

ENTITY-WIDE RISK MANAGEMENT FOR PENSION FUNDS

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ABSTRACT

This paper explores the application of ERM-style techniques to pension funds. It uses the term 'entity-wide risk management' rather than 'enterprise risk management', even though both have the same acronym ('ERM'), because many pension funds do not view themselves as business 'enterprises' as such. Some of the techniques that business enterprises have for managing risk (e.g. raising new capital from shareholders or branching into new business areas if existing ones have unattractive risk-reward characteristics) may not be open to many pension funds. The paper argues that the holistic approach to risk management (and governance) that is a hallmark of ERM is as appropriate to pension funds as it is to any other type of entity. This is the case whether the fund is defined benefit or defined contribution in nature, or a hybrid. It is also the case whether the 'entity' is deemed to be the fund itself, the sponsor or the two combined. Indeed, there are aspects of pension arrangements, such as the relationship between the fund and its sponsor, that lend added impetus to the use of ERM-style techniques in practical pension fund management.

KEYWORDS

Enterprise risk management, entity-wide risk management, pension fund, pension scheme, defined benefit, defined contribution, pension risk, sponsor covenant, Solvency II, own risk and solvency assessment, Walker review

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1. Introduction

Rationale for paper

- 1.1 Pension funds across many jurisdictions are experiencing unprecedented change. Populations in the developed world are ageing, longevity is improving and social norms that have underpinned defined benefit pension structures are unravelling. In many developed countries a shift from defined benefit ('DB') towards defined contribution ('DC') is underway. DB schemes are often now closed to new entrants or even to new benefit accrual (and in some cases are being closed down altogether). Effective change management requires effective governance.

At the same time, a wide range of commentators are pushing for improved risk management within the corporate and financial world. Inadequate risk management arrangements within some financial services companies have been viewed by some as contributing to recent economic woes. In the UK, the recent Walker Review of corporate governance arrangements of financial organisations, see HM Treasury (2009) and Section 8.3, recommended that Boards should appoint Chief Risk Officers and set up Risk Functions, if they had not already done so. This recommendation is being implemented, for financial firms, by the UK's Financial Services Authority. Outside the financial services industry, events such as the Deepwater Horizon oil well spillage in the Gulf of Mexico have highlighted the magnitude of the risks, both financial and reputational, that firms can be exposed to in their day-to-day business activities.

A particularly important risk management trend in this context is the growing focus on 'enterprise risk management'. This type of risk management is characterised by a focus on managing risks *holistically*, i.e. in tandem. The alternative is to manage the risks in individual silos. This alternative is still common at present if only because:

- this may be how the organisation's structure has evolved historically;
- there may be a lack of understanding at Board level of the benefits of ERM; or
- there may be limitations arising from organisational structure or availability of individuals with expertise that spans the different risk sub-disciplines.

Even if an organisation's risks from its core business are managed on an enterprise wide basis, it is quite possible that the risks from its pension obligations may still be managed on a silo basis (see Section 7).

- 1.2 Given this background, and the increasing impact of pensions on the business strategies of firms, it is natural to expect many risk management techniques used or available for use in the wider business and financial arena to be applicable to pension funds. This includes techniques associated with 'enterprise risk management'.
- 1.3 However, some refinements to traditional ERM techniques are usually relevant when pension arrangements are present. Pension funds are not normally thought of as 'enterprises' as such, at least not the sorts of enterprises most naturally associated with business corporations. Instead they are generally set up as vehicles with a *specific purpose* in mind, namely to provide retirement benefits to specific individuals. These individuals are often employees of a particular sponsoring employer or group of employers. Some of the most important 'tools' open to business enterprises to manage or mitigate risk (for example, stopping actively marketing a particular business line if it is viewed as 'too' risky¹, seeking new capital from external parties² etc.) may not be available to pension funds. Even if they

¹ In some jurisdictions an active pension risk transfer market is developing, making it more practical to hedge particular pension risk elements, e.g. longevity risk. It is also usually practical to buy out accrued liabilities, wholly or partially, with an insurance company (or with a specialist provider of pension risk transfer products). Pension schemes and/or their sponsors may be able to offer beneficiaries the opportunity to cancel their existing entitlements in return for something else, e.g. an enhanced transfer value to another pension arrangement. However, these strategies are usually quite costly, especially if the scheme's finances are already strained. Of course, exiting a business line may not be costless as far as a conventional business organisation is concerned. For example, there may be redundancy costs and equipment write-offs if the relevant resources cannot be profitably deployed elsewhere. At issue is that pension promises are typically much longer term than other financial commitments a corporation may enter into. The costs involved in transferring them to a third party may also be larger, if insufficient funds have been set aside to cover this eventuality.

² A corporation with a sound business model is likely to be able to borrow money on the strength of future profits it might expect to generate from its business activities. In contrast, a pension fund's borrowing powers

are possible, they may not be easy to implement or they may be very costly to do once the pension fund has been established for some time.

A holistic approach to risk management for pension funds also ideally needs to take account of the interaction between the fund and its sponsor (if it has one). This introduces additional dynamics and complexities not otherwise directly relevant to most business enterprises³.

- 1.4 The aim of this paper is to meld together both of these angles. Our goal is to show the applicability of ERM-style techniques to pension funds (both defined benefit and defined contribution) but also to highlight how standard ways in which ERM techniques are applied to business enterprises often need modification for pension funds. To this end, we have sought to use terminology and language that we hope is pension fund friendly. For example, we prefer the term 'entity-wide' risk management to 'enterprise' risk management. The former is generally applicable whatever the type of entity in question. The latter implicitly brings to mind a focus on business enterprises and management of for-profit business activities. Its use may therefore unwittingly encourage an inappropriate silo approach to pension fund risk from the perspective of the sponsor.

Main conclusions

- 1.5 Effective ERM is valuable to virtually any type of pension fund and to any type of sponsor. From the scheme's (and scheme beneficiaries') perspective, just because the scheme is well funded now and/or has the strong support of a well capitalised sponsor does not mean that this will remain true throughout its life. From the sponsor's perspective, the support it might need to offer in adverse circumstances to schemes it currently sponsors may, when needed, prove more onerous than expected.

We do not wish to claim particular novelty for the ERM techniques and disciplines described below. They correspond in broad terms with current best practice in this area as articulated in, say:

- Deighton *et al.* (2009), Hitchcox *et al.* (2009) or IAA (2009) which are primarily insurance orientated;
- Orros and Smith (2010) which provides a health insurance perspective;
- Lam (2003) which focuses on ERM in a financial services context; or
- Chapman (2006) which considers the more general corporate and government environment.

Material more specifically focused on application of ERM-style techniques to pension funds includes Hatchett *et al.* (2010) for UK defined benefit pension schemes and Byrne *et al.* (2009) for Irish pension schemes. The OECD and the International Organisation of Pension Supervisors (IOPS) have also jointly published good practice guidelines (2011) outlining the main features of risk management systems pension funds employ. They provide guidance for pension fund regulators on how to check that such systems are in place and operating effectively.

are generally very limited. It will often have little if any ability to borrow significant sums of money directly from third parties (without offering collateral in return) unless it is already well funded or has ready access to financial resources from its sponsor.

³ We shall see in Section 5 that some corporations, particularly some financial corporations, may have established other types of special purpose vehicles ('SPVs'). Depending on their legal structure, these SPVs may exhibit analogous complexities.

1.6 Where this paper might claim greater novelty is in codifying and articulating how traditional ERM-style techniques are best adapted and translated for use within the pension fund arena and in how these adaptations vary depending on the type of pension entity in question. We argue that:

- (a) A holistic approach to risk management, as epitomised by ERM, is highly relevant to pension schemes.
- (b) Different pension schemes are exposed to different mixtures of risk. Some of the risks may be more amenable than others to being managed by those legally responsible for the scheme (or, in some cases, by the pension scheme sponsor).
- (c) Investment risk can often be perceived as a dominant risk contributor. However, for many pension schemes, longevity risk and risks relating to the implicit or explicit support that the sponsor might offer in times of trouble may also be very important.
- (d) It can be easy to fall into the trap of misstating the importance attached to operational risk. Operational risk has characteristics that differentiate it from most other types of risk to which a pension fund might be exposed. It is typically 'asymmetric' in the sense that losses due to operational risk exposures generally fall to the fund itself while corresponding gains generally accrue to others. These direct losses may then indirectly damage the reputation of staff and others responsible for the governance of the scheme. They may also place a financial burden on the sponsor, if it is responsible for financing the fund.
- (e) When a pension scheme and its sponsor are viewed in tandem then additional elements come into play. These include risks relating to how pension costs might best be accounted for in the sponsor's own business statements (and how this might change in the future). They also include issues raised by the inter-play between management of the 'sponsor covenant'⁴ by trustees⁵ and the impact that this can have on the sponsor's wider business interests. Some pension schemes are so large in relation to their sponsors that an understanding of the risks embedded within the scheme is essential to a proper appreciation of the dynamics of the business as a whole.
- (f) The optimum relative ERM effort applied by the sponsor in respect of its pension fund risk may be expected to depend on the size and aggregate risk characteristics of the scheme relative to other risks inherent in the sponsor's (business) activities. However, the sponsor's perspective should not be the sole or even usually the main determinant of the scheme's own perspective on such matters. The sponsor is not normally the main beneficiary for whom the scheme was established. Getting the

⁴ See Sections 2.2(a), 3.2(b) and elsewhere throughout this paper for a definition of and further discussion on 'sponsor covenant'.

⁵ In the UK and in some other jurisdictions pension schemes are often set up as 'trusts' and the individuals or bodies legally responsible for their management are then called 'trustees'. In other jurisdictions (or for some types of UK pension arrangement), there may be separate management boards or equivalents that carry the same responsibilities. For simplicity we use the term 'trustees' for such bodies throughout this paper, even though such a term may not reflect the exact legal structure under which the scheme has been set up.

balance of interests 'right' and, as far as possible, aligned can be crucial to effective risk management for all concerned⁶

⁶ A parallel within the insurance field is that of with-profits (i.e. participating) funds, where there can again be scope for divergence of interests between policyholder and insurer (see Section 5.9).

Intended audience, scope and structure of paper

- 1.7 This paper is being presented at Sessional meetings of the Institute and Faculty of Actuaries. Its intended audience is primarily other members of the Institute and Faculty of Actuaries or of the worldwide actuarial profession, particularly those working with pension funds or in enterprise risk management. We also hope that the paper will be sufficiently accessible that its primary audience will be happy to share its contents with others to whom it may be relevant, including those outside the actuarial profession. The authors thank the Institute and Faculty of Actuaries for the opportunity to share the ideas that it contains, but accept responsibility for any errors and omissions. The authors would also like to thank those who have provided helpful comments on earlier drafts, including anonymous referees.

The authors hope that the paper will increase familiarity with, and the emphasis placed on, ERM-style techniques by actuaries working in pensions. They also hope that it will provide a useful summary for actuaries working in risk management disciplines who wish to understand better how to incorporate pension fund risks within an ERM framework. The UK Actuarial Profession is committed to promoting the relevance of actuarial skills to risk management. A substantial proportion of the UK Actuarial Profession is employed in pension fund work. It is natural to want these individuals to be equipped with the best possible tools and understanding of risk management as it applies to pension funds, so that they may be well positioned to help their clients and to serve the public interest. It is also natural to want these individuals to appreciate more fully the similarities (and differences) between risk management as applied to pension funds and risk management as applied to other entities. This should maximise the pool of expertise within the actuarial profession able to apply actuarial skills in a wider context.

Other branches of the worldwide actuarial profession are also seeking to promote actuarial expertise in ERM, most notably via the Chartered Enterprise Risk Actuary (CERA) qualification. Moreover, a reasonable proportion of the membership of the Institute and Faculty of Actuaries is itself based overseas. Bearing this in mind, this paper does not limit itself to discussing types of pension funds that are currently the norm just in the UK. Overarching entity-wide risk management principles ought to be universally applicable, rather than being subject to national boundaries⁷. The universal nature of ERM principles also means that they should apply not just to older-style defined benefit pension schemes but also to defined contribution arrangements (albeit with potentially different importance given to different types of risk). Risk management principles applicable to operators of such arrangements, e.g. insurance companies and asset managers, may also (with suitable modifications) be applicable to the schemes themselves.

- 1.8 Risk management can be explored at many different levels. Some of the techniques commonly used in specific risk management sub-disciplines can involve quite sophisticated mathematics. Others, particularly at the 'entity-wide' end of the spectrum can focus more on governance and other similar topics that are less mathematical in nature. This paper generally concentrates on governance aspects rather than the mathematical components of risk management. Readers interested in mathematical aspects of risk management (or in analytical tools that make this material more accessible to others) are referred to other literature.⁸

⁷ The OECD/IOPS (2011) guidelines are a good example of the application of good practice principles for risk management across national boundaries, different types of pension arrangements and different institutions.

⁸ See, for example, Kemp (2011).

1.9 Bearing these points in mind, the paper is structured as follows:

- (a) In Section 2 we explore a range of different types of pension fund, including those most common in the UK and some types more common elsewhere.
- (b) In Section 3 we also explore at a high level the main risks that such funds, their sponsors and their beneficiaries are exposed to, and how this varies according to fund structure.
- (c) In Section 4 we explore what ERM involves and why we think that it is appropriate to adopt terminology that is more relevant to the particular circumstances in which pension funds might find themselves.
- (d) In Section 5 we explore in more detail the similarities and differences from an ERM perspective between pension funds and other enterprise types.
- (e) In the opinion of the authors, actuarial training is particularly well suited to providing advice that effectively blends both quantitative analyses and qualitative insights. To illustrate how this might work in practice (with ERM for pension funds) we describe in Section 6 quantitative model frameworks that can incorporate sponsor covenant risk, investment risk and other types of risk to which a defined benefit pension scheme might be exposed.
- (f) We then discuss in Section 7 more qualitative aspects of ERM as it might be applied to pension funds and in particular how schemes, sponsors and other interested parties might try to structure effective governance arrangements.
- (g) Much of human learning is by imitation. While blindly imitating what others do is not necessarily a desirable strategy, there are some useful lessons that can be drawn from risk management developments currently occurring in non-pension fund disciplines. In Section 8 we highlight some of these lessons and trends, so that risk managers for pension funds can adopt best practice from other disciplines to the extent that they think that it is relevant to their own needs.
- (h) Finally, in Section 9 we draw together some further observations and conclusions, to the extent that we have not already done so in this Section.

2. Types of pension fund

- 2.1 Pension schemes or funds⁹, also in the European Union called ‘Institutions for Occupational Retirement Provision’ (‘IORPs’), come in many different varieties. Most pension schemes are strongly allied with a member’s employment arrangements. For example, pension benefit accrual in a final salary scheme is directly linked to the salary that the individual member receives from a specific employer.

From the perspective of individual members, the economic nature of a pension arrangement is as a type of retirement savings arrangement financed wholly or partly through deferral of pay. This applies even if contributions towards the arrangement never pass through the individual’s own bank account. It also applies even if the benefit entitlements (e.g. a pension linked to the individual’s final or career averaged salary and carrying rights to specific types of pension increase) are not otherwise accessible in the open market.

The potential for substitution with other ways in which the individual might save for old age or infirmity is perhaps clearest with a pure defined contribution pension arrangement. In such an arrangement, the benefits eventually drawn down from the pension arrangement are specifically linked to the value of a pot of assets invested in a particular way. Some non-occupational savings arrangements behave in an ostensibly similar fashion if they are invested in a similar manner. These include savings invested in unit-linked life insurance policies, in collective investment schemes (such as UCITS vehicles or unit trusts) or even, for the wealthy, in private investment portfolios.

In practice, most jurisdictions differentiate pension provision from other more general savings arrangements. They do so by assigning greater tax privileges to pension arrangements but in return imposing greater restrictions on the ability of members to access the value underlying these arrangements prior to retirement.

This reflects an important social aspect to pension funds. Provision for the financial needs of the elderly or the infirm can and often is at least in part provided by the State through social security systems. Indeed, in many developed countries the majority of old age income provision for the majority of the elderly may be provided via the State. Pre-funding of these systems is unusual. However, many countries also look to the private sector to share in this social goal. Some type of pre-funding is the norm (indeed, some might argue, an almost essential prerequisite) for private sector contributions to retirement provision. Different societies (and different parts of a single society) often organise themselves differently whether for cultural, historic or perceived efficiency reasons. This applies to pension provision as much as to other aspects of life. Not all of the differences seen in practice between pension arrangements in different jurisdictions are easily explainable *ab initio*. Some reflect different tax arrangements or different emphases placed on the needs of different generations within the society in question.

Main types of pension design

- 2.2 Perhaps the most important difference between different types of pension arrangement is between defined benefit and defined contribution arrangements as described below. Readers should note that in practice in many jurisdictions schemes may commonly exhibit

⁹ We use the terms pension ‘scheme’ and pension ‘fund’ as interchangeable throughout this paper. We recognise that some view a ‘fund’ as merely the pool of assets held by a ‘scheme’, whilst others view a ‘scheme’ as merely a particular type of ‘fund’.

characteristics of both such arrangements. We have focused in (a) and (b) below mainly on the two ends of the spectrum:

(a) *Defined Benefit arrangements*

In a (pure) defined benefit arrangement, the individual member becomes entitled to specific future benefits payments defined by reference to his or her prior employment history. For example, the arrangement might be a final salary scheme with members accruing a pension benefit based on, say, one-eightieth of each year of service multiplied by the member's salary at retirement. Once in payment, the pension might be partly or wholly inflation-proofed, being awarded increases in line with, say, consumer prices with a suitable cap and floor. In the UK, public sector arrangements often currently have characteristics similar to the above. However, they may not always use the particular accrual multiplier referred to above. There may also be some flexibility in precisely how 'salary at retirement' is determined and in how indexation is measured. More generally, social security systems typically have a strong defined benefit flavour (but with possibly greater political risk of retrospective changes to benefit entitlements than their private sector counterparts). In many countries the eventual benefits paid may depend in part on 'points' that individuals accrue during their working life. More points may be given to those who have made greater social security payments during their working lifetimes (or who have made them for a greater number of years).

The essential feature of such an arrangement is that once 'vested' the benefit is paid to the member irrespective of experience between time of vesting and time of payment¹⁰. The financial consequences of risks such as investment returns (on any assets held to back the pension liabilities) differing from those expected are borne by the scheme rather than by the member. Likewise, if, say, mortality is lower or higher than expected then this too does not (usually) influence the benefit amount. Or rather, these sorts of risk are usually borne by the scheme sponsor, usually the employer. This is because such schemes are usually balance of cost arrangements where all costs of meeting the promised benefits (perhaps above some limited contributions paid by members themselves) are borne by the sponsor. As long as the scheme itself remains solvent (or if it is underfunded, the sponsor remains solvent and meets any shortfalls that might arise within the scheme), members can proceed on the assumption that they will receive the specific pension benefit that they have been promised.

In practice, the assumption that the scheme/sponsor will remain solvent is a key one. The potential reliance on the continued creditworthiness of the sponsor is referred to technically as the *sponsor covenant*. Pension promises are often payable

¹⁰ The concept of 'vesting' arises because members may switch employment prior to retirement. This raises the question of what proportion, if any, of their overall benefit they are then entitled to. In previous generations retirement pensions might have been awarded when a person retired, as a favour for long-time services rendered. 'Vesting' only then took place on retirement. However, increasingly pension benefits have become seen as accruing in line with employment services as they are provided, so commonly now even 'final salary' benefits vest approximately 'uniformly' through time. For example, if there are two employees with the same salary, one with 5 years of service and one with 10 years of service then the former will, all other things being equal, receive one-half the pension benefits of the latter. It then becomes important to understand what salary is deemed to apply in the benefit computation if early withdrawal occurs. It also becomes important to understand what inflationary increases, if any, are applied to such a benefit prior to eventual retirement.

over many years. Over long enough time periods the attrition rate of sponsors becomes significant. A major reason for pre-funding pension promises is to limit the exposure that members have to such uncertainties.

(b) *Defined contribution arrangements*

In contrast, the risks present in a defined contribution arrangement are (in the main) borne by the members rather than by the scheme itself (or by the sponsor).

There are two main types of 'pure' defined contribution arrangement.

In an *individually-focused* defined contribution arrangement specific sums are set aside into pots attributable to individual members. Often the sums set aside are calculated as a percentage of a member's salary. This percentage may be fixed or it may vary (usually in a predefined manner) depending on the member's age, number of years service, employment grade etc. Members may be able to add to these contributions by, in effect, taking a lower remuneration and investing the balance in the scheme (sometimes with some additional employer's contributions then added as well). Each member pot is usually then invested in a manner implicitly or explicitly chosen (or agreed to) by the member. All benefits that the member eventually receives from the arrangement come directly in value from the member's own accrued pot.

The essential feature of such an arrangement is that the financial consequences of risks such as investment returns differing from those expected between contribution and eventual time of payment are all borne by the member rather than the scheme. The arrangement behaves just like other investments the member might have¹¹, if any.

A *collective* defined contribution arrangement still involves members in aggregate bearing the risks rather than the scheme or sponsor. However, the apportionment of experience between members is no longer directly driven by sizes of individual member pots or investment strategies imputed to be followed by each pot¹². The investment strategy being adopted would then generally be set centrally, rather than being at the potential discretion of individual members.

(c) *Hybrids exhibiting some elements of both defined benefit and defined contribution arrangements*

In practice, many pension structures are neither 'purely' defined benefit nor 'purely' defined contribution in nature. For example, well-funded final salary arrangements may be sufficiently well funded that members may have some expectation that they will receive benefit improvements from time to time, e.g. future discretionary

¹¹ Except for any differential tax and access terms applicable to the type of arrangement in question, see Section 2.1.

¹² Instead the pension fund might, e.g., be set up as a mutual insurance company, with members' contributions being invested in with-profit (or participating) insurance contracts issued by this company. Benefits provided would then be derived from payouts from these policies, which might include, e.g., some intergenerational smoothing of investment returns. Collective DC arrangements such as these are relatively rare in the UK but are more common in some Continental European jurisdictions, particularly for industry-wide rather than employer-specific arrangements.

pension increases. A natural way of differentiating between DB and DC in a paper such as this that focuses on risk management is by reference to 'who bears the risk'. Looked at this way, such an arrangement is no longer a 'pure' DB arrangement.

We may expect that the magnitude of the additional benefits members might receive in such circumstances will vary in a manner that bears some relationship to scheme experience. In principle they might be directly set by reference to the current value of contributions the members have previously paid into the scheme. More common in practice is for discretionary benefit improvements to have little if any direct link to the contributions, if any, that the individual member may have made into the scheme.

Variants in structure and design

2.3 Within these overall categories there are also many variants.

For example, defined benefit schemes may be:

- Final salary or average salary. With a final salary scheme, the benefit payable is based on the member's salary at or shortly before leaving or retiring. Sometimes 'shortly' is understood flexibly in this context. For example, to smooth out adverse fluctuations shortly before retirement, the benefit might be based on, say, the best 3 years in the last 10 years of employment. With an average salary scheme, it would be based on some average salary throughout the member's working life. Often, revaluations would be applied to past salary levels to adjust for changes in purchasing power through time. Such an arrangement would typically be called a 'career revalued average' scheme;
- Funded or unfunded;
- Designed to have a greater or lesser proportion of benefits defined at outset likely to be guaranteed rather than discretionary in nature;
- Industry-wide (with multiple employers all contributing or utilising the same scheme) or employer-specific.

In the UK, the pension 'promise' is typically now seen as sacrosanct and very difficult to unpick. This mirrors many other terms of service that an employer agrees with its employees as part of the contract of employment. Indeed, there has been a tendency over time for 'best endeavours' promises to be converted by legislation into contractual guarantees¹³.

In other countries, the pension 'promise' has often been more conditional in nature. For example, in the Netherlands, pension increases are typically dependent on schemes having sufficient funds to be able to meet the costs of these increases. In some jurisdictions it is possible to reduce previously promised pension benefits if the pension fund is in deficit. Of course, there may be reputational and other issues for the pension fund in question if this backstop does get used. These issues may be particularly acute as far as the scheme and sponsor are concerned if this behaviour is unusual and not in line with the generality of other similar funds.

¹³ An example of this was the change in April 2003 in UK DB pension fund rules that made pension fund shortfalls a debt on the employer if the employer sought to terminate the pension arrangement. Conversely, the UK government is currently in the process of seeking to adjust some employment terms previously agreed with some public sector employees that it sees as unduly favourable by introducing primary legislation overriding these contracts of employment. If successful, this might be a precursor to the unpicking of some pension promises previously given to public sector employees, if these are also perceived by the government to be unduly generous.

2.4 Defined contribution arrangements also come in many different forms¹⁴. The legal structure commonly used for UK defined benefit pension schemes involves a trust structure with trustees (who may be individuals although more common for large schemes is to utilise a trustee company as the trustee body). UK based DC arrangements may also be set up under a trust structure, with separate trustees who are responsible for looking after the members' interests. Such a structure might be called an 'occupational group DC scheme'.

Some commentators argue that it can be unclear exactly what the trustees involved in an occupational group DC scheme are responsible for, if individual member pots are invested in collective investment structures such as UCITS or unit-linked insurance policies. Conversely, if something does go wrong then lawyers are sure to see these trustees as fair game to go after, to recompense members for potential losses. Perhaps to limit this risk, there seems to be a trend towards eliminating this role and passing more of the risk onto the end provider of the member unit entitlements. In the UK this has been facilitated by the common use of life insurance companies (often subsidiaries or parents of asset managers) to manage DC arrangements. These may be coupled with e.g. 'group' personal pension or 'stakeholder'¹⁵ pension arrangements that may appear to the member to relate solely to a specific employer but actually involve a direct contract between the member and the DC manager, obviating the need for any separate sponsor coordinated trustee body.

Other commentators view the trustees of an occupational group DC scheme as having a very important role. They see this role as encompassing, among other things:

- scheme governance (and investment governance);
- selection of funds that a member can choose from;
- selection of default funds;
- communication and engagement with members (to aid understanding and to mitigate the risk of insufficient contributions to provide adequate retirement income);
- scheme administration (or, often, oversight of a third party administrator); and
- 'at retirement' decisions etc.

2.5 Many of these activities resonate with the good governance arrangements that ERM seeks to foster, see Section 7. The fact that different employers adopt different solutions highlights that no 'one-size-fits-all' approach exists when it comes to applying ERM in practice. Different approaches may have different costs and may also result in different apportionment of costs between different interested parties. Some of the decisions different employers take in this regard will be driven by views on whether pension arrangements provide effective differentiators between firms when competing for labour. They will also be driven in part by societal norms and other cultural factors, as per Section 2.1.

2.6 Collective DC arrangements may invest in the same sorts of funds or policies as individually-focused DC arrangements. However, the member record keeping arrangements that they require may be different as there may be less direct linkage between a member's own contribution history and investment decisions and the end benefits to which the member is then entitled. The extra flexibility this creates also means that larger collective DC

¹⁴ 'Conditional' defined benefit arrangements as defined in the previous paragraph may be sufficiently 'conditional' in nature to be classified as a form of 'collective' defined contribution. As regulation may differ according to the classification applied to the scheme in question, the exact boundary as far as regulation is concerned can have important practical consequences.

¹⁵ Stakeholder pension arrangements are a particular type of DC pension arrangement that was introduced some years ago in the UK with relatively standardised and simple charging structures.

arrangements may invest in their own segregated portfolios. Use of segregated portfolios is not really practical for individually-focused DC arrangements (except for high net worth individuals or the self-invested personal pension market). The essence of an individually-focused DC arrangement is that the scheme's assets need to be accurately apportioned between different members. This usually requires some form of unitised arrangement.

3. Principal risks in pension funds

Risk classification

- 3.1 Any effective form of risk management requires some sort of classification of the risks that an entity might face. Funded pension schemes have both assets (i.e. investments) and liabilities. Therefore, one possible high level subdivision is between *investment risk*, involving risks that primarily relate to the assets, and *liability risk*, involving risks that primarily relate to the liabilities.

However, there are several downsides with such a classification:

- (a) Subdividing risks between assets and liabilities, while a common term of speech, can underemphasise the potential for exposures to affect both sides of the balance sheet. For example, for a pension fund, movements in yields may influence both asset prices and liability valuations. Ultimately the focus should be on the interplay between assets and liabilities, i.e. on *asset-liability risk*. A fall in the value of the assets is much less of an issue if it is accompanied by a corresponding fall in the value of the liabilities than if it is not.
- (b) A tendency with such a mindset is to focus primarily on 'tangible' assets and liabilities that actually appear on the entity's balance sheet as revealed in published or internal financial statements.

Even outside pensions, this type of mindset is often inappropriate. Much of the value of a business may relate to 'intangibles' such as intellectual property or customer goodwill. These may be reflected only imperfectly if at all in such statements. A particular issue is that most such statements are drawn up on a 'going concern' type basis. However, if outcomes are extreme enough then the assumption that the business remains viable may prove invalid. Many assets and liabilities, particularly ones that are relatively intangible such as customer goodwill, can change dramatically if the company's business becomes distressed. Managing only the immediately visible features of an entity is an easy mistake to fall into, but is inconsistent with the holistic stance underlying ERM.

A pension fund may have less in the way of conventional 'intangibles' but still ought to bear in mind the danger that such a mindset can encourage it to manage only the most visible risks. For example, as explained in Kemp (2009) and in Sections 5 and 6 below, a traditionally formulated balance sheet for a pension fund can be made more useful if it is expanded to incorporate balancing items corresponding to the sponsor covenant and to any 'contingent' assets it might have access to in the event of the sponsor running into difficulties¹⁶. Often, their value can be significant relative to other elements of the balance sheet, highlighting their importance to the pension fund.

¹⁶ A 'contingent' asset is one that the scheme would have access to in the event that the sponsor fails to honour some promise. For example, the scheme could be given a charge or 'lien' over a portfolio of properties (real estate) owned by the sponsor. This might involve the ownership of the properties transferring to the scheme (without further payment) in the event that the sponsor defaulted.

- (c) Some pension schemes (even some private sector ones) are unfunded, i.e. do not have any direct investments as such. However, this does not eliminate many of the risks involved (indeed it can introduce or magnify some of them).

3.2 It is therefore generally desirable to adopt classifications that can apply to assets and liabilities in tandem rather than separately. The types of risk faced by pension schemes vary somewhat according to the type of arrangement in question. However, most pension schemes (and/or their sponsors) are exposed to some extent to most of the following risks.

(a) *Market risk*

Market risk is generally understood to involve the risk of loss due to adverse market movements¹⁷. What is important here is not primarily the risk of a fall in the capital value of the scheme's investments in isolation. Instead, the focus would normally be on the impact that adverse market movements might have on the entity's asset/liability position. This might also be called *asset-liability* risk. Market movements in this context would typically include movements in equity values and in interest rates and inflation expectations.

(b) *Credit risk, including sponsor covenant risk*

Credit risk is the risk that the creditworthiness of a name or counterparty to which an entity is exposed declines, causing the entity loss. At one extreme would be actual default of the counterparty. A subtlety here is whether credit risk should:

- be deemed to include only default risk (i.e. some intrinsic assessment now of the risk that the counterparty or issuer might default in the future); or
- also be deemed to include *ratings migration* risk and/or *spread* risk (or other equivalent risks that also take into account uncertainty in future default experience).

The *spread* on a bond-like or cash-like instrument is the difference in the redemption yield available on the instrument versus the corresponding yield available on some standard reference instrument. For example, people refer to the 'spread' versus government bond yields as the difference between the yield on the instrument in question and the yield on government bonds of equivalent duration, type and currency. However, the spread could be measured versus other relevant reference rates, such as Libor cash or swap rates or Overnight Index Swap rates¹⁸, or some other interest rate or yield measure.

¹⁷ This is more specifically (*external*) *financial market risk*. Some commentators, particularly ones from outside the financial services industry, define *market risk* to correspond to the risk of diminishing sales or margins resulting from changes in the market(s) in which the business operates. Adopting such a definition, 'market risk' as far as a software company such as, say, Microsoft is concerned would primarily refer to changes in the business environment in which the company operated. This might include the impact of changes in the relative competitive standing of PCs versus other types of electronic equipment or uncertainty in trends regarding use of software bought as a package for an upfront fee versus use of software provided as a service over the Internet and charged for as usage occurs, etc.

¹⁸ Usually, commentators and analysts are primarily interested in spreads versus 'risk-free' rates, although they may also be interested in spreads applicable to one risky investment versus another risky investment. The wider range of 'spreads' that have become commonly focused upon since the 2007-2009 credit crisis is in part a reflection of the greater emphasis that is now being placed on what we mean by 'risk free', see e.g. Kemp (2009) or Kenyon (2010).

The market price of a bond subject to default risk is influenced by likelihood of future default. We might attempt to proxy this by some statistic based on the credit rating that a credit rating agency or an internal credit ratings team ascribes to the instrument. However, the market price, and hence spread, will also be influenced by the market's expectation of how likelihood of default might change over time. The market might also disagree with the views expressed by credit ratings agencies in this respect. Even if one ignores market prices and focuses on some perceived 'intrinsic' likelihood of default derived from credit ratings, these can change through time. A rating ascribed to a particular instrument can migrate up or down. At issue is whether spread risk is:

- a form of credit risk (i.e. defining credit risk as risks associated with 'credit' instruments); or
- a form of market risk (i.e. defining market risk as anything relating to movements in market prices whatever the instrument type).

A credit risk that is particularly important to many defined benefit pension schemes at present is the exposure the scheme might have to the current and future creditworthiness of its sponsor. The greater the deficit the scheme would have if it were wound up, the greater is this exposure. This reflects the generic characterisation of credit risk exposure as having two key parts, as per the equation below:

$$\text{Credit Exposure} = \text{Probability of Default ('PD')} \\ \times \text{Loss Given Default ('LGD')}$$

Exposure that a pension scheme has to the creditworthiness of its sponsor is usually referred to as the sponsor covenant (see Section 2.2(a)). Readers should bear in mind that there are some nuances that can apply in practice in the management of sponsor covenant risk. For example, 'default' does not necessarily always have to be fully involuntary. A wide range of factors may influence whether and when companies (and particularly sovereigns) decide to default. How firmly the trustees seek to protect the scheme's beneficiaries against sponsor default may itself influence probability of default and/or the loss the scheme's beneficiaries might suffer in the event of default.

(c) *Liquidity risk*

The UK's Financial Services Authority (FSA) defines liquidity risk as "*the risk that an entity, although balance sheet-solvent, cannot maintain or generate sufficient cash resources to meet its payment obligations in full as they fall due, or can only do so at materially disadvantageous terms*", see FSA (2007). Some view a part of the spread payable on non-default free bonds as relating to their liquidity characteristics, again highlighting the difficulties in rigidly demarcating between different types of risk.

Liquidity risk might not appear to be particularly relevant to pension schemes. Many commentators if anything argue that pension schemes should think about being providers of liquidity to others, like banks, who may be more exposed to liquidity risk. By doing so they might be able to gain a premium for 'renting out' their balance sheet to others.

However this view presupposes that there are few if any circumstances in which liquidity might be important to pension schemes, which in turn presupposes that

they will never have to sell (or buy) large parts of their asset (or liability) base involuntarily. Kemp (2009) and Kemp (2010a) point out possible flaws in this reasoning particularly in the context of regulatory capital assessment. Such computations are ultimately seeking to assess the amount of capital needed to avoid distress. Arguably, therefore, they should take into account the possibility that the pension scheme's behaviour at the time of potential stress involves an element of involuntary behaviour. For example, the stress might coincide with the scheme having to buy out liabilities or to transfer them to industry-wide protection arrangements at times that do not suit the investment contracts that the scheme has previously entered into.

Liquidity risk is also linked with the sponsor covenant. We might view 'payment obligations' from the perspective of a (UK) sponsor as corresponding to its commitments to meet contribution payments as set out in any Schedule of Contributions it may have agreed with the trustees. It will need access to sufficient liquidity to be able to honour these commitments. However, in distressed circumstances, the trustees may seek to change the agreed contribution schedule (and may be encouraged to do so by their regulator), asking for more money more quickly to provide protection against a weakening sponsor covenant¹⁹.

(d) *Longevity risk (and other mortality/morbidity/insurance risks)*

Outside the pension fund world, longevity, mortality and morbidity risk would generally be classified as *insurance risk*, i.e. risks specific to insurance companies. The particular focus here is on risk of loss relating to uncertain outcomes of insurance contingencies. This association highlights the close linkage that most external commentators make between pensions and insurance. Insurance risks would also include property/casualty and other sorts of non-life insurance risk (also called 'general' insurance in some jurisdictions such as the UK). It is not always easy to differentiate what risks are 'insurance-related' and what are not, other than by falling back onto the practical but partly circular definition that insurance risks are ones that are carried by insurance companies.

Risks relating to uncertain exercise of member options would probably also fall within such a category. In a pension context, these options might include ones relating to transfer values, early leaver benefits, benefit exchanges and early retirement. Parallels in insurance include surrender values, paid-up options, policy alterations and maturity options.

(e) *Expense risk*

In the insurance world, expense risk is typically classified as a type of 'insurance risk' (perhaps because it is associated with outgoings, and other types of outgoings for insurers primarily involve insurance related risks). However, expenses are a feature of most business activities, not just insurance, so this type of risk is not just insurance specific. It is also relevant in the pension fund world. Investment expenses, fees to third party advisers, costs of paying pensions and costs of administering benefit records and entitlements could all be higher than expected.

¹⁹ Companies can run into similar types of difficulties in the absence of a pension scheme. For example, one of the problems that felled AIG in 2008 was the extra collateral it ended up having to post as its credit rating declined on derivative transactions it had previously entered into.

(f) *Operational risk*

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. 'Operational' risk does not just cover the basic risks that a pension adviser audience might associate with the term 'operations', e.g. missing benefits/poor data. We could for example include governance risk (such as the risk of having an inadequate grasp or process to manage the risks facing the entity) within this category. Losses arising from erroneous advice from advisers, to the extent that these losses cannot be recovered from the advisers or their insurers, might also fall within this risk category. Depending on the granularity of the risk classification used, a wide range of risks may be deemed to fall into this category, including legal risk and, possibly, reputational (and strategic²⁰) risk, several of which we describe separately below.

The range of operational risks that pension funds might face will generally differ from those that the sponsor faces in its other business activities. For example, the fund itself does not need to worry about security of supply of raw materials (except incidentally in terms of the impact that this risk might have on the sponsor covenant). However, it is not a priori obvious which set of risks might be larger, especially for a defined benefit scheme that is very large relative to its sponsor. Management of many of these risks may be outsourced to others (e.g. member record keeping, office services etc.). Increasingly other types of regulated entities are being encouraged to focus on the risks involved in outsourcing. They are being expected to place greater focus on, for example, existence of contractual agreements and service level agreements defining what the regulated entity is entitled to receive and from whom. This is the case even where the parties involved are closely allied, as would be the case if a scheme was receiving services from its sponsor.

Schemes should therefore ask themselves several questions if they receive services from their sponsor. For example, suppose for some untoward reason the sponsor disappeared overnight or was unable to provide the support it had historically given to the scheme (e.g. its computer system fell over at a time when a payroll transfer to the scheme was due to occur). Would the scheme be able to pick up the pieces itself? We can also view this issue in reverse. The sponsor may in turn view itself as having 'outsourced' its pension arrangements to its pension schemes. If there is a mess-up within the administration of scheme benefits then the sponsor may end up incurring the cost (and management time) of picking up the pieces.

(g) *Group risk*

Group risk is the additional risk to a particular legal entity caused by it being within a larger group structure. For example, resources may be diverted from the entity in question to other group companies if the latter companies suffer a large loss. This

²⁰ Scott (2010) seeks to characterise the complete range of risks that different firms face (covering firms ranging from non-financial to insurance to banking). He excludes 'strategic' risk from 'operational' risk, see Section 3.2(h), but still includes risk exposures such as: people risk (hiring, firing and remunerating), environment and sustainability, health and safety, bribery and corruption, fraud, money laundering, regulatory, reputational, terrorist, manufacturing, supplier risk, IT/systems/security/business continuity and tax risk.

can have adverse knock-on (or 'contagion') effects which would not have arisen had the entity been stand-alone.

Usually, 'group' risk relates to the interaction between parent companies and their subsidiaries, and between fellow subsidiaries. Some measure of 'control' or 'dependency' is implied. We wouldn't normally view equity risk within a diversified asset portfolio as a form of 'group' risk, because normally the portfolio itself has little if any control over the companies in which it owns shares.

In the context of *defined benefit* pension funds two important types of 'group' risk are usually differentiated. These are:

- (i) *Sponsor covenant risk* (see also Sections 2.2(a) and 3.2(b)). This is the risk, from the perspective of the fund itself, of the fund's sponsor running into difficulties and being unable to make good deficits that might have arisen within the fund; and
- (ii) *Pension risk*. This is the risk, from the perspective of the sponsor, of the cost of meeting the benefits payable by the fund being greater than expected. 'Cost' here should not be too narrowly interpreted. 'Pension risk' can relate to both the accounting and the business impact of having (or not having) a pension fund. One obvious element might be possibly higher volatility in the Profit & Loss account arising from variability in asset values or other elements within the pension fund, or to the need to make good deficits. However, in the UK it might also relate to the impact that regulatory strictures might have on company behaviour, particularly potential mergers and acquisitions activity. Under current UK regulatory frameworks, pension fund trustees or the pensions regulator acting on their behalf can acquire an effective veto over some actions the sponsoring company might want to adopt.

However, there are other ways in which 'group' risk can manifest itself. Outsourcing risk as per (f) between the scheme and sponsor can be thought of as another example of group risk²¹.

(h) *Strategic risk*

Scott (2010) summarised risks that businesses face into three overarching categories, namely:

- strategic;
- operational; and
- financial.

In essence, any business needs to have a direction in which it is heading, it needs to execute effectively its travel along this path and it needs to have (and create) sufficient capital not to stumble on the way. In a business context, strategic risks would usually be understood to be ones that fall into the first category, i.e. the direction in which we are heading. These include not being in the right market in the first place, facing unexpectedly strong competition or the market environment

²¹ More precisely, we might view the group risk element here as corresponding to the extra risks involved in using sponsor provided services rather than those of an independent third party.

(including regulation, tax, etc.) changing in unexpected ways. Of course, some of these unexpected outcomes may work in favour of the business. Indeed, one of the 'arts' of strategic management is spotting emerging trends before the competition and positioning the business and its trajectory accordingly.

This is one area where ERM as applied to pension funds in isolation differs from ERM as applied to business more generally (or as applied to the pension fund and sponsor when viewed in combination).

Traditional occupational pension funds (at least in countries like the UK) generally have little room for truly 'strategic' manoeuvres. They have generally been set up for a specific purpose, i.e. to provide benefits to their beneficiaries. Their trustees would generally be failing to adhere to their governing documents if they unilaterally decided that they should follow a materially different objective. Perhaps the main truly strategic decision that is open to them is to trigger a wind-up of the scheme (and even this power may often in practice require the approval of the sponsor). So the term 'strategy', as far as such a pension fund is concerned, is more usually associated with other aspects of pension scheme governance, e.g. the overall shape of the investment strategy the trustees think should be adopted for the assets held by the fund.

Rather more 'strategic' options are available to the sponsor (and/or, depending on the governance arrangements in place, to the scheme and sponsor when viewed in tandem)²². The sponsor could, for example, close the scheme or alter the benefit accrual structure, either to new entrants or to existing members (or both). It could set up new pension schemes (or new remuneration structures in which the existing pension scheme did not figure). It could seek to merge different schemes if it has more than one.

(i) *Project risk*

Project risk can be viewed as an example of operational risk or as something to be focused on in particular depth depending on the scale and frequency of specific projects an entity might carry out. ERM principles are commonly applied to project management, particularly but not exclusively to large IT and/or infrastructure projects, see e.g. Chapman (2006) or Lewin (2010). Each such project should be effectively managed. For example, project managers should ensure that project objectives are 'SMART' and compatible with the overall aims of the scheme/sponsor. They should also ensure that the project does not create other unwanted risks (or if it might then these are appropriately mitigated). Execution of the project needs to be timely, effective and achieved at optimal cost etc.

²² The topic of the different meanings that different participants put on the term 'strategy', depending on what is or is not under their control and on how much 'in control of their own destiny' they feel could easily form the basis of an entire paper in its own right. Essentially all (business) objectives, however large or small in nature, can be decomposed into further sub-objectives in a hierarchical structure. Any given individual's employment will usually be focused on some restricted range of objective levels. The individual will typically associate 'strategic' either with actions that have an important bearing on whatever are the most important objectives within his or her remit, or anything else higher up in the hierarchy (unless the individual feels disenfranchised and therefore unable to be 'strategic' about anything!).

Many one-off exercises a pension fund might enter into can fall within this category of activity, and may benefit from holistic assessment and management of risk. For example, the scheme might want to move member administration en masse to a new provider. How does it ensure that this move goes as smoothly as possible and with minimum possibility of latent errors arising? Another example might be if it is planning to initiate an exchange programme in which beneficiaries are allowed and/or encouraged to swap one set of benefits for another. This could include a switch from a defined benefits formula to one involving a greater degree of risk sharing. Those planning and implementing such a programme need to explore how best to structure it to reconcile the conflicting objectives and risk tolerances of the two main stakeholders, here the sponsor and the members (i.e. they need to decide on direction of travel). They also need to mitigate operational, legal, mis-selling and other risks (i.e. achieve successful execution). This includes minimising the possibility that the exchange programme, if successful, still does not eliminate the risks the scheme or sponsor was hoping to get rid of.

Any large scale transfer of assets and liabilities to a third party, as in a pension fund 'buy-out' or 'buy-in', should also be project managed carefully. The implementation of such a transfer can introduce a host of risks not dissimilar to those in a mergers & acquisitions (M&A) transaction of a similar magnitude.

(j) *Legal risk*

Legal risk might be defined as the risk of failing to operate within the law, or of failing demonstrably to do so. This can be by reference either to external legal frameworks within which the entity operates or in terms of legal documents governing the specific behaviour of the entity in question. It can therefore be thought of as a type of operational risk.

For example, if the pension fund is set up under a Trust Deed then the trustees might fail to follow what the Trust Deed specifies, or might fail to understand what the terms of the Trust Deed means. The provisions of the Trust Deed might also be overridden by legislation. Even if an entity follows all legal requirements, it can still be on the receiving end of legal actions claiming that it has not. The unanticipated costs of (and management time incurred in) refuting such claims would also normally fall within the definition of 'legal risk'.

In the wider context applicable to pension promises, a specific form of legal risk is that arising from employment law. Beneficiaries of occupational pension schemes are generally at some point in their lives employees of the sponsoring company or have a close relationship (such as being a spouse or child) with such employees. What the sponsor and or trustees can do in relation to the scheme may be constrained by employment law or practices.

Legal risk may also relate to legislation that is unclear and which is later clarified but in a manner that was not expected by the sponsor/fund in question.

(k) *Political risk*

A very wide range of risks can be included within this risk category. For some commercial businesses, particularly ones operating in less developed countries, political risk may be a very important aspect of doing business.

As far as pension funds are concerned, political risk could for example include the risk that:

- a new regulatory or capital adequacy framework might be introduced;
- a traditionally strong relationship with existing politicians and corresponding local or national government(s) might weaken;
- previously discretionary benefits or those dependent on best endeavours might become more guaranteed; or
- the tax regime within which the pension fund operated changed, see for example Hatchett *et al.* (2010).

Political risk can itself be influenced by other types of risk. For example, Reinhart and Rogoff (2009) highlight the substantial and uncertain economic and socio-political impacts that can arise within an economy if its government defaults. They also note the high proportion of sovereigns that have defaulted at some stage in the past. In some countries sovereign risk is a very topical issue but also one that is clouded with considerable uncertainty in terms of possible outcomes for pension schemes and their sponsors.

(I) *Regulatory risk*

Regulatory risk might be viewed as a subset of legal (or political) risk or as a separate, although related, risk category in its own right. It relates to the risk that the regulatory framework within which the entity is operating might change adversely. This could involve a change in either the general regulatory framework applicable to the entity or in its own relationship with its specific regulator/supervisor (or both).

For example, there might be a change in general regulations affecting pension scheme transfer values (or, specifically, how the regulator thinks these regulations should be interpreted by the scheme in question). This could potentially impact not just individual members but also the scheme or sponsor in aggregate, if the change was material enough.

For pension funds (and other entities in the financial services arena), regulatory risk can relate not only to actual benefits payable but also to the funding of these benefits. For example, it is possible that EU pension funds not already subject to Solvency II will over the next few years become subject to this regulatory regime, see Section 8. If the scheme has operated on the basis that Solvency II is irrelevant because it is not *currently* applicable and has adopted funding approaches or investment strategies that do not sit well in such a regulatory framework then it (and/or its sponsor) may be ill positioned to cope with such a shift if and when it does occur²³.

²³ This particular risk, although strictly political or regulatory in nature, could be viewed as a strategic risk for companies with disproportionately large pension schemes. Their direction of travel could be significantly changed if their pension scheme was suddenly transformed for all practical purposes into a large mono-line insurance company.

(m) *Reputational risk*

Most of the above risks can combine with reputational risk. For example, a firm may face political risk because it operates in areas of the world with unsavoury political frameworks. An inappropriate business approach to such matters might lead to customers blacklisting the firm, with an adverse impact on the firm's revenue base or profitability.

A traditional DB occupational pension scheme may in isolation not be particularly exposed to reputational risk. Its 'customers', i.e. its beneficiaries, will normally have little practical scope to utilise the profit motive to penalise poor service. This contrasts with customer relationships that a normal business might have. Switching to another pension fund may not be a practical alternative or may actually favour rather than penalise the scheme's finances. However, there may be scope for a more nebulous embarrassment risk to fall upon managers (and trustees) if they are perceived to be providing a poor service to members.

Reputational risk is more obviously relevant to the sponsor, if one aim of the pension fund is to provide a positive impression of the sponsor to its employees.

Collective and other types of DC arrangements may be more exposed to this sort of risk than traditional UK-style DB pension schemes. Beneficiaries of collective DC arrangements may be more able to vote with their feet and if enough of them do so it may damage the arrangement's ongoing viability.

(n) *Employment/Human Resources risk*

The social aspect of pension provision introduces some additional risks. For example, historically, pension schemes have mitigated HR risk. They have helped with recruitment and retention of employees and also provided a headcount release valve in recessionary times if the business was not prospering. Employers were able to offer enhanced early retirement benefits to those who were being made redundant, if they were at an age when early retirement was feasible.

The UK is in the process of removing employers' ability to retire individuals automatically when they reach a certain age. It is also (along with quite a number of other developed economies) increasing the state retirement age applicable to its social security arrangements. This reflects a desire to increase employment participation rates more generally among older members of society, as life expectancy rises. This may make it more difficult for employers to retire older individuals they feel are not pulling their weight, especially if the employee cannot afford to retire. Sponsors may still be able to offer enhanced pension benefits to facilitate such retirements, but maybe the cost will be greater to achieve the same level of take-up rate.

Overlaid on this are shifting societal norms. The more paternalistic is the culture of the society in question the more such issues may be seen as falling onto the employer to sort out. In contrast, in some societies the expectation may be that it is someone else's problem (maybe the employee, maybe the state or maybe both). This doesn't necessarily alter the risk to the individual employee that he or she will

have insufficient money to live off in old age. But it may change who is expected to help mitigate this risk.

(o) *Accounting risk*

A final risk that we wish to highlight here is ‘accounting’ risk. This may be viewed as the risk that there is an adverse *accounting* outcome shown in e.g. the scheme’s or the sponsor’s statutory balance sheet (or P&L account or equivalent) other than due to some underlying deterioration in the health of either of these entities.

In one sense, an ‘accounting’ risk as defined above might not be considered particularly serious. We are here specifically attempting to distinguish between:

- underlying economic reality; and
- its mere appearance as per financial statements.

Implicit in this distinction is a belief that there are situations in which the two diverge. This is a proposition that might not be accepted by accounting theorists (if accounting standards are suitably defined).

In practice, life is less simple, particularly as far as the sponsor is concerned. There may be impacts or potential constraints on company behaviour arising from accounting presentation. For example, the accounting presentation may:

- influence the market’s view of the sponsor;
- impact on banking covenants or dividend policy; or
- drive payment sizes under staff bonus arrangements.

There may also be divergent opinions on how the ‘underlying’ position should be identified if not, ultimately, from material sourced from the financial statements²⁴. Of course, even if we do accept the premise that the ‘underlying’ position ought to be derivable from financial statements, this may not be true in practice. O’Brien *et al.* (2010) note how difficult it is to understand the risk exposures that FTSE 100 companies have via their pension schemes purely from disclosures in their company accounts.

A more complete classification of risks to which any entity (not just a pension fund) might be exposed is set out in Kelliher *et al.* (2011).

3.3 It is clear from the above risk descriptions (see also Kemp (2005)) that there can be some overlap between risk categories, in the sense that some commentators categorise some risks in one way while others may categorise them differently. The actual classification adopted may in the end be determined by the convenience of application for particular purposes²⁵.

²⁴ A topical example of this is the relevance or otherwise of marking-to-market, i.e. market consistency, in the computation of assets and liabilities, see e.g. Kemp (2009). Some commentators believe that marking-to-market provides a poor guide as to the underlying state of a financial entity, particularly if it does not need to (or cannot) realise the assets or liabilities in question. Others think that it is very relevant, even if markets appear to be behaving irrationally at the time. After all, how do we objectively tell whether or not a market is currently behaving irrationally (and in which direction)? Allied to this are debates on the extent to which such computations should avoid pro-cyclicality (and whether more general accounting computations should do likewise).

²⁵ Loosely speaking, if pension funds were regulated like insurers and the planned EU insurance regulatory regime, Solvency II, was already in force then the risks implicit in (a), part of (b) and (c) would fall within the

The important requirement for an effective ERM framework is that all risks are covered and none are accidentally forgotten, rather than that they are necessarily given universally agreed names.

Characteristics of risk

- 3.4 In most of the analysis in Sections 3.1 and 3.2 we have equated ‘risk’ with ‘risk of loss’. This is consistent with traditional dictionary definitions of risk. However, the term should also be applied to exposures with possible upside as well as possible downside. When market practitioners talk about ‘trading risk’ they usually mean buying or selling exposures to economic factors that carry uncertain outcomes. Gains (unless hedged) for one party will generally correspond to losses (unless hedged) for another party.

There are certain types of risk relevant to pension funds that are nearly always associated with loss as far as the fund is concerned, particularly operational risk or legal risk²⁶. These correspond to ‘unrewarded risks’²⁷.

However, the majority of risks are more symmetric. For example, equity markets can rise as well as fall. A fund investing more of its assets in equities than it has equity risk exposure in its liabilities will gain if equity prices rise by more than expected.

- 3.5 Merely because a risk can have upside as well as downside does not necessarily make it worth taking. The risk may potentially be rewarded, but does the skill exist to exploit it and is the potential reward adequate for the risk being taken? At the heart of any portfolio construction or other decision-making process that the fund might undertake will be a formulation of a view on whether the risks being adopted (or mitigated) by the proposed course of action are likely to be successfully captured and adequately rewarded.

The issue of what skills, i.e. comparative advantages, an entity possesses is an important one in the context of entity-wide risk management. Proper consideration of this topic is a key part of business positioning as far as any corporation is concerned. In IFRS Practice Statement (2010) the IASB stresses the importance of disclosing in a company’s Management Commentary:

- the principal risks (and opportunities) facing the company;
- how these risks (and opportunities) are changing;
- the company’s plans and strategies for addressing them; and
- how effective its risk management strategies are.

Likewise, pension schemes need to assess what they are good at and what skills they do not possess or have ready access to. In principle, organisations should form views on the risks

‘market risk’ sub-module of Solvency II, part of (b) would fall within the ‘counterparty risk’ sub-module and (d) and (e) would fall within the ‘life underwriting risk’ or ‘health underwriting risk’ modules. The remainder, if covered at all, would fall within the ‘operational risk’ sub-module.

²⁶ Strictly speaking even these often have some symmetrical qualities. For example, an operational error that involves overpayments to a beneficiary which cannot be reversed is both embarrassing to the pension fund and causes financial strain. However, even here there is an unintended winner, namely the beneficiary who has benefited from the operational error. The fund could, of course, also be a beneficiary of someone else’s operational error.

²⁷ Readers should note that some commentators describe other types of risk such as interest rate risk and inflation risk as ‘unrewarded’. Their logic for doing so is that they expect there to be no long term reward from holding such exposures even though these sorts of exposures may introduce mismatch risk.

and rewards that they might face and position their portfolio accordingly, see e.g. Kemp (2010b) for a more mathematical treatment of the ‘risk budgeting’ and portfolio construction problem. In practice, entities often rely on heuristic approaches.

It is important here to benchmark the entity relative to others and not just within its own field. Why, for example, are many defined benefit pension funds currently being advised that longevity risk is unrewarded and therefore to be sold while at the same time some insurance companies and other organisations are risking substantial amounts of capital to purchase it? Ultimately there is a ‘market’ price for the risks involved. If the price to transfer away the risk is too skewed in favour of the buyers (i.e. here the insurers) then the sellers (i.e. here the pension funds and, indirectly, their sponsors) should ideally retain rather than transfer away these risks. However, the pension fund may not have the skills and governance disciplines in place to capture as effectively as the insurer any rewards that might accrue from building up a portfolio of such risks.

Management of risk

3.6 Whether ‘risk’ is primarily ‘risk of loss’ or is more symmetric might be thought of as merely a difference in nuance. However, it arguably has important ramifications in practice, particularly for those involved in ‘risk management’ or in corporate governance more generally. We discuss this topic further in Section 7. We here merely observe that there is no single agreed model for what a ‘risk manager’ should ideally do, there being two alternative articulations of what we might mean by ‘risk management’:

- (a) At one end of the spectrum, risk management might be seen primarily as involving *identification, quantification and/or mitigation of risk of loss*, to the extent that this is deemed appropriate by senior management, bearing in mind that reducing risk of loss may also reduce risk of profit.
- (b) At the other end of the spectrum, risk management might be seen as primarily involved in *deciding what types of risks an organisation should carry*. This might involve the ‘risk manager’ contributing to collective decisions taken collaboratively with other managers, for example in product design or new business lines. The risk manager might, for example, bring a particular mindset to the analysis of risk and more specifically to the quantification of whether taking the risk is likely to be adequately rewarded.

The spectrum between (a) and (b) corresponds with the extent to which the risk manager is expected to provide independent ‘challenge’ of as opposed to being an active participant in business line or entity-wide decision-making. Another way of articulating this distinction is to debate whether the ‘risk manager’ should primarily be a ‘second line of defence’ (and thus separate from revenue generating outward facing teams) or whether he or she should primarily be in a ‘front line’ role working alongside and within these teams to maximise value creation.

As far as the entity as a whole is concerned, both points of view are generally required if we want truly effective risk management. Thus the issue ultimately boils down to how we might best structure available resources to achieve a fully holistic appreciation and management of risk and where within this structure individual employees or advisers should sit.

- 3.7 A broader related point is that for some stakeholders in some pension schemes, the reward profile may be quite different to the one that applies to the sponsor's shareholders. For example, if no discretionary benefits are to be paid (e.g. in a 'pure' DB scheme as above) then members have an asymmetric payoff as their maximum gain is capped but their downside in theory extends to receiving nothing. This is in stark contrast to shareholders whose gain is in theory unbounded. The existence of a sponsor for such a scheme may be viewed as a 'loss absorbing' mechanism as far as the members are concerned. Downside investment risk then does not necessarily translate into 'loss' for members, as long as the sponsor covenant remains good.

Risk and uncertainty

- 3.8 Often an implicit assumption is made within 'risk management' and 'risk measurement' that it is possible to quantify reasonably accurately the risks an organisation might face. However, this is an imperfect assumption, particularly in the business world.

We can conceptually differentiate between two types of risk, namely:

- (a) Risk that is amenable to such quantification. For example, in a (fair) game of poker we can estimate the likelihood of different hands being drawn, using conventional probability theory; and
- (b) Risk, i.e. 'uncertainty', that is inherently not measurable or quantifiable as above. This type of 'risk' is known by economists as 'Knightian uncertainty' after Frank Knight, a Chicago-based economist who wrote in the 1920s. In a classic text, Knight (1921) argued that profits (if any) accruing to entrepreneurs in effect accrue from them carrying such risks. We cannot tell for sure whether a particular business venture will succeed or fail. Even the most promising ventures can come unstuck because someone else comes up with a better way of delivering the same underlying business proposition or the market dries up etc.

Most risks that a pension fund faces (indeed most risks that any organisation faces) involve some mixture of (a) and (b). Part of the 'art' of the entrepreneur is in assessing the inherent uncertainties that exist in business activities and in identifying ways of reducing this uncertainty with a profitable outcome.

A corollary is that any presumption that a 'perfect' risk management system or process exists is necessarily flawed at outset. At best we are instead talking shades of grey. But as the management of uncertainty is a cornerstone of economic life, the different shades also potentially come with quite different financial outcomes. Thus we do not denigrate the importance of effective risk management, we merely highlight its difficulty and we make the observation that there is a limit to how reliably risk (if suitably widely defined) can be quantified.

4. What is Entity-wide or Enterprise Risk Management (ERM)?

4.1 In this section we introduce the main elements of 'enterprise' risk management (ERM) as conventionally understood.

Benefits of ERM

4.2 Before doing so, it is worth highlighting why enhanced risk management might be intrinsically desirable, and hence why a particular type of risk management, namely 'enterprise' risk management, might have particular attractions. Desirability here will depend in part on the stakeholder concerned:

4.2.1 Shareholder perspective

There is some empirical evidence that risk management improves shareholder value, see e.g. Lam (2003). Other, more focused but possibly more theoretical, arguments include (see Hatchett *et al.* (2010)):

- (a) Risk management can reduce income, earnings and/or cash flow variability/volatility. This may lower tax costs and/or increase a company's credit rating or perceived financial standing, lowering the firm's cost of capital or improving its terms of trade;
- (b) Although in theory shareholders could choose their own investment strategies and risk exposures to maximise their own utility functions, in practice it may be easier for the firms in which they invest to do this on their behalf. Firms may be better informed about the risks that they are facing and may be better placed than shareholders to manage these risks. Indeed part of the remit of Boards is to do exactly this;
- (c) Risk management can reduce the likelihood of bankruptcy or financial distress and the direct and indirect consequences of such events, such as reduction or destruction of intangible asset value²⁸; and
- (d) Better recognition and management of the uncertainties that arise in business life may allow a firm to be more entrepreneurial and hence more effective and profitable as a business. It may also lead to better allocation of capital.

The more comprehensive, holistic and consistent the risk framework is, the more likely it is that these benefits will be captured. A silo based approach may result in inconsistent management actions that in extremis might contradict each other. An example in a pensions context might be a sponsor whose business can be expected to benefit if people generally live longer. It might be tempted to focus overly much on longevity risk within its pension scheme without recognising that there may be a natural 'hedge' to this risk present within the rest of its business activities. 'Unwanted' currency exposures within the pension fund portfolio might turn out to be 'wanted' in the context of other business activities. Other examples might be of inflation risks in pension schemes of sponsors whose revenues from

²⁸ It should be noted that modern finance recognises that the option shareholders have to allow a company to default, i.e. the so-called 'shareholder put', itself has value (to them) which needs to be set against the costs referred to here.

their core operations are linked to inflation, or institutions that trade in risks while at the same time are exposed to similar risks in their pension funds.

The advantage of managing these risks holistically through an entity-wide lens is not just to capture the benefits of diversification but also to manage more efficiently any resulting concentrations of particular risks.

Cutting across the boundaries that define individual silos should also eliminate inefficiencies. For example, investment consultants and scheme actuaries have separately defined roles in pension schemes. Historically investment and funding strategies have usually been decided by taking the other as fixed. This deprives the pension scheme of the benefits of an integrated approach that recognises more directly the linkage between the two.

4.2.2 Regulator (or 'supervisor') perspective

Such bodies have a strong incentive to encourage effective risk disciplines within the organisations that they regulate/supervise, because:

- (a) Entities that capture the benefits of effective and comprehensive risk management should be stronger and better able to offer value-for-money to their customers²⁹ in a secure manner;
- (b) Entity failures, if extreme enough, may require bail-outs from the public purse and/or result in beneficiaries/customers failing to receive what they have been promised. Risk management failings may therefore be particularly costly to the stakeholders that these bodies represent and may generate personal embarrassment for the regulators themselves.

They should also be keen on comprehensive and holistic management of risk. Failure to handle effectively any one type of risk may obviate the benefits that might otherwise have been expected from effective management of all the remaining risks.

The FSA believes that firms that coped best with the 2007-09 credit crisis were generally ones which had effective and holistic risk management disciplines most embedded within their overall business management and objectives, see FSA (2009). This is one reason why they have encouraged firms they regulate to improve their risk management disciplines, see e.g. FSA (2010).

The FSA's remit is of course confined to financial firms. We believe that non-financial firms, particularly those with large treasury functions and significant pension risk could also benefit from more holistic risk management. Or, they might at least benchmark what they already do in this context relative to emerging best practice in the financial arena.

4.2.3 Beneficiary (or customer) perspective

These individuals will be particularly interested in the extent to which what they have been 'promised' will actually be honoured. In a pension context, risk management within the

²⁹ Kemp (2009) uses the generic term 'customer' in situations in which analogies can be drawn between pension fund beneficiaries, insurance company policyholders and banking depositors. As the specific focus of this paper is pension funds, the main applicable term is 'beneficiary', at least for UK pension funds which are generally set up under trust arrangements.

scheme, the sponsor or both should help with the delivery of this goal. This is particularly true if the assessment on which it is based is comprehensive and holistic, so that undue attention is not focused on risks that are largely irrelevant as far as the beneficiaries are concerned.

What is ERM?

- 4.3 We see from above that it is particularly desirable that risk management be comprehensive, integrated and holistic. Although there is no universally accepted definition of ‘enterprise’ risk management, nearly everyone using the term mentally includes in its scope this goal, i.e. that it should involve *effective integrated holistic management of all of the risks and opportunities faced by an organisation*.

Of course, organisations have often in the past effectively managed the risks that they faced without having specialist risk teams within their organisational structures or using terminology such as ‘enterprise’ risk management. ERM can in this context be thought of as (merely) a “*logical and evolutionary response to growing complexity, uncertainty and ambiguity associated with 21st century corporate life*”, see IAA (2009).

We might therefore view ERM as corresponding to the corpus of ideas and approaches that constitute modern business best practice as far as holistic risk management is concerned. Like portfolio theory or any other well articulated financial or management discipline, ERM involves a recognisably core body of knowledge as well as nuances that change from time to time as management fashions change. Past practices, to the extent that they are deemed to remain relevant today, will be subsumed within the overarching ERM discipline, but perhaps called something different.

Critics might, of course, argue that there is an element of circularity in such a definition. Why go to the trouble of creating a specific discipline called ‘ERM’ if the ideas it involves have in many cases been around for many years but called something else? We might answer this criticism by noting that humans seek order and structure in their understanding of how things work. We see this in the quest for universal scientific laws and principles as well as in many other human endeavours. So, grouping together activities into overarching disciplines is a natural feature of human activity.

The test is whether the classification so created is *useful*, in the sense of highlighting similarities and relationships between activities and/or bringing further insights to the problem that the classification is attempting to tackle. In the writers’ opinion, there are many advantages in analysing different types of risk in tandem. Similarities and differences between different types of risk become more easily apparent, making it easier to identify management approaches applicable to different types of risk.

- 4.4 Most commentators, particularly ones who are management consultants, also strongly associate ‘enterprise’ risk management with *creating value for owners*, see e.g. IAA (2009). This in part reflects the types of organisation, e.g. proprietary insurance companies or other for-profit businesses, to which ERM has traditionally been applied. The term ‘enterprise’ has a convenient double connotation in this respect. It suggests both an inclusiveness across all business activities that is logically associated with a holistic approach to risk management (as in Section 4.3) as well as a focus on the business as a whole from the shareholder and hence value-creation perspective.

Self interest may, of course, be at work on the part of any external consultants. Stressing the positive impact that ERM can deliver to shareholders, owners and stakeholders is always a good starting point for anyone whose bills will eventually be paid by such people. There may also be an echo of the different emphases different people may place on upside versus downside risk management as per Section 3.5. A consultancy pitch becomes more compelling if we can weave into the story the likelihood not just of better mitigation of downside risks but also of some upside potential.

However, as we have hinted at already, too strong a focus on shareholder value may not always be the right emphasis for pension funds, at least not when they are viewed in isolation. Instead, we will often need to pay more attention than is usually given in an ERM context to the different interests of different stakeholders.

- 4.5 A simple example highlights the issue. Suppose we have a traditional balance-of-cost defined benefit pension scheme and its sponsor wants to ‘maximise shareholder value’ by minimising the contributions it might have to pay into the scheme. If this was the *sole* goal of scheme design then the sponsor should close the scheme to new entrants and reduce or stop further benefit accrual by existing scheme members³⁰. Better still, it should never have set up the scheme in the first place. Reducing or if possible eliminating future benefit payments is a very effective way of reducing the cost of meeting these payments, particularly as it is effective even when combined with practically all other ways we might envisage for managing down costs (e.g. choosing a more effective investment strategy, reducing administrative costs etc.).

Presumably, however, the sponsor had other goals when first setting up the pension scheme, e.g. the scheme might have been seen as an effective recruitment aid or other tool for effective staff management and incentivising employees. Minimisation purely of contributions into the scheme may not be the only or even main objective as far as the sponsor is concerned. We also need to be cognisant of the *underlying purpose* behind the entity we are considering. Moreover, once established, the interests of *other stakeholders*, particularly here the scheme beneficiaries, come into play. These may conflict with the interests of the scheme sponsor³¹.

Organisation of ERM

- 4.6 We will concentrate in Section 5 on the important impact that these subtleties have on the practical application of ERM to pension funds. For the remainder of this section we will focus on ERM as more traditionally applied to profit-making business organisations, given that the holistic focus referred to in Section 4.3 should remain applicable irrespective of the type of entity in question.
- 4.7 Given the holistic emphasis of ERM, we should expect it to be concerned with the totality of systems, structures and processes within the enterprise that identify, assess, treat, monitor, measure, report and/or communicate internal and external sources of risk that could impact the enterprise.

³⁰ This type of action has become increasingly common of late amongst sponsors of defined benefit pension schemes in the UK.

³¹ Elsewhere we note that the sponsor may itself be a beneficiary. It is crucial for trustees and their advisers to form a view on what is the underlying purpose of the scheme and what their own role involves before they can be clear on their own objectives. Clarity of objectives is an essential part of any risk management process.

Organisationally, ERM is generally facilitated by:

- (a) Some centralisation of key risk management activities or at least the coordination of these activities within the organisation;
- (b) Adoption of a common risk management 'language' across the organisation so that risks can be appropriately compared and contrasted and also managed consistently across the organisation;
- (c) An emphasis on governance and behaviours (the risk management 'culture') as well as on specific risk control processes and measurement activities;
- (d) A holistic consideration of risk information, not just relating to past events (e.g. losses or near misses), but also current performance (e.g. risk indicators) and potential future outcomes (e.g. risk assessments and risk profiling); and
- (e) Emphasising co-ordinated decision-making and implementation.

4.8 To the above list, most commentators would also add *Board emphasis and commitment*, as well as *communication*. If effective risk management really is to be viewed as important by the organisation then the lead must come from the top and the stakeholders need to understand how the organisation seeks to add value by managing risks and opportunities in tandem.

4.9 The need to involve the Board is perhaps most obvious right at the heart of any effective ERM implementation process. This is the requirement to set the organisation's overall *risk appetite* and hence *risk budget*.

This might be set by reference to some absolute upper limit (to say yearly overall profit) above which the Board never wants any loss to fall. However, a hard upper limit is in practice virtually impossible to achieve; almost any business activity might in theory incur an arbitrary large loss if the circumstances involved are sufficiently undesirable, e.g. any business might be wiped out if all of its activities were destroyed by a freak natural disaster.

So, risk appetite would more normally be expressed in probabilistic terms (e.g. a loss no greater than X with a given confidence level) or perhaps by reference to a lower level of 'practical' loss that the organisation might focus on and expect not to incur other than in the most exceptional of circumstances³².

4.10 Readers familiar with the concept of Value-at-Risk (see Section 6 for further details), will appreciate that a probabilistic expression of risk appetite needs not just a confidence level but also a time frame.

Correct handling of time frames in pension fund risk management offers many pitfalls for the unwary. For example, take the pension promises being provided by a poorly funded scheme that has a large deficit on a winding-up/buyout basis but standing behind which is a large well capitalised sponsor with a strong credit rating. The promises might currently seem secure on the basis of the (currently strong) sponsor covenant. However, sponsor business

³² This type of specification might more precisely be referred to as the organisation's *risk tolerance*, with appetite for utilising up the tolerance also dependent on the magnitude of the expected rewards available from taking on risk exposures.

models and credit ratings can change surprisingly rapidly over time. A currently highly rated company could still quite easily default over the coming, say, 10 years, if business trends are unkind to it. This is well within the timeframe of interest as far as many of the scheme beneficiaries are concerned.

ERM in practice

4.11 Most practical implementations of Enterprise Risk Management then incorporate several related elements, including:

- (a) A governance framework, often including a specific risk team with the right skills and experience and/or chief risk officer or equivalent, designed to ensure that the risks actually being run by the organisation are within its overall risk budget. Where practical, the governance framework would also aim for the mix of risks to be chosen as optimally as possible in relation to any reward that might be expected from carrying the risks.

The framework would include consideration of whether risks that are present should be accepted 'as is', mitigated in some way, or transferred away (or potentially added to, if the expected reward from doing so is great enough). Particular emphasis would normally be placed on ensuring that, as far as possible, all pertinent risks have been considered. For example, the framework might use (regularly updated) targeted staff workshops, risk registers, analyses of risks that have actually arisen, analyses of the experience of other entities, professional advice etc³³.

- (b) Quantification, where practical of the different risks to which the entity is exposed. Some types of risk, e.g. (external financial) market risk, are typically regarded as easier to quantify than others, e.g. many types of operational risk. This quantification might be relatively narrowly focused on, say, regulatory capital requirements. However, the ethos of ERM is more naturally adhered to if more broadly based and holistic considerations are focused on here. For example, we might be interested in:
 - the broader impact that risks, if they arise, might have on the entity's credit rating, if any, and, if it is a corporate, on its ability to raise new capital; as well as
 - more narrowly focused criteria such as whether it has sufficient cash flow to fund its immediate liquidity needs.
- (c) A methodology for combining risk measures so that risk management is applied most effectively where it is most appropriate to do so, given the ultimately limited resources that any entity is likely to have available to it.
- (d) Ongoing review of the reliability and completeness of the risk management process and analyses aimed at identifying significant vulnerabilities before they actually materialise. These might include stress testing and/or reverse stress testing³⁴.

³³ An important adage to remember here is that what is measured generally gets managed. It is therefore important to ensure not only that measurement and monitoring does take place, but that the right things are being measured, so that the right exposures are also likely to get managed.

³⁴ A stress test will generally involve a predefined set of circumstances (e.g. a repeat of the 1970s Oil Crisis, a 40% decline in equity markets, a repeat of the 2007-09 credit crisis, the largest 2 counterparties defaulting simultaneously, ...), that are unlikely but within the realms of plausibility, which we then apply to the entity,

- (e) Controls and limits that are formulated, agreed, implemented and monitored as appropriate³⁵.

Throughout all of this is the need to ensure that there is effective cultural buy-in throughout the entity to the Board's agreed risk budget. It will be difficult if not impossible for any centralised function to 'control' risks effectively on its own. For the entity to succeed in this respect, everyone needs to be pulling in the same direction (and, of course, for this direction to be a helpful one in the first place!).

without necessarily worrying too much about the exact likelihood of occurrence. A reverse stress test involves identifying the types of outcomes that will result in the business model coming unstuck, however unlikely they might be believed to be at present.

³⁵ Chapman (2006) makes the point that more 'controls' do not necessarily equate to more 'control'. Controls involve systems and processes and usually involve some staff effort to adhere to and/or to promote. If there are too many of them (particularly on relatively irrelevant activities) then this may, for example, diminish the respect individuals place on the remainder to the detriment of the overall control framework.

5. Similarities and differences between pension funds and other enterprise types

5.1 As we have explained earlier, many elements of ERM are just as applicable to pension funds as to any other type of organisation. However, there are some important aspects of pension funds that do not easily fit within the traditional understanding of 'enterprise' risk management. In this section we explore some of the more important distinguishing features of pension funds.

Purpose of entity

5.2 Perhaps the most obvious differentiator is the *explicit defined purpose* for which a pension fund exists.

Most businesses nowadays have very wide powers and objectives and can in principle change their business focus very substantially. An example is Nokia which used to make rubber boots (amongst other things), but is now primarily focused on mobile telephony. Legally, the powers that a (UK) company has are primarily set out in its Memorandum and Articles of Association, but these are usually deliberately very widely drawn.

In contrast, pension funds (at least in the UK) normally exist just for the purpose of providing retirement benefits³⁶ to a specified class of individuals, their 'beneficiaries'. In the UK this is usually facilitated by them being established in the form of trusts. The trustees of the pension fund will then have powers that are explicitly defined in a trust instrument and are required to follow the specific purpose for the fund set out in this instrument.

An important corollary of this observation is that much of the shareholder focus that is accorded to ERM in the context of a business enterprise, including a need to decide which out of a wide range of possible activities the business should focus on, becomes less relevant for many (UK) pension funds³⁷. Or rather, it is less relevant when the pension fund is viewed in isolation, although it may still be very relevant when the pension fund and sponsor are considered in tandem.

5.3 The defined purpose underlying the pension fund (and its effective inability to raise further funds itself by pursuing new business opportunities or raising new capital from outside sources) highlights the issue of who will make good shortfalls, if they arise, in its assets versus its liabilities. Nowadays, at least in the UK, this has at least three important components:

(a) *The investment strategy being followed by the fund*

Stating the obvious, the greater the risk (i.e., here, principally the mismatch relative to the liabilities) the more likely it is (at least in the short term) that a material funding shortfall might arise or exist at a time when the sponsor might default. Over the longer term the picture is not so obvious. There might be some expected systematic reward for taking the risk in question (e.g. an 'equity risk premium') which over a long enough time frame counteracted the extra short-term risks involved in a more mismatched investment strategy.

³⁶ Pension funds often also provide some measure of mortality and disability benefits to their beneficiaries.

³⁷ As noted earlier, this is less true in some other jurisdictions, where private pension provision may be more commonly provided by insurance companies (which potentially have other business lines) and probably also for DC arrangements more generally.

An issue that then arises is whether (and, if so, in what manner) it is reasonable to take credit for these supposed additional sources of long-term returns before they actually materialise (if they ever do)³⁸. Much of the current debate about the appropriateness of funding versus solvency ‘valuations’ (and what each might be best suited to measure etc.) is related to this topic.

(b) *Sponsor covenant risk*

If a shortfall does arise that cannot be met by the scheme’s own assets then the first port of call is likely to be the sponsor. In some jurisdictions, the sponsor can walk away from the fund and wind it up if it so wishes without making good any resulting shortfall. However, as noted previously, in the UK this option is no longer in practice open to scheme sponsors. Instead, winding up of a UK pension scheme by a solvent employer potentially triggers a debt on the sponsor, the size of which is designed to provide sufficient assets to ensure that the scheme can be wound up and meet all of its liabilities as they become due. In the UK there is now a well established practice of managing part of the sponsor covenant risk through contingent funding arrangements whereby specific assets or revenue streams of the sponsor are earmarked for specific risks in the pension scheme and become assets of the pension scheme if certain pre-specified events or conditions occur.

(c) *The impact of external protection arrangements*

Again, there are substantial differences between jurisdictions. In the UK, the Pension Protection Fund³⁹ provides some security to beneficiaries in the event of an occupational pension scheme having insufficient assets to meet its liabilities and a sponsor unable to meet the shortfall. Pension arrangements structured as insurance policies are subject to a different protection arrangement in the UK, namely the Financial Services Compensation Scheme⁴⁰.

Exactly how schemes (and sponsors) should take into account these types of protection arrangements is not always clear, given the potential moral hazards involved. Hatchett *et al.* (2010) refer to recent court rulings indicating that it would be counter to public policy to allow UK pension trustees and others to ‘game’ the

³⁸ For example, if individual scheme members believed in the existence of a long-term equity risk premium they could in principle capture this supposed source of additional long-term returns themselves by investing other savings they possess accordingly. They might therefore not want the scheme to take advance credit for such premiums, and instead might want it to be funded on the basis that these additional long-term return sources might prove illusory. To do otherwise would in effect involve them doubling up their ‘bets’.

³⁹ According to the (UK) Pension Protection Fund’s website, www.pensionprotectionfund.org.uk, the PPF has been established to “pay compensation to members of eligible defined benefit pension schemes, when there is a qualifying insolvency event in relation to the employer and where there are insufficient assets in the pension scheme to cover Pension Protection Fund levels of compensation”. The final part of this sentence reminds us that not all of a scheme’s benefits may be covered by any applicable protection scheme.

⁴⁰ The FSCS is also the relevant protection arrangement for other parts of the UK financial services industry, e.g. other insurance policies, bank accounts and products supplied by the asset management industry. It has a series of supposedly separate compartments for different parts of the financial services industry. However, losses in one compartment can exceed the resources available to that compartment alone, triggering a potential pass-through to other compartments. More generally, the 2007-09 credit crisis has shown that losses in one part of the financial services industry, if large enough, can create contagion, via the general public purse.

PPF in their decision making in order to improve members' benefits. Whether this is practically achievable is less clear and in any case such a ruling may have no relevance in other jurisdictions.

Social aspect of pensions

- 5.4 Another way in which pension funds typically differ from business enterprises is the *social aspect* involved in pension provision. Modern societies generally want to ensure that older members of society have a decent income in retirement. Many jurisdictions meet this goal primarily via state-run social security arrangements⁴¹. However, most jurisdictions also look to private pension provision or other private savings vehicles to meet some of the income needs of individuals in retirement.

Some implications of this aspect of pension provision are:

- (a) Private pension arrangements may be accorded favourable tax treatment, to encourage people to save for their retirement. This might apply to contributions to the pension arrangement, to the returns earned on the assets held within it or to any benefits eventually drawn from it (or to a combination). However, typically the favourable tax treatment is conditional on the savings not then being accessible by the individual concerned prior to a certain age.
- (b) How favourable this tax treatment might be, and the characteristics that a pension arrangement needs to exhibit to achieve this tax treatment, can vary through time. They will depend on what successive governments (and society at large) views as particularly important social goals to emphasise. In the UK we have seen many changes in recent years to how much individuals are able to contribute to a private pension arrangement while still benefiting from favourable tax treatment. There have also been changes through time in the benefit structures that DB pension schemes have needed to exhibit in order to obtain favourable tax status. These include imposition of mandatory revaluations in deferment, to make treatment of early leavers versus long-staying members of the workforce more equitable. In this respect, DB pension schemes may be viewed as having been relatively tightly regulated, at least relative to many types of traditional business enterprise.
- (c) Conversely, in some jurisdictions DB pension funds may have been subject to less stringent capital requirements than if they had been established as insurance companies but provided the same benefits to their beneficiaries. This is particularly noticeable in jurisdictions such as the UK where the two are viewed differently and private pension provision is an important part of overall old age retirement provision. In the UK, many DB pension schemes are in deficit. They would have insufficient capital to meet the capital requirements that they would be subject to if they were established as insurance companies, without substantial capital injections from their sponsors. In other jurisdictions, pension schemes may commonly be structured as insurance companies, rendering this point irrelevant.

⁴¹ In jurisdictions where social security systems do not provide the majority of old age income provision, there will still usually be some social security underpin (or equivalent) applicable to the poorest members of society. These members of society may be incapable of building up sufficient private pension provision to meet their retirement needs.

As long as a strong emphasis is placed on the social aspect of private pension provision, any reduction in benefit security implicit in not regulating pension funds in the same way as insurance companies may be considered a suitable quid pro quo for continued active involvement of private businesses in old age provision. However, a risk is that if the social aspect of pensions weakens and the active support of business falls away (e.g. schemes continue to close to new entrants and/or new benefit accrual) then the political willingness to continue with differentiated regulatory treatment may wane. This topic is one that regularly seems to get raised at a European Union level. Many EU member states have less well developed DB private pension provision than is the case in, say, the UK.

Balancing decision-making

- 5.5 A further differentiator (compared with the generality of situations in which ERM might be applicable) is the existence of more than one party (other than the customers/beneficiaries) involved in the overall arrangement. These are the scheme itself and the sponsor. This raises the issue of whether (and to what extent) there may be (potential) conflicts of interest between the parties and how these (potential) conflicts might then be best managed.

Of course, in practice there are almost always several different parties (stakeholders) involved directly or indirectly in *any* business arrangement. For example, staff working for a firm may have a different perspective from the firm's owners. Moreover, Group companies, particularly where subsidiaries are not wholly owned or are separately regulated, face similar explicit potential conflicts of interest. Often an important part of an effective ERM framework is then to ensure that intra-group exposures are managed effectively. Even if the subsidiary is wholly owned, the subsidiary Boards may still have legal and regulatory obligations to ensure that:

- sufficient capital is held in the subsidiary rather than merely at the group level; and
- relevant service level agreements and other contractual arrangements are in place defining what services the subsidiary can expect to receive from the parent, at what cost and who is liable if the service is deficient etc.

Some of this might seem additional bureaucracy when times are good but can become essential if times become rough.

However, the potential conflicts of interest may be more acute and difficult to manage effectively with an occupational pension scheme, because:

- specific (and occasionally conflicting) powers may be assigned in law to the different parties; and
- there is often a lack of congruence between the interests of beneficiaries and the interests of the sponsor.

Balancing stakeholder conflicts

- 5.6 In the UK, many DB schemes currently have large deficits. Some of these are large enough that they form a substantial fraction (occasionally more than 100%) of the realistic value that might be placed on shareholders' equity within the sponsor. Under the current regulatory regime, if the scheme is under-funded (relative to a funding target agreed between the trustees and the sponsor) then it has the power to seek additional contributions from the sponsor. Indeed the trustees (acting on behalf of the beneficiaries) will usually have an

obligation to do so. If, however, the schedule of contributions required under such a 'recovery plan' is too onerous then this could drive the sponsor to the wall.

Some delicate negotiations may be needed to resolve this conflict of interest. Individuals who have material interests on both sides of the fence (including potentially any employees of the sponsor who are also trustees) need to be careful to ensure that they act appropriately. This may require taking suitable professional advice and potentially stepping aside from negotiations if they are conflicted. The trustees may need to accept liens and other charges on company assets or in specie transfers of particular assets perhaps encumbered in some way⁴² in lieu of additional contributions⁴³.

5.7 An additional complication here is that the interests of different beneficiary groups may also differ, and the trustees generally have a collective legal obligation to look after them all (irrespective of the status of any particular trustee). For example:

- (a) The interests of non-employee beneficiaries might be exclusively focused on honouring the pension promises that they think they have been given. They might therefore be relatively hawkish about seeking additional contributions quickly (or otherwise mitigating against the risk of sponsor default) even if it is quite likely to drive the company to the wall. Employee members might have a greater interest in holding on to their jobs, so might be less hawkish in this respect.
- (b) Conversely, if the sponsor did default and the scheme was in deficit, different members might find their accrued benefits protected differently, depending on the winding-up provisions set out in the scheme's governing documents and on the impact of protection mechanisms such as (in the UK) the PPF. This might alter the picture from what might be expected as per (a)⁴⁴.

An analogy with other financial entities

⁴² For example, the sponsor might offer to contribute property freeholds to the pension scheme, in return for reduced cash contributions to the scheme and a commitment from the scheme that it can remain as tenant in the relevant freeholds. This can be viewed as an example of a 'sale and leaseback' arrangement. It should increase the asset base available to the scheme in the event of the sponsor defaulting (because the scheme would then own the property freeholds). However, if the sponsor did actually default then these freeholds might not be as valuable as the scheme might otherwise expect, because they would then be being let out to a tenant in default.

⁴³ Trustees may also consider insuring with a third party against the risk of the sponsor defaulting (or threatening to do so in such negotiations). They might be able to do this without the approval of the sponsor. Nowadays, derivatives such as credit default swaps exist in which a premium is paid in return for payment (or value transfer) in the event of a company defaulting. As explained in Kemp (2005), extensive utilisation by a scheme of this risk mitigation strategy may have additional consequences as far as the sponsor is concerned. The third parties providing the 'insurance' may seek to hedge their own risks by, in effect, shorting any bonds or other debt that the sponsor has issued, making it more difficult for the sponsor to raise further capital if needed. More explicit (non-market mediated) pooling of such exposures between schemes might also be contemplated. For example, several schemes might swap the exposure each one has to a single sponsor for a more diversified pool of exposures spread across several sponsors. This may not perhaps be thought to be practical in, say, the UK given current legislation. However, arguably the UK's PPF can be thought of as a mechanism that, in part, achieves just such a diversification across UK sponsors in aggregate.

⁴⁴ Relevant legislation may also override whatever winding-up provisions are specified in the scheme's own governing documentation.

- 5.8 Other financial vehicles also exist with explicit defined purposes. In a non-pension fund context these might be called *special purpose vehicles* (SPVs). Many pension funds would be very reluctant to be associated with some types of SPVs, but some lessons can still be drawn from such analogies.

Take, for example, *collateralised debt obligations* (CDOs). These involve different investors collectively investing in a portfolio of debt instruments. However, they do not operate like conventional collective investment funds, in which each unit or share is treated equally. Instead, with a CDO different investors invest in different *tranches*, which have different priorities in the event of there being insufficient assets to redeem in full all investors' entitlements. The most senior tranches are met in full before less senior ones receive any redemption proceeds.

As explained in Kemp (2009) it is possible to reformulate the balance sheet of essentially all types of financial entities (including pension funds) in a manner analogous to a CDO (see Appendix). The analogy is not so much with CDOs as investment vehicles⁴⁵, but with the transparency in structure and how the business model is being implemented. We have already used this analogy to highlight the importance of the sponsor covenant in the delivery mechanism for pension funds. Contingent assets, which have featured heavily in funding and security arrangements of many UK pension funds in recent years, usually under SPV wrappers, can also be included in this analogy.

Discretions, expectations and reality

- 5.9 DB pension funds also share some other characteristics with such vehicles, for example:
- (a) Different beneficiaries may have different priority rights in the event of the fund winding-up. The sponsor itself may be a 'beneficiary' of the scheme, in a technical sense, if any eventual surplus on windup might return to it, or there are other situations in which such repayments could occur. If so, it usually has a different set of interests than the generality of (other) beneficiaries.
 - (b) DB pension funds may be viewed by some pension experts as relatively understandable and transparent, but many others less involved in their day-to-day management might view them as relatively opaque. In the UK, the difficulty many people have had in understanding fully the financial characteristics of DB pension funds may have contributed to the spate of closures and partial closures we have seen over the last few years.
- 5.10 The nearest parallels to such a situation in the UK life insurance industry are probably with-profit funds. With-profit policyholders are entitled to some share of the profits accruing on such funds, but with some guaranteed underpin underwritten by the insurer. The guarantee typically relates to the original sum assured plus bonuses already declared.

Some years ago the potential conflicts of interest that applied to such funds were recognised and the governance arrangements that they needed to adopt were refined. The role of the with-profits actuary was established. He, in effect, focuses on the policyholders' interests. These funds were also required to come up with a (publicly available) document setting out

⁴⁵ CDOs came in for harsh criticism from some quarters or generated large losses for some market participants during the credit crisis because they turned out to be difficult to value.

in broad terms for policyholders how the fund was expected to be managed. This document is called the fund's Principles and Practices of Fund Management ('PPFM'). The intention of this document is:

- to ensure greater consistency and predictability in the use by insurers of the discretions available to them in relation to with-profits business;
- to improve transparency; and
- generally to improve the governance of with-profits insurers.

The central issue of discretion arises in a number of areas, including investment and bonus policy, smoothing, charges and expenses, new business levels, the management of any inherited estate and the balance between the interests of with-profits policyholders and shareholders.

- 5.11 The exercise of discretion, expectations of pension scheme members and the balance between the interests of pension scheme members, employers and other stakeholders are also issues which trustees and sponsors of pension schemes have to reckon with. It can be argued that the requirement under the current (UK) Pensions Act that each UK (DB) pension scheme has its own scheme actuary has a similar underlying purpose to the role of the with-profits actuary. We might therefore ask whether it would be desirable to have some equivalent to the PPFM for such schemes. To some extent this already exists, because there are obligations on scheme actuaries to set out the implications of adopting different contribution strategies. However, arguably it is not as formalised as a (UK) with-profit fund's PPFM.

One difference between the role of the scheme actuary and the role of the with-profits actuary is that:

- the scheme actuary's primary duty is to the trustees rather than to the beneficiaries; while
- the with-profits actuary perhaps has a clearer direct line of responsibility to the underlying policyholders of the with-profits fund.

Whether this difference is relevant in practice is less clear.

The scheme actuary arguably does not have a direct line of communication to members (although some lawyers argue that the actuary's duty of care extends to the members). If trustees follow a course of action that the actuary believes is clearly not in the interests of beneficiaries then there are options available to the actuary, e.g. to resign. If, however, the actuary wanted to communicate directly to the members the potential impact to their benefits of the policies being pursued by the trustees then there is no practical avenue to do so except via the trustees.

Conversely, it can be argued that the sole responsibility of the scheme actuary's client (the trustees) is to look after the beneficiaries, so should not have the same conflict of interest as the board of a life company. Moreover, there are whistle blowing requirements on scheme actuaries, which would require the scheme actuary to report to the regulator if he or she thinks the trustees are in breach of their duty. With-profits and other actuarial function holders within UK life companies are subject to similar whistle blowing requirements.

Perhaps a more important difference in practice is that, while much of the governance is in place for the discussion referred to in (a) to take place between the trustees, sponsors and their advisers, there is no requirement for any of the agreed policies to be made publicly

available. In contrast, the PPFM is publicly available. It is also required to contain sufficient detail to enable a knowledgeable observer to understand how the firm has exercised its discretion in managing the with-profits fund, and hence what the possible risks and rewards are of being a member of that fund.

Transparency of risks and expectations

- 5.12 Some advantages and disadvantages from an ERM perspective of preparing (and potentially disseminating) a more formal document along the lines of a PPFM are set out below.

Advantages include:

- (a) Formal preparation of such a document would focus the minds of individuals responsible for managing the scheme on the issues involved and on the full range of potential risks to which the scheme (and sponsor) might be exposed. This is particularly true if it sets out how the scheme/trustees/sponsor might expect to react in the event of the scheme/sponsor getting into distress. It would also highlight potential conflicts of interest that might arise between scheme and sponsor;
- (b) Advance preparation concerning how to deal with problems before they arise is likely to lead to a better overall outcome. Among other things it reduces the risk of surprises;
- (c) Public disclosure of key policies and in particular how they seek to balance conflicting objectives is of immense value in communicating the risks to stakeholders and providing opportunities for challenge; and
- (d) Mitigation strategies that are practical to develop in advance of trouble may be much more difficult or impossible to develop if and when trouble does actually materialise.

Disadvantages include:

- (e) Preparing a robust document along these lines that covered the relevant issues in sufficient detail might be a significant challenge. In the UK, post the Pensions Act 2004, considerable effort has been devoted by many pension schemes towards developing and formally documenting their funding and investment policies and developing tools and processes for managing the sponsor covenant. Some commentators might therefore expect that the additional effort for those who want to go the extra distance might not be too onerous. However, we suspect that the governance challenge would still in many cases be quite considerable;
- (f) Disseminating such information publicly might have undesirable consequences as far as the sponsor and or scheme/trustees were concerned. For example, it might highlight how important the continued health of the sponsor was to honouring existing pension promises, or how important the health of the scheme was to the sponsor's ongoing business model. This might be viewed as a particular issue if it is perceived that the position is already strained and dissemination of a document equivalent to a PPFM might make the problem more acute;

- (g) Poorly worded, the document might unhelpfully constrain one or both parties in ways that they would not like. However, there is a flip side to this, which is that part of the benefit of having such a document is that it might provide greater clarity of likely response were problems to arise. This should aid planning. Complete flexibility of future action may appear to be helpful (to a business). However, one reason why modern developed societies have legal systems (and presumably one reason why pension promises are generally set up within some underlying legal framework) is because the public interest is better served if there is greater certainty of outcomes than would be the case if no-one ever agreed to anything.

Forward planning

- 5.13 A half way house might be to prepare such a document but only use it internally⁴⁶. This could be akin to the Own Risk and Solvency Assessment (ORSA)⁴⁷ that will be introduced for EU insurers under Solvency II (see Section 8).

We might characterise such a document as describing a ‘journey plan’ that would help all interested parties formulate an integrated approach to funding, investment policy and other risks. The (UK) Pensions Act has encouraged investment consultants, scheme actuaries, covenant advisers and others to work together rather than in silos each on their own respective patches as far as UK pension schemes are concerned, but we believe that an all embracing framework is rare in practice.

However, one anonymous reviewer of this paper cautioned against use of the term ‘journey plan’ on the grounds that it might induce a dangerous complacency. In the reviewer’s experience, many pension funds have, or are considering, ‘journey plans’ but they are almost never anywhere near as comprehensive as the sort of document being suggested here. In particular they rarely include planning for difficult issues between trustees and sponsor.

Exploring exactly how far ‘into the future’ such a document should peer could itself form a helpful debate. For example, should it include an exploration of what might happen in the very long term, in an ‘end game’ that might involve a run-off of the scheme or a buy-out with an insurer? Should it focus on the specifics of what might happen if the sponsor defaulted or otherwise disappeared? There is strong regulatory pressure elsewhere in the financial community in favour of firms drawing up ‘living wills’, also called ‘recovery and resolution plans’⁴⁸, despite the extra effort firms need to incur to do so. This reflects the

⁴⁶ We refer here to a single integrated document. We are conscious that (UK) Pensions Act requires the preparation of a Statement of Investment Policy (SIP) as well as a Statement of Funding Principles (SFP); however, these requirements have evolved separately over time and the resulting documents are usually prepared separately, thus making it easier for decision-making on these linked policies to be compartmentalised. There is also a tendency for them to be drawn very widely, to avoid constraining future actions. They may therefore be at one end of the spectrum envisaged in Section 5.12(g). By contrast the ORSA requires an integrated and more dynamic approach. In the context of pensions, if the entity is defined as the pension fund and the sponsor combined then an ORSA would further join-up with the sponsor’s business strategy as well as involve consideration of stakeholder issues at the boundary between the sponsor and the trustees.

⁴⁷ The ORSA is part of a firm’s risk management system and a key driver for embedding ERM into the business, requiring an assessment of the overall solvency needs taking into account the specific risk profile, risk tolerance limits and business strategy of the firm and demonstrating compliance on a continuous basis with the capital requirements.

⁴⁸ See, for example, Bank of England (2009).

rather obvious but often unpalatable observation that most organisations are eventually taken over, default or otherwise cease to exist.

- 5.14 Some of the issues highlighted above are reduced with (pure) DC schemes. For example, the continued financial health of the sponsor will usually be much less important⁴⁹. There is no direct equivalent in a UK life insurance context to a PPFM statement outside the with-profits part of the industry, suggesting that the FSA believes that potential conflicts of interest are less in this part of the insurance industry.

However, UK insurance companies are still required to prepare Individual Capital Assessments (ICAS) and other entities such as UK banks and asset managers are required to prepare equivalent analyses, called ICAAP. Solvency II will require ORSAs for all insurers, not just with-profits ones, indicating that regulators believe enhanced risk management disciplines have wide merit.

- 5.15 A PPFM or ORSA or equivalent could also usefully be formulated for (or provide a useful template for) not just the scheme in isolation but also the scheme and sponsor in tandem. Insurance companies and banks are required to incorporate pension risk within their ICAS/ICAAP/ORSA, but we think that in many cases their staff pension fund is still largely managed as a silo.

Outside the financial services industry, corporates saddled by pension schemes which are disproportionately large relative to their core business operations could be obvious benefactors of ERM.

ERM principles should not, however, be limited to just these companies. Large companies with currently negligible pension scheme deficits can over time become smaller companies with much larger pension deficits. Part of the benefit of ERM is that it enforces additional forward planning on a joined-up basis, particularly in areas that tend to get overlooked, or are viewed as unnecessary diversions, when times are rosy.

⁴⁹ However, it may still not be irrelevant to a (pure) DC scheme. For example, the scheme might be heavily reliant on the continued existence of the sponsor for receipt of administrative services etc. It might offer investment options involving reinvestment in the shares or debt of the sponsor (uncommon in the UK but less uncommon in some other jurisdictions, if we define 'pension schemes' widely enough). Members' pots might also be indirectly exposed to the fortunes of the sponsor. For example, it might be a large company whose shares form a material fraction of an entire local equity market.

6. Modelling and quantifying risks

Model risks

6.1 A very important part of managing risks is to model and quantify them. As we noted in Section 3.8, not all risks are easily amenable to quantification. Moreover, to quantify a risk normally requires the creation of a ‘model’, i.e. here a quantitative abstraction of reality, and this introduces several types of *model risk*, including:

- (a) *Model selection risk*. This is the risk that our underlying model framework is wrong⁵⁰;
- (b) *Model construction risk*. This is the risk that although our underlying model framework is sound we somehow introduce errors in how it is actually constructed. Quantitative models usually involve the application of mathematical algorithms, which are often implemented using spreadsheets or other types of computer software. Model construction risk may therefore be mitigated in part by adopting appropriate Information Technology (‘IT’) disciplines.
- (c) *Parameter risk*. This is the risk that although our model is actually intrinsically sound, we feed it the wrong input parameters. This can also occur for a variety of reasons. Some may also have IT aspects. Others may involve misunderstandings regarding what inputs the model needs on the part of users (who will often not be the same individuals as those who have selected the model or those who have constructed it).
- (d) *Model output misinterpretation risk*. This is the risk that (a)-(c) have not materialised but those making decisions based on the output of the model misinterpret what the output means when deciding what to do. This may again arise because it is normally good practice for those creating models to be different to those actually interpreting their outputs⁵¹. Some of the criticisms that quantitative modelling incurred at the height of the 2007-09 credit crises arguably fell into this category. Decision-makers within some firms appear to have been too willing to conclude from model outputs run before the crisis that ‘all was well’, when actually the models were not focusing on the right issues. Was this a failure of models per se, of the particular models being used by the firms involved, of the model creators, or of decision-makers who did not spend enough time understanding the limitations of the models on which they were basing their decisions?

A particular issue here is that decision-makers may be fooled into believing that the more complicated the model the more likely it is to be correct. Kemp (2010b) points out the potential flaws of Monte Carlo simulation techniques in this respect. They may look very sophisticated and involve large run times and significant expense to

⁵⁰ An anonymous reviewer has reminded us of George Box’s maxim that “*all models are wrong, but some are useful*”. In reality, model selection is more about shades of grey than about black and white per se. This also applies to parameter selection risk. This mirrors the point we made in Section 3.8 that the sorts of risks covered by ERM and operating in practice in business life are at best only measurable imperfectly.

⁵¹ Anyone who has created a complicated spreadsheet or other type of IT tool will be aware of how easy it is for errors to creep into such tools and how much easier it is for someone other than the creator to spot them. They will also be familiar with the problem of being ‘too close’ to the model construction to be able to see the wood from the trees when interpreting its output. It is very easy to see what you want to see rather than what is really the correct conclusion to draw from the output. Thus IT design usually involves some differentiation between developers, checkers, users and interpreters.

create. However, they may only be as good as the underlying model from which the random numbers characterising the simulations are being drawn.

However, we reject the notion (particularly in the company of actuaries!) that the best response to model risk is to avoid using models. This would focus overly much on one type of risk (i.e. model risk) but cripple our ability to manage other types of risk more effectively. Instead we should ideally aim for our models to be as straightforward, as robustly created, as easily used and as easily interpreted as possible.

Model structure

6.2 To create a model that can help us analyse the dynamics of a (DB) pension scheme in more detail we need to decide:

- (a) What types of risk we want to model;
- (b) What sorts of output we want the model to provide; and
- (c) How we will create and implement the model.

6.3 The most obvious types of risk to model are ones that most influence the ongoing dynamics of the pension scheme. O'Brien *et al.* (2010) explored what might be the best pension scheme risk exposures to include in corporate accounts, in order to contribute to the debate regarding the International Accounting Board's (IASB's) IAS 19 exposure draft, IASB (2010), on the accounting for defined benefit pension schemes⁵². They suggested that for (UK) DB pension schemes the main risks could be encapsulated in a table showing the (upward and downward) sensitivities of assets, liabilities and current costs to the following factors:

- (a) Price inflation and salary growth
- (b) Real salary growth
- (c) Interest rates⁵³
- (d) Equity prices
- (e) Expectation of life⁵⁴

⁵² Enhanced disclosure of risk information may itself foster a more effective ERM mindset. It certainly heightens focus placed on whatever is going to be disclosed. O'Brien *et al.* (2010) take as read the principle that it is desirable for companies to disclose publicly the risks they are exposed to via defined benefit pension schemes, as long as the disclosures are informative, not disproportionate and do not give undue weight to one business risk versus another. This stance is consistent with ICAEW (2002) and most other accounting standards bodies. Management is acting on behalf of shareholders and should give an account of the major risks that the business might face to these shareholders and other stakeholders. Improved disclosure is also consistent with most emerging financial sector regulatory frameworks. For example, the three pillar frameworks underlying Basel II, Basel III and Solvency II all contain a third pillar that focuses on market transparency and public disclosure of information. However, disclosure may not always be desirable in practice, particularly if it relates to confidential information about business strategy. Where the interests of sponsor and pension fund diverge there may be additional issues to consider.

⁵³ Current narratives and guidance in the main refer to 'discount' rates, i.e. rates used to calculate liability valuations. One of the main observations of O'Brien *et al.* (2010) is that it would be better if these instead referred to 'interest' rates, i.e. were applied to both assets and liabilities, so that it was easier for external parties to understand the extent to which assets and liabilities were well matched in relation to interest rate risk.

⁵⁴ Inclusion of life expectation sensitivity in such a table reminds us that upward trends in longevity have had a material impact on overall pension scheme funding levels in the UK and may continue to do so in the future. Its presence also highlights some inherent uncertainty in the current value placed on the liabilities. In the absence of a well developed market in longevity, any valuation placed on the liabilities will include a significant

O'Brien *et al.* (2010) of course accept that there are other economic factors that may be expected to influence pension scheme liabilities. For example, (UK) corporate DB pension schemes often have caps (and floors) on the magnitudes of the inflation-linked increases that might be applied to pensions in payment or in deferment. The levels of these caps and floors can materially influence future liability progression.

6.4 From an ERM perspective, it is also desirable to include several other important risk elements, including:

- (a) *Sponsor covenant risk*, i.e. who suffers on the downside. We have already noted that this is a very important risk as far as many (UK) DB pension schemes are concerned. It is largely ignored by O'Brien *et al.* (2010), presumably on the perfectly reasonable grounds that corporate accounts primarily focus on the going concern position and the sponsor covenant only becomes particularly significant in the event of potential wind-up⁵⁵. However, in this paper we are specifically considering ERM not just from the sponsor perspective but also from the scheme perspective (and from the combination). Sponsor covenant risk may not be particularly important as far as shareholders of the sponsor are concerned (because they can avail themselves of the shareholder 'put' option in the event of firm failure) but is very important as far as beneficiaries and hence trustees are concerned.
- (b) *Who benefits from the upside?* We have also noted that there is, in risk terms, a spectrum between DB and DC. The more the members benefit or lose out from movements in economic variables then the more the scheme can be thought of as DC-like. In a DB context, this means that it is important to understand the extent to which the impact of favourable outcomes accrues to members rather than to the sponsor. A further advantage of incorporating such an element is that it makes the model less UK-centric and more globally applicable. In overall terms, the more one party is favoured relative to the other, the greater the proportion of economic value that should be ascribed to that party in any intrinsic apportionment of (market) value.
- (c) *Operational risk*. Operational risk may not always be given great prominence by pension fund risk managers but it has one important characteristic that normally differentiates it from most other types of risk. It is generally asymmetric, i.e. errors generally work to the detriment of the fund and/or sponsor⁵⁶.
- (d) *Correlations between pension fund economic sensitivities and wider business sensitivities*. These could be particularly relevant for the sponsor. The pension

subjective element regarding assumed future improvements in longevity. This sensitivity should help readers of accounts appreciate the extent to which the accounts may be unreliable because of uncertainties in these trends.

⁵⁵ O'Brien *et al.* (2010) do, however, refer to the contentious issue of whether liabilities should be discounted at a risk-free discount rate, rather than (as per IAS19) using yields derived from high grade corporate bonds. This is linked to the wider issue of 'own credit risk'.

⁵⁶ Operational risks can also of course result in favourable outcomes. The point is that these generally result in someone else benefitting. Most regulatory and legal frameworks in effect require an organisation to compensate customers when it makes an 'error' that is in its own favour, but to shoulder the burden if it makes an 'error' that is in their favour. However, there may be some flexibility over what is classified as an 'error' as far as this asymmetry is concerned.

scheme might have one type economic exposure but the sponsor might have a natural hedge to this exposure elsewhere in its business (or a compounding risk exposure)⁵⁷. They may also be relevant to beneficiaries, particularly if the beneficiaries are placing significant reliance on the sponsor covenant.

Model outputs

- 6.5 The most common *outputs* that (traditional) pension fund asset-liability management ('ALM') models generate are expected outcomes and spreads of outcomes for key funding, contribution rate and solvency statistics. These are usually derived via Monte Carlo simulations of how the future might evolve. Usually, the impact of following different possible investment strategies is considered. If a long-term expected outperformance of equities versus other assets is assumed (an *equity risk premium*) then higher exposure to equities typically results in a more favourable mean (and median) outcome but at the expense of a wider (and hence usually riskier) range of outcomes.
- 6.6 We discussed in Section 5 the potential conflicts between stakeholders with differing interests in the pension fund and the issues these raise for trustees who have a collective legal obligation to look after them all. These issues arise regularly when assessing the merits of policies which apply across the board but which impact on different stakeholders (including the sponsor) in different ways, for example, funding, investment and risk transfer. We suggest that in an ERM context it would be helpful to go beyond traditional ALM models to examine the relative interests of different stakeholder groups in a pension fund and the trade-offs involved from pursuing particular policies. Chapman *et al* (2001), Kocken (2006) and Kemp (2011) describe suitable models to analyse these balancing interests quantitatively in a market consistent manner.
- 6.7 We believe that a particularly useful model to focus on from our perspective is one that aims to estimate the following:
- (a) The spread (versus risk-free) on the beneficiaries' pension benefits implicit in the arrangement, because payment of pension benefits will in general be contingent on the continued health of the pension fund and ultimately therefore on the continued health of the sponsor.
 - (b) The effective (instantaneous) asset mix underlying the beneficiaries' interest in the fund⁵⁸.
 - (c) The effective (instantaneous) asset mix underlying the sponsor's interest in the fund.
- 6.8 Reasons for use of such a model include the following:
- (a) It fits naturally with the balance sheet characterisation described in Section 5.8 and the Appendix;

⁵⁷ For example, a drug company might benefit if people live longer even though this hurts its pension scheme finances. Conversely, a life assurance company, particularly one targeting the annuity buy-out market might be hurt by improvements in longevity in both its core business and its pension fund.

⁵⁸ We mean here all beneficiaries *other than* the sponsor, in circumstances where the sponsor is also a (potential) beneficiary.

- (b) It helps us differentiate between sponsors and beneficiaries in cases where their interests diverge, as per Section 3.7;
- (c) These outputs potentially offer insights not directly available from traditional ALM models. For example, they provide a more effective way of analysing sponsor covenant risk from the perspective of beneficiaries/trustees than traditional ALM models;
- (d) Such a model naturally places 'economic' values on assets and liabilities and thus is immediately consistent with financial economic principles. This type of model behaviour is seen as particularly important for promoting effective ERM by Hatchett *et al.* (2010); and
- (e) It hopefully simplifies the interpretation of any assumed equity risk premium (and other similar aggregate economic assumptions). As explained above, traditional ALM models generally include an assumed (positive) equity risk premium. Often their primary purpose is to help quantify the trade-off between more favourable expected outcomes and potentially more unpalatable adverse outcomes.

Beneficiaries (and sponsors) should therefore be particularly interested in understanding how much of any apparent risk-adjusted return uplift is *purely* the result of an assumed equity risk premium and how much derives from other factors. For example, beneficiaries who are rich enough could alter the disposition of the remainder of their assets to neutralise their implicit equity exposure via the pension scheme. The same is true of the sponsor⁵⁹. The effective (instantaneous) asset mixes in 6.5(b) and (c) indicate the magnitudes of the adjustments that each would need to make to their other assets (and liabilities) if they wished to hedge their investment exposures in this manner⁶⁰.

Model governance risk

- 6.9 Some of the risks that are inadequately catered for in such models can be addressed or at least mitigated by use of tools such as risk registers, qualitative listings of risks, workshops etc.

We might therefore identify yet another type of risk, namely *model governance risk*, which we might equate with having insufficient governance 'budget' and/or access to suitable experts to be able to address these and other model risks effectively. Another aspect of governance risk, if we were aiming to use a model of the sort described above, is the extent to which its outputs result in no action (perhaps because they are communicated poorly to decision-makers) when some action is warranted.

⁵⁹ A rather important issue that we gloss over in this respect is the impact that such a strategy might have on the tax position of the beneficiaries and/or the sponsor. As we have already noted in Section 2.1 funds set aside for private pension provision are often tax advantaged relative to other savings routes.

⁶⁰ It should be noted that effective (instantaneous) asset mixes such as these correspond to hedging parameters in a derivative pricing problem. Readers are reminded that estimation of such parameters is intrinsically less reliable than is estimation of overall values, see Kemp (2009).

7. Identifying appropriate governance structures

- 7.1 We have noted earlier that ERM is in essence the framework that binds together decision making processes so that an entity's core business strategy can be aligned with its risk management strategy, and each informed by the other. Governance plays a key role in joining the two. The role of the board and senior management cannot be over-emphasised.

In this Section we explore the essential ingredients of good governance, starting with elements of governance structures which are thought to be essential for ERM generally and then considering how they might need to be adapted to cope with particular features that make pension funds different from other types of organisation. We consider this from the viewpoint of the management board of a pension fund wishing to manage its risks in a holistic way within an ERM framework. We also consider it from the viewpoint of the board of an organisation that seeks to manage in a holistic manner the risks from its core business alongside the risks from its pension 'subsidiary'.

Key enablers of ERM

- 7.2 As we have stated earlier, the differentiator in ERM is not just that risk management is applied across the whole business to include all types of risk that the business is exposed to, but that it is also integrated into the whole business in a structured and consistent way. The key enablers for successful implementation of ERM are that:
- There is commitment and leadership at the top levels of the organisation. This allows business strategy to be firmly linked to risks and opportunities. It also allows a clear message to be given to the rest of the organisation about the importance of risk-focused behaviour for the success of the business.
 - Risk is owned by the business with line managers accountable for it. This provides an incentive for it to be managed as a core activity, or at least provides a constant reminder that associated with every business decision is also a risk decision that line managers are also responsible for.
 - There is a supporting risk management function covering activities specific to risk management. These include identification, quantification, evaluation, management and monitoring the risks on a consistent basis across the organisation.
 - There is effective communication of risks faced by the organisation and how they are being managed. This communication needs to be both internally to the board (and relevant committees) as well as externally to supervisory bodies, investors and analysts.

Embedding these successfully into the business of any entity is not a trivial task. Financial firms perhaps see this as more of a commercial imperative, partly because their core business is, in effect, risk management and also because of the recent regulatory push. However, even in these firms, ERM remains a function in transition, as highlighted by e.g. successive surveys of the Economic Intelligence Unit, see EIU (2009). These surveys indicate that communications between risk functions and the broader business are sometimes fragmented and the achievement of an enterprise-wide culture and awareness of risks is often made difficult by barriers of corporate culture and constraints of operational issues.

ERM governance

- 7.3 The board has a crucial role in underpinning the entire ERM framework. It sets the overall vision and strategy of the firm and thus defines its culture in the context of the risks and

opportunities the business might pursue. Without a firm board underpin ERM is doomed to fail.

Corporate governance refers to the way in which the board controls the company and the processes it puts in place to ensure that the company is being run in the best interests of its owners and other stakeholders. It focuses on the conduct of, and the interaction between, the board, the managers, the employees, the owners and others such as regulators and external advisers.

Corporate governance is an essential component of ERM. It is a key management tool for providing top down monitoring and control of the risk management function. It is also a crucial way of placing responsibility on the board for ensuring that appropriate systems and policies for risk management are in place ('risk governance').

- 7.4 Within this, risk management is an enabling process that facilitates the effective and efficient operation of the business via the employment of appropriate skills and the exercise of direction, control, accountability and reporting to key stakeholders. The aim is to accomplish this through the identification and assessment of risks and opportunities facing the business and responding to them through appropriate policies.
- 7.5 This is usually achieved by implementing a suitable internal controls framework alongside a risk management function resourced with the right skills and experience. Ideally the risk management function should be overseen by a senior resource (perhaps called the 'Chief Risk Officer') who:
- acts as the organisation's risk champion;
 - oversees risk management activities across the organisation;
 - provides guidance to the risk owners;
 - challenges business decisions on key risk areas; and
 - coordinates risk information across the organisation.
- 7.6 In large organisations it would be usual to have a dedicated board level risk committee to focus on matters relating to risk management⁶¹. It would be responsible for:
- centralised oversight of the organisation's risk management;
 - policy setting with respect to risk assessment and risk management;
 - information gathering; and
 - engagement with the executive management and the board.

The risk management structure should define the roles of key individuals and functions for the successful implementation of ERM: the CEO, the CFO, the senior risk manager and other executive management, and the interaction between them. This structure would most likely be supplemented by well defined roles for 'risk sponsors', who represent each of the major business units and support functions. Risk sponsors may be assigned risks for successful delivery of the risk committee's objectives. In addition, depending on the organisational complexity and structure of the business, there may also be defined roles for 'risk owners'. They may take responsibility for managing a specific risk or a set of related risks.

- 7.7 There will soon⁶² be a regulatory requirement in most UK financial services organisations for the following risk governance structure:

⁶¹ Sometimes, however, the entire board may be members of the board risk committee. The 'committee' is then more a way of ensuring that adequate focus is given to risk matters in the overall board agenda.

- (a) A risk committee, separate from the audit committee. It will have responsibility for oversight and advice to the board on current risk exposures and future risk strategy, including strategy for liquidity and capital management, and for embedding and maintaining throughout the organisation a supportive culture in relation to the management of risks.
- (b) A specific risk function headed by a Chief Risk Officer (CRO) or equivalent participating in the risk management and oversight process at the highest level on an enterprise wide basis. The function would report to the risk committee with an internal reporting line to the CEO or CFO but with complete independence from individual business units.

7.8 In non-financial firms the corporate structure might make greater use of the CFO's proximity to the business, and responsibility for the management of financial risks, to build a risk culture that addresses risk at all levels and across all functions in the firm. In such firms, the finance function may have the infrastructure and many of the skills to build an integrated risk-view and provide some risk management support. The treasury function may have many of the modelling skills for quantifying and managing financial risk exposures. However, the role of a dedicated CRO is nevertheless recognised as adding further value. The main benefits of such a role are usually perceived to be as follows⁶³ :

- (a) It allows expansion of risk management to address more risks and to involve better maps of the relationships between different risks;
- (b) It should enable the business to make better decisions. In particular, such a role may result in a more effective approach to measuring and comparing risk and reward; and
- (c) It should provide a better understanding of the overall risk profile of the organisation.

Risk management function

7.9 The clear trend towards a greater explicit role for a risk management function and hence a CRO begs the question of exactly what this function and individual might be expected to do in practice. As we noted in Section 3.6, risk managers in practice carry out a range of roles which can primarily be thought of as a mixture between two main remits:

- (a) At one end of the spectrum, risk management might be seen primarily as involving *identification, quantification and/or mitigation of risk of loss*.

With such a remit there is a reasonably clear demarcation between the risk management department (often centralised) and those employed in individual front-line business activities. The front-line individuals might be expected to manage their businesses in a risk aware manner, but are unlikely to be as expert in risk management disciplines and techniques as those employed in the risk management department. The risk management department might then primarily be seen as a 'second line of defence'. They might perhaps primarily aim to spot weaknesses in

⁶² See Section 8.3.

⁶³ See, for example, ICAEW (2005b).

how the front-line individuals are managing risk (especially where the front-line individuals might be under-incentivised to consider the downside). They might also focus on identifying and then managing operationally any risks that might otherwise fall through the cracks in any practical organisational structure⁶⁴.

- (b) At the other end of the spectrum, risk management might be seen as primarily involved in *deciding what types of risks an organisation should carry*.

With such a remit, there is no longer as clear a demarcation between risk managers and any other type of business manager. The risk managers might be expected only incidentally to focus on the operational management of risk exposures.

The spectrum between (a) and (b) corresponds with the extent to which the risk manager is expected to provide independent 'challenge' of as opposed to being an active participant in decision-making.

Different risk managers and risk management teams lie at different points along this spectrum. Moreover, Chief Risk Officers will often have a stature sufficient to result in them becoming involved in actual business decisions or at least a mandate to do so. So they may be more towards (b) than (a) even if most of their team's activities are positioned differently.

The point is that effective risk management generally requires coverage of both (a) and (b). So, choice of remit for the risk management team (and hence for risk managers within this team) is primarily driven by issues to do with selection of effective organisational structures and governance arrangements. These can be as much if not more so driven by corporate culture and other 'soft' issues as by any specific quantification of the precise merits of one organisational structure over another.

However, it is often perceived to be easier to justify having a specific risk management team differentiated from other business activities if there is clear demarcation between what it does and what other teams do. This seems to have resulted in a tendency for risk management teams (and hence anyone in the organisation specifically carrying the title 'risk manager') to focus increasingly on (a) rather than (b)⁶⁵.

Of course, irrespective of chosen organisational structure, organisations still need to decide which risks to carry and to assess whether the rewards for carrying these risks are likely to be adequate. Many pension funds operate with very small if any dedicated staff resource. More of the burden of effective risk management decision taking may then fall on the funds' governing bodies than might be the case in other organisations. Pension funds, if they are

⁶⁴ Some individuals within risk management teams may also have purely administrative (or secretarial) roles, perhaps collating information that is then used by others (either risk managers within the team or managers elsewhere in the business) to make decisions.

⁶⁵ Arguably, regulators are incentivised to promote such a view of 'risk management'. The regulators' own 'risk' is that too many of the organisations on their watch will run into difficulties which the regulator might have been able to mitigate had they designed their regulatory framework differently. They are therefore naturally particularly focused on the downside. In contrast, shareholders (if the organisation is a financial business) may be the main winners if instead the upside materialises.

occupational schemes with sponsoring employers, may also utilise relevant support functions from within their own sponsors, which could include risk management resource⁶⁶.

- 7.10 In smaller organisations there is no evidence that the attitudes to risk are any different from those in larger organisations. However, the frequency with which the general risk profile of the business and specific risks are discussed at board level is thought to be lower (see, e.g. ICAEW, 2005a). One reason for this might be that the risk management structure is usually less formal or less regimented, bearing in mind the resources available. A risk is that it may then be more fragmented, might only cover some risks and there may not be the processes in place to escalate risk issues as necessary, thus leaving a governance gap.
- 7.11 The ERM framework should be appropriate to the nature, scale and complexity of the business and its risks. There is no universally agreed 'best' approach, other than that:
- the framework should be integrated with the business operations;
 - it should reflect the desired business culture and behavioural expectations; and
 - it should address all reasonably foreseeable and relevant material risks faced by the business in accordance with a properly constructed risk management policy.

Payback from good ERM

- 7.12 We mentioned in Section 4 that there is some empirical evidence linking enhanced risk management to improved shareholder value. Further evidence can be found in the related area of investment governance, which describes the system of decision-making and oversight used in institutional investment.

In the context of pension funds there are many similarities between investment governance and ERM governance. Pension trustees, although ultimately responsible for investment strategy, also need to rely on effective governance structures to tap the skills, resources and processes of others to create value.

A number of studies have shown a strong positive link between good processes and superior (investment) returns. For example Ambachtsheer (2007) concluded that the (investment) governance shortfall – the return foregone due to problems in internal governance and management – between good and bad (investment) governance was 100-200 basis points per annum, or even higher.

- 7.13 Clark and Urwin (2007) identified a number of (investment) governance related factors common among leading edge institutional funds, six of which they considered to be within the reach of most funds:
- clarity of mission and commitment of stakeholders to the mission statement;
 - evidence of leadership at the board/investment committee level, with the key role being that of the Investment Committee chairman;
 - strong investment beliefs commanding fund-wide support that align with the goals and inform all investment decision-making;
 - investment process framed by reference to a risk budget aligned to goals;

⁶⁶ A possible weakness in this approach is that risk managers employed by the sponsor may primarily be experts in non-pension fields, and may thus unintentionally focus more on traditional business risks (e.g. risk of supply chain disruptions) than on pension fund type risks even if the latter are more important as far as the sponsor is concerned. Risk managers too closely associated with the sponsor may also adopt an unduly sponsor-centric view of risks, which may not be appropriate as far as the scheme is concerned, see Section 1.6(f).

- resourcing each element in the investment process with an appropriate budget considering impact and required capabilities; and
- effective use of external managers, governed by clear mandates, aligned to goals and selected on fit for purpose criteria.

While the research and language are investment-centric, the parallels with the broader ERM environment and its key enablers are obvious. In ERM the scope is of course wider, incorporating not just investment risks, but also insurance risks, operational risks and all other risks of the entity. The challenge is therefore proportionately bigger, particularly where the entity is the pension scheme and its sponsor, but so are the potential rewards.

Maturity of ERM structures

7.14 ERM is in essence a behaviour supported by appropriate processes. Consequently it does not just happen at the whim of the board but grows over time. Most organisations probably practise some elements of it already. IAA (2009) defines the following three stages of maturity for ERM against. Organisations can use this to benchmark where they are in the spectrum:

- (a) *Early*: Risk management and internal control activities exist in part, are inconsistently applied and not well understood by management and the relevant employees in limited business areas. Significant opportunities for enhancement remain.
- (b) *Intermediate*: Risk management and internal control activities are established, but not consistently applied or fully understood by management and relevant employees in key functions/business areas. Moderate opportunities for enhancement remain.
- (c) *Advanced*: Risk management and internal control activities are established, consistently applied and well understood by management and relevant employees across the organisation. Opportunities for enhancement remain to align and coordinate activity across the organisation.

According to these definitions the hallmark of good and effective ERM appears to be:

- the extent to which risk management has been embedded into the culture of the business;
- how developed the risk management framework is; and
- whether it is consistently applied across the whole business.

This is of course another way of articulating the governance gap, and appears to be broadly consistent with the research of Clark and Urwin on investment governance. It is also consistent with the more general approaches to risk management and corporate governance identified by risk management executives in a wide range of industries and regions across the world (see, for example, EIU (2009)).

7.15 In the UK, Corporate Listing Rules and related guidance also stress, among other things:

- the importance of embedding internal controls into the business;
- the need for all employees to have some responsibility for risk management; and
- why the culture, HR policies and performance rewards should support risk management and internal controls.

- 7.16 How the Board and senior management embed risk into the business will depend on many factors. There is no simple solution. Convincing business managers that risk management improves business decisions is not an easy task. People sensitivities are important and each organisation will address them differently.

The ideal risk structure will also vary according to the nature and complexity of the organisation. For example, consider the very different risk characteristics of corporate, retail and investment banking or the often greater significance of strategic and operational risks in non-financial companies. The important thing is to identify the big risks and to ask whether sufficiently competent and proportionate resource is being applied towards understanding and managing them across the organisation.

Risk governance may also need to fit around functional responsibilities. For example, in some organisations a single risk owner may have responsibility for managing a specific risk across the whole organisation whereas elsewhere line management might be responsible for the management of all risks within their own function.

- 7.17 Cultural and behavioural characteristics of risk management will also invariably be unique to each organisation. They will reflect, among other things, the history, values and style of organisation.

The role of the board and senior management in promoting a suitable risk culture is probably the biggest challenge in ERM. Suitable incentives for alignment might be to include certain risk management responsibilities in the job descriptions and performance evaluation of the CEO and other senior management. In the context of this paper, senior management might include individuals with responsibility for key aspects of the pension fund including finance, administration, funding, investment, outsourcing to external experts and liaison with the regulator.

Governance challenges for pension funds

- 7.18 We have discussed in earlier sections how pensions differ from other financial services products where ERM is fast becoming commonplace. Among other things, decision making has to take account of:
- promises which might be blurred at the edges;
 - currently more relaxed capital requirements (in many jurisdictions);
 - reliance on the sponsor's covenant;
 - asymmetric pay-offs for certain stakeholders
 - a legal interface between the trustees and sponsoring company which defines the balance of powers on the important policy decisions; and
 - a supervisory process that (in many jurisdictions) currently tolerates more risk but with different checks and balances.

We have set out why we think that despite these differences, and perhaps because of them, ERM has a role in improving decision making in pensions. We have also outlined the vital role of governance in aligning many of the qualitative aspects of ERM, and best practices in some areas.

In what follows we consider some of the governance challenges that pension entities need to address in order to tap the benefits of ERM. We start first with the 'entity' being the

pension fund in isolation. We then broaden to the wider concept of the 'entity' being the sponsor and the pension fund in tandem.

- 7.19 Risk management of pension funds has usually focused on investment risks, with the trustee board responsible for setting investment strategy (after consulting with the sponsoring employer, in the UK). In large funds there would usually be specialist roles for an investment committee, strategy and other technical advice (including monitoring services) from investment consultants. Fund management might be provided by external or in-house specialists.

Pension scheme governance has thus historically been generally concerned about investment efficiency and utilisation of resources to exploit investment opportunities. While this approach may allow investment risk to be managed holistically (and there is much in common here with the ERM principles, see Section 7.13), it may result in other risks being managed as silos (albeit with suitable structures to deal with various legislative requirements and third party interfaces). The obvious benefits of a greater ERM focus are therefore the added benefits we can expect from a more fully holistic approach to risk management such as:

- Incorporating other risks such as the sponsor covenant risk, longevity and other insurance risks as well as operational risks in the overall risk map;
- Better management and understanding of the significance of the different risks;
- Better approaches to diversification and concentration of risk (particularly risks relating to the sponsor covenant);
- More joined-up decision-making regarding opportunities for insuring or hedging some of the risks;
- It allows the trustee board to focus better on their prime objective of delivering the promised benefits to members and to map out a plan for how they might do this over time through a combination of direct and indirect funding from the sponsor and investment returns from the pension fund's assets;
- It makes it easier for trustees to define their pain thresholds with respect to their principal objectives, which facilitates consideration of appropriate policies for intervention;
- It aligns funding and investment strategies allowing them to be run in an integrated fashion; and
- It provides a framework within which the trustees can incorporate dynamic strategies for accelerated risk transfer as and when suitable opportunities arise.

- 7.20 Adopting a more holistic risk management framework does, however, increase the governance challenge. It requires, among other things:

- (a) A clearer mission and alignment of key management policies to it;
- (b) A broadening of the scope and skills of the investment committee (or some other body) to make it a more all encompassing risk committee; and
- (c) Suitably skilled resources to integrate, manage and monitor risks consistently.

- 7.21 A particular complication for pension funds is to produce value propositions acceptable to both members and sponsors. This may not always be immediately practical. A clear statement of goals is an important step to building alignment between the parties, so that an appropriate investment risk profile and strategy can be identified. Analysing the impact of

different options on the objectives of each party within an ERM framework provides useful insights for narrowing down differences in perspectives.

- 7.22 Pension funds are generally not resourced to manage all risk management activities in-house and so make greater use of external agents in both advice and delegated roles which exposes them to agency problems. Appropriate governance is therefore critical to monitor and control these potential misalignments. It is also crucial to joining up their contributions in a consistent way with the rest of the ERM framework.

A potentially major challenge with applying ERM to many pension funds is the fact that most have no employees at all. This can make their governance seem more like that of an association than a business as such. Functions are typically either outsourced or carried out on a part time basis by people who have another job. Some larger pension funds do have permanent staff but they are often essentially secretarial – supporting the trustees and their committees rather than being accountable for the results arising from running the pension scheme. Some of the largest pension funds do have a Chief Executive and a more sizeable resource base, and therefore may more closely resemble a business environment but without a profit motive.

This represents a fundamental structural difference between most pension funds and for-profit businesses. However, it does not invalidate the need to apply ERM principles to pension funds since they still need to articulate clear objectives and establish suitable delivery mechanisms. Indeed, it perhaps makes the need more acute. However, it does suggest that pension funds might also benefit from exploring best practice application of ERM among a range of organisations of different sizes, including some like charities, universities and governments, which have prime purposes that are not directly profit orientated.

- 7.23 How to manage the sponsor covenant risk is another governance challenge. In financial terms this risk is now reasonably well defined (in the UK) through the employer debt regulations if a solvent sponsor wishes to ‘walk away’ from the pension fund. However, for the purposes of setting the funding strategy the trustees need to make a judgement about where to set the technical provisions. In essence a judgement needs to be made about how much of the covenant risk to leave ‘off balance sheet’ and therefore dependent on satisfactory future investment returns and/or through a deficit repayment programme.

On an ongoing basis, UK trustees are expected by the Pensions Regulator to manage proactively the sponsor covenant risk by hardening the technical provisions when the employer’s covenant weakens (i.e. increasing the funding deficit) but setting the deficit repayment schedule on the basis of affordability by the employer. During the recent global financial crisis this is exactly what some pension schemes did. They then had to tread the delicate line between:

- lengthening deficit repayment periods (which may have had the effect of reducing member security in the short term); or
- seeking an accelerated reduction of (the now bigger) funding deficit potentially putting further strain on the sponsor’s covenant.

The link between the sponsor covenant risk, the investment risk, the regular contributions to cover technical provisions and the deficit repayment schedule is therefore far from simple. A dynamic management of the various parameters, in an environment requiring the use of

multiple advisers each working to a narrow remit within their own specialist silos, is a significant challenge.

- 7.24 Another governance challenge for the trustees of a pension fund is how to communicate the ensuing risk of non-delivery to the pension scheme members, not all of whom might be affected to the same degree by the winding up priorities⁶⁷. For example, the dynamics of the hardening of technical provisions, such as ones mentioned in the previous paragraph, and its impact on risk as far as members are concerned, over a range of time horizons and priority classes, are complicated to understand and perhaps even more complicated to communicate.

As we have mentioned earlier, there is (in the UK) no exact equivalent in a pension fund of a 'with profits actuary' with a specific remit to consider the interests of the members. Neither is there a requirement for a PPFM type statement from the trustees setting out how the fund might be managed in different situations. To some extent the balancing of risks in a participating insurance fund presents similar problems to that in a pension fund so there should be some useful governance lessons here for pension trustees.

- 7.25 Orros *et al.* (2010) point out that the ERM frameworks for health insurers are likely to be more complex than those for life and non-life insurers because of their interface with government healthcare policy and a mixed economy of public and private sector health providers. The same is also true of the social element in pensions, requiring consideration of yet another stakeholder. It also means that there may be some rather unpredictable risks to incorporate into the ERM governance framework.
- 7.26 Some of the social aspects of pension provision can raise particular issues in certain circumstances. For example, defined benefit pension funds do not necessarily need to have a sponsor (e.g. the sponsor could have defaulted but the trustees could have decided to continue to run the scheme as a stand-alone vehicle without winding it up). Governance for such a fund might then be potentially simpler (because there may be fewer persons to deal with). However, it may also need to be more 'immediate', because the fund no longer has a sponsor as a back-stop. Such entities may also be exposed to greater regulatory risk, because they might be deemed to fall within more stringent insurance regulatory frameworks, either now or at some future date.
- 7.27 Pension schemes with weak sponsors and large deficits are more exposed to these types of issue, particularly if, as is the case in the UK, this position gives the trustees significant influence over the affairs of the sponsor. For example, Hatchett *et al.* (2010) describe a case study in which the sponsor has a market capitalisation of £18m and the scheme a deficit of £436m, with it being proposed that the scheme take over 90% of the company's shares. Issues illustrated by this situation include:
- (a) Could the trustees have cut their losses earlier if they had adopted more effective entity-wide risk management and not allowed the current situation to develop in the first place?

⁶⁷ We have already discussed some of the issues relating to disclosure of risks within the sponsor's report and accounts, see Section 6.3. However, the types of disclosures shown there will not necessarily be the most appropriate ones for beneficiaries, since the interests of sponsor, shareholders/creditors and beneficiaries will not always be aligned. For example, sponsor accounts will normally be drawn up on a going concern basis, and so may provide little if any indication of the impact sponsor default might have on security of pension promises to beneficiaries.

- (b) Is it practical to manage such a scheme as a significantly underfunded mutual, or does it need to address its financial position more comprehensively, e.g. by cutting benefits if this option is available.
- (c) If the trustees do decide to take over 90% of the sponsoring company, how likely are they to be competent in managing the sponsoring company and how best should they discharge their responsibilities to their beneficiaries?

7.28 When the definition of entity is widened to include the sponsoring employer and the associated pension fund, the scope for ERM also widens to include all strategic, operational and financial risks in the sponsor's business as well as in the pension fund. Some additional organisational challenges might arise from the need to involve a wider human base, non-investment risks, operational silos, a wider stakeholder base and additional decision making constraints. However the prospects for extracting additional value from ERM are also correspondingly greater.

Embedding pensions into the core governance structure

7.29 For firms in the financial sector the application of ERM to their core business should not be new, notwithstanding that 'maturity' of ERM may differ from one firm to another. In most cases there will also be an associated pension fund, probably still at present managed as a silo. The question then arises as to how the core business risks and the pension risks should best be integrated into a more holistic framework.

In a large and complex firm we might find a risk management model for the core business of the type described by Deighton *et al.* (2009) with 'three lines of defence':

- (a) *First line*, where risk management is the primary responsibility of front line managers who, as part of their day job are responsible for identifying and evaluating significant risks to the business from any action they are proposing, and for designing and operating suitable controls.
- (b) *Second line*, which is a risk oversight process consisting of independent oversight of the risks and centralised policy management. The latter can range from the quasi-bureaucratic, such as setting overall policies, standards and limits to providing leadership in the development and implementation of risk management techniques.
- (c) *Third line*, which is the independent assurance from neutral parties that the risk management environment is operating effectively. The neutral parties are usually the board and its committees, assisted by internal and external auditors (although how the board can ensure neutrality in relation to itself is an interesting challenge!).

If ERM is reasonably well embedded in the business then one possibility would be to view the pension fund simply as an additional line of business. Among other things this would force, at the highest levels of decision making, the discipline of continually assessing the value of the pension fund to the business and its role in the business strategy. The impact of the associated pension risks would also then be viewed in tandem with the core business risks, using language understood across the business.

Another advantage of this approach would be to place responsibility on business managers to manage the potential impact of any actions they take on pension liabilities e.g. salary increases, definition of pensionable salaries, early retirement options, pension promises to senior executives, pension enhancements on redundancy etc.

The aggregation of financial and insurance risks should in theory be relatively easy. However, in practice the use of different models, assumptions, measurement metrics and outputs may be a challenge, and different ways of dealing with particular risks may highlight some governance gaps requiring further attention.

7.30 In other financial firms the risk management model may be different. However, if they are practising ERM then some form of governance model should nevertheless be in place for managing the core business risks holistically. This should provide a suitable starting point for integrating effectively a new financial 'subsidiary' with many similar risks.

7.31 Outside the financial sector, board and management structures for risk oversight might be more consolidated. There is no formal requirement in such organisations for a separation of the risk and audit committees, nor for a CRO-type function with an independent enterprise wide brief. In such firms there may be a tendency to think about risk management in terms of 'operational' and/or strategic risk. While it may be true that many of the firm's biggest risk exposures might be of these types, financial risks might not necessarily be insignificant. This may be especially true of firms with more complex treasury functions and/or large pension funds.

Some of these firms may already be practising ERM extensively, but others may only do so for specific activities or major projects, see for example Lewin (2009). The governance for managing at least some of the risks on ERM principles may therefore already be in place. Integration of financial risks in the pension scheme (if significant) should be an important step towards more holistic risk management. Even where ERM is not the norm, the pension scheme, particularly if it poses significant risks to the business, might be a catalyst for an increased focus on entity-wide risk management.

Model governance

7.32 A final aspect of governance that is worth referring to in this Section is the need for governance around (quantitative) models used for ERM purposes. From a parochial perspective, these might often be prepared by actuaries.

As far as UK actuaries are concerned, there are various generic Technical Actuarial Standards that currently or will shortly apply to much of the relevant work (in the UK) of actuaries who are members of the UK Actuarial Profession. These Standards should provide some assurances to trustees and sponsors in this respect. They include the Board for Actuarial Standard's TAS M ('modelling'), TAS D ('data') and TAS R ('reporting')⁶⁸. Elsewhere, other similar actuarial professional standards promoted by other corresponding actuarial standards setters may apply.

However, pension schemes and their sponsors do not necessarily employ actuaries to carry out all of their modelling activities. Those that do not may wish to consider whether they should seek adherence to similar principles in the model construction, input validation and reporting that other professionals may do on their behalf.

⁶⁸ See BAS (2010), BAS (2009a) and BAS (2009b).

Whoever the pension scheme or its sponsor employs to carry out modelling activities, an important additional issue hinted at in Section 6.1(d) is the need to ensure that the model outputs are appropriately interpreted. The adage that 'what one person says is not necessarily what another hears' is particularly relevant here. It is not enough for pension scheme trustees or boards of sponsors to assume that they can delegate the whole of the risk management task to others. This contradicts the fundamental principle that ERM will only be effective if it is owned and promoted by the board itself. Trustees and boards of sponsors must ensure that they have within their own number sufficient expertise to understand the risk issues involved. They must also themselves explore how best to mitigate the possibility that they may be unduly and inappropriately swayed by irrational exuberance or the like when they come to consider model outputs.

8. Recent developments in other fields

- 8.1 In this Section we explore further some recent developments in ERM in other financial fields, in the hope that these may provide insights that can help actuaries and other professionals better apply ERM techniques to pension funds.

The Walker Review

- 8.2 As we have noted earlier, many commentators have concluded that some of the problems some financial firms faced during the 2007-09 credit crisis were in part due to deficiencies in their risk management processes and their lack of emphasis in placing risk management at the heart of their strategic decision making.
- 8.3 The Walker Review, see HM Treasury (2009), analysed corporate governance in UK banks and other financial industry entities. In broad terms, it concluded that existing Board structures and other governance approaches already typically in place in listed UK financial services firms were 'fit for purpose' if combined with tougher capital and liquidity requirements (for banks) and a tougher regulatory stance by the FSA⁶⁹. It also concluded that the principal deficiencies in Boards related more to patterns of behaviour than to organisation per se. However its executive summary did highlight the following two risk management issues:
- (a) *"The most critical need is for an environment in which effective challenge of the executive is expected and achieved in the boardroom before decisions are taken on major risk and strategic issues";*
 - (b) *"given that the overriding strategic objective of a BOFI⁷⁰ is the successful management of financial risk, board-level engagement in risk oversight should be materially increased with particular attention to the monitoring of risk and discussion leading to decisions on the entity's risk appetite and tolerance. This calls for a dedicated non-executive director focus on high-level risk issues in addition to and separately from the executive risk committee process and the board and board risk committee should be supported by a Chief Risk Officer with clear enterprise-wide authority and independence, with tenure and remuneration determined by the board".*

It also concluded that more time needs to be committed by non-executive directors, there needs to be better engagement between those acting on behalf of shareholders (typically fund managers) and the boards of investee companies, and substantial enhancement is needed in board level oversight of remuneration policies.

In its response to the Walker Review, the FSA agreed to introduce a requirement that all firms that it regulates have a specific risk function (alongside other control functions, such as an audit function and a compliance function), see FSA (2010). In other than modestly-sized organisations this can be expected to be headed up by an individual Chief Risk Officer or equivalent.

⁶⁹ The FSA was criticised by some commentators (and by itself) for being too 'light touch' in the run up to the 2007-09 credit crisis, see e.g. FSA (2009).

⁷⁰ The term BOFIs is used in the Review to mean 'banks and other financial institutions'.

- 8.4 While pension funds may not have the same business perspective as the majority of BOFIs, it can be argued that successful management of risk is still one of their most important objectives, if they are to serve their beneficiaries effectively. There should therefore be substantial carry across of lessons highlighted in the Walker review into the pension arena. Many pension funds may not have the resources to employ a dedicated CRO, but we would recommend that the decision-making structures and behaviours adopted reflect the principles set out in the Walker Review, adapted to the specific needs of pension funds. The same recommendation would apply to non-financial corporations exposed to large financial risks even if they are exposed to little if any financial risk from pension funds.

Solvency II

- 8.5 A similar risk function/CRO role will also, in effect, be mandated under Solvency II, the new EU-wide regulatory framework for insurers that is planned for implementation in late 2012/early 2013. One of the responsibilities of this function will be the preparation of the insurer's Own Risk and Solvency Assessment (or 'ORSA'), see Section 5.13.

The ORSA is expected to be an internal process. However, some reference to its contents and output and how it has been carried out is likely to need to be included in the insurer's (annual) Solvency and Financial Condition Report ('SFCR') and the Report to Supervisors ('RTS'), see CEIOPS (2009a). The SFCR will be publicly disclosed while the RTS will be a private report, presumably more detailed, provided to the insurer's supervisor. Both are expected to be stand-alone (although following a similar structure) and to involve a qualitative report including quantitative data as well as quantitative reporting templates. Insurers will need to develop a written policy to ensure on-going appropriateness of the information to be disclosed, detailing who is responsible for drafting which disclosures and who is responsible for reviewing the disclosures and the deadlines to which each will work. The SFCR is expected to include material on the insurer's system of governance and to provide details on the process that the firm has undertaken to fulfil its obligation to conduct an ORSA. The results themselves are likely to need to be reported only in the RTS.

A short and easily understandable summary of the SFCR, aimed specifically at policyholders, will be required. It will, among other things, need to profile material changes that have occurred in the firm's business written, risk profile, solvency position or system of governance since the last reporting period.

- 8.6 CEIOPS view the ORSA as a very important element in an insurer's risk management. Article 43(1) of the Solvency II framework directive states that:

"Insurance and reinsurance undertakings shall have in place an effective risk management system comprising strategies, processes and reporting procedures necessary to identify, measure, monitor, manage and report, on a continuous basis the risks, on an individual and aggregated level, to which they are or could be exposed, and their interdependencies.

That risk management system shall be well integrated into the organisational structure and in the decision making process of the insurance or reinsurance undertaking."

In CEIOPS's view, an effective risk management system (for an insurer) requires at least the following, see CEIOPS (2009b):

- “a) A clearly defined and well documented risk management strategy that includes the risk management objectives, key risk management principles, general risk appetite and assignment of risk management responsibilities across all the activities of the undertaking and is consistent with the undertaking’s overall business strategy;*
- b) Adequate written policies that include a definition and categorisation of the material risks faced by the undertaking, by type, and the levels of acceptable risk limits for each risk type, implement the undertaking’s risk strategy, facilitate control mechanisms and take into account the nature, scope and time horizon of the business and the risks associated with it;*
- c) Appropriate processes and procedures which enable the undertaking to identify, assess, manage, monitor and report the risks it is or might be exposed to;*
- d) Appropriate reporting procedures and feedback loops that ensure that information on the risk management system, which is coordinated and challenged by the risk management function is actively monitored and managed by all relevant staff and the administrative, management or supervisory body;*
- e) Reports that are submitted to the administrative, management or supervisory body by the risk management function on the material risks faced by the undertaking and on the effectiveness of the risk management system; and*
- f) A suitable own risk and solvency assessment (ORSA) process.”*

8.7 We think that the introduction of these disciplines for (EU) insurers is a potentially very important development for (EU) pension schemes. As noted earlier, some pension arrangements in some EU jurisdictions are commonly set up as insurance companies and so will be directly subject to Solvency II as soon as it is implemented. However, even those EU pension funds that are not (currently) regulated in a manner akin to insurance undertakings should note that:

- (a) Unless the (EU) pension scheme is *sure* that it will remain open indefinitely (and what in life is ever this sure!), then it may well need at some stage to transfer some or all of its liabilities to an insurer that *is* subject to Solvency II style rules (or successor rules).
- (b) There appears to be a trend towards greater harmonisation of pension fund and insurance regulatory frameworks, and so some form of Solvency II style regulatory framework may in due course be imposed on them.

Potential regulatory harmonisation

8.8 The applicability or otherwise of insurance regulatory norms on the pension fund industry is the topic of long and sometimes heated debates. On the one hand, the pension fund industry is usually seen as having a much greater association with social and intergenerational solidarity than is the case with insurance. The primary purpose of pension funds is to facilitate financial security in retirement, rather than being an ‘industry’ in its own right. On the other hand, the pension benefits promised to members via pension schemes

often have strong similarities with some types of benefits to which (life) insurance policyholders might be entitled. As the population ages, and as DB wanes relative to DC, the two types of benefit appear to be trending towards each other, in substance if not necessarily yet in form, and it becomes more and more difficult not to give reasonable credence to the principle that similar benefits should be valued and regulated similarly⁷¹.

This divergence of opinion is mirrored within regulatory bodies. For example, when responding to the recent EU paper on pensions provision, see EC (2010), CEIOPS (the then current pan-European insurance and occupational pensions supervisor) indicated that there *“are different views among CEIOPS Members about the suitability of Solvency II for IORPs”*, see CEIOPS (2010). CEIOPS recognised the importance of a thorough impact assessment and also recognised the particular issue of proportionality of effort as far as small IORPs are concerned, noting that there are significant numbers of small IORPs throughout the EEA. In its view, an IORP supervisory framework should adhere to four principles, involving forward-looking risk-based approach, market consistency for solvency purposes, transparency and proportionality.

8.9 Many of the divergent views on this topic relate to the different ways in which different pension schemes in different Member States seek enhanced security of pension promises in addition merely to the building up of pre-funded assets within the IORP. CEIOPS listed the following (in no particular order, not all of them apply in all Member States and their significance can vary from state to state and from case to case):

- Risk buffers (including regulatory own funds)
- Sponsor support (which may be limited)
- Guarantee schemes and/or other security mechanisms
- Conditional benefit promises
- Controls on contribution/premium calculations
- Use of subordinated loans and/or
- Risk management obligations and investment rules

CEIOPS also noted that:

“In addition to these factors, some Member States permit or require as a last resort mechanism a reduction in future unconditional indexation and/or adjustment of accrued benefits in certain circumstances.”

⁷¹ Included in such a debate may be views about the underlying purpose of regulation. For example, some commentators argue that much of the regulation of insurance and banking is driven by the need to mitigate potential conflicts of interest between shareholders and customers, in a sector where information asymmetries can make competition an ineffective driver of good shareholder behaviour. If you start from the premise that regulation of financial institutions is primarily about the balance sheet and level of capital then this may automatically bias you towards a view that similar benefits should be regulated similarly. It may also, these commentators argue, favour large commercial institutions and e.g. squeeze out local credit unions and company pension funds. Starting from the premise that such regulation is more about ERM may, these commentators argue, lead to very different conclusions. A possible flaw in such logic is that equivalent information asymmetries may also exist for pension funds, with the cards now stacked in favour of the sponsor’s shareholders. Moreover, regulators are generally at pains to stress that they believe that additional capital is not the only or even necessarily the most effective way of managing risk. They also generally regulate mutual insurers in a manner that is similar to how they regulate proprietary insurers. This is so even though the potential conflicts of interest between shareholders and customers should be less with mutual insurers because shareholders and customers are often then the same individuals. So mitigating potential conflicts of interest between shareholders and customers does not appear to be the only driver behind formulation of regulatory frameworks.

A further influence on the security of benefits is the response required in case of a trigger event, for example a breach of funding requirements. For instance, the length of the recovery period has an impact on member and beneficiary security.

An important difference between a number of the factors above and the solvency regime for insurance undertakings is that only some of these factors are capitalised, i.e. they provide security in advance of anticipated events. However others represent responses that occur or are required after a trigger event.”

- 8.10 The Groupe Consultatif (2010) reconciled these different strands by defining the security of pension promises for IORP members as a combination of quantitative as well as qualitative components, both needing to be addressed together:

“By analogy with other financial services legislation, the components of pension security span the full spectrum of Pillars I (funding and solvency), II (supervisory process) and III (disclosure and market discipline). However, in pension schemes it is also necessary to include various aspects of plan design since individual governments may use some of these as tools for social policy, with cost and other consequences for sponsors which in turn may be reflected in other parts of the ‘pension package’. The components of pension security may be summarised as follows:

<i>Quality of benefits:</i>	<i>statutory minimum benefits; conditional benefits; protection of accrued benefits</i>
<i>Scheme collateral:</i>	<i>technical provisions and prudence margins; deficit funding plans; asset protection measures; financing requirements for new accruals</i>
<i>External security:</i>	<i>risk based capital; sponsor covenant; contingent assets; guarantee funds</i>
<i>Governance:</i>	<i>regulatory powers; regulatory oversight; scheme governance; sponsor governance</i>
<i>Disclosure:</i>	<i>to regulator; to members; to other influencers”</i>

Looked at in this way, the overall level of pension security depends on various trade-offs between different stakeholders each with its own objectives and constraints. From the member’s perspective the risk to the delivery of the promised benefits requires that all of these components be considered holistically. We believe that an ERM framework provides the appropriate discipline within which this can happen in a transparent manner.

- 8.11 Importantly from our perspective, CEIOPS also noted that:

“Although not formally a security mechanism or an element of a formal solvency regime, the governance of an IORP is clearly an important aspect of maintaining solvency. Any consideration of a common solvency regime should therefore take account of this matter, perhaps as a separate sequenced task”.

We believe, as apparently does CEIOPS, that development of a full common solvency regime, which may or may not be closely aligned to Solvency II, will be a very complex task and one that may involve considerable political challenges.

In the meantime, a much easier and less contentious step would be to seek greater harmonisation of governance systems and risk management disciplines between the two areas, as long as it can be done proportionately, bearing in mind the needs of smaller as well as larger IORPs. It will be less contentious because:

- (a) It can be presented as beneficial to the IORPs themselves, if one accepts the widely held premise that ERM adds value through co-ordinated decision making aligned with agreed objectives.
- (b) The greater emphasis being placed on more effective risk management and governance frameworks is not specific to insurance or pension funds; instead it resonates more widely across the entire financial services arena and beyond.

8.12 We therefore think that (EU) pension funds would be wise to analyse and consider the types of risk management disciplines that will be introduced under Solvency II. Doing so may both help them improve their current risk management frameworks and also be a good way of planning for possible regulatory changes that may come their way in the next few years. To do otherwise could involve failing to apply ERM principles adequately in relation to regulatory risk! If by doing so the gap between what pension scheme members perceive as the ideal level of security and what is actually realistic to achieve can be narrowed sufficiently then the regulatory pressure for stronger funding standards may also ease.

9. Conclusions

- 9.1 Pension funds play an important part in provision of adequate income in retirement for many individuals. They are also important players in the wider economy, given their large asset and liability bases. It is therefore in the public interest that they be managed efficiently and effectively, as well as in the interest of their beneficiaries and sponsors.
- 9.2 In this paper we have described the many ways in which entity-wide risk management makes sense for pension funds to adopt, whether they are defined benefit or defined contribution in nature. We have also explored the adaptations needed to some traditional ERM techniques given differentiating features of pension schemes including their separate legal structure and specific purpose for existence.
- 9.3 For pension funds in isolation, despite their singular purpose and limited strategic options, we have argued that pension funds should find it desirable to employ an ERM framework to define a 'business plan' and direction of travel. This should make it easier for them to manage execution of their strategic plans within a governance programme that:
- complies with regulatory requirements;
 - recognises the acceptable 'pain thresholds' of pension scheme members; and
 - recognises other financial parameters and risk characteristics that need to be in place to 'keep the sponsor at the negotiating table'.
- 9.4 For pension scheme sponsors with large exposures to pension risks the benefits of aligning their business strategy with the risks and rewards of the pension scheme are in many ways quite obvious. For many firms who already have some form of ERM in place, an initial step might be to extend the governance and risk management function in what may already be an effective framework for decision making in the core business to incorporate the pension subsidiary. Even if no ERM framework currently exists, the effort involved in integrating the pension scheme into the firm's decision making processes may not be dissimilar to the change management effort that might follow the acquisition of a subsidiary.
- 9.5 The Walker Review and the FSA's response have strengthened the role of ERM in financial firms. Non-financial firms, particularly those with large treasury functions and significant pension risk could also benefit from more holistic risk management or at least benchmark what they already do in this context relative to emerging best practice in the financial firms. Where it is not possible to apply the principles of ERM on an entity-wide basis it may nevertheless still be possible to apply the principles to significant projects by defining clear objectives and harnessing the strategic, operational and financial risks within an ERM framework.
- 9.6 Perhaps the most important reason for encouraging pension schemes and their sponsors to be more rigorous in their adoption of ERM techniques is the fact that they do not exist in isolation. The interconnected nature of the society in which we live creates plenty of upside in many ways. However, it also creates and amplifies many types of risks. Organisations outside the pension arena are increasingly focusing on holistic risk management recognising the value that it should bring. Pension funds do have some unique characteristics, but non-exposure to a wide variety of interconnected risks is *not* one of them. ERM is as relevant to pension funds and their sponsors as it is to other parts of the economy and to society more generally.

References

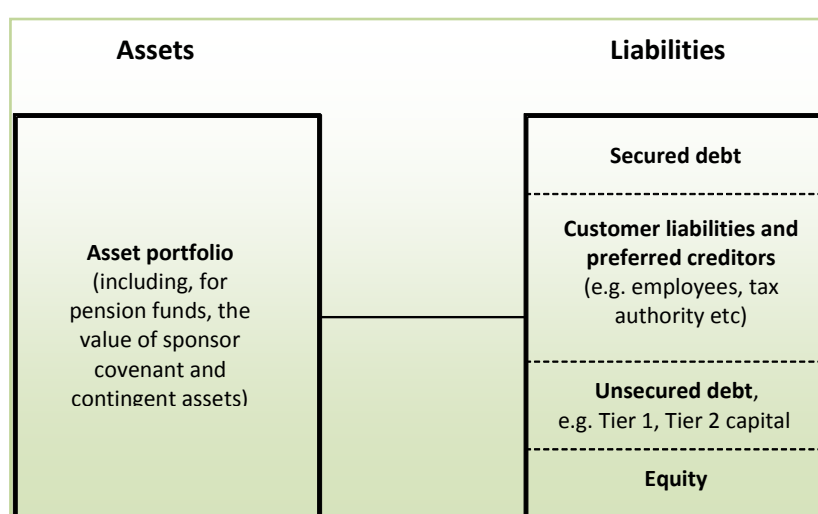
Hyperlinks to most of the documents set out below are available in [references for ERM for Pension Funds](#), i.e. at <http://www.nematrion.com/SmartList.aspx?c=1-c6bbe76843fa47be>.

- Ambachtsheer, K.P. (2007). *Pension Revolution: A Solution to the Pensions Crises*. John Wiley & Sons
- Bank of England (2009). Recovery and Resolution Plans – Remarks by Andrew Bailey. *Bank of England News Release*, 17 November 2009
- BAS (2009a). Technical Actuarial Standard D: Data. (UK) *Financial Reporting Council (Board for Actuarial Standards)*
- BAS (2009b). Technical Actuarial Standard M: Modelling. (UK) *Financial Reporting Council (Board for Actuarial Standards)*
- BAS (2010). Technical Actuarial Standard R: Reporting Actuarial Information. (UK) *Financial Reporting Council (Board for Actuarial Standards)*
- Byrne, P., Mitchell, R., O’Sullivan, D. and Sykes, I. (2009). Pension risk: Risk management for pension schemes. *Initial report of the Pension Risk Working Party, (Irish) Society of Actuaries*, November 2009
- CEIOPS (2009a). CEIOPS’ Advice for Implementing Measures on Solvency II: Supervisory Reporting and Public Disclosure Requirements. *CEIOPS*, October 2009
- CEIOPS (2009b). CEIOPS’ Advice for Implementing Measures on Solvency II: System of Governance. *CEIOPS*, October 2009
- CEIOPS (2010). CEIOPS response to European Commission Green Paper – “Towards adequate, sustainable and safe European pension systems”, *CEIOPS*, 15 November 2010
- Chapman, R.J. (2006). *Simple tools and techniques for enterprise risk management*. John Wiley & Sons
- Chapman, R.J., Gordon, T.J. and Speed C.A. (2001). Pensions, Funding and Risk. *Paper presented to a Sessional Meeting of the Institute of Actuaries*, 23 April 2001
- Clark, G. and Urwin, R. (2007). Best-Practice Investment Management: Lessons for Asset Owners. *Oxford-Watson Wyatt Project on Governance*
- Deighton, S.P., Dix, R.C., Graham, J.R. and Skinner, J.M.E. (2009). Governance and Risk Management in United Kingdom Insurance Companies. *Paper presented to a Sessional Meeting of the Institute of Actuaries*, 23 March 2009
- EC (2010). *GREEN PAPER: Towards adequate, sustainable and safe European pension systems*, European Commission, 7 July 2010
- EIU (2009). Beyond box-ticking: A new era for risk governance. *Report from the Economic Intelligence Unit*
- FSA (2009). Discussion Paper 09/4: Turner Review Conference Discussion Paper. A regulatory response to the global banking crisis: systemically important banks and assessing the cumulative impact. *UK Financial Services Authority*
- FSA (2010). Consultation Paper 10/3: Effective corporate governance (Significant influence controlled functions and the Walker review). (UK) *Financial Services Authority*, January 2010
- Groupe Consultatif (2010). Security in occupational pensions. *Report of a working party of the Groupe Consultatif Actuariel Européen*
- Hatchett, J., Bowie, D. and Forrester, N. (2010). Risk management for DB pension funds. *Paper presented to the Staple Inn Actuarial Society*, 26 October 2010
- Hitchcox, A.N., Klumpes, P. J. M., McGaughey, K. W., Smith, A. D. and Taverner, N. H. (2010). ERM for Insurance Companies – Adding the Investor’s Point of View. *Paper presented to a Sessional Meeting of the Institute of Actuaries*, 25 January 2010
- HM Treasury (2009). A review of corporate governance in UK banks and other financial industry entities, Final recommendations. *Her Majesty’s Treasury*, 26 November 2009

- ICAEW (2002). *No surprises: working for better risk reporting*, Institute of Chartered Accountants in England and Wales, London, Briefing Note, June 2002
- ICAEW (2005a). Risk management: Risk Management among SMEs. *Report by the Consultation and Research Centre of the ICAEW*, November 2005
- ICAEW (2005b). Risk management: A guide for finance professionals. *Report from the Faculty of Finance and Management of the ICAEW*, December 2005
- IAA (2009). *Note on Enterprise Risk Management for Capital and Solvency Purposes in the Insurance Industry*, International Actuarial Association
- IASB (2010). *Defined benefit plans: Proposed amendments to IAS 19*, Exposure Draft/2010/3, International Accounting Standards Board, London
- IFRS Practice Statement (2010). Management Commentary: A framework for presentation. *A non-binding practice statement issued in December 2010 by the IASB*
- Kelliher, P.O.J., Wilmot, D., Vij, J. and Klumpes, P.J.M. (2011). Discussion Paper: A Common Risk Classification System for the Actuarial Profession. *UK Actuarial Profession Risk Classification Working Party, UK Actuarial Profession website*, December 2010
- Kemp, M.H.D. (2005). Risk management in a fair valuation world. *Paper presented to a Sessional Meeting of the Institute of Actuaries*, 25 April 2005
- Kemp, M.H.D. (2009). *Market Consistency: Model Calibration in Imperfect Markets*. John Wiley & Sons
- Kemp, M.H.D. (2010a). Liquidity Risk – Its Relevance to Actuaries, *Nematrian* (www.nematrian.com/LiquidityRiskRelevanceToActuaries.aspx)
- Kemp, M.H.D. (2010b). *Extreme events: Robust Portfolio Construction in the Presence of Fat Tails*. John Wiley & Sons
- Kemp, M.H.D. (2011). Entity-wide risk management for pension funds: Resources on the Nematrian website. *Nematrian* (www.nematrian.com/EntityWideRiskManagementForPensionFunds.aspx)
- Kenyon, C. (2010). Post-shock short-rate pricing. *Risk*, November 2010 or Short-Rate Pricing After the Liquidity and Credit Shocks: Including the Basis. *Social Science Research Network*
- Kocken, T.P. (2006). *Curious Contracts: Pension Fund Redesign for the Future*. Tutein Nolthenius
- Knight, F. H. (1921). *Risk, Uncertainty and Profit*. Cosimo Classics
- Lam, J. (2003). *Enterprise Risk Management*. John Wiley & Sons
- Lewin, C. (2010). The New ERM Guide. *Presentation to ERM Guide Networking Evening, Institute of Actuaries*, 20 April 2010
- O'Brien, C., Woods, M. and Billings, M. (2010). Pension risk disclosures by FTSE100 companies. *The Institute of Chartered Accountants of Scotland*
- OECD/IOPS (2011). Good practices for pension funds' risk management systems. *Organisation for Economic Cooperation and Development and International Organisation of Pension Supervisors*, January 2011
- Orros, G.C. and Smith, J. (2010). ERM for health insurance from an actuarial perspective. *Paper presented to a Sessional Meeting of the Institute and Faculty of Actuaries*, 29 November 2010
- Reinhart, C.M. and Rogoff, K.S. (2009). *This Time is Different: Eight Centuries of Financial Folly*. Princeton University Press.
- Scott, P. (2010). Making money safely: A personal view of risk management in non-financial corporates, insurance and banking. *Presentation given to ERM networking evening, Institute and Faculty of Actuaries*, 15 November 2010

Stylised pension fund balance sheet

- A.1 To navigate through the many issues involved for a holistic management of pension fund risks, it helps to have a clear conceptual framework capable of differentiating between the different aspects of assets and liabilities and the interests of different groups of stakeholders. Ideally it should be capable of incorporating the subtleties that exist in practice (e.g. the preference regulators and others might have for firms to use one sort of capital rather than another in addition to merely having a particular quantum of capital to hand).
- A.2 Kemp (2009) describes such a conceptual framework. He argues that (absent future new business or capital raising) the balance sheet of any financial firm or organisation can be conceptually organised as in the chart below.



- A.3 In this representation, 'customer liabilities' correspond to liabilities to depositors (for a bank), policyholders (for an insurance company) or beneficiaries (for a pension fund). There may be some liabilities that rank above customer liabilities (e.g. mortgages secured on particular assets), but usually most non-customer providers of the organisation's capital have a priority ranking below that of the firm's customers (i.e. in the event of default customers will be paid in preference to these capital providers).
- A.4 Stand-alone entities may only be able to replenish capital ranked below customer liabilities by raising new capital from elsewhere. The entity's ability to do so will depend heavily on the extent to which it is expected by outsiders to have access to profitable new business flows in the future.
- A.5 A similar representation can also be used for a DB (or DC) pension fund even though such a fund does not have precisely the same profit-focused outlook that is typical of a commercial firm.
- A.6 Importantly, the asset part of the portfolio may include both assets actually directly held within the scheme's balance sheet and also implicit or explicit access that the fund may have to capital that is currently held on its sponsor's balance sheet. This latter part of the capital structure is usually termed the *sponsor covenant* and is akin to a contingent IOU that the

fund may be entitled to call upon in times of trouble. Some of this IOU may be 'committed' in the sense that the sponsor may be committed to pay it as part of a recovery plan, if the scheme is currently in deficit. The rest may be conditional upon the happening of specific events, but with an expectation that it would actually be forthcoming if those events happened.

- A.7 If a DB pension fund has no sponsor (e.g. because the sponsor has defaulted) and therefore no sponsor covenant to fall back on then its position is akin to a stand-alone entity as above except that, not being commercial, it is unlikely to be able to raise much capital ranking below its own beneficiaries in the event of getting into trouble.
- A.8 All other things being equal, the greater the amount of capital the organisation has ranking below its own customer liabilities the better protected are its customers against the organisation running into difficulties. Only after this capital cushion is exhausted would customers start to find their liabilities not being fully honoured. A corollary is that 'solvency' is never absolute. As long as there are some customer liabilities there will always be outcomes we can envisage that are severe enough to result in the exhaustion of this cushion and hence in customer liabilities not being honoured in full. For example, the organisation (or its sponsor, if the organisation is dependent on a sponsor covenant) might suffer a particularly massive fraud, be hit with a particularly large back tax or liability claim, suffer reputational damage which exhausts its future earning power, or just make the wrong business decisions and end up making losses which exhaust its capital base.