

**Second Pillar Schemes - Defined Benefit Schemes, Defined Contribution Schemes  
or Hybrid Schemes?**

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**Supplementary Paper to the Final Report of the Pensions Working Group  
Supplementary Paper No 05**

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## **Executive Summary**

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The Paper discuss briefly the different risks associated with Defined Benefit and Defined Contribution Schemes and also looks at the features of different Hybrid Schemes.

Each of the traditional forms of SPPSs – the DB and the DC Scheme – have their own advantages and disadvantages, each affecting employers and employees from different perspectives.

One main difference however is that in a DB Scheme, the employer shoulders the investment risk of the assets of the Scheme, which in turn determines the viability of the Scheme. Moreover, DB Schemes define benefits in advance and hence provide certain certainty of retirement planning for the individual. However these Schemes are less portable and impinge on the mobility of employees.

On the other hand, in DC Schemes, the investment risk of the assets of the Scheme is transferred on to the employee, who does not have any guaranteed promised benefit upon retirement. This could raise issues of adequacy of retirement income. On the other hand, DC scheme's contributory costs are fixed, they are more portable and more conducive to employee mobility.

In certain countries outside Malta, DC Schemes have become the norm following certain economic, demographic and regulatory trends amongst others.

Alternative SPPSs have also emerged, known as Hybrid Schemes.

Hybrid Schemes are halfway on the scale between DB and DC Schemes. They combine features of both Schemes. These Schemes can take various forms, however one main general feature is that they spread the investment risk between employers and employees.

The Hybrid Scheme proposed by the Actuaries is more of a DC design with embedded control levers. In the proposed structure, the investment risk is not spread between employers and employees – but rather between different generations of employees who are members of these type of Scheme. The aim is that this would address the issue of sustainability as the costs would be fixed in advance, while the control levers which ensure smoothing fluctuating investment values would address the issue of fluctuating values as it avoid members left at the mercy of the performance of the markets.

### **Recommendations**

Employers generally have control of the type of Scheme that will be offered to their employees – particularly in voluntary scenarios. However in mandatory scenarios, this could possibly amount to a policy decision.

To research further the actual operational mechanics of the SPPS recommended by the Actuaries.

To determine whether any particular regulatory requirements need to be imposed on Hybrid Schemes, if at all, and develop the framework under the Special Funds (Regulations) Act, 2002 accordingly.

The proposed Hybrid Scheme should also be reviewed with reference to the proposed tax structure for the second pillar and third pillar schemes.

## **01. Introduction**

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### **01.1 Remit of Paper**

The remit of this Paper is to analyse the different types of Second Pillar Pensions Schemes (“SPPSs”) that are ordinarily established by contributors and beneficiaries, and in particular the hybrid structure recommended by Hewitt Bacon & Woodrow Limited (“the Actuaries”) in the Actuarial Impact Assessment that was commissioned by Government post publication of the White Paper - Pensions, Adequate and Sustainable in November 2004.

### **01.2 Structure of the Paper**

Chapter 02, discusses briefly by way of background, the types of SPPSs established outside Malta, in particular the shift from Defined Benefit to Defined Contribution Schemes and the emergence of Hybrid Schemes in foreign markets.

Chapter 03 looks at the hybrid structure recommended by Hewitt Bacon & Woodrow Limited (“the Actuaries”) in the Actuarial Impact Assessment.

Chapter 04 includes some conclusions.

## 02. Types of SPPSs in Markets Outside Malta

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### 02.1 General Types of SPPSs

Basically there are two main types of SPPSs, namely:

- Defined Benefit Schemes (“DB Schemes”).
- Defined Contribution Schemes (“DC Schemes”).

#### 02.1.1 Defined Benefit Schemes

DB Schemes are an arrangement where the benefits, which are ordinarily determined by the scheme rules, are defined in advance. Benefits are often related to the final salary and/or years of service of the employee<sup>1</sup>.

The fact that benefits are defined in advance provides certainty to the individual for his retirement planning, and the defined benefit can easily be assessed from an adequacy point of view.

Contributions are generally made by the employer and often also by the employees. Contributions are normally determined by a number of factors<sup>2</sup>, such as:

- scheme assets at any time;
- the composition of scheme membership;
- the changing salary levels of scheme members;
- changing mortality rates and their impact on the costs of providing benefits;
- the investment returns on scheme assets;
- changing regulatory requirements.

The delivery of the quoted benefits<sup>3</sup> is the main responsibility of the employer (who is generally the guarantor of the defined benefits). Hence the investment risk of this type of scheme is carried by the employer who is obliged to make good, at the time of pay-out, any shortfall between the investment returns achieved by assets and the quoted benefits. This means that employers may be exposed to increasing costs to ensure that such a scheme will be in a position to meet its liabilities. Any increase of costs for the maintenance of such a scheme may also affect the solvency of the employer as a viable employment agency. Hence the fact that costs associated with these type of schemes may rise or fall throughout the life of the scheme may raise issues of sustainability.

The main risk for beneficiaries is the solvency of the employer so as to be in a position to meet the promised benefits.

Given the fact that generally the benefits receivable under these type of schemes are based on final salary, these schemes are generally designed namely for long-serving employees<sup>4</sup>. Any early opt-outs from DB Schemes generally entails loss of benefits due to the fact that in DB Schemes the assets are owned by the guarantor of the fixed benefits which are usually calculated on final salary<sup>5</sup>. This hinders mobility of employees.

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<sup>1</sup> Transport Salaried Staffs' Association - TSSA (n.d), 'Defined benefit pensions v defined contribution schemes', p.1.

<sup>2</sup> op cit, TSSA (n.d.), p.1

<sup>3</sup> Financial Services Authority web-site: <http://www.fsa.gov.uk>

<sup>4</sup> Ross D & Willis L (2002), 'The Shift from Defined Benefit to Defined Contribution Retirement Plans and the Provisioning of Retirement Savings', p 7

<sup>5</sup> ibid, p 7

## 02.1.2 Defined Contribution Schemes

DC Schemes are arrangements where the retirement benefit is not known or defined in advance<sup>6</sup>. Rather the level of retirement income receivable on pay-out date<sup>7</sup> is related to the:

- level of contributions made over the accumulation period;
- the charges deducted by the product provider;
- the investment returns of the fund during the accumulation phase;
- the annuity rates at retirement.

The beneficiaries carry the risk of fluctuating pension levels and also face the uncertainty about the level of pension benefit receivable from the scheme. This makes it more difficult for purposes of planning for retirement and also to measure the adequacy of the benefits receivable, unless members have access to regular and focused feedback about the scheme's performance and the benefit due to them.

Contributions are generally made by the employer and the employee and these are fixed in advance – so the cost of a DC scheme is known in advance. This should not give rise to issues of sustainability, as in theory these type of schemes cannot be in deficit.

DC schemes are very transparent and more flexible in terms of calculating the amount of pension due to an individual at any point in time. This is due to the fact that proportional assets are directly attributable on an individual basis, and hence the value is more easily and accurately calculated.<sup>8</sup> This makes DC schemes very portable and attractive for part-time workers and a mobile work-force.

## 02.1.3 Comparative Analysis – DB Schemes vs. DC Schemes

DB Schemes and DC Schemes vary in nature and hence have different characteristics – which are tabled in Table 01 below.

**Table 01: Comparative Analysis of Characteristics of DB and DC Schemes**

Defined Benefit Schemes	Defined Contribution Schemes
Benefits are fixed in advance. Benefits do not depend on investment returns or annuity rates	Benefit is not known in advance. Benefits depend on investment returns, contributions and costs of annuities at retirement
Employer contributes necessary costs in excess of employee contributions (costs may be variable)	Employer contributions are fixed.
The employer underwrites the vast majority of the costs so that if investment returns are poor or costs increase, the employer need either to make adjustments to the scheme or to increase levels of contribution <sup>9</sup> .	The Scheme member / employee shoulders the investment risk of performance of the assets by the Scheme. If contribution rates are not increased when investment returns are poor or costs increase, then the retirement benefits receivable by scheme members / employees will be lower than they had planned for <sup>10</sup> .
Employer takes financial risk (although member still exposed to employer solvency risks)	Member takes financial risk
Early leavers often suffer a loss as benefits are broadly linked to prices rather than	Early leavers generally do not suffer a loss because their account remains invested

<sup>6</sup> *ibid*, p.4

<sup>7</sup> *op cit*, TSSA (n.d.), p.2

<sup>8</sup> *op cit*, Roos D & Willis L (2002), p 7

<sup>9</sup> *op cit*, TSSA (n.d.), p.2

<sup>10</sup> *ibid*, p.2

earnings	within the scheme
Benefits designed for long serving employees with progressive increases in pensionable pay. Less Portable.	Benefits designed for short serving employees or those whose pensionable pay fluctuates. Portable.
Assets owned by guarantor	Assets attributable at individual level

Source: CIPD - Occupational Pension : Strategic issues

Due to their varying nature, each Scheme provides different advantages and disadvantages from the employer's and employee's perspective. These are included in Table 02 below.

**Table 02: Advantages and Disadvantages of DB and DC Schemes – Employee and Employer Perspective**

Defined Benefit Schemes		Defined Contribution Schemes	
Employer	Employee	Employer	Employee
X Risk of investment performance	Certainty of benefits (easy to measure benefits in terms of adequacy and better for retirement planning)	Fixed costs	Fixed costs
X Potential increase in costs (issues of sustainability)	X Solvency of employer	No risk of Investment performance	X Risk of investment performance
	X Not very portable (hinders mobility)		X Uncertainty of retirement benefits
			Portable and transparent

## 02.2 Shift from Defined Benefit Schemes to Defined Contribution Schemes

Traditionally SPPSs were often structured as DB Schemes. However, recently there was a strong shift away from DB Schemes towards DC Schemes in various countries<sup>11</sup>.

Statistics show that 97% of companies in the United States ("US") offer DC schemes and in Australia less than 5% of superannuation fund assets remain in pure DB Schemes<sup>12</sup>. Similarly in the UK, approximately a third of pension schemes are DC schemes and the trend away from DB Schemes is expected to continue<sup>13</sup>. In some countries employers are establishing new schemes as DC schemes and preventing any new employees from joining already existing DB schemes. In other countries, such as the UK, some employers are even closing their DB plans to new and in at times, also to existing members<sup>14</sup>.

Various reasons have been cited by employers to explain the shift from DB Schemes to DC Schemes, including but not limited to:

<sup>11</sup> op cit, Ross D & Willis L (2002), p.4

<sup>12</sup> ibid, p.4

<sup>13</sup> Tower Perrins HR Services (2004), Defined Contribution Pension Arrangements, UK

<sup>14</sup> op cit, Ross D & Willis L (2002), p5-6

### **Increased Awareness of Risks associated with DB Schemes**

Increased volatility in financial markets and the recent poor performance of the equity market, has put more pressure on certain employers (especially those whose DB Schemes were predominantly invested in equities near pay-out<sup>15</sup>) in meeting the quoted benefits under DB Schemes. In turn, these factors have created broader awareness among employers of the risks associated with DB Schemes, leading employers to opt towards DC schemes<sup>16</sup>.

### **Economic Factors, including Increased Costs**

The composition of the labour force has changed over the years. Workers have become more mobile and unlike DB schemes, DC schemes are more transparent and more portable. As discussed earlier, the retirement value is more easily and accurately calculated in a DC Scheme, rather than in DB Schemes<sup>17</sup>. DB Schemes are generally targeted at employees who remain with the same employer for their whole career<sup>18</sup>.

Moreover, population demographics with an increasing number of people living for much longer periods in retirement, have increased the cost of pension benefits.

[To note that the concept of increased costs is counter-argued by the fact that employers do not compare like with like when they try to compare the real overall cost of providing a typical DB scheme with a typical DC scheme. The benefit by employers from favourable investment returns with DB Schemes is often overlooked. It is also argued that reductions and contribution holidays (which were prevalent in UK DB Schemes in periods where markets were buoyant and some DB schemes held surpluses) are often not accounted for. On the other hand, under a DC scheme the employer is required to maintain the fixed level of contributions irrespective of how well the investments are performing, subject to any maximum levels that the framework may impose<sup>19</sup>.]

### **Excessive Regulation**

Various countries, such as the UK, have introduced strict legal, funding, accounting (introducing FRS 19), valuation and solvency requirements on DB schemes over the years, to address the inherent risks therein, so as to ensure that pension plans are protected and preserved until retirement<sup>20</sup>.

Employers argue that this has made the administration of DB schemes more onerous for them.

## **02.3 Consequences of the Shift to DC Schemes**

The shift from DB Schemes to DC Schemes does not mean that DC schemes are worse. The risks and responsibilities associated with each are different and the advantages and disadvantages associated with each vary from the perspective of the employer and the employee, as seen in Table 02 above.

Moreover, the above shift does not mean that certain employers would not still want to offer DB Schemes to their employees.

However the main consequence of the shift from DB schemes to DC Schemes is, in theory, the transfer of the risks of the provision of adequate retirement benefit, from the employer to the employee.

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<sup>15</sup> Dr Ross Altman (n.d.), 'Brief summary of crisis facing UK employers running final salary schemes'. In the UK, "Pension funds relied on equity investments, which delivered exceptionally strong returns in the 1980's and 1990's and actuarial valuation methods failed to predict future interest rates, inflation, investment returns and mortality correctly. This meant that the actuarial valuations underestimated the liabilities and over-estimated the expected assets, to suggest that schemes had more than enough money to pay out all the pension promises".

<sup>16</sup> Davis EP (2004), 'Is there a Pensions Crisis in the UK?'. Brunel University and NIESR London, UK, p13

<sup>17</sup> op cit Ross D & Willis L (2002), p 7

<sup>18</sup> ibid, p 7

<sup>19</sup> op cit, TSSA (n.d.), p.3-4

<sup>20</sup> op cit, Ross D & Willis L (2002), p.6

Barnett Waddingham (n.d.) 'DB v DC: The middle way', p2

As discussed earlier, whereas there are no deficits in DC schemes as in DB Schemes, the level of retirement income is not known in advance and is dependent on a number of factors, not least on the investment performance of the DC Schemes' assets. This creates uncertainty for the individuals in terms of preparing for their retirement<sup>21</sup>. Moreover, if assets are not invested competently<sup>22</sup> or not enough contributions<sup>23</sup> are put in the scheme, the members may find themselves disappointed with the accumulated sum when facing retirement<sup>24</sup>.

Under a DC Scheme, much greater responsibility is placed on the employee, and where investment decisions are left in the hands of competent managers, also on the management of these Schemes. A degree of responsibility also falls on the Government in a mandatory scenario, where the concept of saving is forced, and where often individuals have little or no control over the asset allocation of their fund<sup>25</sup>.

Increasing the level of involvement of the individual member is potentially a means of engaging the individual in the process and hence reducing this uncertainty about the final pension receivable<sup>26</sup>.

Involvement of the individual can be achieved in various ways. One way is through pensions communication that is placed in the context of the individuals' situation and aspirations<sup>27</sup>. In fact, it is argued that DC Schemes require good reporting so that members can have a realistic indication of the value of their likely pension in real terms, so members may have the opportunity of assessing their prospects for retirement income in time to consider doing something about it at an affordable cost<sup>28</sup>.

However primarily, DC Schemes involves a culture or attitude change from relying on the State or the employer (in DB Schemes) to provide retirement benefits to assuming responsibility (or a degree of responsibility) to provide for one's own retirement.

## 02.4 Emergence of Hybrid Schemes

The shift from DB schemes to DC schemes can be described as a move from one end of the scale to the other opposite end – in so far as responsibility for pension provisioning is concerned.

Less 'drastic' alternatives exist. Employers may tailor the features of DB Schemes offering DB benefits at a lower scale to reduce the associated investment and costs risks<sup>29</sup> by:

- increasing retirement ages;
- increasing contributions by members;
- limiting personable salary increases.

However, while this will only partially address the issue of costs – because as long as there is an element or a degree of defined benefit, a potential risk of sustainability would still remain for the employer.

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<sup>21</sup> op cit, Ross D & Willis L (2002), p.18

<sup>22</sup> Lack of diversification or undue exposure to certain instruments. Paper regarding the investment framework for asset investments refers.

<sup>23</sup> Op cit David (2004), p.16 : Much depends on the level of DC contributions effected throughout the life of the pension scheme. In principle, with identical contributions to DB, such risks are offset by reduced losses on changing jobs. But there is not a level playing field, owing to lower contributions to DC schemes. Average contribution – in UK – are much lower for DC schemes. This points to the risk of a future crisis of low future retirement incomes, especially given the rising longevity to add to the heightened investment risks and uncertainty for members.

<sup>24</sup> Op cit, Ross D & Willis L (2002), p.16: If there is disappointment with the final pension receivable under a DC Scheme, this may lead to dependency on the state system during retirement, thereby increasing the funding pressures. Therefore far from transferring the risk from the employer to the employee, the risk ultimately resides with the state, particularly in a mandatory scenario. [This ultimate transfer of risk to the State can however also be applied to DB schemes in the instance there is a default on the guaranteed pay-out by the employer].

<sup>25</sup> ibid, p 19

<sup>26</sup> ibid p 19

<sup>27</sup> op cit, Towers Perrins HR Services (2004), p.4

<sup>28</sup> op cit, TSSA (n.d.), p. 3

<sup>29</sup> op cit, Barnett & Waddingham (n.d.) p.4-5

Some markets, particularly the US, have seen the emergence of SPPSs known as Hybrid Schemes.

Hybrid Schemes seek to combine features of DB and DC schemes in some way and can take a variety of forms. For example:

- A DC scheme with the option for employees who have been with the company for a certain number of years to move into a DB scheme<sup>30</sup>.
- A Scheme promising pensions based on average career earnings rather than final salary, or which changes the amount of pension one can expect for each year of service completed<sup>31</sup>.
- A DC scheme offering a guarantee that it won't fall below the level that would be provided by a DB scheme. The guarantee offers some protection against the pension scheme's investments performing badly.
- A DB scheme but with the chance to do better if the scheme's investments perform so well that the contributions made can provide a higher pension
- A DC scheme but with the employer's contributions varying with the aim of achieving a particular target pension.

Appendix 1 includes details of different types of Hybrid Schemes that are ordinarily established by employers.

Hybrid Schemes can combine the best, or the worst, of both DB and DC schemes. They can be relatively complex and potentially involve higher administration costs as well as necessitate certain employee educational and communication efforts<sup>32</sup>.

However Hybrid Schemes can potentially offer a significant opportunity of offering some level of retirement-income guarantee, without incurring the full cost and risk of traditional DB arrangements<sup>33</sup>. In fact, the main common and most important feature of Hybrid Schemes is that they spread the risk of pension provisioning between the employer and the employee and allow for greater flexibility. Employers do devolve a degree of the investment risk to employees but often guarantee an investment return to workers such that the expected return on Scheme's assets is sufficient to cover the cost of these risks. Workers do retain some residual investment risk depending on the form of the Hybrid Scheme – for example in so far as returns over the minimum guaranteed amount or early in the life of the Scheme. However workers often have a certain degree of certainty in so far as part of their retirement income, which is guaranteed, is concerned.

Also, Hybrid Schemes tend to be more age neutral in their retirement incentives than traditional DB plans and most Hybrid Schemes do not have early retirement incentives..

Table 03 depicts and compares the main features of DB, DC and Hybrid SPPSs.

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<sup>30</sup> bCentral web-site, (n.d.) 'Pension Schemes what are the options?' Available online: <http://www.bcentral.co.uk/people/pay/pension-schemes.msp>, Last accessed 10<sup>th</sup> June 2005

<sup>31</sup> Shackleton R (2003), 'How do Hybrid Pensions Work?', BBC News, UK

<sup>32</sup> op cit, Towers Perrins HR Services (2004), p.6

<sup>33</sup> ibid, p.6

**Table 03: Main Features of DB, DC and Hybrid Schemes**

Features of Alternative Employer-Sponsored Retirement Plans				
Plan Feature	Defined Benefit Plan	Defined Contribution Plan	Hybrid Plan	Hybrid Plan Tendency
Employer contributes	Virtually always	Sometimes	Virtually always	DB
Employee contributes	Very rarely	Virtually always	Very rarely	DB
Participation	Automatic	Employee choice	Automatic	DB
Contribution level	Automatic	Employee choice	Automatic	DB
Early departure	Yes	No	No	DC
Benefits easily portable	No	Yes	Yes	DC
Annual communication	Benefit at end of career	Current balance	Current balance	DC
Retirement incentives	Occur at specific ages	Neutral	Most are neutral	DC
Accrual of benefits	Loaded to career end	Level over career	Level or back loaded	Mixed
Financial market risks	Employer bears	Employee bears	Shared	Mixed
Longevity insurance	Typically yes	Typically no	Not often taken	Mixed

Source: Adopting Hybrid Pension Plans Financial and Communication Issues by Rober Clark, John Haley and Sylvester Schieber

## 02.5 Regulation of SPPSs

The legislative and regulatory framework adopted by countries for SPPSs usually provides for DB and DC schemes.

International regulatory guidelines and principles for pensions schemes (such as those issued by the Organisation for Economic Co-Operation and Development (“OECD”), the European Union Directive 2003/41 EEC regarding Pensions and the Principles issued by the International Network of Pensions Regulators and Supervisors (“INPRS”) also distinguish namely between DB and DC schemes. Regulatory requirements for DB and DC Schemes impose obligations aimed at addressing specific risks inherent in each type of scheme.

Rather than creating regulatory regimes specifically catering for Hybrid Schemes - given the variety of hybrid scheme designs - it is common for other regulators to adopt the regulatory framework for DB and DC schemes and tailor it according to the specifics and particularities of the Hybrid Scheme involved. The regulatory requirements for Hybrid Schemes are thus commonly applied on a case by case basis depending on the nature and specifics of the hybrid scheme proposed.

The Special Funds (Regulations) Act, 2002 (“SFA”) and the directives issued thereunder – which provide a regulatory framework for international SPPSs - already take into consideration the international principles and regulatory guidelines mentioned above. The local framework distinguishes between DB and DC schemes but does not cater specifically for Hybrid Schemes. In this regard, it is recommended that the framework for DB and DC schemes under the SFA is adopted for local SPPSs and also applied as appropriate for Hybrid Schemes. However, the requirements applicable to such schemes would be tailored on a case by case basis as considered appropriate taking into consideration the standards applied for DB and DC schemes as similarly done by other foreign regulators.

## **03. Actuarial Recommendation regarding the use of Hybrid Schemes**

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### **03.1 The recommended Smoothed Hybrid Scheme Design**

Hewitt Bacon & Woodrow Limited (“the Actuaries”) recommend that SPPSs (Tier 1) are always based on the smoothed Hybrid Scheme design as this is considered as a key part of providing adequate pensions for the lower paid in particular. The Actuaries also recommend that SPPS (Tier 2) should also be based on the smoothed Hybrid design in the earlier years. When the smoother Hybrid Design has settled down the Tier 2 could be extended to include other standard DC choices offered by the competing funds<sup>34</sup>.

The form of Hybrid Scheme that is recommended is one which:

- is specifically designed to avoid allocating the whole investment risk onto each individual member - a major drawback of the standard DC design – and providing for smoothed investment returns through the use of control levers by the Scheme management;
- does not involve any guaranteed benefits as found in DB schemes which can create residual liabilities - a major issue with DB design – and in turn requiring additional costs (such as payment of extra contributions, which undermine the DC design feature.

The aim of this proposed form of Hybrid Scheme is to enable strategic management of pensions, with gradual adjustments as necessary over time, with the aim of ensuring a desired level of adequate pension benefits within acceptable and sustainable contribution levels<sup>35</sup>.

### **03.2 Operational Aspect – Distribution of Benefits by the Smoothed Hybrid Scheme Design**

The proposed Hybrid Scheme mainly has a DC element where contributors have a fixed contribution rate and the scheme does not define any benefits.

The benefits are still dependent on the investment performance of the assets of the Scheme as the Benefits are not guaranteed in advance but will depend on the level of investment returns.

However, to minimise the risk of investment performance (and hence minimise situations where a pensioner retiring during a period of bear markets receives a low pension as opposed to an individual who retires during a period of bull markets receives a high pension – depending on the portfolio allocation of the Scheme, it is proposed that the scheme spreads volatility risk between the scheme members.

This spreading of volatility risk between the scheme members would be the responsibility of the management of the Scheme through the use of what are called “control levers”.

The actual allocation of investment return is thus not linked automatically to the performance of the Fund and the Scheme does not mechanically follow the market when crediting smoothed investment returns to Members. Rather the return to the individual member is determined by highly competent scheme Manager/s. The idea is that the Manager of the Scheme levels out the distribution of the return on assets across the years – reserving some of the return achieved during bull markets, and distributing it in periods of bear markets to make up for the low return otherwise receivable during bear markets. Given that it will not be possible to predict bear markets, the credited returns will need to be set initially at a prudent level – not too high – and these should be decided by the scheme’s Directors with actuarial input.

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<sup>34</sup> Hewitt Actuarial Impact Assessment, p. 47-51

<sup>35</sup> *ibid*, p.1

### 03.3 The Control Levers for the Smoothed Hybrid Scheme Design

The control levers utilised by the Management of the Scheme to smooth the investment returns between generations of members are namely three:

- a. Management decisions regarding the allocation of investment returns across periods, applied throughout the life of the Scheme.

These management decisions will impact the scheme over time. The Scheme Directors will also be required to monitor and approve the level of smoothed investment returns credited to members - proposed by the directors of each fund - initially based on price inflation plus a % per annum and later modified in a smoothed manner to reflect actual investment performance achieved by each fund. The Scheme Directors will set/review the objectives and the fund directors will decide on the investment strategy, investment management structure, investment benchmarks and selection of asset manager(s) to target those objectives.

- b. Annuity conversion rate applied at the point where an individual's contributions are converted into a monthly pension.

The proposed Hybrid Scheme will involve reviewing on a regular basis the annuity conversion terms. Worsening or improving the conversion terms allows for adjustments depending on the actual versus expected performance of the assets – if assets are performing consistently less well than expected, then the conversion terms could be altered over time to provide a smaller pension for the same value of an individual's assets<sup>36</sup> and vice versa.

- c. The level of pension increases awarded to pensions in payment, as necessary at any time after a pension comes into payment.

Pension increases paid can be altered depending on the investment performance of the Scheme's assets.

Worsening the conversion terms or awarding lower pension increases are methods of adjusting for unanticipated poor investment returns. The key issue is equity between different generations of members. This is a governance issue which should be managed by the scheme Directors, so that the Fund Directors are left to focus on the investment objectives set by the scheme Directors.

### 03.4 Potential Risks

There needs to be appropriate governance so that the Schemes do not attempt to compete by simply proposing high credited returns. There would need to be active involvement by the Directors of the Scheme. The objectives set by the Scheme Directors need to ensure that competition is achieved through long-term investment performance, with transparent disclosure to fund members on a regular basis of the extent of any superior performance. This will provide a clear indicator of potential higher smoothed credited returns in the future if the superior performance is sustained.

To minimise the risk of miscalculation of distributions by the Manager (as well as for monitoring purposes), it is recommended that the basis of calculation of distributions is defined in advance. In this regard, the idea is that the Manager calculates the amounts to be distributed on the average price inflation plus an additional percentage, say 2%. While the average price inflation is available statistically, the remaining percentage has to be determined by the Manager. Basing the calculation of the distribution on the average price inflation is viewed to be a better calculation than linking distributions to average wage inflation. If the Maltese economy was to boom and wages increase drastically to reach EU levels, it could well likely be the case that the distribution amount would outstrip the return on the Scheme assets, whereas if the linkage is retained with the Average Price Inflation, the distributed amount should still remain relatively adequate in so far as spending power is concerned.

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<sup>36</sup> *ibid*, p.54

In the case where the Manager of the Scheme finds that it has been overly conservative in calculating the distributions, it could decide to utilise another control lever by increasing the annuity conversion rate, thereby increasing pension bonuses to members who have already retired. This would overcome the risk of low distributions by the Manager. The risk of overly high distributions by the Manager can only be counter-acted by ensuring the competence of the Manager and requiring actuarial input.

Moreover, to reduce the uncertainty element for the individual who would need to plan for his retirement, it is also suggested that the conversion terms can be defined prior to retirement – for example fixed for a five year term before the expected retirement date of the individual. This way, Scheme members would have a clearer picture of the benefits they can expect as they approach retirement<sup>37</sup>.

Transferring between Retirement Funds could possibly involve the loss of the smoothing benefits. This is an aspect which needs to be assessed in more detail.

### 03.5 Involvement of actuary for the proposed Hybrid Scheme

The operation of the proposed Hybrid Schemes involves the use of an actuary.

Actuarial expertise in the investment area will provide useful input to the scheme Directors when approving the smoother credited returns and setting the investment objectives. Actuarial input would be helpful in determining the smoothed investment returns credited to members and the level of pension increases. Moreover, actuarial expertise is essential for the annuity conversion terms and accordingly an actuary would be required when calculating the conversion rate for an annuity.

The actuarial input will thus cover all the available “control levers”.

### 03.6 Conclusion

The Hybrid Scheme proposed by the Actuaries is more of a DC design with embedded control levers. In the proposed structure, the investment risk is not spread between employers and employees – but rather between different generations of employees who are members of these type of Scheme. It’s main aim is to address the issue of sustainability by not guaranteeing benefits and adequacy through the application of control levers addresses the investment risk that is inherent in DC Schemes by smoothing any fluctuations in retirement amounts.

Further research is required to assess the actual operational aspects and implications of this Hybrid proposal, including but not limited regarding transferability issues and annuity management.

**Table 04: Main features of the proposed Hybrid Scheme with a typical DB, DC and other typical Hybrid Schemes**

Features	Typical Defined Benefit Scheme	Typical Defined Contribution Scheme	Typical Hybrid Schemes	Proposed Hybrid Scheme
Investment Risk	Carried by Employer	Carried by Individual	Spread between employer and employees	Spread between individuals of different generations
Certainty of Retirement Provisions	Certain	Uncertain	Mixed	Certain due to fixing at the target level say 5 years before retirement
Costs	Variable	Fixed	Part Fixed / Part Variable	Fixed

<sup>37</sup> ibid, p.54

## **04. Recommendations**

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Employers generally have control of the type of Scheme that will be offered to their employees – particularly in voluntary scenarios. However in mandatory scenarios, this could possibly amount to a policy decision.

To research further the actual operational mechanics of the SPPS recommended by the Actuaries

To determine whether any particular regulatory requirements need to be imposed on Hybrid Schemes, if at all, and develop the framework under the Special Funds (Regulations) Act, 2002 accordingly.

The proposed Hybrid Scheme should also be reviewed with reference to the proposed tax structure for the second pillar and third pillar schemes.

## 05. References

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Altman R, (n.d.), Brief summary of crisis facing UK employers running final salary schemes. Available online: <http://www.rosaltmann.com/crisisfacingUKemployers.htm> Last accessed: 28th June 2005

Barnett Waddingham (n.d.) 'DB v DC: The middle way', Available on-line: <http://www.barnett-waddingham.co.uk/cms/services/actuarial/news02052/viewDocument>. Last accessed: 27th June 2005

bCentral web-site, (n.d.) 'Pension Schemes what are the options?' Available online: <http://www.bcentral.co.uk/people/pay/pension-schemes.mspx>, Last accessed 10th June 2005

CIPD - Occupational Pension : Strategic issues. Available on-line: <http://www.cipd.co.uk/subjects/empbnfts/pensions/occpension.htm>. Last accessed 13th June 2005

Davis EP (2004), 'Is there a Pensions Crisis in the UK?'. Brunel University and NIESR London, UK

Elliot K. R. & Moore J. H. Jr (2000) Cash Balance Pension Plans: The New Wave Compensation and Working Conditions Summer 2000

Financial Services Authority web-site: <http://www.fsa.gov.uk>

Green B (2003), 'What is a Pension Equity Plan?', Bureau of Labor Statistics, US. Available on-line: <http://www.bls.gov/opub/cwc/print/cm20031016ar01p1.htm>

Hewitt Actuarial Impact Assessment

Ross D & Willis L (2002), 'The Shift from Defined Benefit to Defined Contribution Retirement Plans and the Provisioning of Retirement Savings', The Pensions Institute, Birkbeck College, University of London, UK. Available online: <http://www.pensions-institute.org> Last accessed: 18th May 2005

Shackleton R (2003), 'How do Hybrid Pensions Work?', BBC News, UK

Tower Perrins HR Services (2004), Defined Contribution Pension Arrangements, UK

Transport Salaried Staffs' Association - TSSA (n.d), 'Defined benefit pensions v defined contribution schemes'. Available on-line: [http://www.towersperrin.com/hrservices/webcache/towers/United\\_Kingdom/publications/Reports/Pension\\_arrangements/DCSurvey2004.pdf](http://www.towersperrin.com/hrservices/webcache/towers/United_Kingdom/publications/Reports/Pension_arrangements/DCSurvey2004.pdf). Last accessed: 15th June 2005

## **Different Types of Hybrid SPPs' Structures**

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**Appendix 1**

## Types of Hybrid Pension Plans

### 01. Pension Equity Plan

[Extract from Green B (2003), 'What is a Pension Equity Plan?', Bureau of Labor Statistics, US. Available on-line: <http://www.bls.gov/opub/cwc/print/cm20031016ar01p1.htm>]

A pension equity plan is a defined benefit plan that provides an annuity or lump-sum benefit at the termination of a participant's employment. Pension equity plans define benefits in terms of a current lump-sum value. Annual credits can be based on age, service, or a combination of both. The plan determines the total benefits by providing a "schedule of percents" that are accumulated throughout the work life of the employee. When an employee leaves the employer, either at retirement or at any time once vested, the accumulated percentage is applied to final earnings (defined by the plan) to determine a lump-sum benefit.

The following tabulation shows an example of how a pension equity plan might accumulate percents of earnings strictly on the basis of age:

**Table 05: Accumulation of earnings on the basis of age**

Age	Percent of earnings accumulated
29 and younger	2.5
30 to 35	3
36 to 40	4
41 to 45	5
46 to 50	6.5
51 to 55	8.5
56 to 60	10.5

Employees receive a percent of earnings credits for each year of service, which are accumulated throughout the employee's career with the employer. The total percent (shown as a credit in some plans) is multiplied by the employee's final average earnings. Final average earnings generally are defined as an annual average of the highest earnings over a specific number of years for example the average of the highest 3 years of earnings.

Table 1 illustrates how three different workers would accumulate benefits under a pension equity plan. Each employee leaves the company with the same final average earnings (as defined by the plan), but the amount of their actual lump-sum benefit and consequently their annuity value differs considerably because of differences in their ages and lengths of service. Because the benefit credits accumulate more quickly for older workers, employee 1 with 15 years of service at age 40 has a smaller lump-sum benefit than does employee 3, who has 15 years of service at age 65. The employee with 30 years of service who retires at age 65 has the greatest accumulation, reflecting both long service and nearness to retirement age.

**Table 06: Accumulation of benefit credits and calculation of lump-sum and annuity values under a Pension Equity Plan**

	Employee 1	Employee 2	Employee 3
Age at hire	25	35	50
Age at separation	40	65	65
Total years of service	15	30	15
Credits per year:			
Age 30 and younger (2.5 percent)	5 @ 2.5 = 12.5	0	0
Age 31-35 (3.0 percent)	5 @ 3.0 = 15.0	0	0
Age 36-40 (4.0 percent)	5 @ 4.0 = 20.0	5 @ 4.0 = 20.0	0
Age 41-45 (5.0 percent)	0	5 @ 5.0 = 25.0	0
Age 46-50 (6.5 percent)	0	5 @ 6.5 = 32.5	0
Age 51-55 (8.0 percent)	0	5 @ 8.0 = 40.0	5 @ 8.0 = 40.0
Age 56-60 (10.5 percent)	0	5 @ 10.5 = 52.5	5 @ 10.5 = 52.5
Age 61 and older (13.5 percent)	0	5 @ 13.5 = 67.5	5 @ 13.5 = 67.5
Total credits (percent)	47.5	237.5	160
Final average earnings (1)	40,000	\$40,000	\$40,000
Lump-sum benefit	\$19,000	\$95,000	\$64,000
Footnotes:			
(1) As defined by the plan.			

Employers may use alternative approaches to determining credits under a pension equity plan. For example, an employer with multiple lines of business can adjust the percents to accommodate many different types of workers. Table 06 shows an example of this flexibility. In this example, the plan includes three different schedules of percents for three different occupational groups within the same company.

**Table 07: Examples of pension equity plan credits that vary by occupation**

Age	Percent of earnings accumulated		
	Job group 1	Job group 2	Job group 3
29 and younger	1.5	2.8	5
30-39	2.5	3.8	7
40-49	4	5	13
50-59	5.5	8	18
60 and older	6	11	22

Pension equity plans can vary their accrual rate based on both age and service, and they can provide different accruals for those earning more than the Social Security taxable wage base. For example, an employer can provide a standard age-based accrual and add to that a smaller accrual based on service. Employees with 10 to 20 years of service might receive an additional service accrual of 2 percent per year, while those with more than 20 years of service might receive an additional 3 percent per year.

Defined benefit pension plans are also allowed to "integrate" benefits with Social Security; such a provision takes into account the employer funding of Social Security benefits up to an annual threshold (the Social Security taxable wage base). A pension equity plan might vary its accruals for those earning less than or more than the wage base. For example, a plan that accrued 3 percent of earnings per year for those aged 31 to 40 might increase that accrual to 5 percent per year for those earnings that exceed the wage base.

### **Distributions**

While pension equity plans identify their benefits in terms of a lump sum (a percent multiplied by final earnings), as a defined benefit plan they must make benefits available in the form of an annuity. In practice, this annuity requirement is typically only applicable to workers who are nearing retirement age. By law, defined benefit plans with a value of \$5,000 or less can, without the consent of the covered employee, pay the employee a lump sum and not offer an annuity option. In a traditional defined benefit plan, such value is determined by the present value of future benefits. In a hybrid plan, the value is the actual account balance.

Workers whose account value is greater than \$5,000 must be offered the option of an annuity; in fact, the standard form of benefit for a married employee must be a joint-and-survivor annuity. Only if both the employee and spouse waive the right to a joint-and-survivor annuity can the benefit be paid out in another way, such as a lump sum.

While hybrid plans are designed to allow workers to know the value of their retirement benefits at any time, and to have easy access to the lump-sum value of those benefits should they leave their employer, receipt of retirement benefits prior to retirement age can have adverse tax consequences. Such distributions are considered taxable income in the year they are received. The distribution may also be subject to a 10-percent Federal tax penalty for early receipt of retirement benefits, depending upon the employee's age. To avoid such taxes, the employee terminating employment and moving on to another job can roll over the lump-sum benefit into an Individual Retirement Account (IRA) or a retirement plan sponsored by a future employer.

### **Pension equity plan advantages**

The ability of employees to know the current value of their plans at any time is one of the advantages of pension equity plans. Another perceived advantage is that there is no reduction in benefits due to early retirement. This means that if a worker terminates his or her employment before normal retirement age, but has fulfilled the vesting requirements, the benefit will reflect the length of time worked. In contrast, a traditional defined benefit pension plan specifies periodic pension distributions as the amount available at normal retirement age. Employees receiving benefits before that age typically receive lower benefits to account for receiving benefits over a longer expected lifetime. While this early retirement "reduction" is considered a penalty by some, it is in fact merely an adjustment based on life expectancy. (Some employers subsidize that adjustment by making the reduction less than a true actuarial reduction.) No such adjustment occurs in a pension equity plan. Because benefit accruals typically rise with age, however, the pension equity plan formula already has adjustment for age built into the accrual formula.

While pension equity plans and cash balance plans share methods of accumulating value, a major difference is the earnings used to determine the benefit. Cash balance plans specify a credit each year, based on that year's earnings. By contrast, in a pension equity plan, the credits are applied to final earnings. This feature provides built-in inflation protection. Regardless of whether an employee has just a few years of service required for vesting or has worked under the plan an entire career, benefits are based on earnings at the end of the employee's career.

Through its annual benefits survey, Bureau of Labor Statistics US (BLS) has tracked the change in retirement plans over time, from traditional defined benefit to defined contribution to hybrid plans. BLS will continue to monitor and report on the incidence of pension equity plans.

## 02. Cash Balance Plan

[Extract from Elliot K. R. & Moore J. H. Jr (2000) Cash Balance Pension Plans: The New Wave Compensation and Working Conditions Summer 2000 pp. 3 – 11]

A cash balance plan, a type of defined benefit pension plan, promises an employee an employer contribution equal to a percent of each year's earnings and a rate of return on that contribution. The benefit is always expressed as a total account balance.

### **Cash balance versus defined benefit**

A traditional DB plan, typically promises an employee a flat amount based on years of service or an annuity - a periodic benefit usually based on years of service and an employee's earnings in the years closest to retirement. Cash balance plans build value steadily and often at the same pace for all employees—whether they've worked for the employer for 1 or 30 years. The focus of these plans is on wealth building and "portability." On the other hand, traditional DB plans are designed to encourage career employment with one employer. Instead of focusing on wealth, they focus on providing retirement security; the design of these plans does not reward employees who choose to change jobs. Cash balance plans provide more uniform benefit accrual throughout the employee's career. Conversely, under a traditional DB plan, the value of a dollar of promised future retirement income is directly related to the discounting period. In addition, most DB plans are based on a multiple of an employee's years of service and final pay with the employer. Thus, an increase in compensation in one year increases the value not only of that particular year's benefit accrual, but also of the benefit accruals for all prior years. It is important to note that, for cash balance plans, there is not actually a cash account in existence for each participant. Hypothetical retirement accounts define an employee's accrued benefit at any point in time. The account is merely a record-keeping feature. Cash balance plans are funded on an actuarial basis, in the same manner that traditional DB plans are funded. The amount the employer contributes to the plan each year is based on actuarial assumptions. In addition, employers can invest the cash balance plan funds just like they can invest other DB plan funds. Participants' retirement accounts grow by earning annual credits that typically are based on a flat percentage of pay and may or may not be integrated with Social Security benefits.

In addition, accounts earn an interest credit each year that is tied to some external index, such as the Consumer Price Index or the rate on Treasury bills. For example: employer XYZ provides a cash balance plan that credits all employees' accounts with 6% of their annual salary. In addition, these accounts are credited with 5% interest, which is paid by the employer on an annual basis. This method of benefit accrual allows cash balance benefits to grow more evenly over an employee's career than would occur under a final average pay plan in which the majority of benefit accrual takes place in the final few years prior to retirement. In other words, benefits for cash balance plans are determined by an employee's pay averaged over his or her total years of service. Benefit accrual formulas based on an employee's career average earnings tend to be more beneficial to employees just beginning their careers than to employees who are close to retirement and have worked most of their career under a more traditional DB plan.

### **Cash balance versus defined contribution**

Although cash balance plans may appear similar to DC plans, there are numerous differences between them; some are critical from a policy perspective. First, in cash balance plans, the investment decisions and the investment risks associated with those decisions generally are the responsibility of the employer, not the employee. Even though the benefits are expressed in the form of individual accounts, assets are managed in the aggregate by the plan trustee. Second, cash balance plans, unlike DC plans, are covered by an insurance program, meaning participants' benefits are protected even if the plan or the company runs into financial difficulty. Finally, cash balance plans must offer employees the ability, within the plan, to convert their account balances to lifetime annuities at no additional cost.

### Are cash balance plans gaining in popularity?

As mentioned, traditional defined benefit pension plans typically base the accrued benefit on a multiple of an employee's salary level and years of service. These plans are back-loaded meaning much of the value of the benefit is earned in the final years just prior to retirement—and, as such, are ideal for employees who spend their entire career with a single employer. The assumption that employees experience their highest earnings toward the end of their careers implies that the pension benefit due to them would accrue much faster at a later stage of their employment. If workers leave the firm before qualifying for retirement, they suffer a pension “capital loss” by giving up the opportunity for a substantial graduated increase in pension benefits. Thus, the benefit in remaining with the same employer for a number of years is established. Plans based on final earnings can produce little benefits for employees who switch jobs several times during their careers. The back-loading of traditional defined benefit plans makes it costly for employees to leave, thereby reducing the likelihood of mobility. On the other hand, cash balance plans may be more responsive to a mobile workforce and may be more attractive to employees prone to change jobs throughout their careers. For mobile workers, cash balance plans may provide meaningful benefits sooner and more evenly over a career, so that shorter job tenure need not mean reduced retirement benefits. The design of cash balance plans responds to workers who want to transfer accumulated pension benefits when changing jobs. This portability provision affords workers who switch jobs the opportunity to leave their assets in the plan (where they will continue to receive interest credits), elect an annuity, or roll over their account balance to their next employer's retirement plan. Although cash balance pensions have been in existence for a number of years, they have recently begun to receive much attention as new plans are surfacing and, in some cases, replacing traditional defined benefit plans.

Data from the US (BLS Employee Benefits Survey) indicates that participation in cash balance pension plans among employees in medium and large private establishments doubled between 1995 and 1997, from 3 to 6 percent of all defined benefit plan participants. These data are supported by the fact that, overall, cash balance plans have increased from 5 percent to 12 percent in just the last 2 years, according to a survey conducted by Hewitt Associates. Furthermore, in 1998, 16 percent of Fortune 100 companies offered their employees a cash balance plan. (See Figure 1).

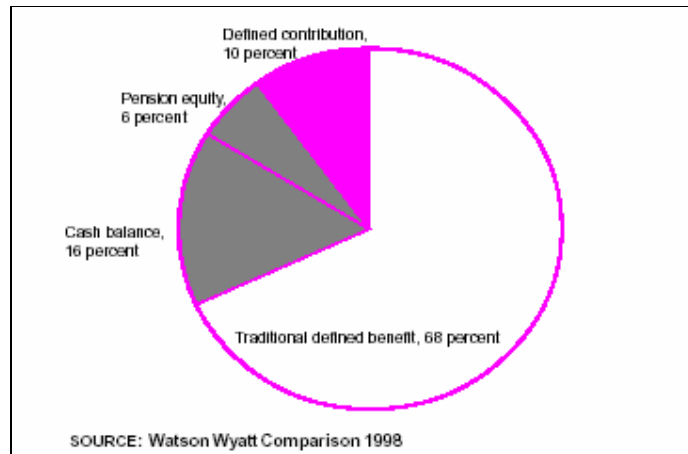


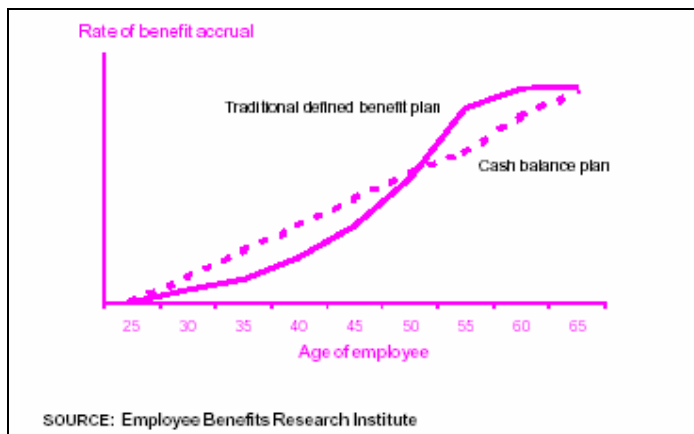
Figure 1: Percent distribution of pension plans among Fortune 100 companies in 1998

Traditional defined benefit plan formulas are often complex and are not expressed in the form of an account balance. Cash balance plans with their account balance and understandable benefit accrual seem to provide benefits that are easier for employees to comprehend. Employers are under the impression that very few employees understand, or even appreciate, traditional defined benefit plans because of the difficulty in determining the benefit to which they are entitled: "...[It] is perceived that some employees have little understanding of or appreciation for traditional pension plans....Plan participants tend to appreciate cash balance plans because they can actually see their pension 'benefit' accruing throughout their years of service with an employer, and because they can take that accrued benefit with them when they leave, even if that is years in advance of retirement age." (Source Carol Quick "An Overview of Cash Balance Plans," EBRI Notes (Employee Benefits Research Institute, July 1999), p. 4). Cash balance plans may be more attractive to younger workers

(workers more likely to change employers) because, once vested, they are guaranteed an unreduced benefit if they change employers.

**Why do cash balance plans appeal to employers?**

Employers find that the cash balance plan provides additional funding flexibility, thereby easing the burden of budgeting for future pension plan costs. The cash balance plan does not define the employer’s contributions, but instead defines the future pension benefits that will accrue in each individual account. The employer’s contributions are based on actuarial valuations, as is the case with traditional defined benefit plans. These actuarial valuations describe an amount that must be present in the plan to fund all employees’ pension benefits. The employer contributions to the plan in any given year may be more or less than the sum of the additions to all participants’ accounts. The employer or plan sponsor, or both, determine how the assets from the plan will be invested and assume all risks. Investment gains and losses affect the employer’s future contributions. If the fund earns a rate of return equal to or greater than the rate of return promised to employees, the plan can become fully funded without additional employer contributions. There are other reasons why cash balance plans may appeal to employers. As with traditional defined benefit plans, employers still bear the risk and receive the reward from plan investment strategy. But cash balance plans may not subject employers to the same degree of risk of pre-retirement inflation that can occur with terminal earnings formulas. Benefits are expressed in terms of a lump-sum payment, and at any point in time the employer knows the value of an individual’s account. Large wage increases just prior to retirement must be funded, but they do not have the same influence on employees’ final benefits that they would in traditional defined benefit plans.



**Figure 2: An example of how hypothetical traditional defined benefit and cash benefit pension plans build value of an employee’s career plan**

**Table 08: Comparison of features of Pension Equity Plans and Cash Balance Plans**

Comparison of features of Pension Equity Plans and Cash Balance Plans		
<i>Feature</i>	<i>Pension Equity Plan</i>	<i>Cash Balance Plan</i>
Benefit formula	Percent of earnings, may vary by age, service, or earnings	Percent of earnings, may vary by age, service, or earnings
How benefits are accumulated	Percent of earnings, as determined by the benefit formula, are accumulated each year, but the final benefit is not determined until employee leaves the plan	Money amount (benefit formula times earnings) placed in hypothetical account each year; interest on account balance also credited each year
Definition of earnings	Total accumulated benefit applied to final earnings, as defined by the plan; final earnings typically those in last 3-5 years before retirement	Percent applied to each year's earnings
How to determine value of benefits for current employees	Employees can multiply their accumulated percent of earnings times their final earnings as defined by the plan to determine their current benefit	Account balance is the current benefit
Distribution	Specified as a lump sum, but can be converted to an annuity	Specified as a lump sum, but can be converted to an annuity

### 03. Target Benefit Schemes

[Extract from Swati D. (2003) Hybrid Pension Schemes. Dissertation submitted to the Department of Actuarial Science And Statistics, City University, London]

Target benefit schemes are essentially DC schemes with a prescribed target benefit. This will be based on a DB formula, e.g. 1/60ths of final salary multiplied by the number of years of service. The contribution necessary to fund this target on a level basis up to normal retirement age is actuarially determined, as would be the case with a DB scheme. The contribution determined will differ for employees entering the scheme at different ages. Older employees joining the scheme will require higher contributions than younger employees in the same position. This is because there is less time for the contributions paid into the account to accumulate and reach the target benefit. They will consequently accrue benefits more quickly. Individual accounts exist, which the employer will annually credit with the predetermined contribution. Employees normally have control over investment decisions, which is typical of DC schemes. It is important to note that even though the employer is aiming for a target benefit, with contributions calculated accordingly, this benefit is not guaranteed. The ultimate benefit received will depend on the money accumulated in the account at the point of retirement. It may be greater or less than the target level. Target benefit schemes have a similar incentive structure to DB schemes but this similarity does not extend to the benefits provided, which are variable. From an employer's perspective this type of scheme is advantageous because it provides a DB-like incentive structure without the administrative and compliance burden of a DB scheme. Additionally, the costs of the scheme are more stable as the employer contribution is fixed. Since older members benefit from higher contributions than younger members, the scheme aids in the attraction and retention of mid-career, highly compensated employees. The disadvantage of

using target benefit schemes is that the employer provides no investment guarantees whatsoever therefore the retirement benefits payable can vary considerably depending on market performance.

#### **04. DC Schemes with Rate of Return Guarantees**

[Extract from Swati D. (2003) Hybrid Pension Schemes. Dissertation submitted to the Department of Actuarial Science And Statistics, City University, London]

Defined contribution schemes are becoming increasingly popular, not just in the UK but around the world. However, a primary feature of traditional DC schemes is that the employee bears the financial market risk of scheme investments and this concerns some employers. It is possible to reduce this risk in a few different ways:

- Implementing a low risk investment strategy by holding a suitably diversified portfolio or alternatively by investing in guaranteed products, which would reduce capital market exposure;
- Government monitoring and regulation of pension funds and financial markets;
- Introduction of rate of return guarantees. As a result an employee's account is credited with a less volatile rate of return compared to the actual rate earned on their assets. Consequently the employer has to share in bearing the financial market risk with the employee. Hence such a scheme is less risky to employees, for a given portfolio mix, than a traditional DC scheme. Individual accounts are usually not invested separately but rather as a single fund. Members do not tend to have any investment choice but will benefit from inter-generational smoothing of returns and secure accrued benefits. In order to smooth returns, free reserves need to be established.

In a paper presented by Turner J. A. titled "Rate-of-return guarantees for defined contribution plans" (2001) puts forth a conceptual basis for assessing rate of return guarantees. The variety of possible features of these guarantees is discussed. However, it is important to note that the analysis provides a general overview regardless of any country-specific rules and regulations, which might restrict the rate of return guarantees an employer could actually impose in practice. Various schemes around the world are considered for examples of these guarantees. In addition to voluntary DC 9 schemes, mandatory DC schemes have also been observed as they can provide some useful insight. Using the framework proposed by Turner (2001), it is possible to segregate the various aspects of rate of return guarantees into four areas:

- The measurement of the rate of return to be guaranteed.
- The process determining the guarantee.
- The insurance provided by the guarantee;
- The financial backing for the guarantee.

#### **Measurement of the Guaranteed Rate of Return**

It is possible to measure the rate of return to be guaranteed in a variety of ways:

##### *Real or Nominal*

The guaranteed rate of return can be real or a fixed nominal rate of return. It is also possible to have a hybrid, which will lie somewhere in between the two extremes. This hybrid type of guarantee is implicitly provided when a cost of living adjustment is established at the inflation rate minus a fixed percentage.

##### *Fixed or Indexed*

The guaranteed rate of return can be fixed (either real or nominal) or indexed whereby it varies according to a capital market index. The index can be based on many different things e.g. on the rate of return achieved by a particular asset or portfolio of assets, on the return obtained by a certain group of investors (such as all pension fund managers) or on the actuarial rate of return assumed for an associated DB scheme.

#### *The Averaging Period for the Guaranteed Rate of Return*

The time frame for the rate of return can be fixed e.g. the rate of return over a month, a calendar year or each consecutive 12 month period. Alternatively, it is possible to compound annual rates of return over a lengthier period to determine a cumulative rate of return. Typically, guarantee periods are annual periods (Turner, 2001). The use of longer periods will result in lower costs as the average returns determined over these periods are less likely to drop below the level guaranteed.

#### *Explicit or Implicit Rates of Return*

The rate of return guarantee might be in the form of an explicitly stated rate of return. However, instead the scheme might guarantee a minimum level of assets in an individual employee's account thus implicitly guaranteeing a minimum rate of return.

#### *The Actual Rate of Return Received on the Portfolio or a Benchmark Rate of Return*

The actual rate of return received on the scheme's portfolio of assets might be used to determine the guaranteed rate of return. The other option is to use a benchmark rate of return. This has the advantage of solving the moral hazard problem that would arise in the selection of investment portfolios by employees, employers or pension fund managers. For example, if an employer or pension fund company were providing a guarantee based on actual portfolio returns, but the employees could choose their investment portfolio, they would have every reason to invest in a very risky portfolio. However, if the guarantee is based on a benchmark it does not matter how the employee's portfolio performs but rather how the benchmark performs. Employees will not have the incentive to invest in a very risky portfolio as they may experience low returns but if the benchmark returns are not low they will not be protected. Another benefit of using a benchmark return is that a greater variety of portfolios could be chosen.

#### *Gross or Net Rates of Return*

The rate of return guaranteed can be calculated gross or net of expenses. A comparable measurement issue is whether the rate of return should be determined using the market value of assets or an alternative valuation.

### **The Process Determining the Guarantee**

The guarantee offered may be dependent upon a fixed rule or subject to the discretion of the guarantor. In addition the guarantee may be formal or informal with the latter case being a result of expectations of political realities.

### **The Insurance Provided by the Guarantee**

#### *The Risk Sharing in the Guarantee*

It is possible for the guarantee to be a minimum guarantee whereby employees have the potential to earn a higher rate of return. The alternative is a point guarantee (either nominal or real). In this case, the provider of the guarantee (e.g. the employer) will be entitled to the entire part of the rate of return that exceeds the guarantee level. This is like a cash balance scheme. The rate of return received by the employee is not related to the return earned on the underlying investments. With respect to a minimum guarantee, the employee may be permitted to receive the entire rate of return above the guarantee level. However, the guarantor may be able to claim part of it. This situation arises if there is a maximum limit in place (in addition to the minimum). As a result the employee is entitled to the entire return if it is above the minimum but below the maximum, but will only receive part or none of the return above the maximum.

#### *The Application Frequency of the Guarantee*

The point in time at which the guarantee is exercised is established by the guarantee period. It may be a fixed periodic interval, e.g. a quarter or a year, making it a series of successive guarantees. Alternatively, it may be a cumulative guarantee. If this is the case, the guarantee period extends from the start of participation until its end. Therefore the guarantee is dependent on the termination value of the account. It is important not to confuse the application frequency of the guarantee with the aforementioned averaging period of the rate of return.

#### *The Extent of Liability of the Guarantor*

The guarantor may face either a limited or unlimited liability. In the former case, the guarantee is such that a cap is placed on the guarantor's expenditure. Some analogy can be drawn to the caps in health insurance policies.

#### *The Risk That the Guarantor Will Fail to Meet the Guarantee*

On one hand the guarantee may have close to 100 per cent certainty of being met. On the other hand, there may be some residual uncertainty concerning whether the guaranteed rate of return will be totally met. In practice there is always some element of risk associated with the guarantee as it is possible for some form of financial catastrophe to occur impacting on the guarantee.

#### *The Risk That the Guarantee Will be Prospectively Changed*

The guarantee could be regarded as a lasting promise into the future or as a promise that will likely be amended in the future, e.g. the guarantee may have a specific period over which it applies (perhaps a year) and at the end of this period it could be reset. Even in the former case there is some risk that the guarantee will be altered prospectively in the future. A guarantee is more likely to be revised if it is high and the capital backing it is low. The risk that the guarantee will be changed is also higher if fixed nominal guarantees are in place rather than real guarantees or guarantees set relative to an index. This is because the latter are inherently more flexible.

#### *The Type of Insurance Provided*

The guarantee may be relatively high compared to the expected return. This results in rate of return smoothing over time. The other extreme is that the guarantee may only provide catastrophic protection against a particularly low rate of return and thus rarely influence the return credited to an employee's account. It is possible to consider guarantees by the expected value of the percentage years that will see the guarantee being exercised e.g. guarantees may be classed as 20 per cent, 50 per cent or 80 per cent, referring to the percentage of years the guarantee will be in effect.

#### *An Individual Participant Based Guarantee or a Scheme Based Guarantee*

If the guarantee is a fixed periodic guarantee and a group of workers all belong to the same DC scheme, it is possible to implement the guarantee on a scheme basis. However, in the event that each employee holds a different investment portfolio, it is evident that the guarantee must now be offered on an individual basis. Calculations on an individual basis also need to be made for cumulative guarantees. An exception is when all members of a scheme have the same start date and the guarantee is settled annually. In this situation a scheme-wide guarantee is applicable.

#### *The Degree of Choice the Employee has associated with the Guarantee*

It is possible for the guarantee to be mandatory or voluntary. It is possible to vary the mandatory or voluntary features for employees and employers. Therefore, the guarantee could be voluntary for employers but once they offer it, it would be compulsory for their employees. On the other hand, it could be mandatory for employers to provide a DC scheme with a guarantee as an option, but employees would have a choice to elect the option. Whatever the case, the employee could be offered a variety of different guarantees with different combinations of expected return and level of guaranteed rate of return.

### **The Financial Backing for the Guarantee**

#### *Funded or Pay-As-You-Go*

One option is to have the guarantee fully or at least partly funded in advance. The other option is to go for a pay-as-you-go approach.

#### *The Party Financing the Guarantee*

A number of different parties could be financing the guarantee. They include the employee, the employer, the pension fund management firm or the government. As an example the guarantee offered by the mandatory DC scheme in Chile is partially financed by three parties: the employee, the pension fund management company and the government. The employee is involved in the financing as during some periods a portion of the rate of return earned on his/her account is set aside for this purpose. The pension fund management company must allocate some of its own money to fund the guarantee. Finally, the government acts as the insurer of last resort and therefore might become involved in financing the guarantee.

#### *The Party Backing the Guarantee*

The party backing the guarantee may be the employer, pension fund provider, an insurance company or the government. It is important to note that there may be a party financing the guarantee in some cases but not necessarily in all cases.

*Purchase of a Guaranteed Product or Purchase of a Guarantee*

It is possible for the guarantee to be acquired via the purchase of a guaranteed product, for example from an insurance company. Alternatively, the guarantee could be offered on a portfolio that would not normally be guaranteed. In the US, DC schemes have a number of different ways to provide a guaranteed rate of return to members. Firstly, Guaranteed Income Contracts (GICs) or fixed annuity contracts purchased from insurance companies by participants or employers, provide a guaranteed nominal rate of return. Another option is to invest in zero coupon government bonds, which if held to maturity provide a guaranteed nominal rate of return. It is also possible to get a guaranteed real rate of return if zero coupon inflation indexed bonds are purchased instead. Thirdly, participants can benefit from a guaranteed rate of return by purchasing a put option, which gives them the right to sell their assets at a fixed minimum price thus setting a floor on the value of the portfolio they hold.

**Table 09: Summary of various different voluntary DC scheme guarantees around the world**

Voluntary DC Scheme Guarantees surveyed by country		
<i>Country</i>	<i>Plan Design</i>	<i>Features</i>
Brazil	Open pension funds	Required real rate of return 6% p.a.; portion of excess return paid into workers' account based on tenure; unavailable on new accounts
Denmark	Occupational schemes	Insurance contracts provide guaranteed rate with maximum set by government and further restricted by EU; participant may receive excess yields above allocation to reserve funds; maximum guaranteed rate declining with fall in market interest rates
Germany	Supplementary scheme	New system (2001) must guarantee nominal value of total principal contributed by retirement service with a favourable tax treatment
	Existing occupational schemes	Guaranteed minimum rate of return available in some schemes
Japan	New supplementary Schemes	New system (2001) mandates have three investment options, including guarantee of total principal contributed
New Zealand	National Provident Fund	Primarily for employees of local governments, now closed to new entrants; fund credits member accounts with nominal return equal to 4% p.a. financed through conservative asset allocation and use of reserve fund; government backs shortfall
Sweden	Supplementary schemes	Specific to blue-collar workers as negotiated by their trade union and employers; minimum guarantee is one option with the return set historically in a range of 3-4% by the Financial Supervisory Board
United Kingdom	Investment option for DC schemes	Investment banks and mutual funds (unit trusts) may offer funds that purchase put options to guarantee a certain return
United States	United Methodist Church	Base interest credit set annually by oversight board and backed by reserve fund financed by portion of returns in better-than-average years.
	YMCA	Guarantee set annually by board of trustees for following year and backed by reserve fund; if fund reserves warrant, trustees may declare extra interest credits to active participants and even retirees
	Ohio STRS	Primarily for employees of local governments, now closed to new entrants; fund credits member accounts with nominal return equal to 4% p.a. financed through conservative asset allocation and use of reserve fund; government backs shortfall
	TIAA Traditional Annuity	Primarily for college and university professors. Guarantees principal and specified interest rate, while offering opportunity for greater growth through dividends

Voluntary DC Scheme Guarantees surveyed by country

It is quite common for the guarantees associated with voluntary DC schemes to be fixed nominal rates of return over a calendar year (Turner and Rajnes). In some countries, insurance companies offer the guarantees. Alternatively, the guarantee could be backed by a reserve fund or an associated DB scheme. It has been necessary to alter the fixed nominal rate guarantee in some cases due to the falling rates of return experienced by the capital markets. Another problem is that in some instances the reserve funds have emerged to be insufficient thus resulting in unfunded liabilities for the guarantor.

### **Methods for Determining a Fixed Rate of Return Guarantee**

There are a number of different methods available for calculating a rate of return guarantee. They include:

- Smoothed earning rates – time-weighted.
- Smoothed earning rates – money-weighted.
- Smoothing capital gains only.
- Crediting real interests.

Once a crediting rate has been calculated using one of the methods, a number of factors need to be considered prior to recommending the crediting rate that will actually be used. These include:

- Legislation and trust deed.
- What was done the previous year (however, the reasons why such a policy should be followed may no longer be valid and the environment may also have altered).
- Trustees' current policy.
- The current and prospective investment mix. Also, prospective liquidity requirements of the scheme (imminent large benefit payouts should be considered under this).
- The scheme's current and prospective financial strength including its future prospects i.e. is it expected to grow, shrink, merge with another scheme or wind up. Possible large benefit payments or transfers in the short term should also be considered.
- The economic, political and investment environment, both current and prospective, should be borne in mind (national and global).
- Trustee and member expectations – these might be based on interest rates presently offered on secure personal investments, the previous year's crediting rates and the crediting rates set by alternative schemes.

### **Advantages of DC Schemes with Rate of Return Guarantees**

- Employees are less exposed to financial market risk. Hence a guaranteed DC scheme may seem attractive to paternalistic employers.
- These schemes may also appeal to employers who have previously found it difficult to cover low-wage employees. This is because low-wage employees tend to be more risk-averse than high-wage employees.
- These employees are therefore likely to have accumulated inadequate benefits at retirement under traditional schemes due to low contributions (which arise from their low salary) and conservative asset allocations in the years preceding retirement. Since they are risk averse they will view the guarantee favourably.
- Some DC schemes with rate of return guarantees do not permit employees to have any investment choice. This would be attractive to employees who do not wish to manage the investment of their retirement assets.

### **Disadvantages of DC Schemes with Rate of Return Guarantees**

- Unlike a traditional DC scheme, contributions can vary over time;
- Employers have to bear some of the financial market risks (whereas with a traditional DC scheme no risk is borne at all) and this might especially be unattractive to small employers;
- In some cases the employer may have to manage the scheme assets and they may consider this to be undesirable.

It is important to note that incorporating a rate of return guarantee into a DC scheme is not intended to replace other risk reduction strategies, e.g. moving to a low-risk portfolio on approaching retirement. It is meant to supplement these initiatives thus providing an additional level of flexibility for the pension system to meet the needs of both the employee and the employer.

## **05. Floor Offset Schemes**

[Extract from Swati D. (2003) Hybrid Pension Schemes. Dissertation submitted to the Department of Actuarial Science And Statistics, City University, London]

They may also be known as floor schemes or as underpin schemes. Such a scheme involves simultaneously running a DB and a DC scheme alongside each other. On retirement, the greater benefit of the two is paid to the employee. The scheme may be designed such that a relatively low defined benefit is stated in the scheme rules, which will likely be surpassed ('offset') by the DC scheme. Alternatively, the defined benefit may be generous and subsequently will only be offset in the event that high investment returns are earned. Typically the DB formula used is 1/80ths final salary i.e. for every year of service with the employer, the employee earns 1/80ths of their final salary as their retirement benefit (40 years of service will thus entitle the employee to a pension of half their final salary). This type of scheme will be attractive to employees as it provides the best features of DB and DC schemes. From an employer's perspective, this hybrid might cut costs if a 1/60ths final salary scheme is being replaced by a floor offset scheme with a DB underpin based on a 1/80ths formula. According to the Guardian this is because the DC scheme is unlikely to pay more than the DB underpin, which in turn is less generous than the 1/60ths formula previously used (which would pay an employee with 40 years of service two thirds of their final salary). However, an issue arises with respect to investment choice. If substantial DB benefits are being guaranteed by the employer but the employee is in control of investment choice, they will be inclined to opt for risky assets as they could earn high returns but are protected from low returns by the underpin. Since it is the employer bearing the investment risk it is not unreasonable that they should have some degree of investment control.

## **06. Conversion Schemes**

[Extract from Swati D. (2003) Hybrid Pension Schemes. Dissertation submitted to the Department of Actuarial Science And Statistics, City University, London]

Conversion schemes comprise of a DC scheme until the employee reaches a specific age. Subsequently, the benefits accumulated in the individual's 'pension pot' are transferred into a final salary DB scheme. Therefore new employees being hired could go into either scheme depending on their age. It also means that an employee of the firm could start off being a member of a DC scheme and finish off as a member of the DB scheme. Employees might be given the option to continue with the DC scheme at the conversion date. However, if they decide to transfer to the final salary scheme, rules need to be set governing how the benefits accumulated under the DC scheme will be credited to the final salary DB scheme. For example, Dun & Bradstreet Corporation allow transfer of credits at a two-thirds ratio, which means that 10 years of experience in the DC scheme will count as 6.67 years of service on joining the final salary scheme.