OBSERVATOIRE DE L'EPARGNE EUROPÉENNE

ACCOUNTING FOR OCCUPATIONAL PENSION PLANS IN THE MAIN EUROPEAN COUNTRIES

Research realized for the Observatoire de l'Epargne Européenne by Fixage

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I. Executive Summary

I.1. The assessment of pension funds as part of households assets

In some European countries, occupational plans represent a significant part of pensions for retirees. Therefore one can't assess the wealth of households without taking into account this future revenue. It is then important to understand how these liabilities for plan sponsors and claim for households is assessed and accounted for.

This report deals with the calculation and accounting within the employer's financial statements of liabilities for post-employment benefits in the case of defined benefit plans, unless otherwise specified.

Concerning the calculation of the plan sponsor liability for defined benefit plans, this study shows a great disparity of actuarial methods and assumptions between European countries and even within a single country. On an actual plan sponsor, we have calculated a "standard liability" applying the Unit Credit method with salary projection and reasonable hypothesis. Using the most common actuarial method and average assumptions used in different European countries (except for the local mortality tables since we retained one table for the calculations), we obtain accrued liability varying from around 45% to 130% of the "standard liability". Should we have retained the mortality tables employed locally the gap would have been from 1 to 4 instead of 1 to 3.

The accounting practices also vary widely from one country to another. Most European countries do not have specific accounting regulation for pension funds. In these countries large companies often use international standard such as FAS 87 or IAS 19 but sometimes only partially. The United Kingdom is an exception with a new FRS 17 standard that is due to replace the former SSAP 24 standard. The situation might change dramatically with the adoption of IAS standards progressively from 2005.

However, the assessment of plan sponsors' obligations is made difficult by the fact that their liabilities are covered by 4 means that bear different risks for the employees:

Funds held by insurance companies,
Funds held by pension fund asset managers,
Book reserves in the plan sponsor balance sheet,
Unrecognised liabilities.

For defined benefit plans, the households' monetary/asset value of their claim relies on the capacity of the plan sponsor to fulfil its obligation and

assessing/rating this capacity. In case of pension fund deficits the plan sponsor will have to pay additional contributions.
The primary risk borne by the households is then a default risk on their employer. The secondary risk for the households is a default risk on the insurance companies if parts of the benefits are covered by insurance contracts. The financial risk is directly borne by the employer or the insurer, but the occurrence of this risk can lead an employer, the pension fund or an insurer to bankruptcy and employees would loose their rights.

This situation has led some countries to edict strict regulation to protect the employees. For example, Netherlands forbids book reserves and demands that pension funds be fully funded and the UK has Minimum Funding Requirements.

Compared to defined benefit plans, defined contribution plans seem much safer. The households' "receivables" equals the value of the assets at their name in the pension fund or equivalent body and the main risk for the households is a financial risk. The only differences compared to a mutual fund directly owned is the lack of liquidity (the pension fund assets can't be sold by the beneficiaries) and, to some extend, less arbitrage possibilities (the beneficiaries can't arbitrate the pension funds assets or only in a limited manner).

I.2. The impact of pension deficit disorder

The global trend of employee benefits accounting standards (whose full implementation is delayed due to present market conditions) towards rules for recognising assets and liabilities with less smoothing has an impact on plan sponsors income statement, balance sheets and cash demands.

During most of the 80's and 90's, companies have used smoothing methods to calculate their accrued pension liability and assets, allowing them to partially postpone full recognition of their pension liability. In the same time, a wide freedom of choice in the actuarial assumptions allowed them to use optimistic expected rates of return on assets and/or discount rates, potentially minimizing their accrued pension liability and pension expense. In Europe, there can be up to a 300% difference in the accrued pension liability calculated between two countries with same plan formula and demographics.

The rise of stock markets until mid 2000 boosted funding levels of pension funds that, in some country, were largely invested in equities. This allowed plan sponsors to strongly reduce their contributions or even take contributions holidays.

IAS 19 and other new regulations force companies to calculate their accrued liability with stricter rules and assumptions and recognise shortfalls faster in their balance sheets. For some companies the impact on earnings is strong and immediate.

The ability to estimate the pension fund assets on averaged market values or by using estimated rates of returns is also quickly vanishing. This is a strong incentive for plan sponsors to change their pension funds asset allocation to less volatile asset classes, to avoid excessive variation in the valuation of their assets.

These evolutions have the following main consequences:

The conjunction of a severe bear market since the last quarter of 2000 and stricter accounting rules (even if progressively adopted) proves to be potentially disastrous for pension fund sponsors and weights on global economic recovery.

The risk exists that pension funds massively sell their equities, keeping the equity stock markets at low levels for a long time.

A growing trend for companies to replace their defined benefit plans by defined contribution plans in order to limit the risks for their earnings and their balance sheets. This trend, which originated in the United States in the mid 90's, is quickly getting up steam in Europe.

As a conclusion one can say that pension liabilities are now viewed with a different perspective. The collapse of the equity bull market has brought a new gang of creditors of the world most reputable companies: their employees. The discrepancy between assets and liabilities are now seen as the amount the workers have lent to their companies, out of retirement benefits. Credit agencies have realised such unwitting generosity comes at a price. The decision by Standards & Poor's to put more weight on pension liabilities in its assessment of debt illustrates this new awareness and raises pressure on all companies to come clean about the shortfalls, and to set out to reduce them.

II. The importance of employee benefits in Europe

Ageing populations in Europe are a major challenge for the ability of pension systems to maintain adequate and sustainable pensions.

Over the coming decades, European countries will face a significant acceleration of demographic ageing due to three main factors:

The baby-boom generation reaching retirement age,
The continuing increase in life expectancy,
The decreased fertility since the 70s.

All three factors combine to produce a major financial challenge for pensions systems in the near future when the number of pensioners will rapidly increase and the size of the working age population will diminish.

Awareness of these demographic challenges, which are mainly seen as a problem for public pension schemes, probably leads many Europeans to take a rather pessimistic view of their future state pensions entitlements. According to a "Eurobarometer" survey conducted by the European Commission in the autumn of 2001, more than 50% of Europeans expect to have some difficulties getting by on their state pension, while almost 30% of them have no opinion.

In countries like Ireland, UK or the Netherlands, the ability to maintain one's living standard after retirement depends in a large extent to access to private retirement schemes. Although the importance of those private schemes varies considerably from one country to another, they constitute an important tool to partly relieve the burden from public schemes. It is likely that their importance will strongly grow in the coming years.

The table below summarises information on the importance of private pensions provision for the following EU countries, mainly through occupational schemes.

Country	Year	Importance of private pension schemes
Belgium	1999	Beneficiaries: 12.8% of all those receiving public old-age pension 35% of all employees pay contributions to an occupational pension scheme. (These figures underestimates coverage because they do not take into account second pillar pensions from sector pension plans governed by the Fund for Security of Existence (construction and metallurgical industry), pension promises made by employers to individual employees and voluntary supplementary pensions for the self-employed.

Country	Year	Importance of private pension schemes
Denmark	1998	82% of full-time employees aged 15-59 pay contributions to a labour market pension scheme. 68% of population over 66 receive a pension from ATP, a statutory fully funded defined contribution scheme
Germany	1999	Beneficiaries: 28% of employees in commerce and 64% in industry were covered (in the former East Germany the figures are 16% and 20%). Overall, in the former West Germany, around half the male employees last employed in the private sector of the economy receive an occupational pension in old age Public sector employees: 87% of men and 52% of women last employed as public service employees in former West Germany were awarded a supplementary public service pension in 1999. The public service (excluding civil servants as such) is covered by collective agreements concerning special supplementary provision. 7% of total old-age income stems from the second pillar. Third pillar arrangements account for 10% of old age income.
Spain	2001	Only 10% of the 5.89 million people covered by a pension plan (individual life and group insurance funds, social provision mutual funds, occupational plans) are member of occupational pension schemes, compared to a total of 16.290 million people paying into the social security system in 2002.
France	1999	Voluntary occupational schemes pay around 1.7% of total pension benefits (basic scheme and compulsory occupational schemes) to employees and self-employed workers. Information on book reserves managed directly by companies is not available.
Ireland	2002	46.8% of total workforce aged 20 to 69 are members of their employer's occupational pension scheme Overall coverage of private schemes amounts to nearly 51%.
Italy	2001	8.7% of workforce contributing in the public pension scheme pay contributions to a supplementary pension scheme (both collective and individual): private employees=13.8%, public employees=0.0%, self-employed=3.7%; men 16.3%, women 9.5%.
Netherlands	2000	91% of all employees are member of second pillar schemes Netherlands 2000. 83% of pensioners' households receive a supplementary pension.
United kingdom	2000	60% of pensioner households had income from an occupational pension. 71% had investment income including private pensions. 44% of working age population is contributing to an occupational or personal pension (males: 51%, females: 37%).

Data from: "Commission of the European Communities: draft Proposal for a joint report by the Commission and the Council on adequate and sustainable pensions" (17/10/2002)

III. Description of employee benefits

III.1. The different kinds of employee benefits

The International Accounting Standard Board defines, within IAS19 (revised 1998), employee benefits as: « all forms of consideration given by an enterprise in exchange for service rendered by employees »

The classification below is given by the IAS19 standard. It covers a very wide range of benefits, all of which are not to be found in every country or every company.

III.1.1. Short term employee benefits

Short-term employee benefits are benefits (other than termination and equity compensation benefits), which fall due wholly within twelve months after the end of the period in which the employee rendered services.

This category includes:

- Wages, salaries and social security contribution.
- Short term compensated absences (paid annual and sick leaves) where the absences are expected to occur within 12 months after the end of the period of services for employee.
- Profit sharing and bonuses payable within 12 months.
- Non-monetary benefits (medical, house, car,…,) for current employees

No actuarial assumptions are required to measure the obligation, as they are valued undiscounted.

Under most accounting standards, these short-term employee benefits should be recognised as an expense and as a liability for the unpaid part.

III.1.2. Post employment benefits

Post employment benefits are benefits (other than termination and equity compensation benefits) which are payable after the completion of employment.

This category includes:

- Retirement benefits,
- Other post employment benefits i.e. life insurance, medical care.

Post employment plans can be formal or informal arrangements and may involve establishment of a separate entity to receive contribution or pay benefits.

III.1.3. Other long term employee benefits

Other long-term employee benefits are benefits (other than termination and equity compensation benefits) that do not fall due wholly within twelve months after the end of the period in which the employee rendered services.

This category includes:

- Long term compensated leaves i.e. long service, sabbatical.
- Jubilee or other long-service benefits.
- Long term disability benefits.
- Profit sharing and bonuses payable after 12 months.
- Deferred compensation paid after 12 months.

III.1.4. Termination benefits

Termination benefits are employee benefits which are payable as a result of either:

- A company's decision to terminate employee's employment before normal retirement age,
- Or employee's decision to accept voluntary redundancy in exchange of those benefits.

They are usually lump-sum payments but may include enhancement of retirement benefits and salary until the end of a specified notice period.

III.1.5. Equity compensation benefits

Equity compensation benefits are benefits settled in shares, share options or other equity instruments of the entity.

III.2. The different kinds of plans

The post employment employee benefits are generally split in two different kinds of plans. The actuarial method and accounting rules that can be used will depend upon the kind of plan implemented by the company.

III.2.1. Defined contribution plans

IAS 19 defines them as plans under which a company's legal or constructive obligation is limited to the amount it agrees to contribute to the fund.

The **contributions** are defined and the resulting benefits are calculated according to the contributions made and returns on assets. The level of contributions may be defined in absolute terms or by reference to the salary/earnings of the employee. The resulting benefits may then be calculated by reference to the actual or notional investment earnings achieved on the contributions, or other factors.

The employee assumes the actuarial risks and investment risks. Accounting for defined contribution plans is generally determined by the amounts to be contributed by the enterprise for the current period. Obligations are measured on an undiscounted basis, except where they do not fall due within 12 months of the employee rendering the service.

Under IAS 19 when an employee has rendered service to an enterprise during a period, the enterprise should recognise the contribution payable to a defined contribution plan in exchange for that service:

(a) As a liability (accrued expense) after deducting any contribution already paid. If the contribution already paid exceeds the contribution due for service before the balance sheet date, an enterprise should recognise that excess as an asset (prepaid expense) to the extent that the prepayment will lead to, for example, a reduction in future payments or a cash refund; and
(b) As an expense, unless another International Accounting Standard requires or permits the inclusion of the contribution in the cost of an asset.

Where contributions to a defined contribution plan do not fall due wholly within twelve months after the end of the period in which the employees render the related service, they should be discounted using the discount rate retained for defined benefit plan liabilities calculations.

III.2.2. Defined benefit plans

IAS 19 defines them as plans other than defined contribution plans.

The **benefits** to be paid are defined in advance. The definition may take several different forms; in particular it may define the benefits as follows:

(a) The **absolute** level of the benefits may be defined in fixed monetary terms, perhaps dependent upon the number of years of service that the employee has achieved. These fixed benefits may also be indexed in line with, for example, a price index (i.e. a semi-dynamic pension plan).

(b) The level of benefits may be defined in terms of the **salary** of the employee/member, usually also dependent on the years of service achieved. The definition may be based on the salary or earnings immediately (or over a specified period) prior to the commencement of benefit payments or on the salary throughout service. These different structures are denoted **final salary** arrangements and **career average** arrangements respectively.

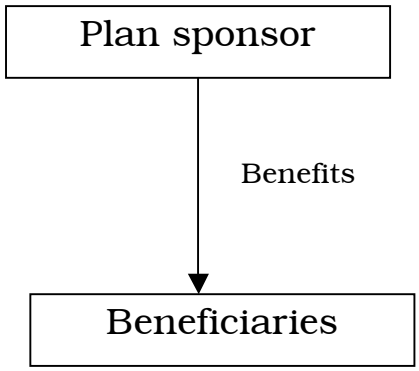
An employer's obligation under a defined benefit plan is to provide the agreed amount of benefits to current and former employees. The benefits are typically based on such factors as age, length of service and compensation.

The employer retains the actuarial risks and investment risks. If actuarial or investment experience is different than expected, an employer's obligation may increase or decrease.

III.3. The different implementation methods

III.3.1. Direct benefit promise

Here the benefits are promised and paid directly by the employer, without recourse to an external institution. When recognized, the liabilities are directly written in the company's balance sheet.



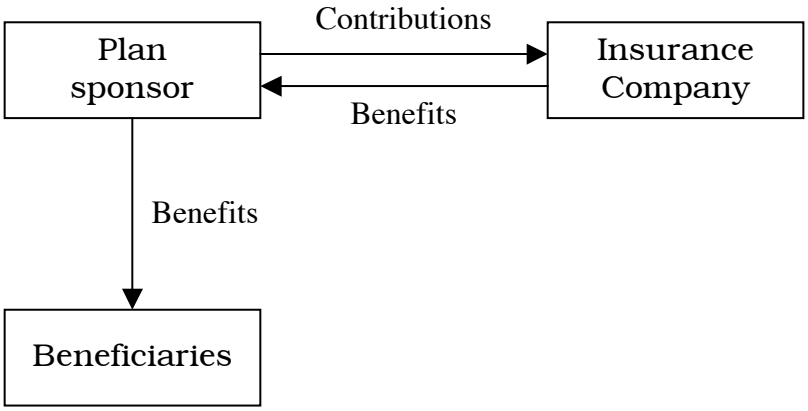
The countries where this is used as a main financing vehicle are:

Germany
France – IFC retirement indemnity payments
Italy (use is declining)
Spain (forbidden since 2002)
UK for senior employee benefits.

In Germany there has been some trend for companies to hold assets in funds (either directly or through special Contractual Trust Arrangements) to back the book-reserved liabilities.

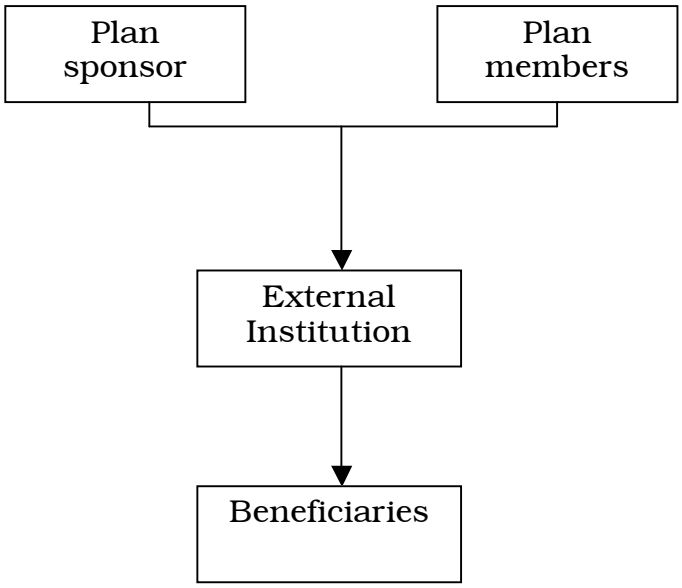
In the UK an unfunded approach has been used by some companies when providing benefits to senior employees in respect of earnings that lie above the maximum that can be taken into account under tax approved pension funds.

The company might underwrite an additional insurance contract to indirectly finance the benefits. In this case the insurance company bears the actuarial and financial risks associated to the plan.



III.3.2. Externally sponsored institution

Contributions are paid by the employer (and/or employee) to the separate institution that then pays benefits to the employees/beneficiaries.



For countries with a well-developed system of occupational retirement or supplementary benefits this is (with the exception of Germany) the most common way of providing benefits.

This route is a main vehicle for providing pension benefits in:

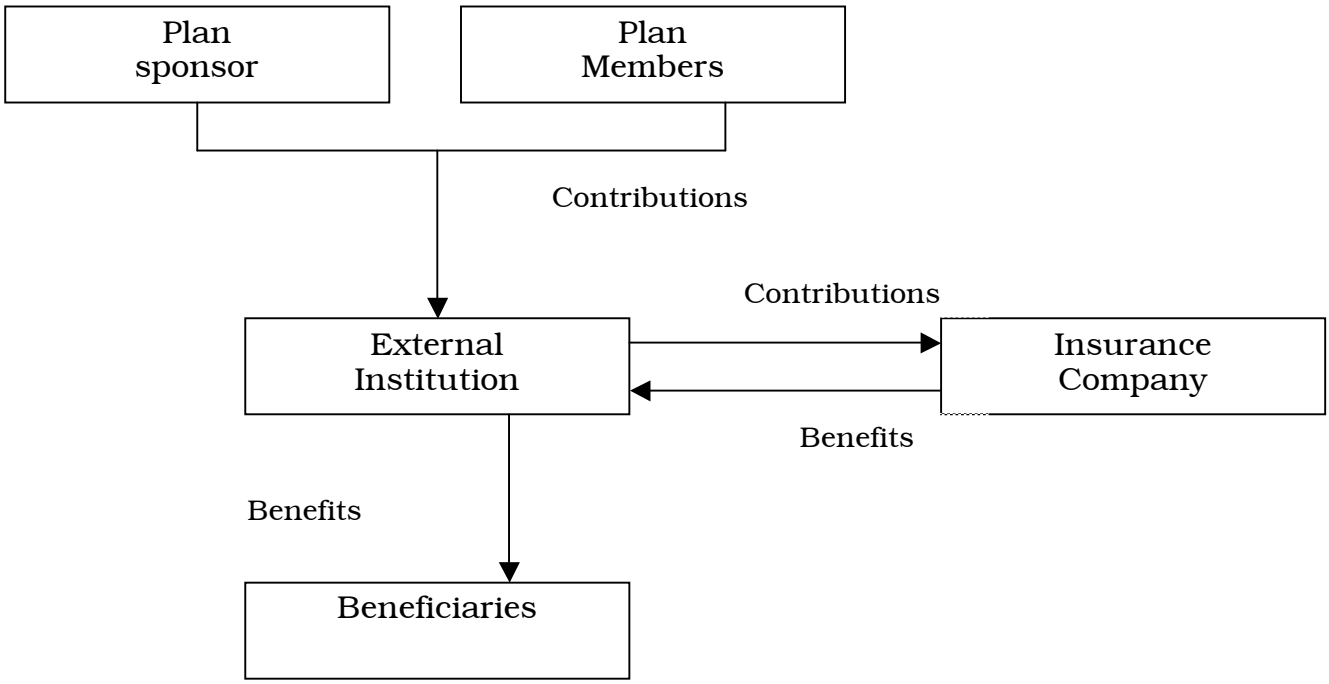
United Kingdom	— Pension funds
Ireland	— Pension funds
Netherlands	— Pension funds
Belgium	— Pension funds (ASBL/VZW)-for larger plans
Spain	— Pension funds
Switzerland	— Pension funds

This method is additionally used in

Germany	— Pensionskassen and Unterstützungskassen (support funds)
Italy	— Pension funds

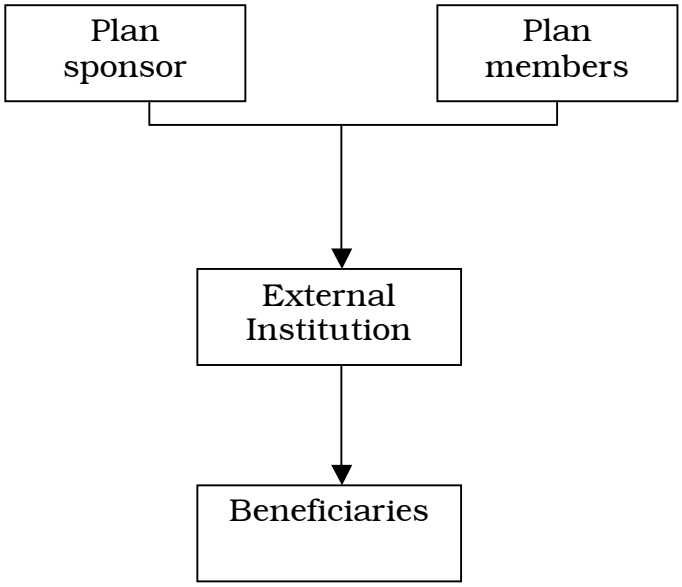
France does not fit in this 3 pillar architecture. ARRCO and AGIRC are mandatory inter branch industry schemes that are assimilated to the first social security pillar and not to the occupational pension plans second pillar.

In the case of a defined benefit plan, using an external institution does not relieve the plan sponsor from its obligation to its employees. But this institution might underwrite an additional insurance contract to indirectly finance the benefits. In this case the insurance company bears the actuarial and financial risks associated to the plan.



III.3.3. Insurance

Here the benefits are provided by using insurance contracts taken out on the lives of the beneficiaries. Contributions are paid by the employer (and/or the employee) to the insurer and the benefits arising from the insurance contracts are paid by the insurer to the beneficiary. This structure is the one most commonly used when defined contribution plans are operated. The contracts are usually held on a fully allocated basis (i.e. a separate account is held for each individual member of the pension scheme). Of special interest is the use of group insurance contracts for the financing of defined benefit plans, particularly where non-allocated funding is allowed (as is the case for Belgium or France).



Insurance is used as a main vehicle for providing pension benefits in most of the member countries, although in some its use is mainly restricted to smaller pension schemes (Netherlands, Ireland, Germany, United Kingdom).

Insurance is used both for defined benefit and defined contribution plans.

III.4. The scope of this report

This report will deal with accounting the post-employment employee benefits provided by privately owned companies to their employees, active and retirees. This is the most important part of long-term employee benefits, and the one where actuarial methods and accounting standards vary widely.

As defined contribution plans do not generate any long-term liability and therefore bear no risk for the company, this report will deal only with defined benefit plans.

IV. The accrued liability calculation

IV.1. Why are actuarial evaluations needed?

The promise to pay a defined retirement benefit commits the provider to the payment of amounts of money, the **timing** and **duration** of which are not fixed or certain, but dependent upon the beneficiary.

The definition of the benefits may also mean that the **amount** of the benefit is uncertain (e.g. if the benefit is defined by reference to final salary).

There may be a considerable delay between the promise to pay benefits being given and the actual payment of benefits. The need for actuarial involvement therefore arises from the requirement to have information on the benefits promised before they are actually paid. In particular the actuary is involved in:

(a) Projecting **when** benefit payments are to be made (demographic projection)

(b) Projecting the **level** of benefits to be paid (economic projection)

These projections involve the actuary in making **assumptions** about future events. We will see in chapter V that, for a given case, these assumptions may vary from country to country.

The main calculations carried out by actuaries in respect of defined benefit occupational pension schemes are to determine:

(a) The **level** of liabilities that should be recognised at a specific point in time (the accrued liability).

(b) The **annual cost** of providing the pension benefits; alternatively the required contribution to an external financing vehicle or allocation to a book reserve.

All these calculations may be done using various methods. The choice of the actuarial method is fundamental, since the pattern of annual costs and the recognition of liabilities will be quite different from one method to another. This has a strong impact on the company's awareness of its future obligations and then on its commitment to finance them.

The actuaries estimate the present value of future obligations and their actual yearly cost. Then the accountants recognize these amounts in the balance sheet and P&L. Theoretically the choices of the actuarial method and the accounting standard are independent. In practice they are often

linked: most accounting standards limit the choice of the actuarial funding method.

The most commonly used methods for calculating accrued liability are described in the section below. We have tried to use the more common names for the methods. But it must be kept in mind that their names can change from one place to another and are sometimes quite misleading.

IV.2. Description of main funding methods

IV.2.1. Pay-as-you-go method

The cost of benefit provision is met when the actual payments themselves are made. Therefore in respect of a single individual no cost is allocated whilst he is expecting benefits, the cost of his/her pension (or other) benefits being met when they are paid (i.e. when he/she is in retirement). No reserves are calculated, even for existing pensioners.

As no reserves are established for future payments, pay-as-you-go financing introduces the concept of using the contributions made in respect of one generation (current employees) to pay the benefits accrued by another (current pensioners). This cross-subsidisation means that the contribution rate is sensitive to the relative development of the active and retired populations and in addition to the development of real earnings in relation to pension benefits. In pay-as-you-go methods the decision to increase pensions is discretionary.

The following funding methods described below are or have been used for pension accounting by either plan sponsors or supervisory authorities.

IV.2.2. Terminal funding method

The cost of pension benefit is met when the employee retires. Then the liability, which is calculated, equals the present value of annuity. Implicitly this method assesses that the employer's obligation begins only at retirement time, when the liability is sure.

The purchase price of a 1-euro life annuity (noted PP thereafter) is given by:

$$PP = \sum_{k=x}^{\omega} \frac{l_k}{l_x} \frac{1}{(1 + dr)^{k-x}}$$

Where: x is the present age of the pensioner,

$\frac{l_k}{l_x}$ Is the probability that the pensioner will still be alive at age k,

dr Is the discount rate,

ω Highest age in the mortality table

This is the amount of money you need on average to be able to pay each year one euro to the pensioner until his death, given that the money you have set up will earn you a yearly return of dr%.

Then the classical formula for a life annuity purchase price (noted LAPP thereafter) is:

$$LAPP = \sum_{k=x}^{\omega} \frac{l_k}{l_x} \frac{A}{(1 + dr)^{k-x}} = A \times PP,$$

Where: A is the constant annuity amount.

This LAPP is calculated for each pensioner, and his or her sum is the employer's liability.

If the annuity is indexed each year, then the formula is:

$$LAPP = \sum_{k=x}^{\omega} \frac{l_k}{l_x} \frac{A \times (1 + ir)^{k-x}}{(1 + dr)^{k-x}} = \sum_{k=x}^{\omega} \frac{l_k}{l_x} \frac{A}{(1 + \frac{dr - ir}{1 + ir})^{k-x}} \approx \sum_{k=x}^{\omega} \frac{l_k}{l_x} \frac{A}{(1 + dr - ir)^{k-x}}$$

Where: A is the annuity amount at age x,

ir Is the indexation rate for annuities.

IV.2.3. Unit Credit method with no salary projection

The employer's obligation is recognized as soon as the benefits are accrued. The accrued liability equals the present value of accrued benefits at the date of valuation (with present salary).

The accrued liability (AL) is calculated as follows:

$$AL = AB_{present} \times S_{present} \times P_{retirement} \times V \times PP,$$

Where: $AB_{present}$ are the accrued benefits,

$S_{present}$ Is the employee's salary at the date of calculation,

$P_{retirement}$ Is the probability that the employee will still be working for the employer at the date of his retirement, taking into account mortality and turnover,

$V = \frac{1}{(1 + dr)^{(retirement\ age - present\ age)}}$ Is the discount factor.

Example

Pension promise:

Retirement pension of:

0% of salary per year of service from year 1 to year 10,
0.5% of salary per year of service from year 11 to year 20,
1% of salary per year of service from year 21 to year 30,
1.5% of salary per year of service after year 30.

Maximum: 27% of last salary.
Retirement age 65.

Personal details:

Age at entry: 25
Current age: 60
Salary: 100,000 p.a.

Calculation:

Accrued benefits for 35 years of service: 22.5%
(0% for the first 10 years, 5% for the years between 11 and 20, 10% for the following 10 years and 7.5% for the latest 5 years)

P : 89.31%
dr : 5%
V : 78.35%
PP: 13.915

$AL = 22.5\% \times 100\,000 \times 89.31\% \times 78.35\% \times 13.915 = 219\,081$

This means that if the employer sets up a 219 081 euros fund which has a 5% return each year, then, on average, he will be able to pay a 22 500 euros annuity (i.e. $Annuity = 22.5\% \times 100\,000 = 22\,500$).

To fund a full pension with 40 years of service at retirement (i.e. 27% of last salary), the employer will have to pay a contribution each year from age 61 to 65. In fact $Annuity \times PP$ is to be fully funded at the date of retirement.

IV.2.4. Unit Credit method with salary projection

This method is quite similar to the Unit Credit method without salary projection. But the salary used for calculation is the estimated salary at the age of retirement.

The accrued liability (AL) is calculated as follows:

$$AL = AB_{present} \times S_{projected} \times P_{retirement} \times V \times PP,$$

Where: $S_{projected}$ is the estimated employee's salary at the date of retirement.

Generally the estimated salary at the date of retirement is calculated using a salary rise rate. But some employers use more sophisticated methods based on observations of actual careers history.

Example

Pension promise: identical to previous example.

Personal details: identical to previous example, plus
Estimated salary rise rate: 2.5%

Calculation
Accrued benefits for 35 years of service: 22.5%
$S_{projected} = 100\,000 \times (1 + 2.5\%)^{65-60} = 113\,141$
P: 89.31%
dr: 5%
V: 78.35%
PP: 13.915
$AL = 22.5\% \times 113\,141 \times 89.31\% \times 78.35\% \times 13.915 = 247\,870$

This means that if the employer sets up a 247 870 euros fund which has a 5% return each year, then, on average, he will be able to pay a 25 457 euros annuity ($Annuity = 22.5\% \times 113\,141 = 25\,457$).

To fund a full pension with 40 years of service at retirement (i.e. 27% of last salary), without paying any contribution until retirement, the employer would have to fund an additional 49 575 euros (difference between 247 870 and $297\,445 = 27\% \times 113\,141 \times 89.31\% \times 78.35\% \times 13.915$).

IV.2.5. Projected Unit Credit with service prorate

Here the accrued benefits are equal to the total available benefits multiplied by the ratio of number of years of service up to the valuation date to total years of service possible until benefits commence payment[1].

The employer's obligation is recognized along the employee's entire career.

The accrued liability is calculated as follows:

$$AL = B_{retirement} \times \frac{YS_{current}}{YS_{retirement}} \times S_{projected} \times P_{retirement} \times V \times PP ,$$

Where: $B_{retirement}$ are the benefits at the date of retirement,
$YS_{current}$ Is the current number of years of service,
$YS_{retirement}$ Is the number of years of service at the date of retirement.

Example

Pension promise: identical to previous example.

Personal details: identical to previous example.

Calculation

Accrued benefits for 35 years of service:

$$= B_{retirement} \times \frac{YS_{current}}{YS_{retirement}} = 27\% \times \frac{35}{40} = 23.625\%$$

$S_{projected} = 100\,000 \times (1 + 2.5\%)^{65-60} = 113\,141$

P: 89.31%
dr: 5%
V: 78.35%
PP: 13.915

$AL = 23.625\% \times 113\,141 \times 89.31\% \times 78.35\% \times 13.915 = 260\,264$

This means that if the employer sets up a 289 182 euros fund which has a 5% return each year, then, on average, he will be able to pay a 26 730 euros annuity ($Annuity = 23.625\% \times 113\,141 = 26\,730$).

To fund a full pension with 40 years of service at retirement (i.e. 27% of last salary), without paying any contribution until retirement, the employer would have to fund an additional 37 180 euros (difference between 260 264 and $297\,445 = 27\% \times 113\,141 \times 89.31\% \times 78.35\% \times 13.915$).

[1] This method generally uses projected salary but can also use current salary. In this later case it is called Unit Credit with service prorate.

IV.2.6. Projected Unit Credit with acquisition prorate

Here the accrued benefits are equal to the total available benefits multiplied by the ratio of number of years of service up to the valuation date to total years of service possible until the maximum level of benefits is attained.

The accrued liability is calculated as follows:

$$AL = B_{retirement} \times \frac{YS_{current}}{YS_{\max\ benefits}} \times S_{projected} \times P_{retirement} \times V \times PP,$$

Where: $B_{retirement}$ are the benefits at the date of retirement,
$YS_{current}$ Is the current number of years of service,
$YS_{\max\ benefits}$ Is the number of years of service at the date when the maximum level of benefits is attained.

Example

Pension promise: identical to previous example.

Personal details: identical to previous example.

Calculation

The maximum level of benefits (i.e. 27%) is attained after 38 years of service.

Accrued benefits for 35 years of service:

$$= B_{retirement} \times \frac{YS_{current}}{YS_{retirement}} = 27\% \times \frac{35}{38} = 24.868\%$$

$S_{projected} = 100\,000 \times (1 + 2.5\%)^{65-60} = 113\,141$

P: 89.31%
dr: 5%
V: 78.35%
PP: 13.915

$AL = 24.868\% \times 113\,141 \times 89.31\% \times 78.35\% \times 13.915 = 273\,957$

This means that if the employer sets up a 273 957 euros fund which has a 5% return each year, then, on average, he will be able to pay a 28 136 euros annuity ($Annuity = 24.868\% \times 113\,141 = 28\,136$).

To fund a full pension with 40 years of service at retirement (i.e. 27% of last salary), without paying any contribution until retirement, the employer would have to fund an additional 23 488 euros (difference between 273 957 and $297\,445 = 27\% \times 113\,141 \times 89.31\% \times 78.35\% \times 13.915$).

IV.2.7. Entry Age method

This is a sophisticated version of the service prorate method. Instead of calculating the ratio on years of service to determine the benefit acquisition path, the ratio equals the present value of past and present salaries divided by the present value of all probable salaries.

The accrued liability is calculated as follows:

$$AL = B_{retirement} \times \frac{PVPS}{PVPS + PVPFS} \times S_{projected} \times P_{retirement} \times V \times PP,$$

Where: $PVPS = \sum_{k=\text{entry age}}^{\text{current}-1} S_k \times (1+\text{dr})^{\text{current}-k}$ is the present value of past salaries,

$PVPFS = \sum_{k=\text{current}}^{\text{retirement}} PS_k \times \frac{1}{(1+\text{dr})^{k-\text{current}}}$ Is the present value of probable future salaries,

IV.3. Pros and cons of these methods

Method	Pros	Cons
Pay as you go	The easiest method Needs no assumptions	Does not allow to estimate whether future obligations will be met
Terminal Funding	Easy to implement	Does not consider all future obligations The liability may vary strongly when the population age pyramid is uneven
Unit Credit with no salary projection	Takes into account employees' mortality and turnover Fits to actual acquisition of employee benefits	Many assumptions[1] For the plans where benefits are acquired at the end of the career (which is often the case), the liability rises sharply during the latest years of service Does not take into account future salary increases (but the discount rate might be lowered)
Unit Credit with salary projection	Takes into account employees' mortality and turnover Takes into account future salary increases Fits to actual acquisition of employee benefits	Many assumptions[1] For the plans where benefits are acquired at the end of the career (which is often the case), the liability rises sharply during the latest years of service
Projected Unit Credit with service prorate	Takes into account employees' mortality and turnover Takes into account future salary increases Smoothes the liability's evolution over the entire career of the employee	Many assumptions[1] Does not fit to actual acquisition of employee benefits
Projected Unit Credit with acquisition prorate	Takes into account employees' mortality and turnover Takes into account future salary increases Smoothes the liability's evolution over the length of acquisition of benefits	Many assumptions[1] Does not fit to actual acquisition of employee benefits
Entry Age	Takes into account employees' mortality and turnover Takes into account future salary increases (but the discount rate might be raised) Smoothes the liability's evolution over the entire career of the employee	Many assumptions[1] Does not fit to actual acquisition of employee benefits

[1] This method requires that many actuarial assumptions must be made which can lead to a wide range of accrued liability levels

IV.4. Actuarial assumptions to be set for the valuation of accrued liability

The actuarial assumptions required in the valuation of retirement benefits can be broken down into two main categories:

(a) Economic assumptions, which are required to project the **amount** of benefits that will be payable.

(b) Demographic assumptions, which are required to project **when** benefits will be payable.

IV.4.1. Economic assumptions

A non-exhaustive list of the economic assumptions made by actuaries in valuing retirement benefits is as follows:

Interest rate for discounting future cash flows
Rate of price inflation
Rate of increase in salaries
Rate of increase in pension benefits for deferred pensioners
Rate of increase in state pension benefits
Rate of increase in dividends/rental income from assets.
Rate of increase in pensions in payment

Some of these assumptions are used to calculate the accrued benefits; others are used to valuate the fund assets.

Their inclusion and level is dependent upon the actual benefits provided, the economic factors affecting the country/employer and the specific restrictions placed upon the actuary when making calculations.

In all cases a discount rate is used. The interpretation of what it represents may however differ. Where corresponding assets do not **directly** exist (e.g. for a book reserved plan) or exist but are not considered to be valued as an integral part of the liability valuation then the discount rate represents an absolute discount rate.

In the United Kingdom and Ireland, where the assets held in a pension fund are sometimes valued as an integral part of valuing the liabilities and are valued by projecting the income and capital proceeds from these assets, then the discount rate is usually considered to represent the rate of interest to be earned on **new** investments made in the future.

There are some interactions between the different assumptions. For example, the discount rate is often close to long term interest rates, which partly depend on the inflation level, while the salary rise rate is slightly over the inflation rate. Therefore, there is an indirect link between the two rates.

IV.4.2. Demographic assumptions

Demographic assumptions are used to project the development of the population of the pension scheme and hence when the benefits to be provided will be paid.

A non-exhaustive list of the economic assumptions made by actuaries in valuing retirement benefits is as follows:

Mortality
Disability
Recovery from disability
Withdrawal
Early retirement
Normal retirement
Proportion married
Age difference with spouse
Number of orphans
Orphans' mortality

The use of standard tables of mortality and disability is widespread. This is due to the use of standard tables being explicitly or implicitly specified by the relevant authorities or out of choice because the experience of the pension scheme does not justify the development of scheme specific tables.

IV.5. Simulation on an actual case

We have calculated a plan sponsor pension liability on an actual case, using various actuarial funding methods.

In our case, the plan sponsor is a mid-sized European company, with over 10 000 active employees. Due to various mergers, there are two separate plans with different benefits. Their employee benefits plans both include a retirement lump sum, which is paid at the date of retirement.

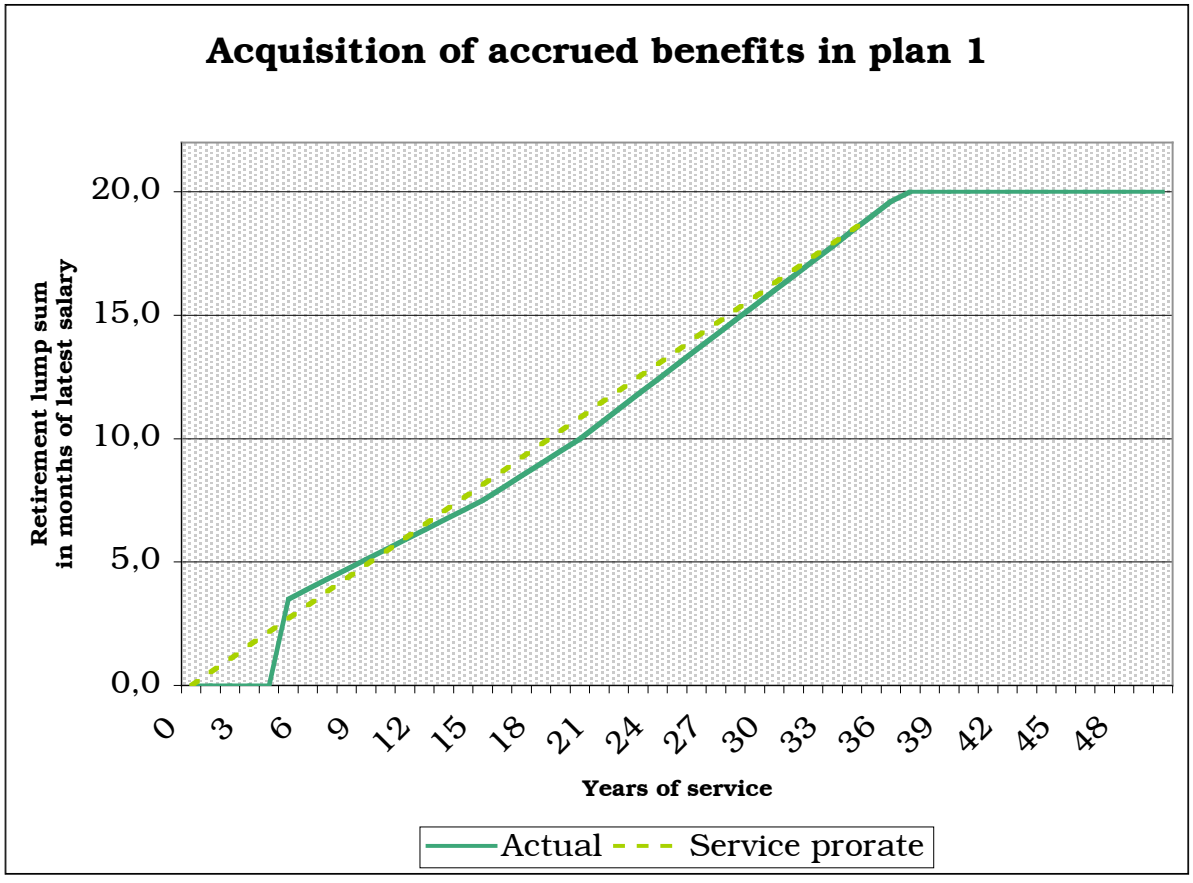
The plans considered do not provide pensions, but the only difference with a pension plan is the absence of liability for annuities in payment. As this

liability would be the same for all actuarial methods (excepted the pay-as-you-go method), the comparison is unbiased.

IV.5.1. Summary of plan characteristics and actuarial assumptions

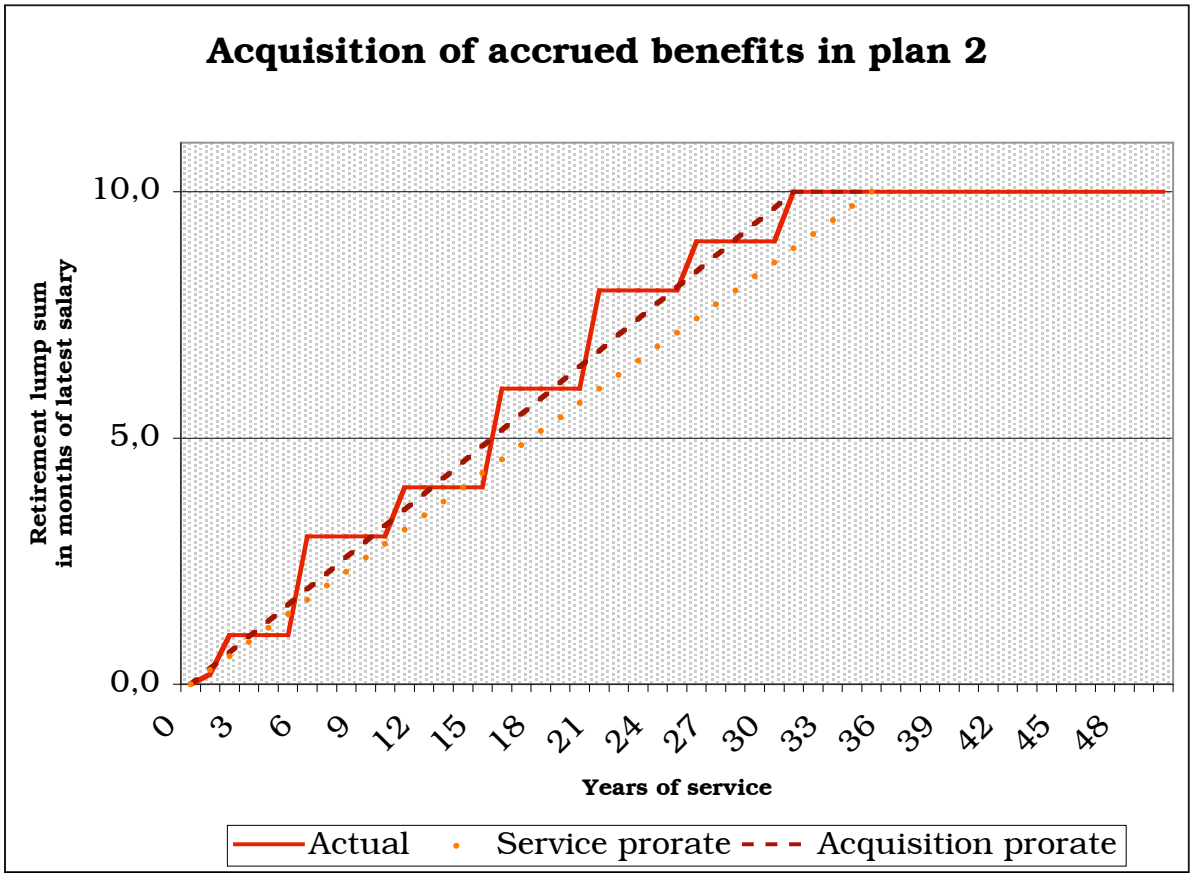
Mortality table	The French 1993 Generation Table, which is the latest and most precise table available. This table is based on a French population observation, with projections.
Salary rise hypothesis	The salary rise hypothesis is based on the employee's category and his age
Turnover rate hypothesis	The turnover rate hypothesis is based on the employee's category and his age
Retirement age	The retirement age depends on the plan and the birth date
Discount rate	FAS 87 or IAS 19 approach i.e. 5.25 % retained considering liability maturity of around 20 years in 2001
Benefits acquisition table	See appendix 1

The chart below illustrates the acquisition path of benefits for plan 1 and compares it to a linear acquisition based on the average number of years of service at retirement age (35 years):



In this plan, there is little difference between "linearizing" on acquisition period and on service period, since, on average, the two periods are the same.

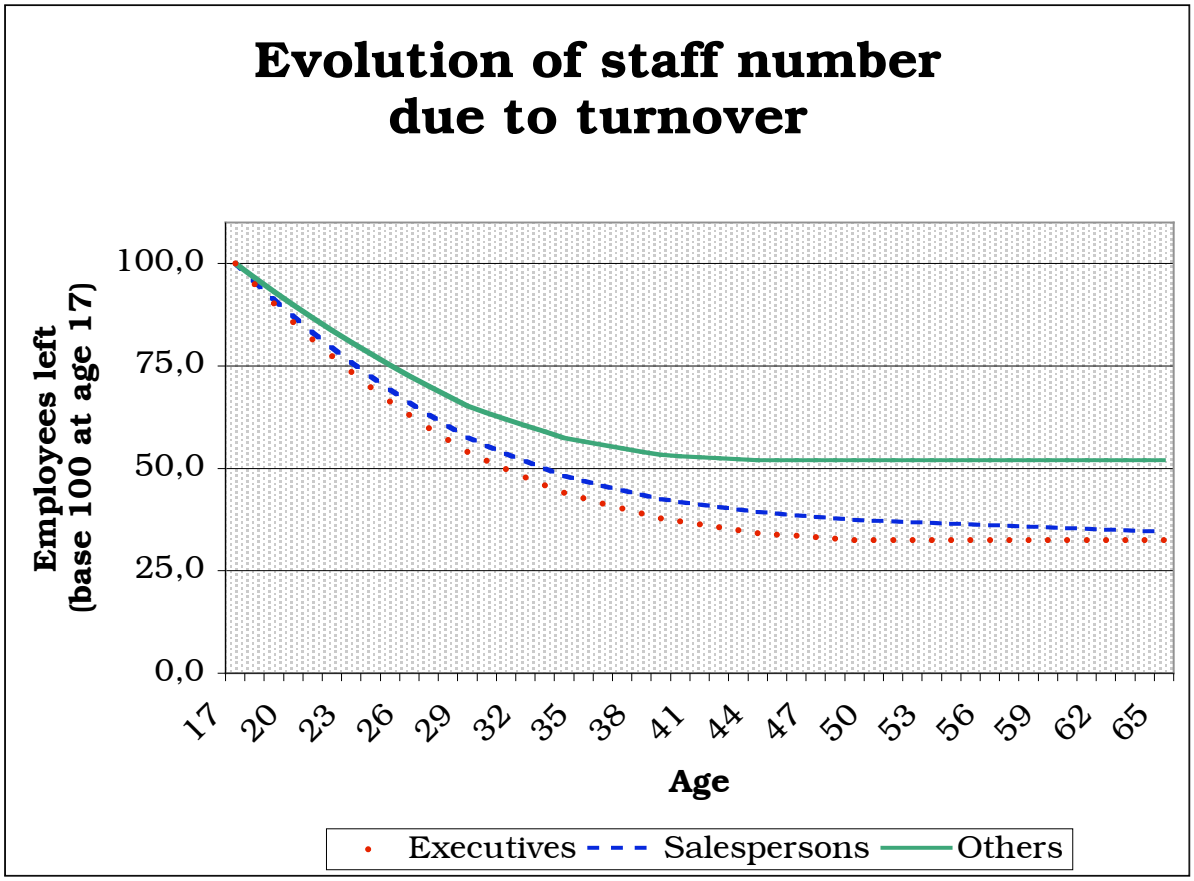
The chart below illustrates the acquisition path of benefits for plan 2 and compares it to two kinds of linear acquisition based respectively on the service period (period until retirement) and the acquisition period (period until maximum benefits are accrued):



For both plans the actual acquisition path is quite close to the two kinds of linear acquisition. It means that the actuarial methods smoothing the accrued benefits will give results close to the method based on actual accrued benefits, if all other assumptions are the same.

The chart below illustrates the turnover hypothesis. It shows the effect of turnover on the number of staff employed by the company, with a base 100 at age 17.

For a 17 years old employee, the probability to be in the company at age 65 varies between 32% for an executive or a salesperson and 52% for other categories.



The chart below illustrates the salary evolution hypothesis. It shows both the annual salary increase and the annual salary (base 100 at age 17).

IV.5.2. Results

The table below summarizes the results:

Method	Liability	Comments
Pay as you go	**0**	There is no liability in this method.
Terminal Funding	**0**	As there are no pensions in payment in the plan, this method does not calculate any liability.
Unit Credit with no salary projection	**72,9**	Without salary projection, the results are lower than in any method using final salary.
Unit Credit with salary projection	**100,0**	The sole impact of salary projection is a 37% rise for the Unit Credit method.
Projected Unit Credit with service prorate	**98,2**	The accrued benefits with a linear approach being very close to the actual accrued benefits, this method give results very close to the Unit Credit with salary projection. The Unit credit method with salary projection gives a lower accrued liability than the projected Unit method with service prorate for back-loaded plans (see the impact of a change in the acquisition path below).
Projected Unit Credit with acquisition prorate	**103,0**	The acquisition period being shorter or equal to the service period, this method gives higher results than the service prorate.
Entry Age	**117,6**	The discount rate being higher than the average salary increase rate, this method gives more weight to past salaries than to future salaries. The accrued benefits rise quicker than in other methods.

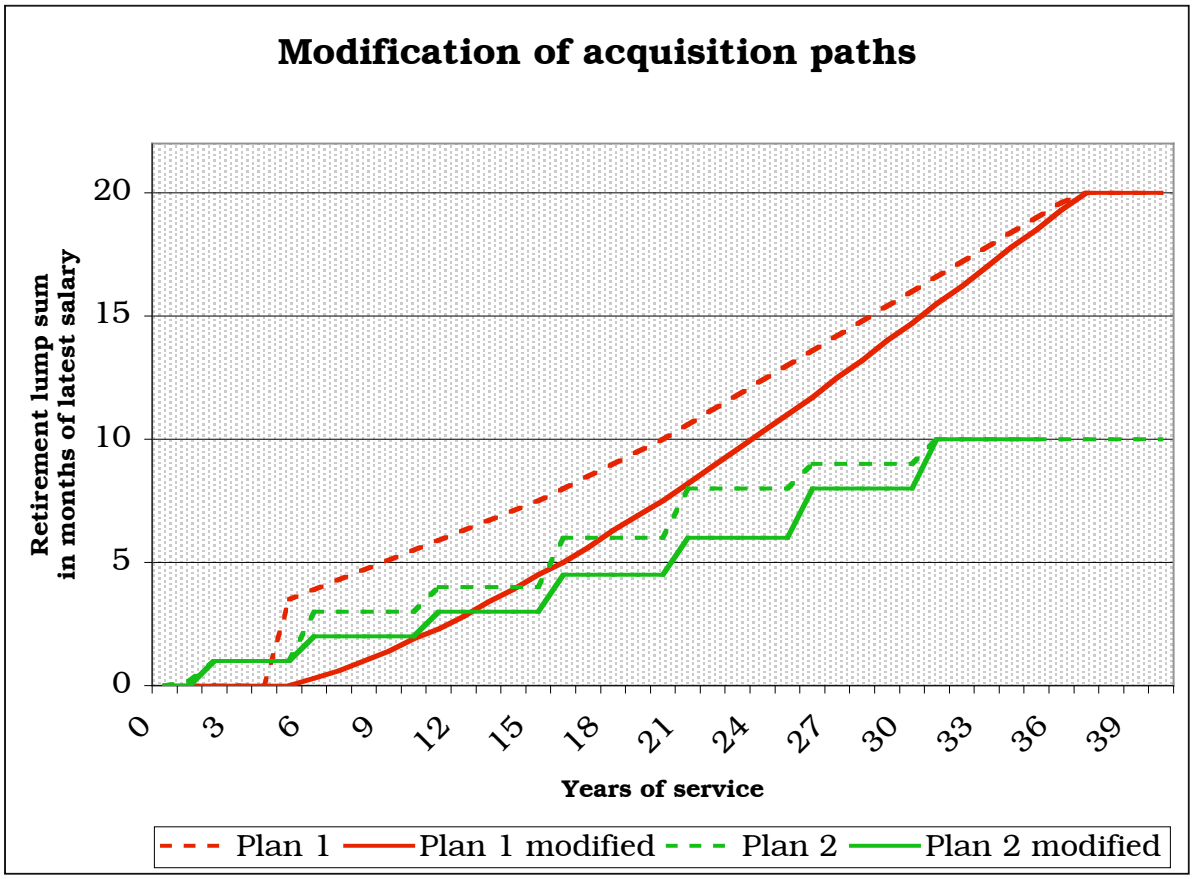
The results are very sensitive to the benefit acquisition path and actuarial assumptions, especially the discount rate and the turnover table.

The acquisition path of benefits

We will first examine the impact of a change in the acquisition path of the benefits accrued under the plan.

The new plan formulas are detailed in appendix 2. For more than 37 years of service benefits are unchanged. But for shorter lengths of service, the benefits may be lower.

The graph below compares the two cases for both plans.



The table below compare the results for both acquisition paths.

Method	Actual case	Modified case	Difference
Pay as you go	**0**	**0**	**NA**
Terminal Funding	**0**	**0**	**NA**
Unit Credit with no salary projection	**72,9**	**57,8**	**-21%**
Unit Credit with salary projection	**100,0**	**76,1**	**-24%**
Projected Unit Credit with service prorate	**98,2**	**94,5**	**-4%**
Projected Unit Credit with acquisition prorate	**103.0**	**99.2**	**-4%**
Entry Age	**117,6**	**111,8**	**-5%**

The Projected Unit Credit and Entry Age methods are based on smoothed accrued benefits and are marginally affected by the change.

The 4% to 5% drop in liability for these methods is due to employees who will not retire with enough years of service to get the maximum benefit. For those employees, the change means a lower compensation at retirement time. Therefore the accrued liability is lowered for them. For all other employees who will get the maximum compensation, the accrued liability is unchanged.

The two Unit Credit methods that are based on accrued benefits at valuation date are much more affected by the change. The accrued liability is unchanged only for employees who have already accrued the maximum level of benefits. For all other employees, even those who will get the maximum compensation at retirement time, the accrued liability is lower.

The impact can be split in two components:

A drop of around 5% due to a fall of benefit at retirement,

And a 15% to 20% drop which is only temporary and will be offset by a higher level of normal cost in future years, since both modified plans are now back-loaded.

The discount rate

We will now examine the impact of the discount rate, by using two new rates: 5.0% and 5,5%.

The table below shows the results for the three different discount rates, with the impact compared to the 5,25% rate calculation).

Method	5.0% rate	5.25% rate	5.5% rate
Pay as you go	**0**	**0**	**0**
Terminal Funding	**0**	**0**	**0**
Unit Credit with no salary projection	**74,8** ***+2.7%***	**72,9**	**71,0** ***-2.6%***
Unit Credit with salary projection	**103,0** ***+3.0%***	**100,0**	**97,1** ***-2.9%***
Projected Unit Credit with service prorate	**101,2** ***+3.0%***	**98,2**	**95,4** ***-2.9%***
Projected Unit Credit with acquisition prorate	**106.2** **+3.0%**	**103.0**	**100.0** **-2.9%**
Entry Age	**120,3** ***+2.3%***	**117,6**	**114,9** ***-2.3%***

The results are sensitive to the discount rate. If the discount rate were to fall to 4.0%, the accrued liability would rise by 14% with the Unit Credit method with no salary projection.

Compared to the Unit Credit method with no salary projection, the Unit Credit method with salary projection and the Projected Unit Credit are slightly more impacted. This is due to the fact that the « net discount rate » (discount rate minus salary increase rate) is lower in these two methods and then more sensitive to any change.

In the entry age method, the discount rate is used to discount the future payments, but also to calculate the $\frac{PVPS}{PVPS + PVPFS}$ ratio, which determines the accrued benefits. When the discount rate rises, this gives more weight to the present value of past salaries compared to the present value of future probable salaries, and the ratio rises also. When the discount rate decreases, the ratio decreases also. This phenomenon partially counterbalances the primary impact of any change to the discount rate and explains why the Entry Age method is less sensitive than other methods.

This real case shows that the choice of an actuarial funding method and its assumptions is critical to the level of accrued liability. This is why one of the aims of IASC for IAS19 was to impose an actuarial funding method in order to provide a better comparability between plan sponsors.

V. The valuation of pension funds assets

Assets held by a pension scheme are normally valued according to one of the following five methods.

V.1. Historic Cost

The assets are valued at their purchase price. It is usual to take as a maximum the current market value of the asset.

V.2. Market value

The assets are valued at their market value as at the date of the valuation, where the market values are quoted on a bid/offer basis the **middle market value** is usually used.

Allowed/recommended by FAS 87, IAS 19 and FRS 17

V.3. Market related value

An **average** market value may be used, which would value each asset according to its average market value over a specific time span. Alternatively the market values of the assets may be adjusted to allow for movements in the market as a whole.

The FAS 87 allows the use of this method, but IAS 19 and FRS 17 forbids it.

V.4. Discounted income value

The value placed on the assets is the present value of the expected future income and capital proceeds from the assets held. This might be done **individually** for the assets held or a **model portfolio** may be assumed with a market value equal to the market value of the actual assets held.

For investments with variable proceeds (e.g. equities, property) this will involve assumptions as to the future development of the dividend/rental income.

SAAP 24 allows actuarial value that falls under this type of method.

V.5. Fair value

The fair value is based on market value for listed securities and on appraisal methods for non-listed assets. (I.e. §102 IAS 19: « when no market price is available, the fair value of plan assets is estimated; for example, by discounting expected future cash flows using a discount rate which reflects both the risk associated with the plan assets and the maturity or expected disposal date of those assets (or if they have no maturity, the expected period until the settlement of the related obligations) »).

IAS 19 allows this method.

VI. The accounting standards

VI.1. The common base for accounting the employee benefits

Every accounting standard has its own particularities, but they all have a common base.

The following example illustrates principles (in a simplified way) retained to calculate the annual cost and the liability to be recognised in the accounts. These principles are incorporated in major accounting methods and are valid whatever actuarial method and assumptions are used.

Example

In our example, company X has a defined benefit pension fund with an accrued liability of 1 700 at the beginning of year N. The normal cost for year N has been estimated at 250. The plan assets are valued at 1 400. Actuarial gains or losses are amortized over 5 years.

The actuarial assumptions are as follows:

Discount rate: 5%

Expected rate of return on plan assets: 6%

The pension liability at the end of year N is calculated as follows:

(1)	Actual accrued liability as of January the 1	**1 700**	
(2)	Benefits earned during the year (normal cost)	250	
(3)	Interest cost	85	5%x(1)
(4)	Benefits paid	-200	
(5)	Estimated accrued liability as of December 31	1 835	(1)+(2)+(3)+(4)
(6)	Actuarial (gains) or losses	40	(7)-(5)
(7)	Actual accrued liability as of December 31	**1 875**	
(8)	Actual plan assets as of January 1	**-1 400**	
(9)	Estimated return on plan assets	-84	6%x(8)
(10)	Employer and employees contributions	-220	
(11)	Benefits paid	200	-(4)
(12)	Estimated plan assets as of December 31	-1 504	(8)+(9)+(10)+(11)
(13)	Actuarial (gains) or losses	-30	(14)-(12)
(14)	Actual plan assets as of December 31	**-1 534**	
(15)	Unamortized actuarial (gains) and losses as of January 1	**0**	
(16)	Amortization of actuarial (gains) and losses	0	
(17)	Unamortized actuarial (gains) / losses as of December 31	**10**	(15)+(16)+(6)+(13)
(18)	Pension liability recognised in the balance sheet as of December 31	**331**	(7)+(14)+(17)

The annual cost for company X is:

(2)	Benefits earned during the year (normal cost)	250	
(3)	Interest cost	85	
(9)	Estimated return on plan assets	-84	
(16)	Amortization of actuarial gains and losses	0	
(19)	Annual cost	**251**	(2)+(3)+(9)-(16)
(10)	Employer and employees contributions	220	
(20)	Pension liability recognised in balance sheet as of January 1	300	(1)+(8)+(15)
(18)	Pension liability recognised in balance sheet as of December 31	331	
(19)	Annual cost	**251**	(10)-(20)+(18)

In year N, actual figures are very close to estimated ones and there are few actuarial gains and losses. The funding ratio is 82% (1 534/1 875), and the "recognition ratio" (assets + book reserve / actual accrued liability at end of year) is 99.5% ((1 534+331)/1 875). Unless the company goes bankrupt at the end of year N, the pension plan obligation is fully covered between pre-funding and book reserving.

The pension liability at the end of year N+1 is calculated as follows:

(1)	Actual accrued liability as of January the 1	**1 875**	
(2)	Benefits earned during the year (normal cost)	270	
(3)	Interest cost	94	5%x(1)
(4)	Benefits paid	-210	
(5)	Estimated accrued liability as of December 31	2 029	(1)+(2)+(3)+(4)
(6)	Actuarial (gains) or losses	11	(7)-(5)
(7)	Actual accrued liability as of December 31	**2 040**	
(8)	Actual plan assets as of January 1	**-1 534**	
(9)	Estimated return on plan assets	-92	6%x(8)
(10)	Employer and employees contributions	-230	
(11)	Benefits paid	210	-(4)
(12)	Estimated plan assets as of December 31	-1 646	(8)+(9)+(10)+(11)
(13)	Actuarial (gains) or losses	321	(14)-(12)
(14)	Actual plan assets as of December 31	**-1 325**	
(15)	Unamortized actuarial (gains) and losses as of January 1	**10**	
(16)	Amortization of actuarial (gains) and losses	-2	
(17)	Unamortized actuarial (gains) / losses as of December 31	**340**	(15)+(16)+(6)+(13)
(18)	Pension liability recognised in balance sheet	**375**	(7)+(14)+(17)

The annual cost for company X is:

(2)	Benefits earned during the year (normal cost)	270	
(3)	Interest cost	94	
(9)	Estimated return on plan assets	-92	
(16)	Amortization of actuarial (gains) and losses	-2	
(19)	Annual cost	**274**	(2)+(3)+(9)-(16)
(10)	Employer and employees contributions	230	
(20)	Pension liability recognised in balance sheet as of January 1	331	(1)+(8)+(15)
(18)	Pension liability recognised in balance sheet as of December 31	375	
(19)	Annual cost	**274**	(10)-(20)+(18)

In year N+1, bear financial markets lead to a negative return on plan assets. The funding ratio falls to 65% (1 325/2 040) and the "recognition ratio" falls to 83% ((1 325+375)/2 040). If company X goes bankrupt at the end of year N+1, it lacks at least 340 to completely fund the pension plan.

Although the financial situation of the pension fund has strongly deteriorated during year N+1, this degradation is not recognised to the same extent in the balance sheet or the P&L. The actuarial loss will be amortised over the next 5 years.

The main issue generated by this type of accounting is not the fact that gains and losses might be smoothed over long periods, but the fact that it may encourage to use overoptimistic actuarial assumptions. The difference between assumptions and reality is then smoothed again in the amortisation of gains and losses that are not recognised immediately in the P&L or the balance sheet. These same overoptimistic assumptions in expected rate of return on assets reduces artificially the annual pension expense cost and lead companies to reduce their contributions or take contribution holidays to their pension plan.

As shown in the example above, the following principles are applied by most standards:

The actuarial gains and losses are the gaps between estimations based on actuarial assumptions and actual figures:

- For the accrued liability, the gap mainly comes from actual variables like mortality, turnover and salary increase being different from expected,
- For the financial products the gap mainly comes from a difference between the expected and the actual rates of return.

Some other losses or gains also derive from changes in the plan or from a change of accounting standard (potentially including the initial recognition of the liability).

These losses or gains can (or must) be deferred and amortised.

The annual cost accounted in the P&L is an aggregate amount. This cost is the sum of benefits accrued during the year, interest loss due to actualisation and amortization of actuarial gains and losses, minus the financial profits made on the pension fund assets.

The accounted liability is the total liability minus the assets held in the pension fund, minus the unamortized gains and losses.

An actuarial method is compulsory or, at least recommended. In any case the use of some actuarial methods is forbidden.

The methods used must be identical from year to year.

The accounting standards mainly differ on the following subjects:

How to amortize the gains and losses?

How to valuate the plan assets?

Which freedom of choice can be left for actuarial assumptions?

How to treat employee benefits after a merger, an acquisition, a divesture, a joint venture, and a settlement?

VI.2. Comparison of employee benefits accounting practices/ standards by country

Preamble:

In all countries even in those who do not have a specific accounting standard to record pension liabilities, the pension fund, insurance and fiscal supervisory authorities have set up rules that govern actuarial calculations of pension liabilities and annual costs. According to the degree of complexity of present rules some boxes below might or might not be fulfilled.

Country	UK	US	International	UK
Accounting Standard:	**SSAP24 Will be replaced by FRS 17**	**FAS87, FAS88, FAS106, FAS132**	**IAS19**	**FRS17 Transition phase up to 2005**
Present situation and development	SAAP 24 was issued in May 1988. Is not as detailed or prescriptive as IAS 19. Expense generally needs to be present in two elements: regular cost (similar to service cost under IAS 19) and variation (similar to the sum of interest cost and the remaining elements under IAS 19). Many companies align funding and expensing within the flexibility allowed. Foreign companies are allowed to use IAS 19 instead of national standard for listing purposes. Changes: see FRS 17 column	FAS87/88 issued in December 1985, FAS 106 issued in December 1990, FAS 112 issued in November 1992, FAS 123 issued in October 1995 and FAS 132 issued in February 1998. US standards are the result of many years' experience in standard setting and widespread application. They constitute a major reference point for any new IAS or other accounting standard being developed. Generally slower amortisation of transitional amounts and past service costs than IAS 19, additional minimum liability test and no limit on any net asset in balance sheet. Market related value of plan assets may be used for certain calculations. Early measurement date allowed. More complex rule s for curtailments and settlements.	First version Issued in 1983, and revised in 1993. Extensive revision in February 1998 and limited revision in October 2000. Main differences with FAS 87 are: Fair value of assets to be used in all calculations, A limit on prepaid asset that can be recorded on the balance sheet More rapid recognition for plan amendments, and No additional minimum liability. Concern has been expressed about differences between the current version of IAS 19 (which will be mandatory for European companies from 2005) and FRS 17 and FAS 87 and 106. To address these concerns, the IASB has established a "convergence project" to investigate these differences and intends to	By immediate recognition of actuarial gains and losses in the STRGL Statement of Total Recognised Gains and Losses rather than the first performance statement, which is the traditional profit and loss account or income statement FRS17 aims are: That a great part of the expense volatility inherent in the FAS 87 or IAS 19 methodology is transferred "below the line" into the STRGL and a "cleaner" provision or prepaid asset is recorded on the balance sheet.

Country	UK	US	International	UK
Accounting Standard:	**SSAP24 Will be replaced by FRS 17**	**FAS87, FAS88, FAS106, FAS132**	**IAS19**	**FRS17 Transition phase up to 2005**
		More prescriptive rules for "equity compensation benefits".	publish a report in 2003 and eventually an Exposure Draft of changes to IAS 19.	
Scope	- Legal, contractual or implicit commitment - Funded or unfunded - Covers pensions and other post-retirement benefits	- Legal, contractual or substantive commitment - Funded or unfunded - Covers pension benefits (FAS87, FAS88, FAS132) and other post-retirement benefits (FAS106, FAS132)	- Legal, contractual or constructive commitment - Funded or unfunded - Covers all employee benefits, including short term employee benefits and termination benefits	- Legal, contractual or implicit commitment - Funded or unfunded - Covers pension and other post-retirement benefits
General approach	- Profit and Loss driven - Stable regular cost with smoothing of assumptions and asset values - Gradual recognition of other items	- Balance sheet driven - Market based measurement - Some smoothing allowed - Gradual recognition of some items.	- Balance sheet driven - Market based measurement - More emphasis than FAS87 on immediate recognition and less smoothing	- Balance sheet driven - Market-based measurement - No smoothing - No spreading
Ownership of assumptions	Actuary	Employer	Employer (actuarial advice recommended)	Employer on actuary's advice
Measurement frequency	Triennial (at least)	Annual	Annual	Annual update but without annual valuations
Actuarial method	Unspecified but Projected Unit Credit Method most commonly used.	Projected Unit Method (With service prorate for back-loaded plans)	Projected Unit Method (With acquisition service prorate for back-loaded plans)	Projected Unit Method(With acquisition service prorate for back-loaded plans)

Country	UK	US	International	UK
Accounting Standard:	**SSAP24 Will be replaced by FRS 17**	**FAS87, FAS88, FAS106, FAS132**	**IAS19**	**FRS17 Transition phase up to 2005**
Asset valuation	Actuarial value	Market value (Market related with value smoothing over up to 5 years permitted for FAS 87)	Market value (no smoothing)	Market value (no smoothing)
Discount rate	Long-term estimate of scheme's investment return	Settlement yield/market yield on high quality corporate bonds (for funded and unfunded liabilities)	Market yield on high quality corporate bonds (for funded and unfunded liabilities)	Market yield on a high quality (AA or equivalent) corporate bond of similar term and currency as liabilities (for funded and unfunded liabilities)
Expected return on assets	Same as discount rate	Long-term estimate of expected return from scheme's assets	Long-term estimate of expected return from scheme's assets (IASB to curb over-optimistic forecast of assets)	*Bonds* - market yield *Equities* - long-term estimate of investment return
Discretionary benefit increases	Preference is to allow in advance for increases likely to be granted, otherwise recognise capital cost in full in P&L when granted	Only to be allowed in advance if substantive commitment, otherwise spread capital cost when granted	Allow in advance if 'constructive obligation', otherwise immediate recognition of capital cost when granted (subject to vesting)	Allow in advance if 'constructive obligation', otherwise immediate recognition of capital cost in P&L when granted (subject to vesting)

Country	UK	US	International	UK
Accounting Standard:	**SSAP24 Will be replaced by FRS 17**	**FAS87, FAS88, FAS106, FAS132**	**IAS19**	**FRS17 Transition phase up to 2005**
Actuarial gains/losses	Spread over working lifetime (method unspecified), with some exceptions	Spread over working lifetime outside optional 10% corridor (Straight line method), or faster	Spread over working lifetime outside optional 10% corridor (Straight line method), or faster	Immediate recognition in balance sheet via STRGL (Statement of Total Recognised Gains and Losses) no effect on P&L
Settlements/curtailments (Including bulk transfers)	Not specified	Gains or losses recognised in P&L on occurrence of event (FAS88), with more restrictions than IAS19	Gains or losses recognised in P&L on occurrence of event, but subject to some restrictions	Gains or losses recognised in P&L on occurrence of event
Acquisitions	Asset or liability recognised immediately in the balance sheet under FRS7	Asset or liability recognised immediately in the balance sheet under acquisition accounting rules	Asset or liability recognised immediately in the balance sheet under acquisition accounting rules	Asset or liability recognised immediately in the balance sheet under FRS7
Balance sheet limitations	None	Minimum recognition of unfunded accrued liability	Pre-payment limited to value of refunds of surplus/future contribution reductions plus unrecognised prior-service and transition costs	Pension asset limited to surplus recoverable by employer via contribution reduction and/or refund already agreed with Trustees Pension liability may, in extreme circumstances, be limited (legal advice needed)
Implementation options	Prior year adjustment or amortise over working lifetime	Transition asset/obligation recognised over up to 15 years from 1989	Recognise transition asset immediately and obligation over up to 5 years	Prior year adjustment
Past Service Cost	Not specified	Straight line over AFS	Straight line to vesting	Straight line to vesting

Country	Germany	Switzerland	France	Netherlands
Accounting Standard:	**HGB art 28 EGHGB (BiRiLiG 19th December 1985)**	**FER 16 (or RPC 16 in French)**	**None Recommandation 1.23 OECCA**	**RJ271 Not yet implemented**
Present situation and Developments	Not as detailed or prescriptive as IAS 19. In practice many domestic companies that do not adopt IAS or US GAAP use the book-reserving system required by tax legislation (for unfounded plans), which generally results in lower expensing compared with FAS 87 or IAS 19. Standard of EU countries expected to conform with IAS in due course. New independent local standard setter being created by DSR. It is feasible to use IAS 19 instead of National Standard for listing purposes for foreign companies and for domestic companies for consolidated financial statements	Liabilities and expenses generally lower and less volatile (than those of IAS 19) due to possible differences in discount rate, use of market related value of plan assets and longer amortisation periods for transitional amounts and past service costs. It is feasible to use IAS 19 instead of National Standard for listing purposes for foreign companies and for domestic companies with any additional local GAAP disclosures Compliance with IAS 19 generally ensures compliance with local GAAP. Swiss pension fund governing body (ABV) is to publish in 2003 a paper outlining what Swiss pension funds should do in case of any under-funding according to 3 funding ratio situation 100%	At present no accounting standard but guidelines form various accounting organisations and especially December 1989 recommendation 1.23 issued by French chartered accountants organisation (OECCA) Expense generally equal to funding cost with no balance sheet adjustments (although there may be some provision for retirement or termination indemnities plans. It is feasible to use IAS 19 instead of National Standard for listing purposes for foreign companies and for domestic companies for consolidated financial statements An Exposure Draft recommendation on retirement and other related benefits has been issued in	Expense generally equal to funding cost with no balance sheet adjustment (although there may be some provisions for unfounded past-service liabilities or voluntary early retirement-VUT-arrangements). Only foreign companies can use IAS 19 instead of national standard for listing purposes. RJ271 is an accounting standard proposal for plan sponsors accounts. This standard is planned to be implemented by 2005. Its provisions are quite similar to those of IAS 19.

Country	Germany	Switzerland	France	Netherlands
Accounting Standard:	**HGB art 28 EGHGB (BiRiLiG 19th December 1985)**	**FER 16 (or RPC 16 in French)**	**None Recommandation 1.23 OECCA**	**RJ271 Not yet implemented**
		minus, 90-100% and less than 90%.	2002 by the CNC (Conseil National de la Comptabilité) the French GAAP board and is being discussed. At present the idea is to take up IAS 19 provision with adaptation and reference to French regulations	
Scope	Company-sponsored and industry-sponsored pension schemes which provide defined benefit and are financed using following vehicles: Book reserve (Pensionsrückstellung) Support funds (Unterstützungskassen) Pension funds (Pensionskassen) Direct insurance (Direktversicherung).	Company-sponsored pension funds	Company-sponsored pension schemes	Company-sponsored and industry-sponsored pension schemes. At present no accounting standards for local statutory accounts of plan sponsors. Accounting and funding rules apply to pension fund only.
General approach	- Balance sheet driven - Emphasis on stable hypothesis	- Balance sheet driven - Emphasis on stable hypothesis	- Conservative assumptions - Some smoothing allowed - Gradual recognition of some items.	
Ownership of	Actuary, with legal	Actuary, but following	Employer	Actuary, using actuarial

Country	Germany	Switzerland	France	Netherlands
Accounting Standard:	**HGB art 28 EGHGB (BiRiLiG 19th December 1985)**	**FER 16 (or RPC 16 in French)**	**None Recommandation 1.23 OECCA**	**RJ271 Not yet implemented**
assumptions	restrictions	actuarial "convention"		society tables
Measurement frequency	Annually for book reserves 3-yearly for Pensionskassen	Annually, sometimes 3-yearly	3 or 4-yearly	Annually
Actuarial method	Individual entry age with minimum entry age of 30	Current Unit method	Recommended methods: Projected Unit Credit Service prorate Entry Age	Current Unit (general case) Projected Unit
Asset valuation	Book value (market value when less)		Market value. (Market related value with smoothing of unrealised capital gain/loss up to 5 years permitted).	Market Value
Discount rate	6% for book reserve 3.5% for pensionskassen This is a net rate including all economic assumptions.	4% This is a net rate including all economic assumptions.	No recommendation	Net 4% for Current Unit. NB: A salary increase assumption of up to 4% is allowed by the pension supervisory authority but is rarely used in practice. Realistic assumption for Projected Unit Method.
Expected return on assets	Not applicable	Not applicable	Recommendation 1.23 (smoothing of unrealised capital gain/loss up to 5 years permitted).	
Discretionary benefit increases				

Country	Germany	Switzerland	France	Netherlands
Accounting Standard:	**HGB art 28 EGHGB (BiRiLiG 19th December 1985)**	**FER 16 (or RPC 16 in French)**	**None Recommandation 1.23 OECCA**	**RJ271 Not yet implemented**
Actuarial gains/losses			Spread over working lifetime	
Settlements/curtailments (Including bulk transfers)				
Acquisitions			Asset or liability recognised immediately in the balance sheet under acquisition accounting rules	
Balance sheet limitations				The pension liability must be fully funded. At end of year 2003, Dutch authorities will demand a 105% funding level.
Implementation options				Only small old obligations not yet recognised. By 2009 all obligations recognised.

	Belgium	Spain	Italy	Ireland
Accounting Standard:	**None**	**Plan General Contable (issued in December 1990 and ICAC resolution (issued 25th September 1991)**	**None**	**SSAP24 or FRS 17**
Present situation and developments	Expense generally equal to funding cost with no balance sheet adjustments (although there may be some provisions for certain unemployment allowances – prépensions- provided on termination. It is possible for foreign companies to use IAS 19 instead of national standard for listing purposes and for domestic companies if they have significant foreign operations or foreign capital sources and companies listed on the EASDAQ. Standard of EU countries generally expected to conform with IAS in due course.	Expense generally equal to funding cost with no balance sheet adjustments. It is possible for foreign companies to use IAS 19 instead of national standard for listing purposes but not for domestic companies National standard setter's policy is to minimise differences between local GAAP and IAS.	Expense generally equal to funding cost with no balance sheet adjustments (although there may be some provisions for termination indemnities – TFR- which are generally evaluated on the prudent side). It is possible for foreign companies to use IAS 19 instead of national standard for listing purposes and for domestic companies for consolidated statements. Standards of EU countries generally expected to conform with IAS in due course.	

	Belgium	Spain	Italy	Ireland
Accounting Standard:	**None**	**Plan General Contable (issued in December 1990 and ICAC resolution (issued 25th September 1991)**	**None**	**SSAP24 or FRS 17**
Scope	Company-sponsored pension funds	Occupational defined benefit plans		- Legal, contractual or implicit commitment - Funded or unfunded - Covers pensions and other post-retirement benefits
General approach				- Profit and Loss driven - Stable regular cost with smoothing of assumptions and asset values - Gradual recognition of other items
Ownership of assumptions	Actuary	Actuary	Actuary and employer	Actuary
Measurement frequency	Annually	3-yearly		Triennial (at least)
Actuarial method	Projected Unit method Aggregate method Current Unit method	Projected Unit Credit Individual Entry Age	Unspecified Aggregate method most common Projected Unit Credit and Entry Age also used	Unspecified

	Belgium	Spain	Italy	Ireland
Accounting Standard:	**None**	**Plan General Contable (issued in December 1990 and ICAC resolution (issued 25th September 1991)**	**None**	**SSAP24 or FRS 17**
Asset valuation	Market value	Market value		Actuarial value
Discount rate	No recommendation	Maximum net rate: 4% (21 th July 1990 regulation)		Long-term estimate of scheme's investment return
Expected return on assets	No recommendation			Same as discount rate
Discretionary benefit increases				Preference is to allow in advance for increases likely to be granted, otherwise recognise capital cost in full in P&L when granted

	Belgium	Spain	Italy	Ireland
Accounting Standard:	**None**	**Plan General Contable (issued in December 1990 and ICAC resolution (issued 25th September 1991)**	**None**	**SSAP24 or FRS 17**
Actuarial gains/losses				Spread over working lifetime (method unspecified), with some exceptions
Settlements/curtailments (Including bulk transfers)				Not specified
Acquisitions				Asset or liability recognised immediately in the balance sheet under FRS7
Balance sheet limitations				None
Implementation options				Prior year adjustment or amortise over working lifetime

VI.3. Pros and cons of IAS 19

Pros and cons of IAS 19 can be analysed by comparison with main standards like UK SSAP 24, FAS 87 and FRS 17 due to replace SSAP 24.

VI.3.1. UK: SSAP 24 (standard to be replaced by 2005 by FRS 17)

Pros: Stable regular cost with smoothing of assumptions and asset values and gradual recognition of other items. A link between pension expense and contributions paid exists.

Cons: Smoothing and gradual recognition are less transparent. The quality of the evaluation relies on the quality of the actuary (who has also ownership of assumptions) and on financial markets behaviour that might prove wrong during some periods. Some overoptimistic forecast can occur.

VI.3.2. US: FAS 87

Pros: First employee benefits accounting standard to have set up clear pensions accounting provisions on key elements and assumptions: funding method, measurement frequency, discount rate, ...

Cons: Some grey areas still remain such as expected return on assets and market related value of plan assets that allow overoptimistic forecast of pension fund assets growth.

VI.3.3. International: IAS 19

Pros: It covers in one standard all deferred employee benefits and not only pensions and aims to apply consistent methodology to all items valued. Benefits from experience on FAS 87 flaws (over optimistic forecast). Has more emphasis than FAS 87 on immediate recognition and less smoothing.

Cons: To cover in one accounting standard all employee benefits is maybe too ambitious.

Issue: Does IAS 19 smooth too much or not enough.

VI.3.4. UK: FRS 17 (transition phase up to 2005)

It must be noted that FRS 17 transition phase has been extended to 2005 until more convergence between IAS 19 and FRS 17 achieved.

Pros: The most transparent of all existing pension accounting standard. Provides a clear picture of assets and liabilities at balance sheet date. Actuarial assumptions are far more prescriptive.

Cons: Volatility generator in the balance sheet and profit & loss account. If companies have to move to balance sheet substantial deficits they can face prospect of credit review that will increase their refinancing costs at a moment when they need to contribute much more cash in the pension fund to make up for shortfalls.

VI.3.5. IAS 19 will impact other EU accounting standards

National accounting associations are likely going to promote local accounting standards that will be influenced by IAS 19 if they do not want to adopt IAS 19 as national standard. Two examples:

France

An Exposure Draft recommendation on retirement and other related benefits has been issued in 2002 by the CNC (Conseil National de la Comptabilité) the French GAAP board and is being discussed. At present the idea is to take up IAS 19 provision with adaptation and reference to French regulations.

Netherlands (RJ271)

RJ271 is an accounting standard proposal for plan sponsors accounts. This standard is planned to be implemented by 2005. Its provisions are quite similar to those of IAS 19.

At present companies just record as expenses the contributions paid to the pension fund. They must only record a pension liability if the pension funding vehicle (pension fund or insurance cover) does not fulfil the 100% funding principle based on accrued benefits without salary or pension increase (ABO with Unit Credit method) at balance sheet date.

VI.3.6. IAS 19 Convergence project

Concern has been expressed about differences between the current version of IAS 19 (which will be mandatory for European companies from 2005) and FRS 17 and FAS 87 and 106. To address these concerns, the IASB has established a “convergence project” to investigate these differences and intends to publish a report in 2003 and eventually an Exposure Draft of changes to IAS 19.

VII. Comparison of accrued liability according to European and international practices or standards

VII.1. Methodology

We have compared the funding methods in the main European countries for two plans :

- An "end of career indemnity" plan,
- A pension plan.

In our simulations, we have used the same employees population in each country. Mortality and turnover tables are identical by hypothesis. The actuarial liability calculations do not take into account the different mortality tables used locally in different countries.

As these mortality tables are more or less conservative compared to the actual mortality, the use of specific tables would change the figures and widen the gaps between countries.

In our simulations, the differences between countries are:

- The funding method,
- The discount rate,
- The salary increase rate
- The pension increase rate.

The actuarial methods and hypothesis retained for our simulations are those given by a report published in December 2001 by the Groupe Consultatif Actuariel Européen, excepted for France, IAS 19 and FAS 87. In these later cases, we have used hypothesis from actual cases.

VII.2. Case of an "end of career indemnity" plan

On the same actual case than used in chapter IV.3., we have calculated actuarial liabilities in different countries for an "end of career indemnity" plan. In this plan, the employer pays a lump sum to his employees at the time they retire.

We remind the reader that funding methods and hypothesis vary between companies within a single country. The figures below reflect only the result of the funding methods, discount rates and salary rise rates commonly used to calculate the liability associated to the promise of paying a lump sum at the retirement date.

The results vary in a range of 1 to 1.4 with the use of the same mortality table and turnover rate.

Country	Actuarial method	Discount rate	Salary increase rate	Other assumptions	Accrued liability
France [1]	Projected Unit Credit with service prorate	5.25%	Variable (3.5% on average)		**98.2**
Germany [2] (book reserve)	Entry Age	6.0%	0%	Minimum entry age of 30	**90.3**
Germany [2, 3] (Pensionkasse)	Entry Age	3.5%	0%	Minimum entry age of 30	**114.9**
Belgium [2]	Unit Credit method with salary projection	6%	3%		**92.4**
Switzerland [2]	Unit Credit method with no salary projection	4%	NA		**83.4**
Netherlands [2]	Unit Credit method with no salary projection	4%	NA		**83.4**
Ireland [2]	Unit Credit method with salary projection	7%	5%		**102.8**
Spain [2]	Unit Credit method with salary projection	4%	2.5%		**110.6**
UK SAAP 24 [2, 4]	Unit Credit with salary projection	6.5%	4.5%		**103.1**
FAS 87 [1]	Max (Unit Credit with salary projection, Projected Unit Credit with service prorate)	5.25%	Variable (3.5% on average)		**100.0**
IAS 19 [1]	Max (Unit Credit with salary projection, Projected Unit Credit with acquisition prorate)	5.25%	Variable (3.5% on average)		**103.0**

[1] source: actuarial methods and hypothesis from an actual case
[2] source: Groupe Consultatif Actuariel Europeen – December 2001 report
[3] Pensionkassen adopt a more prudent insurance-like approach than companies. Their results can't be directly compared to other cases
[4]UK FRS 17: the actuarial method used for calculating the actuarial liability is the same as used in SAAP 24

VII.3. Case of a pension plan

On the same actual case than used in chapter IV.3., we have built a pension plan whose benefits are described in appendix 3.

We remind the reader that funding methods and hypothesis vary between companies within a single country. The figures below reflect only the result of the funding methods, discount rates, salary rise rates and pension increase rates commonly used to calculate the liability associated to the promise of paying a pension to retirees.

The results vary in a range of 1 to 3 with the use of the same mortality table and turnover rate. With the mortality tables actually used in the different countries, the range of results would probably be of 1 to 4.

Country	Actuarial method	Discount rate	Salary increase rate	Pension increase rate	Accrued Liability Pension
France [1]	Projected Unit Credit with service prorate	5.25%	Variable, average 3.5%	2%	**73.8**
Germany [2] (book reserve)	Entry Age	6.0%	0%	0%	**44.6**
Germany [2,3] (Pensionkasse)	Entry Age	3.5%	0%	0%	**76.0**
Belgium [2]	Unit Credit method with salary projection	6%	3%	2%	**84.2**
Switzerland [2]	Unit Credit method with no salary projection	4%	NA	0%	**75.0**
Netherlands [2]	Unit Credit method with no salary projection	4%	NA	0%	**75.0**
Ireland [2]	Unit Credit method with salary projection	7%	5%	3%	**94.9**
Spain [2]	Unit Credit method with salary projection	4%	2.5%	2%	**129.5**
UK SSAP 24 [2,4]	Unit Credit method with salary projection	6.5%	4.5%	3%	**100.5**
France	Projected Unit Credit with service prorate	5.25%	Variable, average 3.5%	2%	**73.8**
FAS 87 [1]	Max (Unit Credit method with salary projection, Projected Unit Credit method with service prorate)	5.25%	Variable, average 3.5%	2%	**100.0**
IAS 19 [1]	Max (Unit Credit method with salary projection, Projected Unit Credit method with acquisition prorate)	5.25%	Variable, average 3.5%	2%	**100.0**

[1] source: actuarial methods and hypothesis from an actual case
[2] source: Groupe Consultatif Actuariel Europeen – December 2001 report
[3] Pensionkassen adopt a more prudent insurance-like approach than companies. Their results can't be directly compared to other cases
[4]UK FRS 17: the actuarial method used for calculating the actuarial liability is the same as used in SAAP 24

VIII. Country & Europe snapshot

VIII.1. Belgium

Although Belgium's reform law for pensions has still not reached the statute book its proposals are already making their mark on the country's pension system. The Belgian government is planning to reform the state pensions system in an attempt to increase employees' access to occupational schemes. Frank Vandenbroucke, the social security minister and Didier Reynders, the finance minister, announced the number of salaried workers with a second pillar pension had risen from 900,000 to 1.2 million since the new law was announced.

Economists are also welcoming reforms to the state-run system. Without the reforms, economists say that the cost of the state pension scheme would increase by as much as 3.4% of GDP between 2010 and 2030.

The most recent figures show Belgium to have only e35bn under management in industry-related pension funds (e23bn of which is in group insurance). Neighbouring Holland has roughly e400bn by comparison.

The controversial 3.25% guarantee rate due to be imposed on Belgian second pillar schemes may be reduced to 2% if companies are found to be struggling to honour it due to market conditions.

Some of Belgium's biggest companies are faced with a pensions shortfall that could hit their 2003 results due to a pension plan adjustment.

The OCA/CDV (Office de Contrôle des Assurances/Controledients vorr Verzekeringen) has carried out a survey of pension funds on the basis of the situation at 31 August 2002 as it did with the insurance companies as at 31st July).

Regulations on funding and solvency say that if the assets of the pension fund at market value fall below ABO (the value of a pension taking into account past service and present salary) plus a solvency margin (if the pension fund covers death/disability benefits) the fund must discuss a recovery plan with control authorities.

The authorities could decide to apply the law in a more stringent way if market conditions worsened.

The implementation of IAS 19 will improve transparency on the pension fund exposure.

VIII.2. Denmark

The Danish pension systems a four-tier top up system. Above a universal pay-as-you-go basic pension, there are three levels of defined contribution schemes:

- A statutory fully funded scheme, the ATP,
- Several compulsory industry-wide or company schemes,
- Individual savings contracts.

The Danish regulation stipulates that any pension promise made by a private employer must be covered by externally settled funds that match the actuarial liability. Any pension fund is under evaluation of an approved actuary and under supervision of a national agency.

These rules ban book reserves and internal pension fund. Although they do not ban defined benefit schemes, they favour defined contribution pension funds.

This regulation and the employers' desire to avoid any future responsibility in relation to pensions led Danish companies to set defined contribution schemes, with the approval of the supervisory authority.

The second pillar is now composed of industry-wide or company-wide insurance schemes set up by the social partners or by company schemes using a private insurance provider.

To provide security to the employees, the Danish system is based on a collective insurance model, which implies a high level of risk sharing for social risks and investment risks.

The pension contracts use a mechanism similar to the one used for French life insurance (« contrat en euros »). The contracts guarantee an implicit minimum interest rate in the form of nominal benefit guarantee. Excess returns are accumulated in bonus equalization funds that are allocated over time to increase the pension promise.

This model, which allows incorporating all workers without selection and secures very low costs, has some drawbacks:

- Membership is compulsory to avoid adverse selection,
- Individual choice concerning the investment policy is impossible,
- The model is vulnerable to low and declining interest rates.

To preserve the financial safety of pension funds, the supervisory authority has lowered the maximum allowed guaranteed interest rate from 4.5% in the early 90's to 1.5%. But this measure only affects new members and contribution increases. This might lead to new members with low guaranteed rates contributing to preserve high guaranteed interest rates of older workers.

In the same time the insurance accounting principles have been modified. The assets are now valued at market value, while bonds could previously be accounted for at their actuarial rate of return. Liabilities are calculated on

the basis of a discount rate set on a day-to-day basis by the supervisory authority. This rate is based on a basket of assets and is therefore quite volatile. In June 2002 the rate was approximately 3.75%.

Insurance companies, which can't pass stress tests based on a decline in equities value and a change in market interest rate, are placed under surveillance.

These new accounting rules can force insurance companies to set up higher reserves and modify their investment policy. The emphasis on short-term solvability might be counterproductive for long-term stability by introducing possible mismatch between assets and liability in the long run.

Recent pension policy changes in many countries have favoured fully funded defined contribution plans. The Denmark example can be helpful to study the advantages and drawbacks of this model.

VIII.3. France

The bulk of pensions are provided trough nation wide compulsory pay-as-you-go schemes. Companies are far less impacted (but it may happen by their pension schemes in France) because company occupational plans represent only about 2% of total French pension benefits. A greater impact is felt trough foreign subsidiaries.

The decision on February 7th, 2003 by the rating agency Standards and Poor's to put some of Europe's leading companies (amongst them Arcelor and Michelin) under negative credit watch because of their unfunded pensions liabilities is a vivid example.

VIII.4. Germany

The pension received from the state scheme makes up the major portion of a pensioners' retirement income.

Life insurance funds are favoured over Riester private pensions funds as a mean of investing for their retirement. A complicated regulatory framework is to blame for the poor take-up rate of the new private Riester pension funds.

On the occupational pension scheme landscape, pensions deficit hit German groups ratings. A report issued from Dresner Kleinwork Wassertein in London shows that German companies with pension fund shortfalls are more at risk of seeing their credit ratings come under pressure than companies in other European countries. The reason is that in the German system, companies are not required to hold any specific assets against pensions obligations. Standards and Poor's has put on credit watch Deutsche Post and subsidiary Deustche Postbank and Thyssen Krupp.

VIII.5. Ireland

A survey published in November 2002 has shown that total assets of Irish pension funds have fallen to euros 43 billion in 2002 from euros 50.6 billion at the end of 2001. In average Irish Pension funds have lost 19% in 2002 versus 10.9% return on average over the past 10 years. Stocks remain their key assets.

The Irish pension regulator recognised that the introduction (even if transition period extended to 2005) of the New FRS 17 accounting standard, which takes a snapshot of pension's fund liabilities and assets as one of major external influences for the growing trend of shift from DB to DC arrangements.

VIII.6. Italy

The government is to propose a pension reform that aims to favour later retirement dispositions. Another reform considered which could be implemented in 2004 would be that contributions paid to fund the end of career indemnity "TFR-trattamento di fine rapporto" would be redirected to an external scheme. Companies do not back this reform since contributions for TFR book reserves represent a significant part of their cash flows.

VIII.7. Netherlands

As in many countries the Dutch Pension system relies on 3 pillars:

First pillar: basic old age state pension
Second pillar: Supplementary pension schemes (including AVC's – Additional Voluntary Contributions)
Third pillar: Supplementary private pension schemes.

There is no formal obligation for an employer to implement occupational pension scheme except if an industry wide Collective Labor Agreement impose it. Which is the most frequent situation, especially within large companies, since in 2001 91% of workers were covered by such schemes.

A new Dutch Pension Law is studied taking into consideration advice from the Dutch Social and Economic Council (SER) that is an advisory board for the government. The 100% funding provision could be abandoned from 2009.

Presently the second pillar operates under the Dutch Pension and Saving Act "PSW" Pensioen en Spaarfondesenwet and the supervisory authority "PKV" Pensioen en Verzekeringskamer.

The 100% funding provision (on a accumulated benefit obligation basis) is still in force and this is an issue due to financial markets situation since 2000.

Due to falling financial markets, PVK has sent in October 2002 a letter to 1,000 pension funds asking those whose coverage levels had fallen under 100% to rectify the situation and has increased the minimum funding level to 105%.
The funding level has dropped from 140%-150% in 1999 to 105% currently on average.

It also tightened up the buffer funds that Dutch schemes are require to hold-instructing funds to have a sufficiently large buffer to cover a 40% drop off the highest valuation their equity holdings have reached in the two last years, and to cover a 10% drop from the lowest valuation their equity holdings have reached in the last year.

It was estimated in October 2002 that these new requirements would mean e15bn of annual funding in the period 2003-2010 implying a total additional funding of e130bn over the next eight years. The AEX Dutch equity index needs to rise more than 35% to 475 from the 350 level in October in order to make up the shortfall. On Wednesday 22 January 2003 the AEX was at 300.

Consequently for most pension funds it will become increasingly attractive to invest in assets classes with lower buffer requirements, implying that a greater percentage of the Dutch pension funds will become net sellers of equity as soon as share price recover and they are expected to increase their exposure to fixed income.

These PVK guidelines have been criticised for being unrealistic with a time limit too short, and that funds need a longer transition period.

The three main Dutch pension fund bodies have rejected these PVK requirements on cover ratios calling them unnecessary (present level of funding is 105% in average) and bad for the economy (wage costs would rise by 5.4 and 7.8 % in the private and public sectors respectively). 138,000 jobs would be at stake.

It is estimated that contributions should rise by 50% for private sector companies and by 100% for public sector companies over the next five years.

VIII.8. Spain

Spanish pension fund has been implemented in 1987 with a book reserve system like in Germany. From November 1995 external pre-funding is mandatory.

The assets under management at Spanish occupational pension schemes rose 12.31% to 21.15 billion euros at the end of 2002 according to Inverco , the Spanish association of institutional investors and pension funds.

The number of pension accounts holders rose12.76% to 614,000 while the number of occupational schemes rose 9.1% to 1,522.

Strangely even if Spanish social security is not in deficit a new survey has found that pensions are the main worry for 60% of Spanish people over 65 years old before solitude and health.

VIII.9. Switzerland

Liabilities of defined-benefit schemes are valued with a Unit Credit method with no salary projection (ABO in FAS 87) using a 4% discount rate. The liability is understated to the extent that the spread between salary increases and investments returns are below 4%. Defined contribution plans are unusual, as they are required by law to provide a guaranteed investment return of 4% that is being lowered to 3.25% from January 1st 2003.

Moreover in 2003 the Swiss president has said the guaranteed minimum interest rate of 3.25% may be lowered further. Now industry representatives are suggesting 2.5%. A further option, which has received approval from consultants and experts, is the creation of a variable guaranteed minimum interest rate.

At the end of 2002 it was estimated that 30-50% of Swiss occupational pension funds are now underfunded versus 6% in 2001. The Swiss pension fund governing body, the Arbeitsgenmeinschaft Berufliche Vorsorge (AVB) has drawn up a checklist outlining what Swiss pension funds should do in case of any under-funding. AVB has drawn up three degrees of under funding and the necessary measures to be taken in each case:

a) If only the reserves for fluctuation of securities are inadequate but all liabilities are still covered by the assets, then a pension fund is not obliged to change its investment strategy. But it will end all voluntary benefits.
b) If the cover ratio for the fund is moderately below legal requirements i.e. 90-100%, actuaries shall check the scheme thoroughly. If any individual accounts are above the legal minimum, then the interest on paid-in-capital must be reduced, if necessary down to zero percent.
c) If a scheme is below 90% and therefore considerably under-funded, employers and as well as employees should increase contributions.

VIII.10. United Kingdom

UK pension funds reported a negative investment returns of –13.9% in 2002. the worst annual return since 1974.

Estimations in 2002 by Morgan Stanley put deficits of defined benefit schemes for UK FTSE 100 companies at a massive 65 billion pounds at the end of 2002, compared to estimates in August 2002 by UBS Warburg of 28 billion pounds and 200 million pounds at the end of 2001. Analysts believe

that, since the beginning of 2003, the deficit could have risen to as much as 85 billion pounds given falling bond yields and further equity weakness.

A new study based on latest annual reports for more than 330 major companies has found that pensions contributions made by employers have risen by 25% over the past two years to a total of more than 8.95 billion euros. Special contribution payments aimed to tackle deficits now account for more than 25% of the money employers has been paying into schemes.

Pension costs for typical final salary scheme are expected to rise by 30% over the next five years. Closure of such schemes to new entrants will only reduce the increase by 5% to around 25%. The trend towards DC schemes is going to be bigger.

The latest funding deficit for UK pension schemes is estimated to be around 130 billion pounds (197.5 billion euros) under FRS 17 accounting rule.

This financial strain has been exacerbated by falling bond rates, the accelerating maturity of funds, the Minimum Funding Requirement (MFR) and accounting standards (FRS 17).

VIII.11. Europe

"European Pensions: A leaking vat?" was the title of an Equity research paper issued by Morgan Stanley in May 2002. The recent credit watch issued by Standards & Poor's and other similar research paper show that pension fund shortfalls will have the following consequences:

Increasing pressure on cash and earnings is anticipated
Adjusting for the impact of pension finance gains and costs can significantly affect reported income
Growing cash demands on some companies is anticipated
European accounting converging to IAS will increase transparency: required convergence to IAS by 2005 should lead to more visibility about pensions issues and may cause changes in funding and investment strategies. This trend will be exacerbated if IAS shifts to the new UK pension standard FRS 17.

IX. Methodology

This report has been written using materials from numerous sources, which sometimes contain heterogeneous information.

As far as it was possible we have tried to compare facts and figures from different sources.

We have given priority to the information from practitioners over digest when possible. But the diversity of practices between countries or even within a country makes it difficult to gather homogeneous information.

Concerning the simulations, the accrued liability has been calculated by FIXAGE using company personal data. As the data for each employee were sufficient, FIXAGE had no need to make any further hypothesis than those described in this report.

X. External sources

(a) AFPEN : Association Française des regimes et Fonds de Pension
(b) Benefits & Compensation International
(c) Commission of the European Communities: draft Proposal for a joint report by the Commission and the Council on Adequate and sustainable pensions (17/10/2002)
(d) FAS statements
(e) IAS statements
(f) Financial Times
(g) Global Pensions
(h) Groupe Consultatif Actuariel Européen: Actuarial Methods and Assumptions used in the valuation of Retirement Benefits in the EU and other European countries (December 2001)
(i) IASC Webside and brochures
(j) IPE Newsline
(k) L'Agefi
(l) L'Argus de l'Assurance
(m) Les Echos
(n) Le Figaro
(o) Le Monde
(p) Morgan Stanley equity research paper
(q) La Tribune
(r) Wall Street Journal

XI. Example: information on employee benefits liabilities amongst the CAC40 companies

We have gathered the public information available about employee benefits in annual reports for the CAC40 companies. The table hereafter summarizes the collected information.

There is a great diversity in the quality of the information provided.

Very few companies indicate the accounting standards they have used for employee benefits, but it seems that FAS87 is quite common. The lack of clear information may be due to the fact that many companies might apply only part of this standard.

Among companies, which give this information, the Unit Credit Method with salary projection is widely used. For retirement lump sum payments (IFC: Indemnités de Fin de Carrière), the Service prorate method is generally preferred.

Unsurprisingly, there is a wide range of actuarial assumptions concerning the discount rate and the expected return on plan assets. Even if these rates have been in most cases lowered since year 2000, they sometimes seem quite optimistic.

No company indicate its funding ratio, but 20 companies among 40 gives enough information to estimate the following figures:

Funding ratio (fund assets / accrued liability): 51% on average,

« Recognition ratio » (funds assets + book reserves / accrued liability): 93% on average.

If the pension funds were to be fully funded, it would have a significant impact on French companies.

The use of insurance contracts to provide benefits to employees is common, but only one company (PPR) indicates the value of insurance funds.

It is interesting to note that Peugeot decided in 2001 to close its defined benefit plans wherever it was possible to open defined contribution plans. The main reason for this move is that defined contribution plans “give better security to employees’ pensions and limit financial risks for the company”.

This study shows the difficulty of assessing the level of recognition of employer’s liabilities relating to employee benefits on a nation-wide basis. Not all companies give enough information about the kind of benefits they provide or the actuarial methods and assumptions they use. Almost no company indicates the results given by other methods.

Company	Accoun-ting standard	Actuarial method	Future benefits	Salary rises	Discount rate	Inflation rate	Salary rise rate	Valuation of assets	Expected return on assets	Accrued liability	Funds assets	Gain/ losses and other gaps	Book reserve	Insured
Accor	IAS 19	Service prorate	Yes	Yes				Market value					53	
AGF													349	
	The former industry-wide retirement plan has been closed in 1996 (liability = 103 Meuros). The AGF retirement plan has been closed in 1998 (liability transferred in 1999).													
Air Liquide													254	
	In France, the former retirement plan has been closed in 1996. It was a DB plan but with a cap on annual contributions and the company does not account any liability for it. Since that date there is a DC plan.													
Alcatel		Unit credit w/ salary projection	No	Yes									1120	
Aventis	Probably FAS 87	Unit credit w/ salary projection	No	Yes	F: 5,5% G: 6% Others: 6.25 -7%			Market value	3 - 9.5%	6739	2918	460	3361	Partially
AXA	Close to FAS 87												2953	Partially
BNP Paribas				Yes	F:: around 3%[1]								1329	
	In France, the former industry-wide retirement plan has been closed in 1994. The pensions are paid on the existing assets of the pension fund and, if needed, by contributions from the banks, which are capped.													
Bouygues		Unit credit w/ salary projection	No	Yes	4.86%		1.5%						179	
Cap Gemini													73	

[1] Discount rate minus inflation rate

Company	Accoun-ting standard	Actuarial method	Future benefits	Salary rises	Discount rate	Inflation rate	Salary rise rate	Valuation of assets	Expected return on assets	Accrued liability	Funds assets	Gain/ losses and other gaps	Book reserve	Insured
Carrefour				Yes						362			105	
Casino		Unit credit w/ salary projection	No	No									44	
Crédit Agricole		Unit credit w/ no salary projection	No	No									265	Partially
Crédit Lyonnais			No	Yes	F: around 3%[1]								137	Partially
Danone		Unit credit w/ salary projection	No	Yes	F: 5% Others 2 - 7.5%		F: 2 - 3% Others: 1 - 5.9%	Market value	F: 6% Others: 5.5 - 8%	771	388	49	334	
Dexia													142	Almost totally
EADS				Yes	5 - 6%	2%	3 - 3.5%	Fair value		3880	571	158	3151	
France Télécom					5%					About 4800		About 500	4270	
	The pensions of the civil servants working for France Telecom will be paid by the French state, in exchange for an annual contribution. There is no liability for this category of employees. Civil servants can leave the company when they are 55, with 70% of their last salary. Most of France Telecom's accrued liability is linked to this agreement.													
L'Oréal		Unit credit w/ salary projection IFC: service prorate	No	Yes	2 - 8%					1699	733	73	893	

[1] Discount rate minus inflation rate

Company	Accoun-ting standard	Actuarial method	Future benefits	Salary rises	Discount rate	Inflation rate	Salary rise rate	Valuation of assets	Expected return on assets	Accrued liability	Funds assets	Gain/ Losses and other gaps	Book reserve	Insured
Lafarge		Service prorate	Yes	Yes	Eland: 5.75%[1] UK: 5.5% Can 6.5% USA 7.75%		Eland: 2 - 3.5%[2] UK: 4.5% Can: 3.5% USA: 4.5%	Fair value	F: 5.82% S: 5.75% Other Eland: 8% UK: 7.5% Can & USA 9%	4497	3844	528	125	Partially
Lagardère				Yes	5%		3%			582	0	20	562	
LVMH													256	
Michelin		Unit credit w/ salary projection	No	Yes									2637	
Orange														
Peugeot S.A.	FAS 87		No		Eland: 5.25% UK: 6%	Eland: 1.75% UK: 2.25%		Market value	F: 6.5% UK: 7.25%	2725	1668	981	76	Partially
	The French DB plan has been replaced by a DC plan in 2002. The obligation related to the DB plan has been transferred to an insurance company.													
PPR		IFC: Service prorate	Yes	Yes	4 - 4.5%					345	196[3]	0	149	Partially
Renault		Unit credit w/ salary projection w/ optional linearization	Some-times	Yes	5.5%	3%	3%			731	16	-16[4]	731	

[1] Excepted Greece 6.25%

[2] Excepted Greece 4.75%

[3] Insurance fund

[4] Including 24 MEuros for past services obligations not included in accrued liability

Company	Accounting standard	Actuarial method	Future benefits	Salary rises	Discount rate	Inflation rate	Salary rise rate	Valuation of assets	Expected return on assets	Accrued liability	Funds assets	Gain/losses and other gaps	Book reserve	Insured
Saint-Gobain	FAS 87	Unit credit w/ salary projection IFC: service prorate	Sometimes	Yes	4 - 7%					5028	3419	275	1334	Partially
Sanofi-Synthélabo				Yes	Eland: 5.25% UK: 5.75% USA: 7% Other: 2.5 - 14.5%				4 - 15%				474	
Schneider				Yes	Av 6.71%	2 - 5%			9.6%	1927	1340	-41	628	
Société Générale										1012[1]			246	
	The former DB plan has been closed in 1993 and the related obligation is funded or reserved.													
Sodexho Alliance	FAS 87													
STMicroelectronics	FAS 87			Yes	Av 6.1%	Av 4%		Market Value	Av 6.65%	138	91	37	10	
Suez	Probably FAS 87			Yes	F: 5%	F: 1.8%		Fair Value		5294	3307	-211	2198	
TF1													14	Partially
Thales				Yes	5.5%		3%		5%				-67[2]	

[1] Only for IFC obligation which is funded

[2] The value of fund assets exceeds the accrued liability and the difference is recognised as an asset

Company	Accoun-ting standard	Actuarial method	Future benefits	Salary rises	Discount rate	Inflation rate	Salary rise rate	Valuation of assets	Expected return on assets	Accrued liability	Funds assets	Gain/losses and other gaps	Book reserve	Insured
Thomson	FAS 87	Unit credit w/ salary projection	No	Yes	F: 3.5% G: 6% US: 7.75%					1091	286	96	709	
Total Fina Elf	Probably FAS 87	Unit credit w/ salary projection	No	Yes	Retirement: av 5.94% Other benefits: av 6.41%		Av 3.74%		Av 7.38%	7964	5517	456	1991	Partially
Vinci		Unit credit w/ salary projection	No	Yes	5.5%	1.5 - 2%	2 - 3%			711	238	0	473	
Vivendi Environnement (31/12/2000)		Unit credit w/ salary projection	No	Yes						976	823	-15	168	
Vivendi Universal		Unit credit w/ salary projection	No	Yes	Retirement: av 6.3% Other benefits: av 6.9%		Retirement: av 4.3% Other benefits: av 3%	Market Value	Retirement: av 7.4% Other benefits: av 6%	2986	2049	FAS 87: 389 French: 312	FAS 87: 548 French: 625	

Appendices

Appendix 1: Benefits acquisition table for IFC case

Appendix 2: Modified benefits acquisition table for IFC case

Appendix 3: Benefits acquisition table for pension case

Appendix 1: benefits acquisition table for IFC case

Years of service	Plan 1	Plan 2
0	0,00	0,00
1	0,00	0,00
2	0,00	0,20
3	0,00	1,00
4	0,00	1,00
5	3,50	1,00
6	3,90	3,00
7	4,30	3,00
8	4,70	3,00
9	5,10	3,00
10	5,50	3,00
11	5,90	4,00
12	6,30	4,00
13	6,70	4,00
14	7,10	4,00
15	7,50	4,00
16	8,00	6,00
17	8,50	6,00
18	9,00	6,00
19	9,50	6,00
20	10,00	6,00
21	10,60	8,00
22	11,20	8,00
23	11,80	8,00
24	12,40	8,00
25	13,00	8,00
26	13,60	9,00
27	14,20	9,00
28	14,80	9,00
29	15,40	9,00
30	16,00	9,00
31	16,60	10,00
32	17,20	10,00
33	17,80	10,00
34	18,40	10,00
35	19,00	10,00
36	19,60	10,00
37	20,00	10,00

The benefits are expressed in number of months of final salary.

Example : if an employee, benefiting from the plan 1 retires with 29 years of service, the employer will pay a lump sum of 15.4 months of final salary.

Appendix 2: modified benefits acquisition table for IFC case

Years of service	Plan 1	Plan 2
0	0,0	0,0
1	0,0	0,0
2	0,0	1,0
3	0,0	1,0
4	0,0	1,0
5	0,0	1,0
6	0,3	2,0
7	0,6	2,0
8	1,0	2,0
9	1,4	2,0
10	1,9	2,0
11	2,3	3,0
12	2,8	3,0
13	3,4	3,0
14	3,9	3,0
15	4,5	3,0
16	5,0	4,5
17	5,6	4,5
18	6,3	4,5
19	6,9	4,5
20	7,5	4,5
21	8,2	6,0
22	8,9	6,0
23	9,6	6,0
24	10,3	6,0
25	11,0	6,0
26	11,7	8,0
27	12,5	8,0
28	13,2	8,0
29	14,0	8,0
30	14,7	8,0
31	15,5	10,0
32	16,2	10,0
33	17,0	10,0
34	17,8	10,0
35	18,5	10,0
36	19,3	10,0
37	20,0	10,0

The benefits are expressed in number of months of final salary.

Example : if an employee, benefiting from the plan 1 retires with 29 years of service, the employer will pay a lump sum of 14 months of final salary.

Appendix 3: benefits acquisition table for pension case

Years of service	Plan 1	Plan 2
0	0,00	0,75
1	1,00	1,50
2	2,00	2,25
3	3,00	3,00
4	4,00	3,75
5	5,00	4,50
6	6,00	5,00
7	7,00	5,50
8	8,00	6,00
9	9,00	6,50
10	10,00	7,00
11	10,75	7,25
12	11,50	7,50
13	12,25	7,75
14	13,00	8,00
15	13,75	8,25
16	14,25	8,37
17	14,75	8,50
18	15,25	8,62
19	15,75	8,75
20	16,25	8,87
21	16,50	9,00
22	16,75	9,12
23	17,00	9,25
24	17,25	9,37
25	17,50	9,50
26	17,75	9,62
27	18,00	9,75
28	18,25	9,87
29	18,50	10,00
30	18,75	10,00
31	19,00	10,00
32	19,25	10,00
33	19,50	10,00
34	19,75	10,00
35	20,00	10,00
36	20,00	10,00
37	20,00	10,00

The annual pension promise is expressed in % of final salary.

Example : if an employee, benefiting from the plan 1 retires with 29 years of service, the employer will pay an pension annuity equal the first year to 18.50% of final salary (future pension increases not taken into account).