial assumptions for the ongoing valuation should be reviewed at least every 5 years. The discount rate should be determined rationally based on the expected long-term rate of return on the plan assets (a typical assumption currently is around 2.5%pa). There is no explicit margin for prudence or solvency. The deficit should be amortized over a period between 3 and 20 years.

- Actuarial assumptions for the discontinuance valuation are largely prescribed by Government. The discount rate is revised every year based on the average yield of long date of Japanese Government Bonds (currently a discount rate for discontinuance valuation is 1.76% pa). As vesting is not common, the definition of accrued benefits used in the discontinuance valuation is different to that for the ongoing valuation. If the annual amount necessary to make up the funding deficiency on the discontinuance basis exceeds that on the ongoing valuation, the excess has to be made by the employer on a tiered basis (over not more than 5 years to restore funding to 80% ; over not more than 10 years to restore funding to 90% ; and over not more than 15 years to restore 100% funding).

At the end of March 2014, the average funding ratio of DBCP Plans was 115% on an ongoing valuation and 110% on a discontinuance valuation, based on 620 DBCP Plans polled by the Pension Fund Association. By contrast, the asset to liability ratio on Japanese GAAP was 90% for funded plans, based on financial reports of 957 publicly listed companies for the fiscal year ending March 2014.

Taxation System for funded plans

Exempt – Taxed (currently suspended from 1999) – Taxed (with generous deductibility)

Insurance / Protection System

If a company with an unfunded (post-employment allowance) plan goes bankrupt, its employees' unpaid allowances and wages are covered under a Workers' Compensation Insurance operated by Government. Coverage is up to 80% but subject to an upper limit which is low relative to the size of the typical benefit.

Funded plans (EPFs) were subject to a different termination insurance programme until March 2014. The programme was eliminated as part of the pension reform in 2013. Funded plans are not now subject to any insolvency protection.

Governance

The DBCP law provides that pension plans should be managed on the basis of mutual consent between labour and management, given requirements on funding, fiduciary duties, and disclosure. The Ministry of Health, Labour and Welfare (MHLW) regulates and supervises DBCP Plans. Members of the board of trustees of the pension fund could be subject to penalties if they are found negligent in their duties. Those who do not obey Government orders or make false reports will be subject to fines or sanctions. The MHLW can also remove / replace the trustees of a pension fund.

Law permits disadvantageous plan amendment provided that the sponsoring entity suffers financial distress and Government concedes that the amendment meets the procedural criteria such as the proper explanation to and the consent of the related participants.

If the sponsoring entity and its participants agree and Government authorizes, a DBCP plan can be terminated. In this case, if the plan has an unfunded liability on its discontinuance basis, the sponsoring entity should make good the deficit. The assets of the terminated plan will be distributed to plan participants and beneficiaries as lump-sum payments based on the plan's provisions.

Funded pension plan participants are provided with annual updates on the management of the plan, including plan design, funded status, and investment policy.

Public Sector

Typical DB benefit structure

Public sector employees typically receive both an unfunded post-employment lump-sum allowance plan (based on the final basic salary) and, prior to October 2015, an unfunded pension plan expressed as an addition to social security (the "occupational addition"). The occupational addition used to be equal to 20% of the earnings-related social security pension benefit for private employees.

Following the unification of social security pensions for both the private and public sectors effective from October 2015, funded occupational type pension plans were implemented as successor plans to the occupational addition. The main characteristics of the new pension plans are:

- applicable to the period from October 2015
- cash balance benefits with the interest credit rate based on the interest rate of JGB
- half of the notional account is converted to a whole life annuity payable at 65
- the rest of the account is converted to an annuity payable for either 10 or 20 years certain ; a lump sum option is also available for this component
- early or deferred retirement benefit available on actuarially neutral terms

Regulatory Framework

Lump-sum allowance plans are unfunded and governed separately (at Government, prefecture and municipality level as appropriate).

The new occupational plans are funded for service after October 2015 and governed separately by the central and local government associations with the financial interchange mechanism between them. Transitional arrangements apply to the occupational addition for service prior to October 2015.

Governance

There is no explicit financial regulation for lump-sum allowance plans. They might be governed as part of general budget of each government.

The actuarial valuations of the new occupational plans, together with those for the transitional occupational addition attributable to the past service, will be performed by Government actuaries at least every 5 years.

Because Government reviews every 5 years the state of equilibrium between the total benefit level of the lump-sum and pension benefits payable for public and private sector employees, public sector benefits may be adjusted based on the results of the review. At the last review, the unfunded lump sum allowance was reduced by 15%.

Appendix A7

Case Studies – Netherlands

Key Issues

- Funded pension plans are common in the Netherlands.
- There are no differences between plans in the Private Sector / Public Sector / Industry-Wide Sector.
- There are prescribed minimum funding rules with some smoothing of discount rates allowed. The calculation of minimum funding is risk based, with funding requirements increasing in line with the level of risk in the pension plan.
- There has been lots of recent change to increase financial security (with a new financial assessment framework), introduce stricter funding rules and reduce tax incentives
- There is pressure on solidarity flat rate contributions .
- Indexation of pension benefits is permitted only if strict financial conditions are met.
- Reductions in pension entitlements and rights are possible.
- There is a shift of investment risks on to beneficiaries
- There are extensive prudential and material requirements on the operational, technical and financial aspects of pension plans
- *Pension Guarantee Scheme* - No. Benefit reductions can be applied when recovery to full funding is not possible.

General

The Dutch pension system consists of three pillars: the basic pension (AOW), the supplementary collective pensions and private individual pension products that each person can arrange. The Dutch basic pension (AOW) is a pay-as-you-go system. The second pillar is financed by capital funding. In the Netherlands there are three different types of pension plans: industry-wide pension plans, corporate pension plans and pension plans for independent professionals. Pension plans are non-profit organizations. Operating as foundations they are independent legal entities and do not form part of a company. The pension plan will therefore not be directly affected if a company gets into financial difficulties.

In the Netherlands there is no obligation by law to become a member of a pension plan. But if the social partners decide to provide a pension plan for their employees, the Government can make a pension plan mandatory for an entire sector or profession. The features of the pension plan are determined by employers and employees, and this is the case for both corporate as well as industry-wide pension plans. There isn't any difference in benefit structure, regulatory framework, taxation, insurance/ protection or governance between the private and public sector, represented by the ABP pension fund for civil servants and teachers.

At the moment many changes are in progress in the Dutch pension system. For instance, with regard to retirement age, benefit accrual rates, governance, communication and financial assessment.

Typical DB benefit structure

In the Netherlands, the majority of pension plans are DB plans. In recent years many of these plans have been converted from final salary to average salary plans. Approximately 90% of active participants are nowadays member of an average salary plan with conditional indexation.

Retirement Benefits: normally 1.875% pensionable salary for each year of service (Average pay system).

Spouse's Pension: Usually 70% of projected or actual old age pension.

Regulatory Framework

The Dutch Central Bank (DNB) examines the financial position of the pension plans. DNB assesses whether the pension plans are financially healthy and whether they can be expected to fulfil their obligations in the future. The DNB is also responsible for substantive regulation, such as monitoring that pension plans comply with the standards set for them.

On January 1, 2015 a new financial assessment framework (FTK) for pension plans is relied upon for pension plan oversight for evaluating funding requirements, mandate funding recovery plans, and determine permissible changes to benefit levels (benefit reductions and indexation).

The FTK is built around the principles of market valuation, risk-based financial requirements and transparency. Market valuation means that investments and pension obligations are valued in the same way. The technical provision is determined by discounting expected future cash flows against the

current nominal term structure of interest rates. The calculation of regulatory own funds is risk-based, so that the requirements increase and decrease in line with the pension plan's exposure to risk. Finally, transparency is aimed at obtaining and disclosing a clear and objective view of the pension plan's financial position.

Other changes resulting from the revision of the FTK:

- Discount rates will be based on the new UFR approach for periods after January 1, 2015, and will result in lower discount rates compared to the current UFR approach.
- Higher solvency buffers will be required in order to realize the legally required degree of certainty (97.5%).
- It remains possible to smooth discount rates over a (maximum) period of 10 years to determine the required contributions. It also remains possible to use the expected return on assets (as a discount rate) to determine the required contributions under certain conditions, including financing and future conditional indexations (instead of the solvency buffer).
- A 12-month moving average funding ratio will be introduced as policy measure, replacing the current point estimate funding ratio. It will be relevant for decisions related to indexation, benefit reductions and recovery plans.
- Stricter funding rules will apply for indexation, while benefit reductions, if necessary, will be smoothed over time:
    * Indexation will not be allowed at funding ratios below 110%.
    * Indexation must be future-proof.
    * Current recovery plans no longer apply and will be replaced by rolling 10-year recovery plans when funding ratios are below the full funding level.
    * Benefit reductions will be required when recovery to full funding within 10 years is not expected. Reductions will amount to one-tenth of the deficit.

Further benefit reductions apply when funding ratios are below 105% and a fund doesn't expect recovery to full funding within 10 years is economically viable.

The Dutch Authority for the Financial Markets (AFM) monitors the behavior of pension plans, in particular regarding the obligations to provide information to members.

Taxation System

In the Netherlands a pension benefit is only taxed when it is received (EET). On January 1, 2015, a new law introduced TEE for pension accruals above €100,000. Reductions in tax incentives for pensions took effect on January 1, 2015. Key changes :

- The maximum accrual rate for tax-favored, career-average pension plans has been reduced from 2.15% to 1.875% for retirement at age 67.
- The maximum accrual limit for tax-favoured, final-pay plans has been reduced from 1.9% to 1.657% for retirement at age 67.

- Pensionable salary under tax-favoured defined benefit and defined contribution plans will be capped at €100,000 per annum (pre-offset — as in the Netherlands, an offset is usually taken into account for social security).

Insurance / Protection System

There is no separate Pension guarantee fund. However, a pension plan must always have sufficient liquidity available to pay the pensions. The Financial Assessment Framework which is part of the Pensions Act, sets out the requirements for the financial position of a pension plan. A pension plan's financial position is reflected largely by the coverage ratio. This expresses the relationship between the plan's assets and the pensions to be paid in the future (pension liabilities).

Governance

Since January 1, 2014 and July 1, 2014 respectively pension funds have to comply with the new Code of the Dutch Pension Funds and the Pension Fund Governance Reinforcement Act. Both were introduced to enhance the professionalism of the Board of Trustees of a pension plan. Each pension plan has to draw up an Actuarial and Technical Business Report (ATBR) describing how a number of important statutory provisions are implemented within the FTK (and outside it). Each pension plan has to adopt an annual report and financial statements within six months of the end of each financial year. In addition, the FTK lays down the categories of information on which reports must be submitted periodically to the supervisor.

The actuarial and technical business report (actuariële en bedrijfstechnische nota or Abtn) lists the core criteria underlying the (financial) policy of a pension fund. The Abtn is intended to make a plan's actuarial and technical business policy transparent and as such fulfils the role of a business plan explaining the overall functioning of the pension plan. The Abtn compels pension plans to acknowledge all the mutually related aspects of operational management, financing policy and risk exposures.

For DNB, the Abtn is a comprehensive source of information it may use in the exercise of supervision. The Abtn must as a minimum include a description of the manner in which implementation of the following points is provided for:

- the substance of the pension administration agreement
- conditional indexation
- the Financial Assessment Framework
- the operational policy of the pension plan
- a statement on the investment principles and a description of the investment mechanics
- a financial crisis plan

Most of the provisions listed above are subject to further regulations.

Public Sector / Industry-Wide Pension plans

The typical DB benefit structure, Regulatory Framework and Governance are all similar to the private sector above.

Compulsory industry-wide pension plans are common in the Netherlands and generally have a duty to charge a flat-rate contribution.

Appendix A8

Case Studies – South Africa

Key Issues

- Pension plans are managed by boards of trustees made up of member and employer representatives. They must be registered with the supervisory authority and they are regulated to ensure they are financially sound.
- Pension plans must submit regular financial statements and actuarial valuations. The supervisory authority lays down guidance on the use of best-estimate assumptions for the actuarial valuation.
- Pension plans may establish contingency reserves, including for data and risk benefits. DB pension plans may also establish a solvency reserve..
- Surplus may only be used if the value of assets exceeds the value of liabilities using a bond-based discount rate.
- DB pension plans that are not financially sound are expected to submit a recovery plan to restore financial soundness within a prescribed period.
- Pension Guarantee Scheme - No
- Public sector plans are similar to private sector plans, although they may be subject to slightly different regulations and governance.

Private Sector

In the private sector pension plans have largely moved from a defined benefit to a defined contribution structure. The notes below relates mainly to the small number of DB funds that are left.

Typical DB benefit structure

Normal retirement:	The typical DB benefit structure consists of an annuity upon retirement which is calculated as years of service multiplied with an accrual factor (typically 2%) multiplied by some measure of final pensionable salary (typically a final average over the last 2 or 3 years prior to retirement). In some instances a gratuity is payable in addition to the annuity.
Annuity:	An annuity benefit, of which a maximum amount of 1/3 may be commuted for a lump sum, which is equal to a percentage of final average pensionable salary for each year of pensionable service.
Gratuity:	A gratuity benefit may be payable as a lump sum, calculated as a percentage of final average pensionable salary for each year of pensionable service.
Early retirement:	Similar to normal retirement but generally penalty factors are applied to the normal retirement benefit to allow for the fact that the annuity would be payable for a longer period.
Late retirement:	Similar to normal retirement benefits, but additional years of pensionable service will enhance the retirement benefit.
Death benefit:	An annuity would typically provide for a spouse's and / or dependant's pension, calculated as a percentage of the deceased member's pension. It may be guaranteed for a period of time, typically 5 years and payable for life (in the case of a spouse) or until a maximum age for dependant children, up to a maximum number of dependants. In many cases pension plans offer a lump sum benefit, as opposed to an annuity, which equals a multiple of annual salary.
Withdrawal benefit:	Funds must provide minimum benefits equal to a maximum of (a) the fair value equivalent of the present value of a member's accrued deferred pension and (b) an amount equal to the value of member contributions, plus any amount payable in terms of the rules in excess of member contributions, less reasonable expense, accumulated with fund return.

Regulatory Framework

There is principal legislation under which pension plans are registered with the supervisory authority and regulated. Each pension plan is a legal entity in its own right with its own set of rules. Sub-ordinate legislation exists in terms of which the principal legislation permits the regulator to prescribe certain

operational and other requirements for pension plans which supplement the provisions in the principal legislation.

The primary purpose of the regulatory framework for DB pension plans is to ensure that these plans are properly governed and remain financially sound. The pension plan must submit annual financial statements and statutory actuarial valuations to the regulatory authority at least once every three years.

The regulatory authority has issued subordinate legislation to establish a consistent actuarial valuation method and basis in terms of which statutory actuarial valuation reports have to be prepared. In terms of this directive, the standard is set for valuations to determine the financial position of a fund.

The directive requires that best-estimate assumptions be used in the determination of the accrued liabilities, meaning assumptions that are:

- realistic;
- depend on the nature of the business concerned;
- are guided by past experience, as modified by any knowledge or expectation of the future, including events, such as changes in tax or legislation, which will impact the expected experience of the pension plan; and

It is required that the valuation basis used to determine financial soundness of a pension plan be sufficiently conservative. For this purpose valuators may use a discount rate related to the expected return on assets, with the condition that the risk premium on growth assets (e.g. equity) may not exceed 3%. Surplus, however, may only be used if the value of assets exceeds the value of liabilities on a more conservative basis using bond rates as basis. The difference between the 2 bases forms an inherent buffer to protect the fund against adverse experience.

Funds are allowed to establish reserve accounts. From a supervisory perspective, it is required that the establishment and magnitude of such reserve be properly motivated.

For DB pension plans that are not financially sound, a recovery plan must be submitted to restore financial soundness within a prescribed period, generally 3 years, and this recovery plan must be accepted by the regulator.

Taxation System

Exempt – Exempt – Taxed:

Contributions to a DB pension fund are tax exempt. In-service members typically contribute 7.5% of pensionable salary and the sponsor contributes balance of cost.

Investment growth on contributions is tax-free.

Retirement income may consist of annuity payments and a gratuity at retirement. Annuity payments are taxed as income in the hands of the recipient when these are received, and the gratuity payment at retirement is taxed at special rates of income tax when it is received.

A withdrawal benefit that is not preserved in another legitimate form of pension provision is subject to a special rate of income tax when it is received.

Insurance / Protection System

South Africa does not have a pension guarantee fund.

Governance

Pension plans have boards of trustees which are (at least) 50% member elected and (at most) 50% sponsor appointed. Boards of trustees owe fiduciary duties to their funds and their members, which are prescribed in the principal legislation and are also derived from the common law. In addition, guidance is given by the Registrar through various directives and circulars.

Public Sector

Public sector DB pension funds are similar to private sector DB funds with similar benefit structures and similar valuation principles. However, some such funds, for example the Government Employees Pension Fund (GEPF), were created by legislation (see below) and are not subject to the Pension Funds Act.

The GEPF is a juristic entity governed by the Government Employees Pension Law of 1996. The GEPF's fiduciary functions are the responsibility of the Board of Trustees with an equal number of employer and member representatives. The GEPF complies with the requirements of the Government Employees Pension Law (GEP Law) and the rules of the Fund, but also looks to the Pension Fund Act for best practice where the two are not in conflict. The Board governs the Fund – it is accountable for administrative and investment performance. The Board is also responsible for compiling and approving the annual financial statements, which are presented to Parliament by the Minister of Finance.

Appendix A9

Case Studies – Sweden

Key Issues

- DB pension plans are largely in run-off and cover historic liabilities only. DC plans increasingly represent most of the employer pension arrangements both in the private sector and in the public sector.
- Private sector DB plans are either book reserve plans with compulsory credit risk insurance or funded arrangements with Alecta, a mutual insurance company.
- Pensions are entirely funded by employers - employees do not contribute.
- Alecta arrangements are conservatively funded at 125% - 155% of technical provisions using an insurance company measure of liabilities. There is some funding of book reserve plans (on average at 70% of liabilities calculated on a much weaker approach) but this does not affect the security of members' benefits only the premium paid for the credit risk insurance.
- Pension Guarantee Scheme - Book reserve plans have credit risk insurance. Alecta maintains insurance reserves.
- Public sector plans are similar to private sector plans, although they may be subject to slightly different regulations and governance.

General

Swedish occupational pension plans are to a great extent based on nationwide collective contracts. There are four major pension plans/collective contracts covering

1. Salaried employees in the private sector
2. Blue collar workers in the private sector
3. State employees
4. Employees in local government/county administration

There are also some industry specific collective contracts/plans, normally mirroring the plans for the first two categories above. In employee numbers, the fourth category above represents the most people, but the first category is the most important in terms of DB pensions/capital.

Over the last few decades a transition from DB to DC pensions has occurred in all these plans, following a similar transition in the National pension system. In the private sector plan for salaried employees the transition period to DC is very long – employees born before 1979 remain in the DB plan. Shorter transition periods were applied in the other plans. Due to the shift to DC shift all DB plans in Sweden are in run-off, with just a few exceptions. A few companies still offer DB pensions, eg for senior managers, but the number is decreasing.

Private Sector

Typical DB benefit structure

Blue collar workers in the private sector overwhelmingly belong to the DC SAF-LO pension plan. The primary DB pension plan in Sweden is the ITP Part 2 plan (the Part 1 plan provides DC benefits to private sector salaried employees). It covers all private sector employees born before 1979 but is now in run-off. The plan is a final salary plan. No contributions are made by employees, only by employers. Pension benefits are calculated as percentages of final earnings with different percentages applying to three different salary bands. There is an upper limit for salaries covered of 4 times higher than the upper limit of the lowest band (the ceiling for the National Pension plan). In February 2015 the salary ceiling for the plan corresponded to an annual salary of US $52,000.

A full pension is earned after thirty years of service, otherwise it is proportionally reduced. Vesting occurs from the age of 28 till retirement age of 65 (in accordance with traditional insurance policy vesting bases). By a long term tradition pensions in payment are indexed in line with CPI, although there is no formal guarantee for this.

The ITP Part 2 plan can be financed by either:

- life and pension insurance contracts with Alecta, the quasi-monopoly mutual insurance company; or
- book reserve provision on the sponsoring employer’s balance sheet, combined with insolvency insurance issued by PRI Pensionsgaranti, a mutual credit risk insurance company.

About 30% – 40% of DB liabilities are covered by the book reserve system, although it is mainly used by the biggest employers with just 1,200 employers out of the approximately 40,000 employers with an ITP Part 2 plan. According to IFRS disclosures, around 60% - 70% of companies report pension liabilities under the book reserve system.

Funding strategies

The Alecta funding strategy aims to keep a surplus of assets over technical provisions, at a level of between 125 % and 155 %. This requires balancing employer interests who do not wish to overfund Alecta, with the need to keep the funding sufficiently high under solvency requirements to maintain capacity to create good capital yield. Surplus arises mostly due to financial market fluctuations, but to manage surplus levels Alecta applies reductions to employer contributions.

Employers can also fund DB pension liabilities within the framework of the book reserve system, by setting up a pension fund (or rather a foundation), which does not carry any pension liabilities but only serve as a pledge for the employer pension liabilities. The employer is allowed to withdraw cash from the foundation only for pension expenditures. In case of employer bankruptcy the foundation assets are used to meet the employer's liabilities to the extent that its assets are sufficient.

Pension foundations are normally funded up to 100% of liabilities, as this creates most freedom for employers. Tax rules stop employers from making further contributions if the foundation is fully funded.

Employers establish pension foundations for a number of reasons. Primarily this can be to improve the management of profit and loss volatility. Because of the insolvency insurance the role of the foundation in providing security for members' benefits is of very little importance. The employer can suffer economic damage by mismanagement of the pension plan, but not the pension plan beneficiaries. For this reason it is the employer who is most interested in the funding and investment strategies.

Actuarial assumptions

Discount rates

In accordance with insurance regulations, Alecta applies a discount rate for calculating technical provisions based on a risk free market interest rate up to 10 years duration and for longer durations phasing in the European Ultimate Forward Rate of 4.2 %. This currently produces very low discount rates even though the Solvency II or IORP II regulations are not yet fixed. Sweden also suffers from having its own currency, SEK, and the lack of a deep corporate bond market in SEK.

In the book reserve system a fixed discount rate of 4% has applied since 1994. This looks high in current market conditions and has been questioned by some. The financial supervisor issues technical bases for pension valuations and prescribes a (much lower) state bond market based discount rate. However, the supervisor cannot prescribe technical bases for employers unless they are financial companies. Instead it is the company auditors who have continued to approve pension book reserves based on a 4% discount rate.

Mortality

Actuarial assumptions on mortality are not controversial. Mortality studies have been carried out several times for the Pension and life insurance industry, the latest published in 2014. A standard mortality table and future mortality forecasts are published and form the basis for assumptions used by Alecta and within the book reserve system. However, the actual mortality experience in the Alecta population differs from the book reserve population, resulting in the use of different mortality tables. For the last couple of years Alecta has used modern generation based mortality assumptions which are not applied yet within the book reserve system. Book reserve mortality assumptions are typically the same as used in IFRS valuations.

The difference in assumptions between Alecta and the book reserve system, results in a difference between a book reserve pension liability and a single premium to Alecta of 30% – 40% in the case of liability transfer of liabilities to Alecta.

Investment strategies

The Alecta investment strategy falls under the legal framework for insurance companies, at present somewhere between IORP1 and Solvency 1 regulations. Even following an implementation of IORP II regulations there will still be solvency capital requirements to meet. The strength of Alecta's financial position has allowed it to pursue sound investment strategies aiming at generating a good yield, thus making it possible to minimise employer contributions. With current very low bond yields this has resulted in greater emphasis on equity markets (still within the constraints of its regulatory requirements). However, it has been apparent for some time that the Alecta surplus capital is now not so high.

Another factor for Alecta is that it is a major financial institution in relation to Swedish capital markets. Large transactions in Swedish equities affect market prices. Additionally, Swedish bond markets, both state and corporate bonds, are small. Hence, Alecta is required to invest substantially in foreign markets, which add currency risk. Foreign investments are made largely in index-tracking funds to keep costs low (a key goal for Alecta).

Alecta does consider alternative investments and financial instruments/ are considered, but most adopts a conservative attitude to investment. However like most Swedish pension and life insurance companies, they do invest partly in property. Alecta also runs separate funds for DC pensions.

In contrast, within the book reserve system, the pensions foundations bear only very light investment regulation. Additionally, since funding within the book reserve system is optional they follow a variety of different investment strategies, often reflecting the underlying purpose for establishing the foundation. However, in most cases pension foundations follow conservative and risk averse investment strategies, partly because they do not have the expertise to compete with Alecta and this can resulting in some cases in non-optimal investment strategies.

Insurance / Protection System

Security within the book reserve system is based on insolvency insurance, which is mandatory if the employer has chosen this financing option. However, not all employers will be granted insolvency insurance, since PRI Pensionsgaranti makes a risk assessment for each applying employer and can refuse insurance. If the insolvency insurance is denied, the employer has to sign an insurance contract with Alecta.

The insolvency insurance with PRI Pensionsgaranti covers the liabilities, regardless of the pledging foundation assets. However the solvency insurance premium is reduced for the proportion of liabilities that correspond to pension foundation assets. Typically, pension foundations assets correspond approximately to 70% of pension liabilities - measured by Swedish GAP.

Governance

Both Alecta and PRI Pensionsgaranti are governed and controlled by the Employers' confederation and a Trade Union cartel, although the owners formally are the policyholders, the employers, and in the case of Alecta also in some respects the employees and beneficiaries. Both Alecta and PRI Pensionsgaranti, are well consolidated and are uniquely founded for their purposes. Alecta is an IORP according to the EU-definition, and should rather be described as a pension fund. However both companies fall under legislation for insurance companies. Alecta assets related to DB liabilities amount to approximately €67billion, while book reserve liabilities amount to €15billion.

Public Sector

The DC pension plans which are the primary vehicle for future pension provision are similar across all sectors of the labour market. But the public sector DB pension arrangements, which are in run-off, differ more, especially when it comes to security and employer contributions. Partly this was based on the assumption that public employers could not go bankrupt.

DB pensions for State employees (SPV) are funded and disclosed in the Swedish State's financial statements. DB pensions for local government workers are partially funded and partially pay-as-you-go (pre 1997 obligations are pay-as-you-go whereas post 1997 obligations are funded). Post 1997 obligations are accounted for on the balance sheet but local governments can choose whether or not to disclose pre 1997 pension obligations and most choose not to.

Taxation system

Swedish pensions related taxes are of the ETT-type. Employer contributions, or pension costs in the book reserve system, are tax deductible. However, employer contributions, or pensions costs are also subject to a "special salary tax" (currently 24%) – introduced to neutralize tax differences between remuneration regardless of its appearance as salary or pension.

There is an investment yield tax (avkastningsskatt) applied to Alecta assets, pension foundations asset and even to book reserve liabilities (currently 0.2% – 0.3% of assets/liabilities) even if there is no funding at all.

Pensions in payment are subject to income tax.

Information to and knowledge among employees and other beneficiaries

Employees and beneficiaries generally have limited knowledge on pensions. A lot of effort has been made to help them understand modern DC pensions and financial markets so that they might make sound investment choices. However, DB pensions and their underlying funding and financing mechanisms are normally considered a “black hole”. But then employees and other beneficiaries are very largely unaffected by Swedish DB pension funding mechanisms.

Nevertheless, a lot of effort is made to give information about the plan design when it comes to DB pension benefits and requirements. Annual pension statements on ITP Part 2 are issued by Alecta, also for pensions in the book reserve system. These never mention the source of the pension, only the amounts. In fact, few employees even know whether their ITP pension is vested within Alecta or within the book reserve system. Pension payments and customer support are also handled by Alecta, under agreements between Alecta and PRI Pensionsgaranti.

Appendix A10

Case Studies – UK

Key Issues

- Actuaries are individually appointed to each pension plan
- The Pension Plan Managers are trustees who are independent of the employer
- The Pensions Regulator provides oversight of the management and operation (including funding) of DB pension plans.
- Pension Guarantee Scheme – Yes. The Pension Protection Fund covers 80%-90% of benefits; financed by a risk based levy.
- There are no formulaic minimum funding rules. In the Private Sector the plan specific funding strategy is determined by the trustees (on the advice of the appointed actuary) but then agreed by the employer and overseen by the Pensions Regulator.
- The actuary appointed to the pension plan is not allowed to advise the employer on any matter that may affect pension plan funding.
- Funding strategies are required to link employer covenant risk and investment risk
- At the end of 2015, the average UK pension plan was roughly 85% funded on an IAS19 basis, maybe 80% funded on its normal funding basis and perhaps just 50% funded on an insurance company solvency test.
- There are compulsory communications to members on plan benefits, plan accounts and plan funding levels

Private Sector

Typical DB benefit structure

DB pension plans in the UK are now largely closed to new entrants and many too are closed to all accrual of benefits. They typically provide:

- A pension of 2/3rds of final salary after 40 years' service
- Guaranteed inflation proofed increases in payment (there is a wide range of pension increase rules using both RPI and CPI inflation measures, often with 3% or 5% caps, plans will typically have several different tranches of benefit with different increase rules)
- Spouses' benefits, typically at the level of 50% or 2/3rds of the member's pension
- Life assurance benefits
- On leaving employment before retirement a vested benefit is provided which increases (largely in line with CPI inflation) before retirement. Members have the option to take a transfer value of their benefits to an alternative pension arrangement.
- There are provisions on early or late retirement to adjust the normal retirement benefits, usually on actuarially neutral terms.

Regulatory Framework

Pension plans are administered by trustees who are independent of the employer supporting the pension plan, but they may include individuals appointed by the employer and individuals elected by the members. They commission regular actuarial reports into the funding of the pension plan. Each DB pension plan has an individually appointed and named actuary. Actuaries advising the trustees on the funding of the pension plan cannot normally also advise the employer.

At the end of 2015, the average UK pension plan was roughly 85% funded on an IAS19 basis (with deficits totalling ~£250billion), maybe 80% funded on its normal funding basis and perhaps just 50% funded on an insurance company solvency test. There are therefore tensions between trustees and employers on the availability of funds to finance deficits. There are also delicate and complicated processes (and guidance from the Pensions Regulator) for managing conflicts of interest for individual trustees who may also have positions of authority within the employer.

Actuarial valuations are carried out every 3 years when the actuary will recommend a funding plan to ensure the adequate funding of the pension plan benefits. There are no statutory minimum funding rules. However the actuarial valuation process is overseen by the UK Pensions Regulator (see below). The actuary is required to certify that an agreed Schedule of Contributions will ensure that the pension plan is "fully funded" by the end of the "Recovery Period" (typically 10 years – although some recovery periods are becoming much longer). This needs to be discussed and agreed with the employer.

The actuary will go to great lengths to ensure that the trustees understand the funding objective and the funding strategy and that these are consistent. The investment strategy is then designed to deliver the funding strategy.

The actuary is required to advise on the expected development of the funding position and solvency position of the plan over the 3 years following the actuarial valuation. The actuary is also required to produce sensitivity analysis to demonstrate the risks associated with the funding and investment strategies as well as produce analysis of the funded status on a best estimate basis.

Taxation System

Exempt (contributions in) – Exempt (investment income) – Taxed (benefits out, some exemptions)

Originally there were tax driven limits on the benefits that could be paid from a tax approved pension plan. Then in the 1980s maximum funding regulations were introduced to limit tax sheltered funding of DB pension plans. These have both subsequently been replaced by individual limits on the annual amounts that can be contributed to pension plans and on the lifetime funds that can be accumulated in a pension plan (without suffering a penal tax charge).

Insurance / Protection System

If a company suffers an insolvency event and there are insufficient assets in the pension plan (and from what can be recovered from the employer) to provide benefits in full to members then the pension plan will fall in to the Pension Protection Fund (the PPF). The PPF is a national lifeboat plan that protects members benefits in the event of an insolvency (providing very broadly 80%-90% of benefit entitlements – although this varies by member, with pensioners and the lower value benefits generally getting better protection). The PPF is financed by a risk based levy on all other pension plans.

Governance

The UK Pensions Regulator oversees the whole governance and regulation of DB plans in the UK. The Regulator expects the pension plan trustees to negotiate with the employer on how much the employer is able to afford based on a prudent assessment of the pension plan liabilities. In assessing what is prudent the Regulator expects the trustees and the actuary to consider the investment risk being run in the pension plan (including whether the size of investment risk is appropriate) and the strength of the employer covenant that is supporting the plan. In particular the Regulator will consider whether the actuarial assumptions adopted are reasonable and appropriate and, in particular, will expect more prudent assumptions to be chosen if the strength of the employer covenant is weaker.

The Pensions Regulator has the power in certain circumstances to insist on a certain level of pension plan funding contributions and, if considered appropriate, to remove/replace trustees. The Pensions Regulator will also chase parent companies (even overseas) for pension plan debts.

Since June 2003, an employer cannot walk away from its obligations to fund the pension plan without a statutory debt which is equivalent to funding the plan up to a full solvency (insurance company buy-out) level. Thus the full and continued support of the employer is required unless and until there is an insolvency event.

Member communications

Members are provided with regular statements of benefits and annual updates on the funding of the pension plan. On request, they are entitled to copies of the annual report and accounts, the trust deed & rules and the full report on the actuarial valuation with detailed information on the solvency position of the pension plan.

Public Sector

Public sector DB pension plans are very similar to Private Sector plans above. There are two types of public sector Plans (both of which are governed by separate regulations):

- Local Authority Plans (funded)
- Central Public Sector Plans (unfunded)

Governance

Local Authority Plans have appointed actuaries who advise on the funding of the plan. Central Public Sector Plans are overseen by Government and their financing is determined on the advice of the Government Actuaries Department.

There are no explicit member security / guarantees which are applicable to Public Sector Plans. Government (Local or National) has the ability to default on benefits but it is very limited, although regulations can be (and have been) introduced to worsen members' benefits.

Appendix A11

Case Studies – US

Key Issues

- Voluntary system—private-sector employers aren't required to provide DB pensions or any other retirement benefits.
- Retirement plans receive favourable tax treatment (are "tax-qualified"): employer contributions are tax-deductible when made, investment earnings on plan assets accumulate tax-free, and employees are taxed on benefits when received, rather than when earned. But in exchange for this tax benefit, plans must satisfy complex rules covering various aspects of plan design and operation, such as participation, vesting, normal retirement age, non-discrimination (in both coverage and level of benefits), forms of payment offered, benefit protections, maximum benefits, minimum funding.
- Two main types of tax-qualified private-sector DB pension plans: single-employer plans and multiemployer plans.
- Formulaic minimum funding rules (with certain prescribed assumptions) differ between single-employer plans and multiemployer plans. These are a key element of funding strategies for many plan sponsors.
- The Pension Benefit Guaranty Corporation (PBGC) protects plan benefits up to statutory limits. PBGC maintains separate insurance programs for single-employer and multiemployer plans, both financed by premiums paid by plans. While the single-employer insurance program is in reasonably strong financial shape, the multiemployer program is expected to be insolvent by 2025 unless the US Congress takes action to save it.

This appendix focuses on the two types of private-sector DB plans that cover most US workers: tax-qualified, PBGC-insured single-employer and multiemployer plans. It excludes those US private-sector DB plans that are exempt from PBGC coverage, including certain church-sponsored plans, plans of professional-service employers (such as doctors or lawyers) that have never had more than 25 active members, plans covering only substantial owners, and plans sponsored by certain international organizations.

Single-Employer and Multiemployer PBGC-insured Plans

Private sector DB plans are classified as either single-employer (SE) or multiemployer (ME) plans. SE plans are generally sponsored and maintained by one employer or a group of employers under common control (parent and subsidiaries). The sponsoring employer generally sets benefit levels, but if members are represented by a union, benefit levels may be subject to collective bargaining between the employer and the union. The sponsoring employer funds the plan, sets the plan's investment policy, oversees plan operations (including calculating and paying benefits), makes required government filings, provides required member communications, and fulfills other fiduciary duties. (Sponsors may contractually delegate specified duties to third parties, such as investment managers or benefit administrators.) Plan assets are held in trust, with the trustee appointed by the plan sponsor.

ME plans are collectively bargained plans maintained by a labor union and two or more employers, usually within the same or related industries. These plans are particularly common in the building and construction industries, where union members often work for a number of employers during their careers. Other industries with significant numbers of workers covered by ME plans include retail and service industries, manufacturing, mining, trucking and transportation, and entertainment (film, television, and theater). A joint board of trustees with equal employer and union representation typically governs and administers the plan. The board of trustees normally makes decisions about the plan's benefit structure. The bargaining parties negotiate an employer contribution rate (such as $3 per hour worked by a member) and the trustees translate that rate into a benefit. Decisions to increase benefits or change the plan are also typically made by the board of trustees.

Coverage

The establishment of DB plans is voluntary and is encouraged by federal tax incentives. To obtain favorable tax treatment, plans must benefit a broad cross section of employees and must not excessively benefit highly compensated employees (as that term is defined by law). Plans are not required to cover all employees, but if any employee groups are excluded, the employer must demonstrate compliance with complex coverage requirements designed to prevent disproportionate coverage of highly compensated employees. Similarly, plans are not required to provide uniform benefits for all members, but if benefits are not uniform, the plan must demonstrate compliance with complex non-discrimination rules intended to prevent excessive benefits for the highly compensated employees relative to lower paid members.

According to PBGC's 2014 Pension Insurance Data Tables (http://www.pbgc.gov/documents/2014-data-tables-final.pdf):

- SE plans: In 2014, there were 22,344 PBGC-insured SE plans covering approximately 31 million

members, of whom 37% were active, 33% were retired receiving benefits, and 30% were former workers entitled to future benefits. Roughly 30% of SE plans were "hard frozen," with no members earning additional benefits. Another 10% had closed to new entrants or frozen accruals for some but not all members.

- ME plans: In 2014, there were 1,425 PBGC-insured ME plans covering approximately 10.3 million members, of whom 37% were active, 35% were retired receiving benefits, and 28% were former workers entitled to future benefits.

Benefits

- Plans may use a variety of benefit formulas. Some of the more common formula types include:
    * Final-average pay. The benefit is the product of a specified percent of highest three- or five-year average earnings, multiplied by years of service.
    * Career-average accumulation. The benefit earned in each year is a percent of that year's pay; these benefits are accumulated over the member's period of service.
    * Flat dollar. The benefit is a flat dollar amount multiplied by years of service (most common for ME plans)
    * Percent of contributions. The benefit is a percentage of the contributions made to the plan that are attributable to a member's work (generally only used in ME plans).
    * Cash balance. A hypothetical account is maintained for each member. The account grows with hypothetical contributions, which are typically a percent of the member's pay for the year (the percentage often increases with age or service, within limits set by IRS benefit accrual (anti-backloading) standards), and with hypothetical interest at either a bond-based rate specified in the plan or the actual rate of return on plan assets (subject to a "preservation of capital" rule). At retirement, the account balance may be paid in a lump sum (with spousal consent if the member is married) or converted to a life annuity.
- Benefits are usually not adjusted for inflation.
- Benefits vest after five years of service (three years for cash balance plans).
- Normal retirement age is typically age 65 (and generally cannot be earlier than age 62, with industry-based exceptions). Early retirement benefits are often available as early as age 55 on reduced basis (a 10% penalty tax applies to distributions before age 59-1/2, unless paid as a lifetime annuity or rolled over to an individual retirement account). Benefits generally must start by April 1 after the year the member reaches age 70-1/2, but active members who are not 5% owners may defer benefits until they terminate employment (their benefits must be actuarially increased for the delay).
- Default payment options must provide lifetime income (with at least 50% continuation to the surviving spouse of a member who is married at the benefit starting date). Most plans allow members to select from a range of annuity payment options. Spousal consent is required if a married member elects a form that does not provide at least 50% continuation of lifetime income to the surviving spouse. All payment options are typically actuarially equivalent, though some plans subsidize surviving spouse benefits.

- Single sum payments in lieu of lifetime income are increasingly available in SE plans, but are uncommon in ME plans. In general, SE plans must be at least 80% funded (on the basis used to determine minimum funding requirements) to pay total lump sums; SE plans at least 60% but less than 80% funded may pay partial lump sums. However, if the plan sponsor is in bankruptcy, the plan must be 100% funded on an adjusted basis (using nonstabilized discount rates) to pay either partial or total lump sums. The lump sum must be no less than the actuarial equivalent of the accrued benefit using prescribed interest and mortality assumptions. Married members must have spousal consent to elect a single-sum payment.

Regulatory Framework

The Employee Retirement Income Security Act of 1974, as amended (ERISA), establishes the regulatory framework for US pension plans. Three federal agencies are involved in the interpretation and enforcement of US pension law:

- The Internal Revenue Service/Department of Treasury has regulatory jurisdiction with respect to the conditions plans must meet to be tax qualified, including minimum funding requirements and maximum tax-deductible contribution limits.
- The Department of Labor has regulatory jurisdiction over ERISA requirements that are not conditions of tax qualification
- The Pension Benefit Guaranty Corporation (PBGC) provides plan termination insurance.

The next table provides a high-level overview of each agency's areas of responsibility:

Internal Revenue Service/Department of Treasury
• Participation standards (maximum waiting periods to join the plan) • Benefit accrual standards (limits back-loading of benefit accrual) • Nondiscrimination requirements (coverage and benefit levels must not discriminate in favor of highly compensated employees) • Minimum vesting standards • Lifetime annuity and surviving spouse annuity requirements (including associated member notices) • Minimum present value requirements (for lump sums and other accelerated payment options) • Prohibitions on plan amendments reducing accrued benefits; ME plan benefit suspensions • Maximum benefit limits • Minimum required contributions • Maximum tax-deductible contributions • Tax penalties on early distributions (before age 59-1/2), excessive deferrals (beyond age 70-1/2), and non-deductible contributions

Department of Labor

• Fiduciary standard of conduct for those managing plan assets, including
  * Requirement to hold assets in trust
  * Duty of loyalty to plan members
  * Prudent expert standard of conduct
  * Minimum diversification standards
  * Restrictions on related-party transactions, self-dealing, investments in employer securities
• Annual reporting of plan information to the federal government for use by all three agencies (Form 5500 filings)
• Disclosure to plan members, including
  * Summary plan description and summary of material modifications
  * Annual funding notices
  * Individual benefit statements
  * Certain event-driven notices, such as notices regarding a failure to meet minimum funding standards, imposition of funding-based benefit restrictions, or transfer of excess assets to a retiree health account
• Participation, service crediting, and certain vesting rules
• Benefit suspension rules (for individuals working beyond normal retirement age or reemployed after starting their benefits)

Pension Benefit Guaranty Corporation

• Separate SE and ME plan termination insurance programs
  * Collect annual premiums from covered plans
  * Assume trusteeship of SE plans terminated with insufficient assets in employer bankruptcy or certain other financial hardships and pay vested benefits up to statutory limits
  * Provide financial assistance to ME plans that have exhausted their assets so they can pay vested pension benefits up to (far lower) statutory limits
• Termination process for plans with sufficient assets to pay all benefits
• Plan reporting, including:
  * Annual reporting of controlled-group financial and plan actuarial information for plans with large unfunded liabilities (ERISA Section 4010 reporting)
  * Reporting of various events affecting the plan or its sponsor that may signal financial problems (ERISA Section 4043 reportable events)

Minimum funding requirements

Minimum funding rules require that SE plans measure the present value of accrued benefits using prescribed discount rates and mortality tables — all other assumptions are best estimate — and target full funding within seven years. This requirement was enacted in 2006 and effective in 2008, but was subsequently modified to ease funding burdens on plan sponsors, which had skyrocketed in the wake of the 2008 financial crisis. Since 2012, the prescribed discount rates have been constrained to within 10% of 25-year average rates, producing funding discount rates substantially above current market rates. (IRS publishes the prescribed rates at https://www.irs.gov/retirement-plans/funding-yield-curve-segment-rates.) This means SE plans that appear well funded on the current prescribed funding basis may actually be substantially underfunded on a solvency basis. Plans must disclose their funded status using non-stabilized discount rates in a supplement to the annual funding notice provided to members.

ME plans measure present values at expected rates of return and amortize most changes in unfunded liability over 15 years. Plans that are endangered (generally less than 80% funded) or critical (generally close to failing to meet projected minimum funding standards) must establish funding improvement or rehabilitation plans designed to meet specified funding benchmarks. Contributing employers to critical plans are subject to an automatic surcharge until collective bargaining agreements are renegotiated consistent with the funding rehabilitation plan.

PBGC plan termination insurance

Vested accrued benefits are guaranteed by PBGC, a federal corporation, up to statutory limits. The PBGC is funded by premiums paid by covered plans, not by tax revenue. In the event the sponsor of an SE plan becomes unable to continue the plan (for example, due to bankruptcy or certain other causes), the PBGC may take over the assets and obligations of the plan and pay subsequent benefits up to the guarantee limits (see http://www.pbgc.gov/wr/benefits/guaranteed-benefits.html for details). For SE plans, the maximum guaranteed benefit is adjusted annually for inflation. For SE plans terminating in 2017, the maximum guaranteed benefit starting at age 65 in the single-life annuity form is $64,431.84 per year. In a 2007 study (see http://www.pbgc.gov/news/press/releases/pr08-11.html), PBGC found that only 16% of retirees' benefits were reduced after PBGC took over their SE plan and the average reduction was 28%.

ME plans generally continue to pay full benefits until their assets are exhausted at which time the PBGC will lend the ME plan funds sufficient to pay guaranteed benefits. The guarantee limits for ME plans are substantially lower than for SE plans and are not adjusted for inflation. The maximum amount the agency can pay to an ME member with 30 years of service is $12,870 per year. In the 2015 report, PBGC's Multiemployer Guarantee (see http://www.pbgc.gov/documents/2015-ME-Guarantee-Study-Final.pdf), PBGC found that 21% of ME members in plans that are already receiving financial assistance have been affected by benefits reductions. But going forward, the agency expects 51% of members in insolvent plans will face a reduction — assuming the guarantee program itself does not become insolvent. The ME program is expected to be insolvent by 2025 unless the US Congress takes action to save it. If the program becomes insolvent, financial assistance will drop to the level that can be supported by current ME premium income.

The regulatory framework for ME plans was revised in late 2014 to permit some plans faced with insolvency within 20 years to "suspend" benefits in excess of 110% of the PBGC-guaranteed amount payable to nondisabled retirees under age 80 (with a phase-out between ages 75 and 80). This step is only available after the trustees have taken all other reasonable measures to prevent insolvency, and only if the benefit reductions are expected — but don't materially exceed reductions needed — to prevent future insolvency. The benefit suspension process is complex, requiring Treasury Department approval and a member vote. As of December 31, 2016, the Treasury Department has approved one application to suspend benefits, denied four applications, and continues to review five applications. A current list of applications submitted to the Treasury Department and their status is available at https://www.treasury.gov/services/Pages/Plan-Applications.aspx.

Appendix B1

OECD Pension plan classification

Pension plan

Pension plan: a pension (or retirement income) plan (arrangement or scheme) is a legally binding contract having an explicit retirement objective or – in order to satisfy tax related conditions or contract provisions – the benefits can not be paid at all or without a significant penalty unless the beneficiary is older than a legally defined retirement age. This contract may be part of a broader employment contract, it may be set forth in the plan rules or documents, or it may be required by law. The elements of the pension plan may be mandated by law or statute or set forth as pre-requisites for special tax treatment, as is the case for many tax qualified savings or retirement programmes designed to provide the plan's members and beneficiaries with an income after retirement. In addition to having an explicit retirement objective, pension plans may offer additional benefits, such as disability, sickness, and survivors' benefits.

Public vs. private pension plans

Public pension plan: social security and similar statutory programmes administered by the general government (that is central, state, and local governments, as well as other public sector bodies such as social security institutions). Public pension plans have been traditionally PAYG-financed, but some OECD countries have partial funding of public pension liabilities or have replaced these plans by private pension plans.

Private pension plan: a pension plan administered by an institution other than general government. Private pension plans may be administered directly by a private sector employer acting as the plan sponsor, a private pension fund or a private sector provider. Private pension plans may complement or substitute for public pension plans. In some countries, these may include plans for public sector workers.

Occupational vs. personal pension plans

Occupational pension plans: access to such plans is linked to an employment or professional relationship between the plan member and the entity that establishes the plan (the plan sponsor). Occupational plans may be established by employers or groups thereof (e.g. industry associations) and labour or professional associations, jointly or separately. The plan may be administered directly by the plan sponsor or by an independent entity (a pension fund or a financial institution acting as pension provider). In the latter case, the plan sponsor may still have oversight responsibilities over the operation of the plan.

- *Mandatory* occupational pension plans: participation in these plans is mandatory for employers. Employers are obliged by law to participate in a pension plan. Employers must set up (and make contributions to) occupational pension plans which employees will normally be required to join. Where employers are obliged to offer an occupational pension plan, but the employees' membership is on a voluntary basis, these plans are also considered mandatory.
- *Voluntary* occupational pension plans: the establishment of these plans is voluntary for employers (including those in which there is automatic enrolment as part of an employment contract or where the law requires employees to join plans set up on a voluntary basis by their employers). In some countries, employers can on a voluntary basis establish occupational plans that provide benefits that replace at least partly those of the social security system. These plans are classified as voluntary, even though employers must continue sponsoring these plans in order to be exempted (at least partly) from social security contributions.

Personal pension plans: access to these plans does not have to be linked to an employment relationship. The plans are established and administered directly by a pension fund or a financial institution acting as pension provider without any intervention of employers. Individuals independently purchase and select material aspects of the arrangements. The employer may nonetheless make contributions to personal pension plans. Some personal plans may have restricted membership.

- Mandatory personal pension plans: these are personal plans that individuals must join or which are eligible to receive mandatory pension contributions. Individuals may be required to make pension contributions to a pension plan of their choice – normally within a certain range of choices – or to a specific pension plan.
- Voluntary personal pension plans: participation in these plans is voluntary for individuals. By law individuals are not obliged to participate in a pension plan. They are not required to make pension contributions to a pension plan. Voluntary personal plans include those plans that individuals must join if they choose to replace part of their social security benefits with those from personal pension plans.

Defined benefit vs. defined contribution occupational pension plans (plan sponsor's perspective)

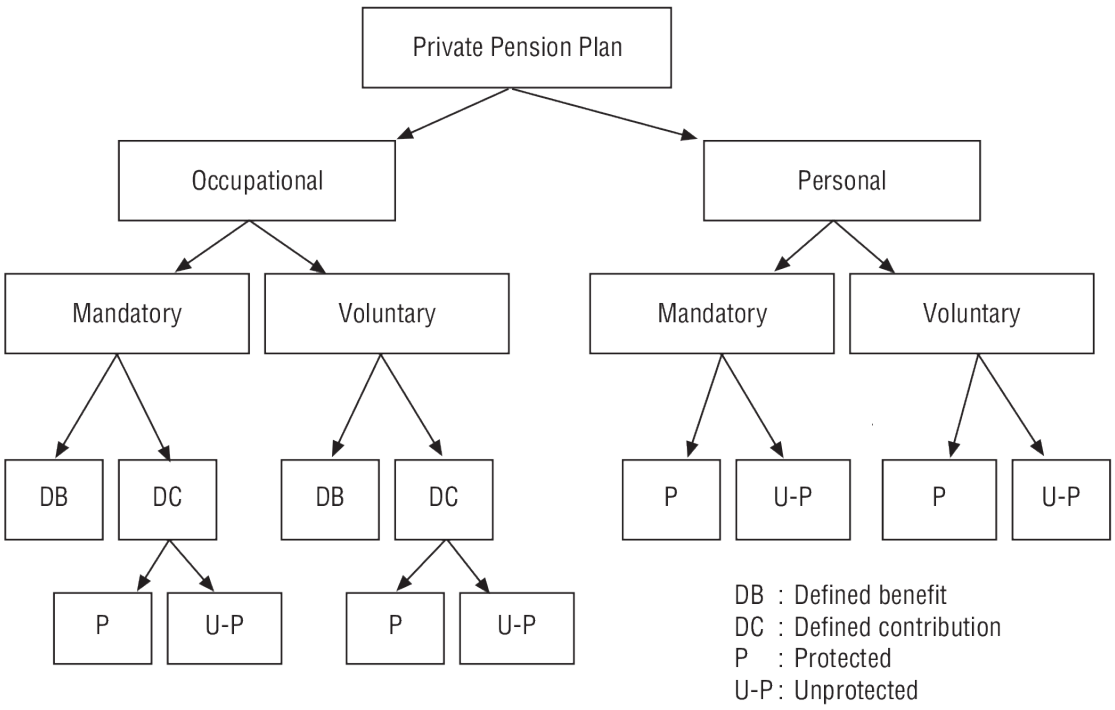
This approach is consistent with IASB's international accounting standards and will be used for OECD statistical data collection.

Defined contribution (DC) occupational pension plan: occupational pension plans under which the plan sponsor pays fixed contributions and has no legal or constructive* obligation to pay further contributions to an ongoing plan in the event of unfavourable plan experience.

Defined benefit (DB) occupational pension plan: occupational plans other than defined contributions plans. DB plans generally can be classified into one of three main types, "traditional", "mixed" and "hybrid" plans.

- "Traditional" DB plan: a DB plan where benefits are linked through a formula to the members' wages or salaries, length of employment, or other factors.
- "Hybrid" DB plan: a DB plan where benefits depend on a rate of return credited to contributions, where this rate of return is either specified in the plan rules, independently of the actual return on any supporting assets (e.g. fixed, indexed to a market benchmark, tied to salary or profit growth, etc.), or is calculated with reference to the actual return of any supporting assets and a minimum return guarantee specified in the plan rules.
- "Mixed" DB plans: a DB plan that has two separate DB and DC components but which are treated as part of the same plan.

Figure 1.1 **Private pension plan classification: functional perspective**



* The IASB's definition of constructive obligations in pension markets is defined in IAS 37 as an obligation that derives from an entity's actions where: a) by an established pattern of past practice, published policies or a sufficiently specific current standard, the entity has indicated to other parties that it will accept responsibilities; and, b) as a result, the entity has created a valid expectation on the part of those other parties that it will discharge those responsibilities.

Protected vs. unprotected pension plans (pension fund/provider's perspective)

This classification from the pension fund's/provider's perspective applies to personal pension plans and occupational defined contribution pension plans.

Unprotected pension plan: a plan (personal pension plan or occupational defined contribution pension plan) where the pension plan/fund itself or the pension provider does not offer any investment return or benefit guarantees or promises covering the whole plan/fund.

Protected pension plan: a plan (personal pension plan or occupational defined contribution pension plan) other than an unprotected pension plan. The guarantees or promises may be offered by the pension plan/fund itself or the plan provider (e.g. deferred annuity, guaranteed rate of return).

Funding of pension plans

Funded pension plans: occupational or personal pension plans that accumulate dedicated assets to cover the plan's liabilities. These assets are assigned by law or contract to the pension plan. Their use is restricted to the payment of pension plan benefits.

Book reserved pension plans: sums entered in the balance sheet of the plan sponsor as reserves or provisions for occupational pension plan benefits. Some assets may be held in separate accounts for the purpose of financing benefits, but are not legally or contractually pension plan assets. Most OECD countries do not allow this method of financing. Those that do usually require these plans to be insured against bankruptcy of the plan sponsor through an insolvency guaranty arrangement.

Unfunded pension plans: plans that are financed directly from contributions from the plan sponsor or provider and/or the plan participant. Unfunded pension plans are said to be paid on a current disbursement method (also known as the pay-as-you-go, PAYG, method). Unfunded plans may still have associated reserves to cover immediate expenses or smooth contributions within given time periods. Most OECD countries do not allow unfunded private pension plans.

Pension funds vs. pension insurance contracts

Pension funds: the pool of assets forming an independent legal entity that are bought with the contributions to a pension plan for the exclusive purpose of financing pension plan benefits. The plan/fund members have a legal or beneficial right or some other contractual claim against the assets of the pension fund. Pension funds take the form of either a special purpose entity with legal personality (such as a trust, foundation, or corporate entity) or a legally separated fund without legal personality managed by a dedicated provider (pension fund management company) or other financial institution on behalf of the plan/fund members.

Pension insurance contracts: an insurance contract that specifies pension plan contributions to an insurance undertaking in exchange for which the pension plan benefits will be paid when the members

reach a specified retirement age or on earlier exit of members from the plan. Most countries limit the integration of pension plans only into pension funds, as the financial vehicle of the pension plan. Other countries also consider the pension insurance contract as the financial vehicle for pension plans.

Appendix B2

Glossary

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Private Pensions: OECD Classification and Glossary
Les pensions privées : Classification et glossaire de l'OCDE

Pensions Glossary

NOTE

In order to develop a common understanding and vocabulary, under the aegis of the Working Party on Private Pensions (WPPP), ongoing work on the "OECD Pensions Glossary"* *includes an expanded list of terms, proposed definitions and related vocabularies. Some of the definitions are extracted from the OECD Secretariat document* "Revised taxonomy for pension plans, pension funds and pension entities".

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* We are grateful to Zoltan Vajda (from the Hungarian Financial Authority, "Pénzügyi Szervezetek Állami Felügyelete"), who in 2002 prepared a first version of this glossary under the WPPP's programme of work.

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	Term	Definition	Related terms	Identical terms
1.	**Accrual factor**	➔		Accrual rate
2.	**Accrual rate**	The rate at which pension benefits builds up as member service is completed in a defined benefit plan.	Defined benefit plan	Accrual factor
3.	**Accrued benefits**	The amount of accumulated pension benefits of a pension plan member on the basis of years of service.		Accrued rights
4.	**Accrued rights**	➔		Accrued benefits
5.	**Accumulated assets**	The total value of assets accumulated in a pension fund.		Accumulated contributions
6.	**Accumulated Benefit Obligation (ABO)**	The actuarial present value of benefits, vested and non-vested, attributed to the pension formula to employee service rendered to a particular date, based on current salaries.	Projected Benefit Obligation (PBO)	
7.	**Accumulated contributions**	➔		Accumulated assets
8.	**Active member**	A pension plan member who is making contributions (and/or on behalf of whom contributions are being made) and is accumulating assets.	Pension plan member	
9.	**Actuarial assumptions**	The various estimates (including assumptions related to changes in longevity, wage, inflation, returns on assets, etc.) that the actuary makes in formulating the actuarial valuation.	Actuary Actuarial valuation	
10.	**Actuarial deficiency**	In a situation when the actuarial value of a pension fund's assets is less than the actuarial liability, the measure of this value.	Actuarial surplus Actuarial valuation	Deficiency
11.	**Actuarial increase**	The amount of benefit increase the pension fund member receives – calculated based on actuarial assumptions – in case of deferred retirement.	Actuarial assumptions Deferred retirement	
12.	**Actuarial liability**	The amount calculated based on actuarial assumptions that represents the present value of the pension benefits accrued in a pension plan.	Actuarial valuation	
13.	**Actuarial reduction**	The amount of benefit decrease the pension plan member receives – calculated based on actuarial assumptions – in case of early retirement.	Actuarial assumptions Early retirement	
14.	**Actuarial report**	The report prepared by the actuary following the actuarial valuation that describes the financial position of the pension fund.	Actuarial valuation	
15.	**Actuarial surplus**	In a situation when the actuarial liability is less than the actuarial value of a pension fund's assets, the measure of this value.	Actuarial deficiency Overfunding Actuarial valuation	Surplus
16.	**Actuarial valuation**	A valuation carried out by an actuary on a regular basis, in particular to test future funding or current solvency of the value of the pension fund's assets with its liabilities.	Actuarial deficiency Actuarial surplus	Valuation

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	Term	Definition	Related terms	Identical terms
17.	**Actuary**	The person or entity whose responsibility, as a minimum, is to evaluate present and future pension liabilities in order to determine the financial solvency of the pension plan, following recognised actuarial and accounting methods.		
18.	**Administration**	The operation and oversight of a pension fund.		
19.	**Annual pensions estimate**	➔		Benefit statement
20.	**Annual report**	A report prepared each year by the pension fund, which informs of its operation, and other information whereby the trustees of pension funds inform all interested parties.		
21.	**Annuitant**	The person who is covered by an annuity and who will normally receive the benefits of the annuity.	Annuity	
22.	**Annuity**	A form of financial contract mostly sold by life insurance companies that guarantees a fixed or variable payment of income benefit (monthly, quarterly, half-yearly, or yearly) for the life of a person(s) (the annuitant) or for a specified period of time. It is different than a life insurance contract which provides income to the beneficiary after the death of the insured. An annuity may be bought through instalments or as a single lump sum. Benefits may start immediately or at a pre-defined time in the future or at a specific age.	Annuity rate	Pension annuity
23.	**Annuity rate**	The present value of a series of payments of unit value per period payable to an individual that is calculated based on factors such as the mortality of the annuitant and the possible investment returns.	Unisex annuity rate Unistatus annuity rate	
24.	**Asset allocation**	The spread of fund investments among different investment forms.		
25.	**Asset management**	The act of investing the pension fund's assets following its investment strategy.	Asset manager	
26.	**Asset manager**	The individual(s) or entity(ies) endowed with the responsibility to physically invest the pension fund assets. Asset managers may also set out the investment strategy for a pension fund.	Asset management	
27.	**Assets**	➔	Liabilities	Pension assets
28.	**Auditor**	A qualified individual or entity endowed with the task of conducting audit.		
29.	**Average earnings scheme**	A scheme where the pension benefits earned for a year depend on how much the member's earnings were for the given year.		Career average scheme
30.	**Basic pension**	➔		Basic state pension

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	Term	Definition	Related terms	Identical terms
31.	**Basic state pension**	A non-earning related pension paid by the State to individuals with a minimum number of service years.		Basic pension
32.	**Beneficiary**	An individual who is entitled to a benefit (including the plan member and dependants).		Pension plan beneficiary
33.	**Benefit**	Payment made to a pension fund member (or dependants) after retirement.		Pension benefit Retirement benefit
34.	**Benefit statement**	A statement of the pension benefits an individual has earned (in a defined benefit plan) or a prediction of what the final pension might be (in a defined contribution plan).		Annual pension estimate
35.	**Book reserved pension plans**	Sums entered in the balance sheet of the plan sponsor as reserves or provisions for occupational pension plan benefits. Some assets may be held in separate accounts for the purpose of financing benefits, but are not legally or contractually pension plan assets. Most OECD countries do not allow this method of financing. Those that do usually require these plans to be insured against bankruptcy of the plan sponsor through an insolvency guaranty arrangement.	Funded pension plans Unfunded pension plans	
36.	**Career average scheme**	➔		Average earnings scheme
37.	**Closed pension funds**	Funds that support only pension plans that are limited to certain employees. (*e.g.* those of an employer or group of employers).	Open pension fund	
38.	**Company pension plan**	➔		Employer's pension plan Occupational pension plan
39.	**Contribution**	A payment made to a pension plan by a plan sponsor or a plan member.		Pension contribution
40.	**Contribution base**	The reference salary used to calculate the contribution.		
41.	**Contribution holiday**	A period when the contributions to a pension scheme are put on hold, the most common reason for this being a situation of overfunding.	Overfunding	
42.	**Contribution rate**	The amount (typically expressed as a percentage of the contribution base) that is needed to be paid into the pension fund.	Contribution base	Funding rate
43.	**Contributory pension scheme**	A pension scheme where both the employer and the members have to pay into the scheme.	Non-contributory pension scheme	
44.	**Corporate trustee**	A company that acts as a trustee.	Trustee	
45.	**Custodian**	The entity responsible, as a minimum, for holding the pension fund assets and for ensuring their safekeeping.		
46.	**DB system**	➔		Defined benefit plans

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	Term	Definition	Related terms	Identical terms
47.	**DC system**	➔		Defined contribution plans
48.	**Deferred pension**	A pension arrangement in which a portion of an employee's income is paid out at a date after which that income is actually earned.	Deferred pensioner Deferred retirement	
49.	**Deferred pensioner**	An individual who draws the pension benefits later than their normal retirement age.	Deferred pension Deferred retirement	
50.	**Deferred retirement**	A situation when an individual decides to retire later and draw the pension benefits later than their normal retirement age.	Deferred pension Deferred pensioner Early retirement	Late retirement Postponed retirement
51.	**Defered member**	A pension plan member that no longer contributes to or accrues benefits from the plan but has not yet begun to receive retirement benefits from that plan.	Inactive member	
52.	**Deficiency**	➔		Actuarial deficiency
53.	**Defined benefit (DB) occupational pension plans**	Occupational plans other than defined contributions plans. DB plans generally can be classified into one of three main types, "traditional", "mixed" and "hybrid" plans.	"Traditional" DB plans "Hybrid" DB plans "Mixed" DB plans Defined contribution (DC) occupational pension plans	
54.	**"Traditional" DB plan**	A DB plan where benefits are linked through a formula to the members' wages or salaries, length of employment, or other factors.	Defined benefit (DB) occupational pension plans "Hybrid" DB plans "Mixed" DB plans Defined contribution (DC) occupational pension plans	
55.	**"Hybrid" DB plan**	A DB plan where benefits depend on a rate of return credited to contributions, where this rate of return is either specified in the plan rules, independently of the actual return on any supporting assets (*e.g.* fixed, indexed to a market benchmark, tied to salary or profit growth, etc.), or is calculated with reference to the actual return of any supporting assets and a minimum return guarantee specified in the plan rules.	Defined benefit (DB) occupational pension plans "Traditional" DB plans "Mixed" DB plans Defined contribution (DC) occupational pension plans	
56.	**"Mixed" DB plans**	DB plans that has two separate DB and DC components but which are treated as part of the same plan.	Defined benefit (DB) occupational pension plans "Traditional" DB plans "Hybrid" DB plans Defined contribution (DC) occupational pension plans	

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	Term	Definition	Related terms	Identical terms
57.	**Defined contribution (DC) occupational pension plans**	Occupational pension plans under which the plan sponsor pays fixed contributions and has no legal or constructive obligation to pay further contributions to an ongoing plan in the event of unfavourable plan experience.	Defined benefit (DB) Occupational pension plans "Traditional" DB plans "Hybrid" DB plans "Mixed" DB plans	
58.	**Dependant**	An individual who is financially dependent on a (passive or active) member of a pension scheme.		
59.	**Dependency ratio**	Typically defined as the ratio of those of non-active age to those of active age in a given population.	System dependency ratio	
60.	**Disclosure regulations**	The rules the pension plan must follow when providing information on the plan operation to its members and the supervisory authority.		
61.	**Early retirement**	A situation when an individual decides to retire earlier later and draw the pension benefits earlier than their normal retirement age.	Deferred retirement	Early leaver
62.	**EET system**	A form of taxation of pension plans, whereby contributions are exempt, investment income and capital gains of the pension fund are also exempt and benefits are taxed from personal income taxation.	TEE system ETE system	
63.	**Employer's pension plan**	➔		Occupational pension plans Company pension plans
64.	**ETE system**	A form of taxation whereby contributions are exempt, investment income and capital gains of the pension fund are taxed and benefits are also exempt from personal income taxation.	EET system TEE system	
65.	**Fair value**	The price at which an asset would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts.	Market value	
66.	**Final average earnings**	The fund member's earnings that are used to calculate the pension benefit in a defined benefit plan; it is typically the earnings of the last few years prior to retirement.		
67.	**Final earnings scheme**	➔		Final salary scheme
68.	**Final salary scheme**	A type of defined benefit plan, whereby the pension benefit is typically based on the last few years' earnings before retirement.	Defined benefit plan Final average earnings Flat rate scheme Earnings related pensions	Final earnings scheme
69.	**Flat rate scheme**	A type of defined benefit scheme, whereby the pension benefit is only based on the length of membership in the scheme and is not affected by earnings.	Defined benefit plan Final salary scheme	

PENSIONS GLOSSARY

	Term	Definition	Related terms	Identical terms
70.	**Fund member**	An individual who is either an active (working or contributing, and hence actively accumulating assets) or passive (retired, and hence receiving benefits), or deferred (holding deferred benefits) participant in a pension plan.	Active member	Member Pension plan member Pension fund member Plan member
71.	**Funded pension plans**	Occupational or personal pension plans that accumulate dedicated assets to cover the plan's liabilities.	Pay-As-You-Go (PAYG) plan Unfunded pension plans Book reserved pension plans	
72.	**Funding**	The act of accumulating assets in order to finance the pension plan.		
73.	**Funding level**	The relative value of a scheme's assets and liabilities, usually expressed as a percentage figure.	Overfunding Underfunding Funding ratio	Level of funding
74.	**Funding plan**	The timing of payments of contributions with the aim of meeting the cost of a given set of benefits under a defined benefit scheme. Possible objectives of a funding plan might be that, if the actuarial assumptions are borne out: *a)* a specified funding level should be reached by a given date; *b)* the level of contributions should remain constant, or should after a planned period be the standard contribution rate required by the valuation method used in the actuarial valuation.	Actuarial valuation	
75.	**Funding rate**	➔		Contribution rate
76.	**Funding ratio**	The funding level expressed as a fraction.	Funding level	
77.	**Funding rules**	Regulation that requires the maintenance of a certain level of assets in a pension fund in relation to pension plan liabilities.		
78.	**Governing body (of the pension fund)**	Governing body (of the pension fund): this is the person(s) ultimately responsible for managing the pension fund with the overriding objective of providing a secure source of retirement income. In cases where operational and oversight responsibilities are split between different committees within an entity, the governing body is the executive board of the entity. Where the pension fund is not a legal entity, but managed directly by a financial institution, that institution's board of directors is also the governing body of the pension fund.		Administrator
79.	**Gross rate of return**	The rate of return of an asset or portfolio over a specified time period, prior to discounting any fees of commissions.	Rate of return Net rate of return	

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	Term	Definition	Related terms	Identical terms
80.	**Group pension funds**	Multi-employer pension funds that pool the assets of pension plans established for related employers.	Collective pension funds Related member funds Individual pension funds Industry pension funds Multi-employer pension funds Single employer pension funds	
81.	**Guarantee**	➔		Pension guarantee
82.	**Guaranteed annuity**	An annuity that is paid until the death of the annuitant. If this occurs prior to a certain date, the annuity is then paid to their dependants until that date.	Annuity	
83.	**Inactive member**	➔	Deferred member	
84.	**Income replacement rate**	➔		Replacement rate
85.	**Indexation**	The method with which pension benefits are adjusted to take into account changes in the cost of living (*e.g.* prices and/or earnings).	Price indexation Wage indexation Mixed indexation	
86.	**Individual pension funds**	A pension fund that comprises the assets of a single member and his/her beneficiaries, usually in the form of an individual account.	Group pension funds Collective pension funds Related member funds	
87.	**Industry pension funds**	Funds that pool the assets of pension plans established for unrelated employers who are involved in the same trade or businesses.	Collective pension funds Related member funds Individual pension funds Group pension funds Multi-employer pension funds Single employer pension funds	
88.	**Late retirement**	➔		Deferred retirement Postponed retirement
89.	**Level of funding**	➔		Funding level
90.	**Liabilities (value of)**	Value of liabilities.	Assets	
91.	**Mandatory contribution**	The level of contribution the member (or an entity on behalf of the member) is required to pay according to scheme rules.	Voluntary Contribution	
92.	**Mandatory occupational plans**	Participation in these plans is mandatory for employers. Employers are obliged by law to participate in a pension plan. Employers must set up (and make contributions to) occupational pension plans which employees will normally be required to join. Where employers are obliged to offer an occupational pension plan, but the employees' membership is on a voluntary basis, these plans are also considered mandatory.	Occupational pension plans Voluntary occupational pension plans	

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	Term	Definition	Related terms	Identical terms
93.	**Mandatory personal pension plans**	These are personal plans that individuals must join or which are eligible to receive mandatory pension contributions. Individuals may be required to make pension contributions to a pension plan of their choice normally within a certain range of choices or to a specific pension plan.	Personal pension plans Voluntary personal pension plans	
94.	**Market value**	The price at which an asset would change hands if it sold on the open market.	Fair value	
95.	**Member**	➔	Active member	Fund member Pension plan member Plan member Pension fund member
96.	**Minimum benefit**	➔		Minimum pension
97.	**Minimum pension**	The minimum level of pension benefits the plan pays out in all circumstances.		Minimum benefit
98.	**Mixed indexation**	The method with which pension benefits are adjusted taking into account changes in both wages and prices.	Wage indexation Price indexation	Swiss indexation
99.	**Money purchase plan**	A pension plan providing benefits on a money purchase basis (ie the determination of an individual member's benefits by reference to contributions paid into the scheme in respect of that member, usually increased by an amount based on the investment return on those contributions)	Defined contribution plan	
100.	**Mortality table**	A chart showing rate of death at each age.	Unisex mortality table	
101.	**Multi-employer pension funds**	Funds that pool the assets of pension plans established by various plan sponsors. There are three types of multi-employer pension funds: *a)* for related employers i.e. companies that are financially connected or owned by a single holding group (group pension funds); *b)* for unrelated employers who are involved in the same trade or business (industry pension funds); *c)* for unrelated employers that may be in different trades or businesses (collective pension funds).	Group pension funds Individual pension funds Industry pension funds Multi-employer pension funds Related pension funds Single employer pension funds	
102.	**Net rate of return**	The rate of return of an asset or portfolio over a specified time period, after discounting any fees of commissions.	Rate of return Gross rate of return	
103.	**Non-contributory pension scheme**	A pension scheme where the members do not have to pay into the scheme.	Contributory pension scheme	
104.	**Normal pension age**	➔		Normal retirement age Retirement age

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	Term	Definition	Related terms	Identical terms
105.	**Normal retirement age**	Age from which the individual is eligible for pension benefits.		Normal pension age Retirement age
106.	**Occupational pension plans**	Access to such plans is linked to an employment or professional relationship between the plan member and the entity that establishes the plan (the plan sponsor). Occupational plans may be established by employers or groups thereof (*e.g.* industry associations) and labour or professional associations, jointly or separately. The plan may be administered directly by the plan sponsor or by an independent entity (a pension fund or a financial institution acting as pension provider). In the latter case, the plan sponsor may still have oversight responsibilities over the operation of the plan.	Mandatory occupational pension plans Voluntary occupational pension plans	Company pension plans Employer's pension plans
107.	**Open pension funds**	Funds that support at least one plan with no restriction on membership.	Closed pension funds	
108.	**Overfunding**	The situation when the value of a plan's assets are more than its liabilities, thereby having an actuarial surplus.	Funding level Actuarial surplus Underfunding	
109.	**Oversight committee**	➔		Supervisory body
110.	**Participant**	➔	Fund member	
111.	**Pay-As-You-Go (PAYG) plan**	➔	Funded pension plans	Unfunded pension plans
112.	**Pension**	➔		Benefit
113.	**Pension annuity**	➔		Annuity
114.	**Pension assets**	All forms of investment with a value associated to a pension plan.	Liabilities	
115.	**Pension benefit**	➔		Benefit Retirement benefit
116.	**Pension contribution**	➔		Contribution
117.	**Pension funds**	The pool of assets forming an independent legal entity that are bought with the contributions to a pension plan for the exclusive purpose of financing pension plan benefits. The plan/fund members have a legal or beneficial right or some other contractual claim against the assets of the pension fund. Pension funds take the form of either a special purpose entity with legal personality (such as a trust, foundation, or corporate entity) or a legally separated fund without legal personality managed by a dedicated provider (pension fund management company) or other financial institution on behalf of the plan/fund members.		
118.	**Pension fund administrator**	The individual(s) ultimately responsible for the operation and oversight of the pension fund.		Governing body

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	Term	Definition	Related terms	Identical terms
119.	**Pension fund governance**	The operation and oversight of a pension fund. The governing body is responsible for administration, but may employ other specialists, such as actuaries, custodians, consultants, asset managers and advisers to carry out specific operational tasks or to advise the plan administration or governing body.		
120.	**Pension fund managing company**	A type of administrator in the form of a company whose exclusive activity is the administration of pension funds.		
121.	**Pension fund member**	➔		Member Pension plan member
122.	**Pension insurance contracts**	Insurance contracts that specify pension plans contributions to an insurance undertaking in exchange for which the pension plan benefits will be paid when the members reach a specified retirement age or on earlier exit of members from the plan. Most countries limit the integration of pension plans only into pension funds, as the financial vehicle of the pension plan. Other countries also consider the pension insurance contract as the financial vehicle for pension plans.	Pensions funds	
123.	**Pension plan**	A legally binding contract having an explicit retirement objective (or – in order to satisfy tax-related conditions or contract provisions – the benefits can not be paid at all or without a significant penalty unless the beneficiary is older than a legally defined retirement age). This contract may be part of a broader employment contract, it may be set forth in the plan rules or documents, or it may be required by law. In addition to having an explicit retirement objective, pension plans may offer additional benefits, such as disability, sickness, and survivors' benefits.	Pension funds	Pension scheme
124.	**Pension plan administrator**	The individual(s) ultimately responsible for the operation and oversight of the pension plan.		
125.	**Pension plan administrator**	➔		Administrator
126.	**Pension plan administrator**	➔		Administrator
127.	**Pension plan beneficiary**	➔		Beneficiary
128.	**Pension plan member**	➔		Fund member Member Pension fund member Plan member

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	Term	Definition	Related terms	Identical terms
129.	**Pension plan sponsor**	An institution (*e.g.* company, industry/ employment association) that designs, negotiates, and normally helps to administer an occupational pension plan for its employees or members.		Plan sponsor
130.	**Pension regulator**	A governmental authority with competence over the regulation of pension systems.	Pension supervisor	
131.	**Pension scheme**	➔	Pension funds	Pension plan Retirement plan
132.	**Pension supervisor**	A governmental authority with competence over the supervision of pension systems.	Pension regulator	
133.	**Pensionable age**	➔		Normal retirement age
134.	**Pensionable service**	➔		Service period
135.	**Individual pension plans**	➔		Personal pension plans
136.	**Personal pension plans**	Access to these plans does not have to be linked to an employment relationship. The plans are established and administered directly by a pension fund or a financial institution acting as pension provider without any intervention of employers. Individuals independently purchase and select material aspects of the arrangements. The employer may nonetheless make contributions to personal pension plans. Some personal plans may have restricted membership.	Mandatory personal plans Voluntary personal plans	Personal plans
137.	**Phased retirement**	A situation when an individual is allowed to retire and receive retirement benefits while continuing to work (usually part-time) and contributing towards the retirement scheme.		
138.	**Plan member**	➔		Member Pension fund member
139.	**Plan sponsor**	➔		Pension plan sponsor
140.	**Postponed retirement**	➔		Deferred retirement Late retirement
141.	**Price indexation**	The method with which pension benefits are adjusted taking into account changes in prices.	Wage indexation	
142.	**Private pension funds**	A pension fund that is regulated under private sector law.	Public pension funds	
143.	**Private pension plans**	A pension plan administered by an institution other than general government. Private pension plans may be administered directly by a private sector employer acting as the plan sponsor, a private pension fund or a private sector provider. Private pension plans may complement or substitute for public pension plans. In some countries, these may include plans for public sector workers.	Public pension plans Pension plans	

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	Term	Definition	Related terms	Identical terms
144.	**Projected Benefit Obligation (PBO)**	The actuarial present value of vested and non-vested benefits attributed to the plan through the pension benefit formula for service rendered to that date based on employees' future salary levels.	Accumulated Benefit Obligation (ABO)	
145.	**Protected pension plan**	A plan (personal pension plan or occupational defined contribution pension plan) other than an unprotected pension plan. The guarantees or promises may be offered by the pension plan/fund itself or the plan provider (*e.g.* deferred annuity, guaranteed rate of return).	Unproted pension plan	
146.	**Public pension funds**	Pension funds that are regulated under public sector law.	Private pension funds Pension funds	
147.	**Public pension plans**	Social security and similar statutory programmes administered by the general government (that is central, state, and local governments, as well as other public sector bodies such as social security institutions). Public pension plans have been traditionally PAYG financed, but some OECD countries have partial funding of public pension liabilities or have replaced these plans by private pension plans.	Private pension plan Pension plan	
148.	**Qualifying period**	➔		Waiting period
149.	**Rate of return**	The income earned by holding an asset over a specified period.	Gross rate of return Net rate of return	
150.	**Regulatory authority**	➔	Supervisory authority	Pension regulator
151.	**Related member funds**	Pension funds that comprise the assets of a limited number of related members who are all in the governing body of the pension fund.	Collective pension funds Group pension funds Individual pension funds	
152.	**Replacement rate**	The ratio of an individual's (or a given population's) (average) pension in a given time period and the (average) income in a given time period.		Income replacement rate
153.	**Retirement age**	➔		Normal retirement age Normal pension age
154.	**Retirement benefit**	➔		Benefit Pension benefit
155.	**Retirement plan**	➔		Pension plan Pension scheme
156.	**Separate accounts**	A pension fund that is legally segregated from both the plan sponsor and a financial institution that acts as the manager of the fund on behalf of the plan member.	Pension fund Plan sponsor Plan member	
157.	**Service period**	The length of time an individual has earned rights to a pension benefits.		Pensionable service

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	Term	Definition	Related terms	Identical terms
158.	**Single employer pension funds**	Funds that pool the assets of pension plans established by a single sponsor.	Collective pension funds Related member funds Individual pension funds Industry pension funds Multi-employer pension funds Group pension funds	
159.	**Superannuation**	➔		Pension
160.	**Supervisory authority**	➔	Regulatory authority	Pension supervisor
161.	**Supervisory board**	The individual(s) responsible for monitoring the governing body of a pension entity.		Oversight committee
162.	**Surplus**	➔		Actuarial surplus
163.	**Swiss indexation**	➔		Mixed indexation
164.	**System dependency ratio**	Typically defined as the ratio of those receiving pension benefits to those accruing pension rights.	Dependency ratio	
165.	**TEE system**	A form of taxation of pension plans whereby contributions are taxed, investment income and capital gains of the pension fund are exempt and benefits are also exempt from personal income taxation.	EET system ETE system	
166.	**Termination**	➔		Winding up
167.	**TPA (Third Party Administrator)**	An entity other than a plan sponsor, that is responsible for administering an occupational pension plan.		
168.	**Trust**	A legal scheme, whereby named people (termed trustees) hold property on behalf of other people (termed beneficiaries).	Trustee	
169.	**Trustee**	A person or a company appointed to carry out the tasks of the trust.	Corporate trustee Trust	
170.	**Underfunding**	The situation when the value of a plan's assets are less than its liabilities, thereby having an actuarial deficiency.	Funding level Actuarial deficiency Overfunding	
171.	**Unfunded pension plans**	Plans that are financed directly from contributions from the plan sponsor or provider and/or the plan participant. Unfunded pension plans are said to be paid on a current disbursement method (also known as the pay as you go, PAYG, method). Unfunded plans may still have associated reserves to cover immediate expenses or smooth contributions within given time periods. Most OECD countries do not allow unfunded private pension plans.	Funded pension plans	PAYG plan
172.	**Unisex annuity rate**	Annuity rates that are the same for men and women.	Annuity rate	

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	Term	Definition	Related terms	Identical terms
173.	**Unisex mortality table**	Mortality table where the rate of death is equal for males and females.	Mortality table	
174.	**Unistatus annuity rate**	Annuity rates which are the same for both men and women and for all family status.	Annuity rate	
175.	**Unprotected pension plan**	A plan (personal pension plan or occupational defined contribution pension plan) where the pension plan/fund itself or the pension provider does not offer any investment return or benefit guarantees or promises covering the whole plan/fund.	Protected pension plan	
176.	**Valuation**	➔		Actuarial valuation
177.	**Vested Benefit Obligation (VBO)**	The actuarial present value, using current salary levels, of vested benefits only.		
178.	**Vested benefits**	➔		Vested rights
179.	**Vested rights**	Deferred pensions for deferred pensioners, benefits accrued to active members and benefits of passive members.		Vested benefits
180.	**Voluntary contribution**	An extra contribution paid in addition to the mandatory contribution a member can pay to the pension fund in order to increase the future pension benefits.	Contribution Mandatory Contribution	
181.	**Voluntary occupational pension plans**	The establishment of these plans is voluntary for employers (including those in which there is automatic enrolment as part of an employment contract or where the law requires employees to join plans set up on a voluntary basis by their employers). In some countries, employers can on a voluntary basis establish occupational plans that provide benefits that replace at least partly those of the social security system. These plans are classified as voluntary, even though employers must continue sponsoring these plans in order to be exempted (at least partly) from social security contributions.	Occupational pension plans Mandatory occupational pension plans	
182.	**Voluntary personal pension plans**	Participation in these plans is voluntary for individuals. By law individuals are not obliged to participate in a pension plan. They are not required to make pension contributions to a pension plan. Voluntary personal plans include those plans that individuals must join if they choose to replace part of their social security benefits with those from personal pension plans.	Personal plans Mandatory personal pension plans	
183.	**Wage indexation**	The method with which pension benefits are adjusted taking into account changes in wages.	Price indexation	

Term	Definition	Related terms	Identical terms
184. **Waiting period**	The length of time an individual must be employed by a particular employer before joining the employer's pension scheme.		Qualifying period
185. **Winding-up**	The termination of a pension scheme by either providing (deferred) annuities for all members or by moving all its assets and liabilities into another scheme.		

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