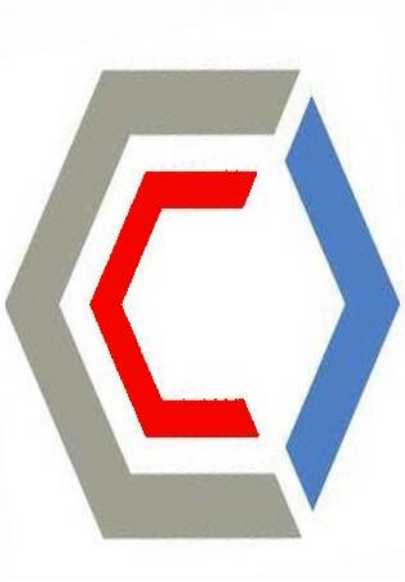

Crystal Risk Consulting

INSIGHT IN AN UNCERTAIN WORLD

Strategy and Risk in UK Life Insurance Companies

A Guide for Non Executive Directors

Patrick Kelliher FIA CERA

About Crystal Risk Consulting Ltd.

Crystal Risk Consulting Limited is an independent actuarial and risk management consultancy with wide ranging experience in financial services risks management, specialising in:

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- Operational risk models, scenario analysis and correlation assessment
- General risk framework development including risk policies and appetite

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Crystal Risk Consulting Ltd.is a founding member of the Actuarial and Risk Consulting Network Ltd. (ARCN) which draws on a network of independent risk and actuarial consultants to offer low cost yet high quality consulting services and can also help meet resource needs.

About the author

Patrick Kelliher is a Fellow of the Institute and Faculty of Actuaries with over 25 years' experience of financial services, predominantly in UK life insurance. Since 2003 he has specialised in risk management, first with Scottish Widows and later as Head of Market Risk and ALM for Aegon UK before starting up Crystal Risk Consulting Ltd. in 2011.

Patrick has recently been awarded Chartered Enterprise Risk Actuary (CERA) status and is a member of a number of actuarial profession risk management working parties including the Operational Risk Working Party which he chairs. He has produced papers and articles on a wide range of risk topics including risk classification, operational risk, liquidity risk and the differences between bank and life insurance risks. Details of these can be found at www.crystalriskconsulting.co.uk along with extensive links to risk management papers and a blog on emerging risks.

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Executive Summary

This paper is intended for non-executive directors (NEDs) of UK life insurance companies. It considers risks to strategy and how strategy may affect risk profile. Strategy is defined in terms of maximising shareholder value (see section 1.) which is based on the sum of:

- Embedded Value:
  - Net assets on an IFRS basis; plus
  - Present value of future profits (PVFP) arising on existing business, adjusted for risk and the cost of capital; plus
- Goodwill based on:
  - The present value of future new business profits; plus
  - Value added through back-book initiatives to manage persistency, reduce costs and improve risk-adjusted investment returns.

Risks to strategy are covered in section 2.and are split into external risks which are beyond the insurer's control, and internal risks which the insurer may directly affect. External risks include:

- Impact of market falls and economic downturns (2.1.1 – 2.1.2);
- Political, fiscal and regulatory changes (2.1.4 – 2.1.6);
- Competitor actions (2.1.9); and
- Issues with distributors and providers like reinsurers (2.1.10 – 2.1.11).

Internal risks include:

- Weaknesses in products, service and systems (2.2.1 – 2.2.3);
- Brand and reputation risk (2.2.6); and
- Project failings affecting e.g. new product developments (2.2.7).

The products sold and strategy pursued will affect the risk profile of the insurer. This is discussed in section 3.by broad risk type:

- Market risk, covered by product, noting in particular the:
  - Impact of market risk on unit linked PVFP (3.1.1);
  - Option-like nature and associated risks of variable annuity and with-profits guarantees, and the limitations of dynamic hedging used for the former (3.1.2 – 3.1.3);
  - Liquidity premium rationale for backing annuities with corporate bonds – though this creates exposure to widening bond spreads (3.1.5) and credit risk (3.2.1);
  - Exposure to stagnant or falling long term house prices under equity release (3.1.6); and

    - Significant market risks in staff defined benefit pension schemes (3.1.8).
- Credit risk including:
    - Bond credit risk including ABSs, CDOs and CDSs (3.2.1);
    - Reinsurer default risk including annuity reinsurance, longevity swaps and reinsured fund links (3.2.4); and
    - Derivative counterparty risk (3.2.5).
- Insurance and demographic risk:
    - Longevity risk including trend and anti-selection risks (3.3.1);
    - Mortality and morbidity risks (3.3.2 – 3.3.3);
    - Persistency risk including mass surrender risk (3.3.4); and
    - Expense risk, noting the sensitivity of embedded value and new business profits to overhead allocation between products, and also initial/maintenance/claim costs (3.3.5),
- Liquidity risk – mainly arising from mass surrenders, but with issues around linked funds investing in illiquid assets like property (3.4).
- Operational risk including:
    - Conduct risk such as misselling as well as SIPP and Wrap conduct risks (3.5.1);
    - Processing risk such as errors in unit pricing, with-profit payouts and underwriting, as well as issues with SIPP, Wrap and financial reporting data (3.5.3); and
    - Outsourcing issues including fund manager exposures (3.5.5).
- Tax, regulatory capital and frictional risks (3.6).
- Aggregation and diversification (3.7)

Section 4., deals with mutual life insurers; the issues raised by falling with-profits sales; and their strategic options. This is followed by some concluding remarks in section 5.

Appendix I sets out some sample questions which NEDs may wish to consider when reviewing and challenging strategy, while Appendix II goes into hedging and other investment initiatives in more detail.

Introduction and Scope

This paper is intended for non-executive directors (NEDs) of UK life insurance companies. Its purpose is to give NEDs an idea of the risks to the successful attainment of strategic objectives, and how strategy may affect the risk profile of the life insurer.

The paper only considers UK life insurers. Different tax and regulatory regimes have led to life insurance markets in other countries evolving in different ways with different products and risk profiles as a result. The risk profile of UK unit linked business is radically different from US spread business for example. Strategy and risk for non-UK life insurers merit separate papers in their own right.

Similarly the paper does not consider wider financial services activities such as banking or institutional asset management. It does however consider retail mutual funds which are integral to insurers product offerings such as Self Invested Personal Pensions (SIPPs) and Wrap platforms, and touches on some of the risks associated with bank deposits linked to these offerings. It also considers equity release products such as lifetime mortgages which many UK life insurers offer.

The focus of the paper is on economic value and risks. Thus there is a focus on risk-based capital as opposed to regulatory capital requirements; and on economic profit and embedded value as opposed to IFRS profits.

The pace at which economic value can be released to shareholders in the form of dividends depends on accounting rules and regulatory capital constraints. However at the time of writing there is considerable uncertainty over both regulatory capital requirements and accounting rules for life insurers, with Solvency II and the revised IFRS4 accounting standard still to be finalised. As a result, the paper does not cover in detail regulatory capital and accounting constraints on the emergence of distributable profit.

While the primary focus is on shareholder value, there is a section on mutuals and how strategy and risk may differ for a life insurer ultimately accountable to its policyholders.

1. Risk, capital and shareholder value

1.1 Shareholder Value

Strategy is often expressed in terms of maximising shareholder value but this begs the question of what is shareholder value in the context of a UK life insurer

A starting point would be the net assets of the insurer over liabilities on an IFRS basis, but this is likely to understate shareholder value. Being a long-term business, there is an intrinsic value to the existing portfolio of policies relating to the stream of future profits that will emerge over time. For instance a stakeholder pension may generate charges of 1% p.a. of the fund value[1], but only incur costs of 0.7% p.a., giving rise to future profits of 0.3% p.a. of fund value. The present value of such future profits (PVFP) is generally excluded from IFRS figures but should be included in any assessment of shareholder value.

1.2 Allowing for risk

PVFP may be estimated based on expectations of future fund growth, lapse and mortality rates, expenses etc. but this will overstate its value to shareholders. There are risks attaching to the future stream of profits such as variances in investment returns, lapse and mortality experience, expenses incurred etc.. PVFP should be adjusted to allow for these risks.

Some risks will be asymmetric in that the downside for shareholders will be larger than the upside. For instance, a fall in markets could increase guarantee costs significantly but a rise in markets may only give rise to a modest reduction in these costs, which cannot fall below £0 after all. Measures of shareholder value will invariably be reduced to reflect these risks.

By contrast, some risks may be considered symmetric in that shareholders are equally likely to gain as lose from fluctuations in risk factors such as market returns or lapse rates. An example of a symmetric risk would be mortality rates on annuity business as shareholders would gain as much from higher than expected mortality rates as they would lose from lower than expected rates.

[1] Such charges are often referred to as fee income – for the purposes of this paper, fees and charges are considered to be one and the same.

The allowance for symmetric risks in PVFP is more nuanced than asymmetric risk. Some would argue that symmetric variations in mortality rates and expenses are idiosyncratic as they are not linked to wider stockmarket movements. Therefore, they would be diversified away in a portfolio of shares. Thus, the argument goes, no allowance is necessary for such risks. Allowance would only be required for symmetric risks linked to the stockmarket, which may include persistency risk where lapse rates vary with stockmarket levels.

I am not convinced of this argument. Longevity risk on annuity business may be considered symmetric but if the risk were to be hedged or the portfolio sold, the life insurer's counterparty would demand a premium for taking on the risk. Gains may be equally as likely as losses relative to best estimates of mortality rates, but counterparties, being risk averse, will attach greater weight to the downside, hence the need for a premium for longevity risk.

I believe that any PVFP should be adjusted downwards for all risks, regardless of whether they are idiosyncratic or symmetric. However, there will also be diversification benefits between risks. For instance, mortality rates and stockmarkets are generally uncorrelated (except, perhaps, in the case of a flu or other pandemic). It would be appropriate to make some allowance for diversification in any adjustment to PVFP for risk.

1.3 Adjustment for the cost of capital (CoC)

As well as allowing for the risks associated with the existing portfolio of business, the PVFP calculation should allow for shareholder capital tied up in supporting that business. There is an opportunity cost to shareholder funds tied up in this way, which should be reflected in any assessment of shareholder value.

There are two types of capital calculation:

- Capital needed to meet regulatory requirements including any "buffers" over the regulatory minimum that are deemed necessary. This is called regulatory or Pillar I capital[2].

[2] Financial services regulation is increasingly based on 3 pillars: Pillar I relating to minimum capital requirements; Pillar II relating to the company's own assessment of its risks and capital need to cover these; and Pillar III relating to market disclosure of information. In the UK, insurers are required to carry out a Pillar II Individual Capital Assessment (ICA) of risks at least at a 99.5% confidence level over a 1-year period.

- Capital needed to cover risks at a desired confidence level e.g. 99.5% over 1-year, broadly commensurate with a minimum BBB credit rating; or 99.97% over 1-year commensurate with a AA target rating. This is often called risk based capital (RBC), economic capital (EC) or Pillar II capital.

The calculations differ:

- Under current ("Solvency I") rules, the Pillar I capital requirement is assessed as a percentage of liabilities plus a percentage of the excess of sums insured over these liabilities. The percentages vary by product line and the liabilities are calculated incorporating margins for prudence. The value of assets available to cover this requirement is written down to allow for concentrations of investments, and generally there is no allowance for PVFP.

- By contrast, Pillar II or Economic Capital calculations generally start from best estimates of assets and liabilities, with no adjustment to assets and with allowance for PVFP. Capital requirements are based on the life insurer's own models of risks and allow for diversification between these.

Typically more shareholder funds will be tied up meeting Pillar I requirements as the calculation does not allow for PVFP[3]. However on a stand-alone basis Pillar II requirements will often be larger as they will reflect risks affecting the PVFP such as persistency risk.

The difference is particularly pronounced for new business as generally initial costs and statutory requirements will exceed initial cash inflows. The difference – the "new business strain" – will deplete Pillar I capital even though the new business may be profitable on an economic basis. By contrast, Pillar II assessments will generally reflect the future profit arising on new business which often exceeds initial costs and economic capital requirements, so writing profitable new business will generally improve the Pillar II position[4].

To the extent that capital tied up reflects Pillar II capital to cover risks, the cost of this capital and the adjustment for risk can be considered one and the same. Indeed adjustments for risks are often based on the cost of projected future risk-based capital requirements.

[3] Note for some unit linked business however, Pillar I requirements may be slight but there may be considerable exposure to operational risk which may give rise to a larger Pillar II requirement to cover this risk.

[4] An exception may be annuities business where economic capital requirements can exceed the new business profit.

However a further allowance needs to be made for any Pillar I capital requirement in excess of the Pillar II risk based capital requirement. In both cases, the cost of capital should be based on the weighted average of debt costs and the target return on shareholder capital.

1.4 Embedded value

I have proposed a measure of shareholder value based on IFRS net assets plus a PVFP figure adjusted for risks and the cost of capital. This may be termed "embedded value (EV)" but it is worthwhile considering this measure against EV calculations often used in supplementary reporting. These calculations may be split into two broad categories:

a) Traditional EV reporting; and
b) Market consistent EV (MCEV) based on principles outlined by the CFO Forum in June 2008[5].

Traditional EV calculations project cashflows and assets based on expected rates of return which include "risk premia": the excess return over risk free rates expected to be earned on equities and other risky assets. Statutory liabilities are also projected and a statutory surplus calculated based on the difference between projected assets and statutory liabilities.

These surpluses are then discounted using a "risk discount rate" to arrive at a PVFP figure. The risk discount rate will generally be higher than the expected return on equities. A high discount rate is intended to make implicit allowance for risks attaching to the projected surpluses. The calculation also allows for regulatory capital requirements as these will affect the emergence of surplus – the later surplus emerges, the greater the impact of the risk discount rate. However the choice of expected returns on assets and the risk discount rate is subjective and the allowance for risk is opaque, so it is not clear whether traditional EV calculations estimate shareholder value satisfactorily.

MCEV seeks to address the subjectivity and opacity associated with traditional EV calculations. Assets are projected and cashflows discounted at risk free rates[6].

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[5] Updated in 2009 and subsequently - see http://www.cfoforum.nl/embedded_value.html#principles

[6] Though in annuity calculations, a "liquidity premium" may be allowed for in respect of corporate bonds backing this business. This reflects the higher return on corporate bonds to compensate for their illiquid nature. This is not really required for annuity portfolios as the liabilities are also illiquid, so the compensation results in an economic gain.

This "risk neutral" calculation, ignoring risk premia expected to be earned on risky assets, implicitly allows for hedgeable market risk[7]. Explicit deductions are then made for market risk which cannot be hedged; for non-market risks; and for the cost of capital.

While MCEV may form a suitable basis for assessing shareholder value, there are a number of issues with this. Following on from 1.2 above, many (if not most) companies using MCEV do not allow for idiosyncratic symmetric risks in the non-market risk adjustment, and so do not allow for any risk premium which counterparties may require to hedge these risks.

Also, the cost of capital focusses on frictional costs of tying up shareholder capital in a life insurer, such as any double taxation incurred and fund manager fees on shareholder assets. It may not fully address the opportunity cost of tying up shareholder funds in this way.

1.5 Goodwill

Not surprisingly given the issues, stockmarket analysts seem to have little faith in EV figures and many life insurers trade at a discount to EV per share. However if the EV figure did make proper provision for risk and the cost of capital tied up in the business, a case can be made that the share price should trade at a premium to EV per share.

This is because the value of a life insurer should be more than its IFRS net assets and any intrinsic value implicit in the existing portfolio. The life insurer can create additional value by writing profitable new business. Even if it is closed to new business it can also create additional value through "back book" initiatives to reduce expenses, improve persistency and enhance the risk : return profile of the existing book of business[8].

We can term the potential value from profitable new business and back book initiatives as "goodwill". Strategy can thus be seen as trying to realise this potential value and in doing so enhance overall shareholder value.

[7] "No arbitrage" theory suggests that if all the risk is hedged away, the return on the asset would be the risk free rate; and with risks hedged it would be appropriate to discount asset cashflows at the risk free rate.

[8] An example of the last would be reinsurance and/or hedging initiatives where the reduction in risk – as measured by allowances for this in PVFP – exceeds the cost of hedging implicit in the reinsurance premium or derivative terms.

1.6 The strategy cycle

This brings us to the strategy cycle which seeks to continually assess what options the life insurer has to realise goodwill, and which of these is optimal having regard not just to the economic value created but also practical constraints such as dividend targets and regulatory capital requirements. Within these constraints, money may be available to fund what may be termed "discretionary" projects – as opposed to mandatory projects required to keep the business going such as projects to meet new regulations.

This discretionary spend may be directed to the development of new products or the enhancement of existing products, which may boost new business sales and/or margins. Alternatively it could be spent on back book initiatives. A life insurer will typically have more potential candidates for discretionary spend than there is money available, and will need to choose between these. In any case it should discard projects which do not generate an adequate return relative to the resources committed.

Economic theory suggests that a "net present value (NPV)" approach, discounting project costs and benefits at a hurdle rate of return, is optimal in selecting projects, but an "internal rate of return (IRR)" is also commonly used. IRR involves solving what discount rate would equate costs and benefits but may give very high – in some cases infinite – rates of return where the cost is low or negligible in relation to returns, even if those returns are modest.

Whichever approach is used, it is worth noting that managers may be biased towards suggesting initiatives that will pursue growth and no doubt help them retain their position. There is a case for NEDs looking to see what may happen if a "do nothing" approach is adopted. If nothing is spent on new products and refreshing existing products, market share will inevitably decline over time, and with it the value of new business created. It may be useful however to understand the alternative to committing money on discretionary projects when this could be returned to shareholders. Ideally, among the range of strategy options presented will include the possible sale of certain business lines deemed "non core" and closure to new business altogether, so that NEDs can understand whether there is any worth in remaining open to new business.

Most figures for projected sales and projected benefits will be highly subjective. Subjective assumptions should be explicitly stated and key assumptions robustly challenged by the Board. Section 2. considers risks to strategy which may invalidate these assumptions and prevent planned targets being attained.

The impact of strategy on the risk profile of the business should also be considered as part of the review of strategy – see section 3. – along with the impact on accounting profits and regulatory capital.

Finally, just as no plan survives first contact with reality, no strategy survives first contact with the market. On implementation, consumers and competitors will react to the life insurer's initiatives in often unexpected ways, while all plans are hostage to events such as stockmarket falls or changes in government. No strategy can ever be considered complete and needs to be continually reviewed and revised.

2. Risks to strategy

Risks to strategy relate to the risks which can prevent planned targets being obtained. There are many different definitions of strategy risk but this section is based on the concept of strategy risk outlined in the Institute and Faculty of Actuaries' paper "A common risk classification system for the Actuarial profession" (Kelliher et al, 2011)[9]. This defined strategy risk in terms of threats to goodwill comprising of new business sales and back book initiatives consistent with 1.5 above. It covers:

- Risks leading to actual strategic outcomes differing adversely to expectations;
- Risks which may inhibit strategy and strategic choices; and
- The risk that the strategy chosen is sub-optimal.

It breaks strategy risks down into exogenous (/external) and endogenous (/internal) categories, with the former relating to external threats to strategy and the realisation of goodwill (e.g. competitor actions) while the latter relates to internal constraints and failings (e.g. project failure). The following expands on the strategy risk categories outlined in the paper in the context of UK life insurers, based on current conditions at the time of writing.

2.1 External risks

2.1.1 Financial market risk

Life insurance sales will be affected by financial markets. Low interest rates – such as those experienced in the current era of quantitative easing – will drive savers from deposits to equity and property investments like those offered by life insurers and mutual fund managers. However a fall in stockmarkets could reverse this trend – rather than see lower market levels as an opportunity to buy, most savers historically have taken fright, leading to lower sales of investment products. Lower markets will also reduce the size of pension fund transfer values, reducing the amount if not the number of transfer business sales which could be a significant part of pension's new business. Lower pension fund values could also lead savers to defer retirement, adversely affecting annuity and other retirement income sales.

[9] See http://www.actuaries.org.uk/research-and-resources/documents/common-risk-classification-system-actuarial-profession and in particular sections 3.1, 3.4 and 10. as well as Appendix I.

Falling stockmarkets can boost demand for products with guarantees and / or structured products based on derivatives. The latter will typically offer security of capital (though see sections 3.1.4 and 3.2.5 below) with some level of participation in stockmarket growth.

The level of participation will depend on option prices and the market volatility implied by these prices. High option prices and implied volatilities will lead to poorer participation rates which may adversely affect sales. Similarly, lower short or medium-term bond yields will also have an adverse effect on the participation rate and sales[10].

Lower long-term bond yields will adversely affect annuity rates, reducing the attractiveness of annuities. This may lead to greater sales of other retirement income products such as drawdown. It may also encourage equity release sales as pensioners seek to boost retirement income.

Equity release sales will themselves be affected by house price levels – rising house prices will increase the amount of equity that can be released and hence case size and margin. However for pensions and investment business, residential property and in particular buy-to-let represents a competing offering: in rising housing markets, many potential mass affluent and high net worth (HNW) customers may see buy-to-let as a more attractive opportunity than a pension plan or an investment bond.

While pensions and investment sales will be sensitive to financial market conditions, protection business will generally be unaffected except insofar as house prices affect mortgage lending and hence demand for mortgage protection products.

Overall the best way to manage the sensitivity of sales to market conditions is to have a diversified range of offerings e.g. to offer structured products and alternative investments such as absolute return funds in addition to equity based products; and/or to offer income drawdown as well as annuities.

[10] Taking a 5-year single premium product as an example, the bulk of the single premium will be invested in bonds to return the initial investment after 5 years. Some of the balance will be used to buy a call option which will generate stockmarket exposure leaving the rest to cover expenses and profit. The lower the 5-year bond yield, the greater the amount that has to be set aside to return capital and the less available to generate stockmarket return. Also the higher the implied volatility, the more expensive will be the call option and the less upside that can be purchased for a given proportion of the premium.

2.1.2 Macroeconomic risk

Life insurance sales will be affected by the wider economy. Economic downturns and higher unemployment will reduce demand across the board.

A downturn in the housing market and in mortgage lending will adversely affect mortgage-related protection sales. The self-employed will have less taxable profits to invest in pension plans while some may go bust or simply cease contributing altogether (see persistency risk in section 3.3.4 below). Lower pay rises will reduce corporate pension scheme increment business while redundancies will reduce corporate pension scheme sizes overall. Lower voluntary staff turnover will reduce the flow of new entrants into corporate pension schemes but there will be a corresponding benefit in terms of improved persistency in respect of existing members. In general lower disposable income will lead to less being available to be invested in pension and investment products.

2.1.3 Insurance experience risk

Higher mortality and morbidity rates will adversely affect the profitability of existing protection business (see 3.3.2&3 below) but may also affect future protection sales. Life insurers can increase premium rates to offset the higher claim rates and preserve margins but the higher premiums could deter sales.

The opposite is true of annuities. Falling mortality rates and longer life expectancy has contributed in part to the decline in annuity rates over the past decade (along with falling bond yields). This fall in rates has contributed to the perceived poor value of annuities in the eyes of consumers, notwithstanding the longer period these are now expected to be paid out for.

Note that there may not be offsets: mortality rates could increase for working age adults who buy protection, while at the same time decrease for pensioners who take out annuities, leading to higher protection premiums, lower annuity rates and reduced sales in both instances. Recent improvements in mortality have also been accompanied by increases in some critical illness claims as conditions previously fatal are cured yet still trigger a critical illness claim. This has led to an increase in premium rates for critical illness policies offsetting lower premiums on life insurance.

2.1.4 Fiscal risk

As in all areas, tax has an important impact on life insurance sales. In general, higher personal taxes will reduce disposable income and hence demand for life insurance products. Specific tax policies can have a significant impact on individual product lines, particularly for pensions business where sales are driven in part by tax relief available, which has been steadily cut in recent years. Investment products written as ordinary (non-pension) life insurance policies can also be affected by changes in capital gains tax (CGT) relative to income tax: lower CGT rates will make mutual funds more attractive from a tax perspective.

Protection sales could also be affected by the availability of tax relief on pension related term assurance or by changes to corporation tax deductions for key man insurance.

Some life insurers can find themselves with transient tax advantages e.g. due to an excess of relievable expenses ("E") over investment income ("I") on ordinary life insurance which is taxed on an "I-E" basis. Such tax advantages could be used to offer tax efficient products to savers, boosting sales. Invariably, only a limited amount of business can be written before the tax advantage is exhausted. Strict monitoring needs to be in place to ensure this limit is not exceeded.

A key fiscal risk is that of changes to life insurance taxation. As well as the impact of such changes on the existing portfolio of business, this could undermine the economics of future sales and business lines.

2.1.5 Political risk

Linked to fiscal risk is the political risk arising from the uncertainty over current and future government policy. Fiscal policy is just one aspect of this and is exacerbated not just by actual tax changes but also potential changes in tax regimes depending on future political outcomes (e.g. a future Labour government may restrict pension tax relief more than a future Conservative government).

Politics doesn't just affect fiscal policy however. A key example of this is the recent abolition of the requirement to buy an annuity with pension scheme proceeds which has adversely affected the annuity market.

More generally, the extent of the welfare state has a direct bearing on the life insurance industry which exists in part to supplement the protection provided by the government. The UK life insurance industry and overall UK private sector provision have both grown because of the relatively modest pension provided by the state.

By contrast in many continental European countries, generous state pensions have relegated insurers and other private providers to a peripheral role in pension provision, which helps explain why the UK life insurance industry is larger than its continental counterparts. Of course changes to state provision may affect this position.

For instance the proposed move to a single flat rate state pension might lead to the abolition of contracting out which in turn could lead to more closures of defined benefit schemes for existing members. This, however, may benefit life insurers offering defined contribution alternatives highlighting that there can be opportunities as well as threats associated with changes in government policy.

A more extreme example of political risk would be measures such as the nationalisation of pension funds seen in Hungary and Argentina, though this looks unlikely in the current UK political environment.

One particular area of political uncertainty worth noting is in the field of long term care for the elderly. Potentially this could be a significant market for life insurers given the growing population requiring such care, but a lack of political consensus makes it difficult to design suitable products for this market.

Last but not least of all political risks, there are Harold MacMillan's "events" which blow governments off course and may seriously disrupt life insurance and other industries. An example of this might be a referendum vote to leave the EU. NEDs should be on their guard against the often unlikely but ever present threat of political turmoil. They should require the impact and potential responses to such political events to be tested as part of regular stress and scenario testing.

2.1.6 Regulatory risk

As well as the risk posed by changes in the fiscal regime and wider political risk, there is also a risk to strategy posed by regulation.

The most obvious impact of regulation is in the area of distribution where life insurers and their distributors are currently seeking to adapt to the Retail Distribution Review (RDR). As intended this will alter distributor behaviour, making it less biased.

While this will be beneficial to consumers, it may adversely affect some products such as life insurance investment bonds, though to what extent is still uncertain. What is known is that higher professional standards for advisers, while improving the quality of advice, will reduce the number of advisers and hence advised sales, at least in the short term. Distributors have had to re-engineer business models to meet the demands of RDR and this disruption will also adversely affect sales in the short term. The RDR has driven and may continue to drive IFA firms out of business and this will also have a negative impact on sales.

Regulation also affects sales in terms of disclosure requirements. There is a fine balance between imparting key facts to consumers and overloading them with information which may put them off. At present there is a drive for increased disclosure of costs and charges particularly around investment costs. While these costs are significant, there is a risk that if increased disclosure of costs is not put in context, it could deter savers from pension and investment products. This could perversely push them towards bank deposits where costs are opaque.

As well as the impact of regulation on sales, regulation may directly impact on product design. The most obvious examples of this are charge caps like those on Stakeholder pensions. These caps are being tightened in the context of auto-enrolment, reducing income from charges. While savings could be made, for instance by restricting fund choice to keep investment costs down, life insurers will probably have to absorb the bulk of this reduction in charge income, lowering margins and in some cases making business economically unviable.

Charge caps are not the only way regulators may inhibit product design. Fund choices and investment options (e.g. hedge funds) may be restricted while any bundling of products is likely to face regulatory scrutiny. There are indications that the Financial Conduct Authority (FCA) will intervene more proactively in product development going forward.

Regulation can also impose additional costs on life insurers e.g. to disclose additional information to consumers. To the extent these costs are not passed on to consumers, they will erode life insurer's margins.

Macro-prudential regulation will also impact on sales and margins. Higher capital requirement – such as those mooted under Solvency II for some business lines – will increase the amount of capital required to write business and hence the cost of capital, reducing economic profit and/or requiring product terms to be made less attractive, harming sales. Note that there may be "collateral damage" from macro-prudential regulation applied to other parts of financial services e.g. leverage ratios and higher capital requirements under Basel III may adversely affect bank lending which will affect mortgage related protection sales, and may dampen economic activity overall.

Lastly, regulation can also affect back book initiatives. For example, investment initiatives to improve risk adjusted returns like liquidity swaps[11] may be stymied by regulatory scrutiny. Hedge initiatives may also be affected if the regulator has concerns over the counterparties and/or the insurer's ability to manage the hedge. Regulators could also affect outsourcing initiatives to drive down costs, for example by imposing additional safeguards which may reduce cost savings.

2.1.7 Market trends risk

Strategy will be based on many assumptions, particularly regarding trends in product markets. For example, in corporate pensions, there will be assumptions about auto-enrolment such as the proportion of employees opting out of a scheme – a higher than expected opt out rate will lead to lower scheme contributions levels and profitability. Another related assumption may be the proportion of company pension schemes going with the quasi-public National Employment Savings Trust (NEST) rather than life insurer plans which will impact the size of the market for life insurers. NEST may also affect margins due to its low charges. The one thing these assumptions have in common is that they are unlikely to be realised exactly in practice.

At the time of writing, a significant area of uncertainty over future market trends is how Wrap platforms will affect savings, investment and pensions markets. Many life insurers have invested significant sums in developing Wrap platforms based on assumptions about the proportion of business that will be done through such platforms in the future. If this is lower than expected, such investment may prove to be a "white elephant". On the other hand, if Wrap platforms come to dominate the market, those life insurers who were sceptical and did not invest in Wrap may come to rue their decision.

[11] These may involve the life insurer swapping liquid assets for illiquid assets with a bank in exchange for an increase in return for the insurer and greater liquidity for the bank. The reduced liquidity may not be an issue for the life insurer e.g. if the assets are backing illiquid liabilities like annuities.

Unfortunately strategy is decided without the benefit of foresight. The key control to manage the risk that a market does not trend as expected is to highlight assumptions made regarding market trends along with alternative scenarios for markets to develop so that Boards can appreciate the significance of such assumptions. Ideally, assumptions should also be backed up by market research, but NEDs need to be aware that even independent, external research can be affected by the biases of those carrying out the research.

2.1.8 Social and demographic trends risk

As well as assumptions regarding product market trends, strategy will also be underpinned by assumptions regarding wider social and demographic trends. For example, e-commerce strategy will be underpinned by assumptions about consumer's willingness to engage with and transact with life insurers over the internet, and whether this will be done by PC or smartphone. Significant sums may be spent developing functionality to carry out transactions by smartphone for example, but expected benefits may not be realised if consumers are more wary of the cyber-security risks involved than anticipated.

Wider social attitudes also affect demand for life insurance products. Perceptions of the value of pensions and the ability of the state to provide will affect the pension market, while attitudes to caring for elderly relatives will have an impact on how the long-term care market develops. Such attitudes can be difficult to elicit and/or may change over time. Misjudging these could lead to over-optimistic assumptions for the growth of pensions market, for example, or not properly appreciating the demand for long-term care – with strategy, there is as much a risk of missing opportunities as over-estimating those we know about.

Assumptions of customer behaviour and attitudes should be backed up as far as possible by customer research, not just of current but of potential future customers. However care needs to be exercised that this research is as objective as possible and does not simply reinforce existing assumptions.

As well as the risk that assumptions regarding social and demographic trends are flawed, there is also a risk that trends may be missed altogether. An example of changing attitudes being anticipated was ethical investment. Led by Friends Provident and others in the 1980s, life insurers identified growing environmental and ethical consciousness among consumers and exploited these by offering ethical funds.

However, despite the presence of a large and increasingly prosperous Muslim population in the UK since the 1950s, it is only recently that life insurers and other financial services companies have developed Sharia compliant products to meet their needs. Boards need to challenge their marketing functions to ensure that they are not missing other trends.

2.1.9 Competitor risk

The actions of competitors represent a key risk to strategy. Often strategy envisages increasing market share for certain profitable product lines but competitors are unlikely to cede such share without a struggle. Indeed competitors may anticipate increased competition and may have contingency plans in place to thwart any attempt at wresting market share away from them.

One area of competitor risk is price: to preserve share, competitors may cut their own margins, leading to lower than expected margins and/or sales. This risk is acute for protection and annuity businesses which are particularly price sensitive. Competitors may even have priced a cut in rates and have prepared systems to implement such a cut in anticipation of other life insurers' moves in these markets. Their response to such an initiative may be quicker than anticipated.

As well as price, competitors may also improve the quality of their products, adding product features to enhance the attractiveness of their offering, thereby preserving or increasing market share. Again a competitor may have such an enhancement "in their back pocket", ready to respond to moves by other life insurers.

Linked to the quality of competitor products is the risk that competitors may copy a life insurer's own product innovations and launch their own versions faster than expected. The uplift in sales as a result of this innovation may be shorter than anticipated. The expected speed of a competitor response is a key area of challenge for the Board.

Competitor actions may also disturb distribution. In particular, competitors tying key distributors will cut these channels off, adversely affecting sales. The extent to which competitors will tie up channels is another key assumption which should be rigorously challenged.

Competitors could also poach key staff, robbing the life insurer of talent. The loss of a key salesperson could disrupt sales, while loss of experienced technical experts such as pricing actuaries could disrupt product development, particularly for product lines such as annuities where such expertise is vital.

Supporting every strategy must be retention and succession plans for key staff along with programs to develop talent and reduce key man dependencies.

A final remark on competitors is that these will not just be life insurers. For corporate pensions, employee benefit consultants (EBCs) offering unbundled service such as scheme administration will be competitors as well as key distributors. Set up as part of auto-enrolment reforms, NEST is also emerging as a key competitor for life insurers, and its low charges will place downward pressure on margins.

For individual pensions, specialist SIPP providers will pose a challenge to life insurers while for savings and investment, fund managers like Fidelity will be as important as life insurers. It should be noted that in the US, most pensions, savings and investment is done through mutual funds rather than unit linked life insurance contracts. That life insurers may be so prominent in the UK may be due in part to higher levels of commission in the past which the RDR has done away with. Lastly, while many Wrap platforms are offered by life insurers, others platforms will be run by non-insurers such as distributors like Hargreaves Lansdowne moving beyond selling to "manufacturing" pensions, savings and investment products through their Wrap platform. Life insurers need to look holistically at who exactly is competing with them, noting that it may be more difficult to understand how well non-ABI members are doing as they may not contribute to market share statistics.

NEDs should query strategies and plans which focus on insurance competitors whilst ignoring competitors who are not insurers. Competitor analysis should consider the degree to which these may seek to expand into insurers' share of the overall market. Furthermore, insurers should look at markets more holistically to understand the breadth of opportunities, not just the segments of markets occupied by insurers where data may be available from the ABI.

2.1.10 Distributor risk

The amount of sales arising from a particular distributor or channel may be affected by:

- High staff turnover
- Regulatory investigation
- Financial difficulties
- Competitor actions including distributor ties
- Relationship failures

As well as risks posed by regulation and the actions of competitors, there are other risks which may affect the volume of business produced by distributors, and the proportion flowing to a life insurer.

In terms of volume produced, high staff turnover is likely to reduce average productivity. Meanwhile regulatory investigations of distributors could disrupt business even if no breach of regulations is found. Financial difficulties may force distributors to retrench by cutting back on financial advisers to save costs but this will also reduce volumes. Among smaller IFAs, a certain level of insolvencies may be expected, but if this was to spike upwards – e.g. because of FSCS levies, or a rise in professional indemnity costs – this will have a negative impact on volumes across the board. The insolvency of a key distributor will have a similar impact, though some of the void may be filled by other distributors. In considering the distribution element of strategy, attention should be given to the financial strength or more importantly weakness of distributors.

Even if total distributor volumes are as expected, the proportion flowing to an individual life insurer will vary. This may be due to increased competition in terms of product terms or distribution ties as noted in 2.1.9 above, but it could also be due to deterioration in the relationship between the life insurer and the distributor. In some cases, a life insurer may choose not to deal with a distributor as they may be too small to be economic, but for those they do choose to deal with, resources will be required to sustain the relationship.

A final word on an insurer's own direct sales force (DSF): while the insurer has control over the size of this sales force (and so this is more an internal risk), there are still risks to the amount of sales produced from this channel. For instance, higher than expected adviser turnover will affect sales as it will take time to train replacements and get them up to the same level of production as those they replace. They may also be affected by regulatory investigations. It cannot be assumed that current production levels will continue if adviser numbers are maintained. Any projected increase from this source needs to be justified in terms of the projected number of advisers, with assumptions for productivity grounded in current productivity and staff turnover rates.

2.1.11 Supplier / provider risk

Life insurers will depend on other providers to help put together their offerings, and there is a risk that these providers will adversely change their terms or worse still, stop providing the components of the life insurer's product, calling into question the entire offering.

Key suppliers include:

- Reinsurers
- Investment banks and other derivative counterparties
- Fund managers, and
- Outsource partners

Reinsurers are a key supplier for protection business. While reinsurance premiums will include a profit margin for the reinsurer, they often can accept risk on a more cost effective basis than the life insurer, so perversely the higher the proportion reinsured the greater the profit to the life insurer[12].

In taking risk off a life insurer, on the right terms, the reinsurer allows the insurer to write more business and accept more risk on a gross basis (i.e. before reinsurance) for a given amount of capital. Not only will economic capital requirements be lower due to the risk transfer, regulatory capital requirements may also be lower. Furthermore reinsurers can help with the new business strain: the gap between the initial costs and regulatory capital required over initial premiums. For instance, as part of the reinsurance terms, they may offer an initial period where no reinsurance premiums are payable, helping to ease the strain.

Generally, once the life insurer enters into a treaty the reinsurance premiums and terms are set[13], but to the extent that treaties may need to be renewed or new treaties required for new products, there may be uncertainty as to the terms offered and hence the profitability of new business.

Reinsurance premiums will vary with an "insurance cycle" whereby rates charged vary between "soft" (i.e. lower reinsurance premiums) and "hard" depending on the flow of capital into insurance markets and the level of claims experienced. The latter may be affected by natural and other catastrophes – heavy losses on hurricanes in Florida can deplete reinsurer reserves and capacity, leading to higher reinsurance premiums for UK term insurance amongst other things.

As well as taking on risk and helping with new business strain, reinsurers also offer considerable help to life insurers in terms of expertise on underwriting and pricing. This may extend to underwriting and claims systems[14]. A break-down in the relationship (or in extremis, reinsurer insolvency) could deprive the life insurer of this support.

[12] Though the reinsurer will generally reinsure no more than 90% of the risk so the life insurer still has "skin in the game" and underwrites risks properly

[13] Though life insurers need to be aware of the operational risks which may give the reinsurer cause to break with the treaty (see 3.5 below)

[14] E.g. Swiss Re's Magnum automated underwriting system

Another source of provider risk is derivative counterparties. As noted in 2.1.1, general market disruption could increase the price of options, reducing the participation rates and hence the attractiveness of structured products. However a reduction in a life insurer's own credit rating could lead to derivative counterparties imposing harsher terms which may have a similar effect.

There may also be a contraction of counterparties willing to write the bespoke options required for structured products, again pushing up prices and adversely affecting participation rates. This may be driven in part by regulation such as increased capital requirements for investment banks and/or a push towards centrally cleared derivatives which may not cater for bespoke options.

Fund managers are another source of provider risk. A life insurer tied to a poor performing fund manager could suffer in terms of sales, though offering a range of fund managers through "open architecture" products may mitigate this risk. Fund managers may also provide services in relation to the establishment and the pricing of funds, and another risk is that the terms of the fund manager for these services may limit fund choice and/or reduce the life insurer's own margin. While terms may be written into an investment management agreement, life insurers may have leverage if the fund manager needs life insurance funds to "seed" (i.e. provide initial investment into) the fund manager's own funds, and the life insurer may be able to renegotiate terms. Also, beyond any "lock in" period, it may be able to move funds to another manager or even manage funds in-house[15].

The ability to develop attractive products for the market may also be affected by outsourcing partners and what they can effectively administer. Even if outsourcers can administer the products a life insurer wished to sell, there is a question as to what they may charge to do this, which could render any proposition uneconomic.

This may be tied into the wider relationship with the outsourcer and whether administering existing business is profitable for the outsourcer. For a life insurer that is open to new business, outsourcing arrangements should be negotiated not just in relation to cost savings on the administration of existing business, but also to how well the outsourcer may cope with new products and how much they might charge for administering these. The relationship should be actively managed, exploiting any leverage the life insurer may have e.g. to change outsourcers.

[15] Friends Life has recently been doing this.

Lastly, life insurers writing protection business will also depend on doctors to help in the underwriting process. The amounts doctors charge for reports and medicals used to be agreed between the ABI and the BMA but this is no longer the case. The cost of these may vary, which will have an impact on costs and profit margins.

NEDs should seek to understand the extent to which their company's strategy is reliant on such third parties, and to query what contingency plans are in place in case a key supplier is not able or willing to support the insurer's strategy.

2.2 Internal risks

2.2.1 Product risk

Life insurers do not develop strategy in isolation. Strategy necessarily builds on a life insurer's current position in the life insurance market and its current suite of products.

Product risk relates to the risk that the current range of products is uncompetitive, either in terms of cost or product features, thereby preventing planned targets being achieved. For savings, investment and pensions business, poor fund performance and/or a lack of fund choice can detract from the life insurer's offering, though offering a range of funds from different managers through "open architecture" can mitigate this. For protection business, the insurer's record in terms of ease of underwriting and claims payment may also impact sales.

It is important that any strategy should start with an honest assessment of the strengths and weaknesses of the current product offerings and whether these are sufficiently competitive to achieve planned sales. To the extent they are not, there should be product development proposals to address these weaknesses but the Board could well conclude that current offerings are indeed competitive and that a proposed development may bring only marginal benefits.

It may also conclude that the current product range is unwieldy, with too many variants of products not generating enough sales to justify the increased complexity associated with the different variants. Strategy appraisal can be a good time to take stock of the extent of the current product range and prune uneconomic product variants or indeed product lines.

Another aspect of product risk is whether the product terms are consistent with-profit targets. Products may need to be re-priced to achieve these targets, which may call into question whether even current volumes can be maintained if charges / premiums are increased. Lower volumes may in turn make it even harder to achieve profit targets as fixed costs will be spread over a smaller number of policies.

Conversely lower charges / premiums will lead to more business and the economies of scale gained could outweigh the lower marginal income per policy. In my experience, however, there is often a great deal of wishful thinking with this "pile 'em high, sell them cheap" strategy which should be vigorously challenged. Again an honest appraisal of the impact of varying prices on volumes and overall profits is required.

2.2.2 Service risk

Aside from the current product range, another risk to strategy may be the life insurer's reputation for service. A poor reputation can be a key handicap to building market share, particularly for pensions where scope to compete on charges may be limited due to charge caps while differentiation on fund choice is limited with most providers products operating on an open architecture basis. An honest appraisal of the quality of service is necessary to understand how well the life insurer is placed in terms of customer service. This should include consideration of any planned changes, and be backed up by extensive customer research.

It may be that the life insurer has a project planned to improve service, providing the platform for sales targets to be met, in which case the risk becomes one that the project fails or does not deliver anticipated benefits (see 2.2.7 below).

Conversely a life insurer may have a good reputation for service, but cost cutting initiatives such as outsourcing may threaten this going forward. The Board needs to balance the benefits from such initiatives with the potential deterioration in customer service that may arise and its impact in terms of lower sales as well as poorer persistency.

As well as cost cutting initiatives, another factor that can compromise service is the number of new policies written. A modest increase in policies could be comfortably accommodated, particularly if there is some spare capacity in servicing areas.

If a strategy envisages large growth in the number of new policies, however, there is a risk that service will deteriorate unless there is a commensurate increase in skilled staff to process this new business and over time, to deal with the increased number of in-force policies.

A good reputation for service can be difficult to achieve but readily lost. NEDs need to be on their guard against complacency when it comes to a good reputation for service.

As well as the quality of service offered, there is a need to consider the cost of providing this, and whether this is affordable given the margins available. It is no good offering a Rolls Royce service on a Lada budget.

This is particularly true for corporate pensions where margins are thin. Ideally most servicing would ideally be done via the internet but this in turn requires a robust, well designed e-servicing platform. How contributions are paid is also important for corporate pension servicing costs and hence profitability. Allowing corporate pension schemes to pay contributions by cheque with details on a paper list will require more servicing effort[16] than where contribution details are submitted electronically with contributions then collected electronically – the former option may just not be viable within margins available.

There is not a straightforward relationship between service cost and quality. As Napoleon remarked, "the morale is to the physical as three is one" and the morale of customer servicing staff is key to a good customer experience. Good morale and hence good service can be created by good management at little cost, while thoughtless management can just as easily destroy it. Any savings by penny pinching management could easily be offset by lost sales and higher lapses if this results in poor morale and service.

The quality and experience of customer service staff is also important. In this regard, staff retention is critical as long serving members of staff will typically be more productive than new members. For example, moving staff to an out of town warehouse may lower costs in the short term but if staff turnover increases, the benefit will be lost due to the loss of experienced staff, the cost and difficulty of recruiting and training replacements, and the lower average productivity associated with shorter average experience.

[16] Staff may need to input contribution details from the paper list manually into the system, and there are often discrepancies between the amount of the cheque and the total amount of contributions which need to be resolved.

Cuts to training may also prove to be a false economy, offset by increased operational losses due to errors by poorly trained staff as well as lower efficiency. NEDs need to consider the long term impact of such "savings" on customer service, sales and persistency.

Administration systems are another part of the servicing equation. The less functionality a system has to administer a product, the greater the amount of manual effort and hence servicing costs. There is also a greater likelihood of error with such manual "work-arounds", giving rise to poor service and operational losses such as customer compensation for errors made.

Unfortunately administration functionality is often not complete when products are launched, particularly for product features like loyalty bonuses which may not be added until the policy is in-force for say 10 years. All too often, developing this functionality is first to be de-scoped if the system development falls behind. Rather than accept the assertion that a project has been successfully delivered, NEDs should query what functionality remains outstanding at the end of the project, whether the project should have covered this, and what problems are being stored up for the future with undeveloped functionality.

Finally, the quality and cost customer service can be a function of product complexity. This may not be an issue if most of the complex features are administered automatically, but to the extent they are not, the more complex the product, the more complex and time-consuming any manual processing will be, and the greater the likelihood of errors and operational losses.

2.2.3 IT systems risk

IT systems can be another barrier to success. One risk is that IT systems cannot support new products, which may limit the scope to participate in certain market segments. There is also a risk that new business systems fail which may disrupt sales and damage the life insurer's reputation. As for servicing, a large growth in the number of new policies could stretch systems beyond their capacity, leading to system crashes.

Legacy systems in particular may struggle to cope with new products and increased volume. Often these will already have been extended to cover products they were not originally designed for. There comes a point where they cannot support any more variations to products and/or becomes so unstable that system crashes are not only likely but inevitable.

More recently established life insurers with newer systems often have a competitive advantage in terms of having more modern, flexible and robust systems.

For an insurer plagued by legacy issues, there is always the temptation to ditch legacy systems and start from scratch. This is not a decision to be taken lightly. In my experience, there can be considerable development required even in buying "off the shelf" administration systems as these will need to be customised to the life insurer's business. There is a surprising amount of complexity involved in ensuring policies can be set up, premiums collected, fund values updated, charges collected and claims paid out correctly.

Unit linked business is particularly complex: a unit linked policy can be compared to a multi-currency bank account with sterling premiums converted into units at a fund price as opposed to foreign currency at an exchange rate, but while there are scarcely 200 currencies in existence, some providers may offer over 2,000 funds. Fund prices may need to sourced from scores of external fund managers. Different insurers will have different charging structures, with a mixture of fixed charge (in sterling terms) and charges levied as a percentage of fund value, often with rebates in respect of the latter.

Non-linked business can be complicated by options to vary policy terms which may require complex actuarial calculations. There may be a need to capture detailed underwriting information, particularly for protection business. Tax deductions and limits may complicate the administration of annuity and other claim payments.

Even if a new administration system can be successfully built from scratch, there is then the question about what to do with existing business. Migration from legacy systems to the new platform would be an obvious solution, but again in my experience, this can be a complex and laborious project which should not be undertaken lightly.

The alternative is to leave legacy products on legacy systems but there will be a cost to maintaining two separate systems, particularly where systems need to be changed to meet regulatory requirements such as new disclosure rules: two separate change programs are required to update each system.

2.2.4 Cost base risk

Complex products, inefficient servicing models and/or obsolete systems can lead to a life insurer having heavier costs than its competitors. This can be exacerbated by high corporate overheads. Even if it can cover these costs through charges, in the long term it will not be competitive and this will act as a drag on strategy. In any case, cost efficiency should be pursued for its own sake even if sales do not seem to be affected by high costs and charges.

2.2.5 Pricing capability risk

Aside from products, service, systems and costs, another constraint on strategy is the ability to price products properly. This requires having both expertise and data. The former can be a particular problem for annuity business where there is a need to understand longevity and other risks to properly set rates. If this is not done properly, the result may be "anti-selection" with competitors with more refined rating structures "cherry picking" customers leaving the life insurer with poorer risks i.e. customers who are more likely to live longer (see 3.3.1.2 below).

Lack of data could affect life insurers entering new markets, particularly for protection business. More established players will have built up experience and may have a better understanding of the risks. This may place a new entrant at considerable disadvantage. NEDs should bear this limitation in mind in reviewing any drive into new markets.

2.2.6 Brand and reputation risk

Of all the prerequisites for a successful strategy, the most important are brand and reputation. A good reputation is essential to sell life insurance which at the end of the day is simply an intangible promise to pay. Reputation damage can decimate sales and increase lapses. Such damage can be driven by operational failings such as misselling or by concerns over financial strength, perhaps in the event of a financial market crisis. It may also be self-inflicted such as the damage suffered by Ratner's after unguarded remarks by its CEO on the quality of its products. Often there may be no substance to the damage, such as false rumours over financial health. Meanwhile a life insurer may suffer "collateral damage" from the failings of others – just as all meat processors were affected by the recent horse meat scandal arising from some of their number.

While a life insurer does not have to do anything for its reputation to be damaged, good PR management can limit damage even where there has been a major failing such as misselling. A life insurer should have contingency plans in place to handle the public relations side of any major operational or other failing.

While a good reputation is prerequisite for sales, this may not be enough to attain strategic goals. A life insurer may have a good reputation but its brand may not support its strategy. By way of an analogy, both Volvo and Ferrari have good brands, but the latter would appeal more to high net worth clients.

To gauge whether the life insurer's brand is compatible with its chosen markets, an honest appraisal is required of what the life insurer's brand is, supported by customer research that is as objective as possible.

2.2.7 Project risk

As noted above, a life insurer's current products, its servicing model and/or its systems may be unsuitable to pursue strategic aims. To close these gaps, projects may be proposed to update the product range, improve customer service and address systems limitations. In addition "back book" projects will be proposed to realise goodwill by cutting expenses, improving persistency and improving the risk : return profile of the business.

The delivery of these projects will be key to the success of the strategy, but there are considerable risks to a project successfully delivering on time within the budget set, including:

- Planning failure: failure to properly budget for costs; assess risks to the project; and build in adequate contingency margins.
- Project management failure: once the project is underway, failure to ensure costs are managed and milestones on the path to delivery are met.
- Project counterparty failure: the risk that external parties critical to the project fail to deliver what is expected of them; or only do so at excessive cost. This includes the risk the counterparty goes bust.
- Key person risk: relating to the loss of key staff and the disruption this causes; or from not having adequate expertise in place at outset. This may be a particular problem for back-book initiatives such as hedging which may rely on legal and actuarial expertise.
- Unexpected project costs: relating to unanticipated increases in existing costs (e.g. due to an increase in VAT) or new costs arising (e.g. additional costs imposed by regulators).

- Project implementation: flawed implementation of developments including failure to test system changes to ensure these meet specifications; failure to properly "regression test" the changes on existing systems; and failures when putting changes into production.
- Change portfolio mismanagement – failure to manage multiple projects at the same time.

Last but not least, even if a project is successful in terms of implementation on time within budget, there is a risk that promised benefits do not materialise. For instance the uplift in sales from a new product development may be smaller than expected.

There is considerable overlap here with other risks: the lower than expected uplift in sales may be due to faster than anticipated competitor response (see 2.1.9) or incorrect assumptions of market trends (2.1.7), but even if these are as expected, there is still residual uncertainty as to what uplift a new product development will have.

More often than not, projected benefits will be based on subjective judgements, and there is every chance the outcome will differ even if all other assumptions in terms of successful delivery, competitor response and market trends are met. It is important that sales targets and assumptions are vigorously challenged before and not after the project.

2.2.8 Business mix risk

Even if sales targets are met, there is still a risk that new business profit margins will not be realised. Profitability will vary by the size and term of the policy amongst other things. Strategy plans will make assumptions regarding the mix of business but the actual mix may differ, with a higher proportion of less profitable business than expected.

Business mix will also affect the capital requirements of new business. Some types of policy will be more capital intensive than others, so an adverse mix could also lead to higher than expected capital requirements.

2.2.9 Initial expenses risk

Projected new business profits will also be based on assumptions of initial costs per policy[17]. To the extent that volumes are lower than expected, fixed costs will be spread over fewer policies and initial expenses per policy will be higher than anticipated, so a shortfall in sales may have a disproportionate impact on new business profits[18]. Initial costs per policy may also be higher than expected due to higher than expected marketing and sales costs, or higher than expected corporate overheads allocated to marketing and sales.

Linked to business mix risk above, there is also a risk that commission costs may be greater than expected due to distributors with higher than average commission rates accounting for a larger proportion of business than expected. With the Retail Distribution Review however, this is only likely to be a significant issue for protection business.

2.2.10 Capital risk

In general, capital is required to write new business. Initial costs and regulatory capital requirements generally exceed initial cash inflows. This will place a strain on the regulatory capital position. Consequently there is a need to consider the potential for higher than expected sales and the risk that this will damage financial strength.

There is also a risk that market, credit, insurance or operational losses reduce regulatory capital, and that the life insurer may need to scale back new business plans to preserve regulatory capital and financial strength.

2.2.11 Leadership risk

Last but not least of the internal risk categories, strategy will be affected by the quality of leadership. There is a risk that poor leadership will lead to a sub-optimal strategy and/or failure to execute strategy properly. Among the risks that may give rise to this:

- Loss of leaders – to other companies, or through sickness, death or family circumstances.

[17] The ultimate profitability of new business will also be affected by ongoing maintenance and claim costs over time, though this is generally considered under Insurance and Demographic Risk - see 3.3 below.

[18] There is an overlap between this risk and other risk categories which may lead to the shortfall in sales.

- Inexperienced leaders with insufficient understanding of the business, or leaders inadequately equipped to deal with changing markets.
- Disunity of purpose – with different managers pursuing their own agendas, leading to lack of clarity and "turf wars".
- Agency risk – as managers interests are not aligned with those of the shareholders. For example, managers may pursue overly aggressive strategies to boost share prices and the value of their stock options, not paying enough attention to the risks they run.
- Lack of oversight and challenge of strategies selected.

On this point, the oversight of the Board is probably the biggest guard against management selecting sub-optimal strategy, and thus the greatest protection of shareholder value. Other controls include succession plans to guard against the loss of key staff and an executive development program to ensure both current and prospective leaders have a sound understanding of the business and the markets it operates in.

2.3 Joint-ventures, mergers and acquisitions (M&A)

Joint-ventures, mergers and acquisitions span internal and external categories of risk, involving as they do both the life insurer's management and execution capabilities as well as those of third parties.

2.3.1 Joint-venture risk

Joint-venture risk relates to failure of joint-ventures to realise expected benefits. This may be due to the factors outlined in 2.1 and 2.2 above. However, it may also be down to the relationship with the joint-venture partner, who may have different objectives to the life insurer. There is also a risk that joint-venture partners go bust or are otherwise unable to fulfil their obligations under the joint-venture agreement. Last but not least, there may be clashes of personality and/or culture which prevent the joint-venture from fulfilling its true potential.

The key mitigant of this risk is detailed due diligence of the partner's financials, their business objectives and their culture. A perfect fit is not always available, particularly if a UK life insurer is looking to expand into overseas markets where participation may have to be through a joint venture with a local firm. Still the Board should be fully aware of where the stresses in the relationship may arise and plan for how these can be managed.

2.3.2 M&A risk

A life insurer may well seek out merger and acquisition (M&A) opportunities to fulfil its strategic goals, adding another firm's capabilities to its own. However there are a number of risks to M&A including the risks that:

- An overly ambitious M&A program places a strain on the overall business due to the difficulty of combining the different entities. Management overstretch could lead to a loss of focus, damaging sales and other initiatives.
- Planned mergers and acquisitions do not proceed e.g. due to competition authority objections.
- Completed mergers and acquisitions fail to deliver anticipated benefits e.g. expected synergies and cost savings are not realised, either due to these being over-estimated in the first place, or because of failure to integrate fully, limiting the benefits arising.

Last but not least, there is a risk that a life insurer may fail to identify M&A opportunities – as ever with strategy, there is a risk that opportunities will be missed as well as not exploited properly.

2.4 Strategy risk – general

Often strategies fail for a range of reasons but there can be some common contributing factors. One is poor leadership as noted in 2.2.11. Another is the general calibre of staff – poor morale and high staff turnover can affect service quality and DSF production, but also project delivery and the quality of strategy development.

The culture of the organisation also plays a part. A cautious, risk-averse culture may fail to capitalise on opportunities, while an aggressive culture could embark on a fundamentally reckless strategy which may ultimately lead to ruin.

Strategy is underpinned by a wide number of assumptions, most of them inherently subjective. These assumptions need to be supported, where possible, by facts, and robustly challenged. Failure to do so could lead to over-optimistic assumptions about market trends and the impact of product launches. This is likely to lead to disappointment – and worse, money wasted on projects which fail to realise benefits, nor recoup the investment in them. Rigour is key to the strategy development process.

Last but not least, a successful strategy relies on as good an understanding of the risks involved as possible. There will always be "unknown unknowns" which no one could have foreseen, but more often than not, financial institutions fail because they fail to appreciate the "known unknowns". Two good examples of this are Northern Rock's failure due to an old-fashioned bank run, or HBOS's catastrophic losses on relatively mundane commercial lending. Failure to appreciate the impact of strategy on risk can lead to an unsound strategy that may ultimately threaten the survival of the life insurer.

3 Impact of strategy on risks

After identifying a range of strategy options, and the risks attaching to the attainment of goals under each option, the next step in the strategy evaluation process is the assessment of how strategy pursued affects the wider risk profile, particularly in relation to new business sales. Consideration should be given to how risks relating to new business interact with risks inherent in the existing portfolio, whether there are any diversification benefits, or whether they merely add to the sum total of existing risks. Even closed books need to be wary of the impact of strategy on existing risks – for example, outsourcing servicing will increase operational risk exposure to third party suppliers.

3.1 Market risk

Market risk in this context relates to financial markets, not the markets for life insurance products. The common risk classification paper referred to in 2.above defines this as the "risk that as a result of market movements, a firm may be exposed to fluctuations in the value of its assets, the amount of its liabilities, or the income from its assets". The nature and extent of market risk varies from product to product.

3.1.1 Unit-linked business including pensions and mutual funds

UK unit linked business generally has few guarantees (except for variable annuity business – see 3.1.2 below). The policyholder primarily bears the risk of poor investment performance. The risk profile is akin to that of mutual funds, albeit with a different legal form.

However both unit-linked policies and mutual funds have management charges linked to the value of the fund. This charge income will fluctuate with the markets in which the funds are invested in. IFRS profits are typically based on income in a single accounting period and the fluctuation in this income will be modest. In terms of shareholder value, however, the impact on future charges and PVFP will be considerable. Thus there is substantial economic exposure to equity, property, currency and other risks which affect fund values[19].

[19] PVFP is generally not reported for mutual funds but there is an economic value to the future profits from mutual funds business, and this economic value will be sensitive to fund value, so it is useful to consider this economic risk for mutual fund business.

Also some life insurers act as de facto market makers in unit linked funds, holding a "box" of units to smooth out variations between net inflows and net outflows thus preventing frequent changes in unit prices (see 3.4.2 below). This will directly expose the insurer to market fluctuations in the underlying assets

Note market risk exposure does not just relate to changes in indices like the FTSE100 and S&P500. There is also "basis risk" relating to the performance of a fund relative to such benchmark indices. Poor performance would exacerbate stockmarket falls, though funds can also outperform, reducing the impact of any market fall.

Interest rate risk relating to changes in risk free rates[20] will affect bond values and hence fund values, but it will also affect discount rates used in the PVFP calculation and hence the value of (a) future fixed or premium related charges and (b) fund related charges on future premiums[21]. Higher medium- and long-term risk free rates will reduce the value of these.

3.1.1.1 SIPP and Wrap

Market risk exposure on SIPP and Wrap will be similar to traditional unit-linked plans, with charge income fluctuating with the value of the fund. However these products allow investment in a wider range of unit-linked and mutual funds including exchange traded funds (ETFs), as well as direct investment and shares and commercial property. Cash balances are typically invested in a separate deposit account. These funds may also be invested in asset classes not typically offered through conventional unit linked funds e.g. ETFs investing in commodities, so there will be some difference in the nature of market risk exposure for these products.

3.1.2 Variable annuities

Variable annuities are an important product in the US life insurance market and may become more important in the UK market. Essentially these are unit linked policies with guarantees e.g. on death, or on a certain anniversary.

[20] For the purposes of this paper, risk free rates are assumed to be based on swap rates consistent with the risk classification paper but they could be based on Gilt yields. There is a risk relating to variances in the gap between Gilts and swaps.

[21] For fund related charges on existing funds, an increase in the discount rate will be offset on a market consistent basis by a higher risk free rate used to project future charge income. For fund related charges on future premiums, however, the benefit of the higher projection rate only applies from when the premium is paid.

The value of these guarantees will typically be hedged, with the cost of the hedge reflected in charges to the policyholder.

The guarantees are like put options on the underlying fund, with the policyholder benefitting from the higher of the fund or the guarantee in the same way as put options underpin individual share or stock index option values. However the guarantees will relate to unit linked funds as opposed to shares or indices; and are generally of longer terms than most traded options.

As such the guarantees cannot usually be hedged through the purchase of options. Therefore, they will usually be hedged using "dynamic hedging". This involves holding a varying portfolio of derivatives which seek to match and offset changes in the value of the guarantees to different market variables. The key variables ("greeks") affecting the value of guarantees are:

- Delta – the first order increase in guarantee values as a result of a fall in asset prices;
- Gamma – the second order impact of a fall in prices: the change in the value of the guarantee is non-linear, and delta itself will change with different asset price levels;
- Vega – the value of guarantees will increase as the volatility of assets implied from the price of options on these increase; and
- Rho – the value of guarantees will generally increase as risk free rates decrease (though rises in bonds held in unit funds may offset this).

The delta exposure can be hedged though futures, but there is a need for further protection against the non-linear impact on the value of guarantees of larger asset price falls (gamma). This may be done through holding out of the money put options.

Vega could also be hedged through put options or through variance swaps[22]. Rho can be hedged through a portfolio of interest rate swaps structured so that the any increase in the value of guarantees with lower risk free rates is offset by profits on the swap portfolio.
Crucially, the sensitivities of the value of guarantees will change over time – vega and rho are proportional to the term of the guarantee while gamma is inversely proportional – and will also change with different asset prices, volatility levels and risk free rates. The portfolio needs to be constantly varied so that it can continue to hedge the value of guarantees, hence the term dynamic hedging.

[22] Variance swaps are like interest rate swaps but are based on the actual volatility of asset prices over a certain period. Note that put options required to match vega will be different for that required to hedge gamma.

There will be a cost to frequent adjustment of hedge portfolios. Dynamic hedging typically involves buying high and selling low, and the resulting cost would be comparable to the premium on a put option of similar term, strike price etc. (if it were available). This cost of hedging guarantees will need to be factored into charges under the variable annuity policy, and the resulting annual management charges can be considerable: 2%+ p.a., which limits the demand for variable annuity products.

Note that in practice, hedges may not be continually rebalanced – they may be rebalanced daily, weekly or less frequently to reduce transaction costs, and also because of the time taken for the actuarial function to calculate sensitivities. The less frequently the hedge is rebalanced, the greater the likelihood it will cease to match the value of guarantees, leading to under- or over-hedging. Under-hedging will lead to losses when the value of guarantees rises as it will not be offset by a rise in the hedge portfolio. Over-hedging will lead to losses when markets rise and the fall in the hedge portfolio exceeds the fall in the value of guarantees. Of course, gains may equally arise in either position, but the point is that the life insurer is not hedged against market risks.

Even if an insurer wanted to continually rebalance, this may not be possible in stress conditions when markets can fall faster than the insurer can react. This occurred on Black Monday 1987 where investors using dynamic hedging, "portfolio insurance" techniques could only sell short a fraction of the futures contracts they needed to rebalance their hedges.

Aside from infrequent rebalancing and the impact of sharp falls in markets, there is also basis risk. The derivatives will generally be based on stockmarket indices but the guarantees will relate to fund values which may underperform these indices. Such underperformance is likely to be unhedged and will lead to guarantee losses. There is a need to limit the range of funds in which a variable annuity policyholder may invest to ensure that the potential for underperformance and the degree of variance between fund assets and the hedge portfolio is limited.

In my opinion, it is not a question of whether dynamic hedging techniques will fail, but when. NEDs should be under no illusions that the market risk associated with the value of guarantees is fully hedged, but should seek to understand in what circumstances a dynamic hedging strategy could come undone[23].

3.1.3 With-profits

With-profits business used to be the mainstay of UK life insurance business. With-profits business evolved differently in the UK compared to the US and continental Europe, with the UK version offering a combination of guarantees, equity based investment and smoothing of returns that proved to be a compelling customer proposition.

However in the aftermath of Equitable Life's problems in 2000/01, the FSA introduced its realistic balance sheet reporting regime. This forced life insurers to mark the value of guarantees to market, and lead to higher capital requirements for with-profits business. To offset these higher capital requirements, life insurers restricted guarantees and moved with-profit funds out of equities and into bonds, reducing prospective returns. Coupled with criticism of with-profits for a lack of transparency, with-profits has fallen out of favour with consumers and their advisers. There has been a sharp fall in sales. It remains important for some life insurers, but others have stopped selling with-profits business either actively or altogether. Still most insurers will have a sizeable legacy portfolio of with-profit business and hence exposure to market and other risks associated with these.

At the heart of UK with-profits is the concept of the "asset share". This is a with-profits policy's share of with-profit fund assets and is generally based on premiums rolled up at the rates of investment return earned by the with-profits fund, less expenses, death claims and other costs incurred. The asset share may be supplemented by profits on non-profit business or reduced by the cost of shareholder dividends.

The asset share forms the basis for with-profits payouts but these would also be underpinned by guarantees which increase with regular (also known as reversionary) bonus additions. To the extent that the asset share exceeds the guaranteed value, the difference would be made good through a final terminal bonus addition.

[23] For a further discussion of the risks associated with variable annuities, the author would recommend "An executive's handbook for understanding and risk managing unit linked guarantees" (Maher et al, 2010) – see http://www.actuaries.org.uk/research-and-resources/documents/executives-handbook-understanding-and-risk-managing-unit-linked-gua

UK with-profits funds will be invested in a range of assets, typically including equities and other volatile assets in order to deliver higher investment returns and meet policyholder expectations of competitive payouts. However, there is a mismatch between guarantees and equities and other volatile assets in the with-profits fund. Falls in these assets could bring the asset share below the guaranteed level, giving rise to guarantee costs. In this way, a with-profits policy is similar to a variable annuity albeit with guarantees applying to the asset share as opposed to the unit fund[24]. There will be similar exposures to falls in asset prices, changes in risk free rates, and rises in implied volatilities. The size of many legacy with-profit portfolios, and the option-like nature of the cost of guarantees, can lead to significant balance sheet volatility. Many life insurers have sought to hedge out guarantee costs using options and other derivatives (see Appendix II.1.2).

Note there are significant differences between with-profits and variable annuities. One is "smoothing": before arriving at a payout, the asset share will be smoothed so that payouts will be greater than asset share when markets are falling and less than asset share when they are rising. Over time, smoothing is supposed to be a zero sum game but from time to time, the life insurer will need to absorb over-payments before these can be clawed back by under-payments when markets recover.

Another distinctive feature of with-profits business is the degree of discretion afforded to the life insurer. Unlike variable annuities, where the policyholder chooses which funds to invest in (albeit from a limited range), the life insurer may vary the investment mix of the with-profits fund and hence the degree of risk. It may also vary the pace at which guarantees build up through varying reversionary bonus. Last but not least, it may pass some of the guarantee costs on to other with-profit policies by deducting the cost from their asset shares. However all these areas of discretion need to be tempered by Treating Customers Fairly (TCF) obligations and also the Principles and Practices of Financial Management (PPFM) which sets out how with-profits funds should be managed fairly in the interests of policyholders and shareholders.

In conclusion, with-profits' market risks are similar to variable annuity risks. Indeed on newer with-profits products, any guarantees would often be hedged using similar dynamic hedging techniques. However smoothing of returns introduces complications. The life insurer may also have more leeway to manage with-profit market risk by varying investment mix, bonus rates and guarantee cost charges to policies, albeit within TCF and PPFM constraints.

[24] It should be noted, however, that the asset share is a notional figure not generally visible to the policyholder, unlike a unit linked fund value.

3.1.4 Structured products

Structured products include guaranteed equity bonds (GEBs) which are single premium policies which promise to return capital after a certain period along with a percentage of the growth of a stockmarket or stockmarkets. Typically part of the single premium will be invested in bonds to repay the capital, with the balance after expenses and profit invested in call options[25] to provide the exposure to the stockmarket(s). In this way the assets and liabilities are matched.

However, as the underlying assets will be bought before the GEB is sold, there will be transient yet considerable market risk exposures in holding these assets pre-sale. These are often referred to as "ware-housing" risks.

An income based variant of the GEB is the precipice bond. A smaller portion of the premium is invested in bonds, guaranteeing only a partial return of capital. Another part is paid out as income, often at very attractive levels, but the higher income rate the lower the proportion of capital guaranteed. The balance after expenses and capital is invested in call options which will make good the difference in capital at the end of the bond's term but only if markets do not fall over the period of the bond. If they do, policyholders may suffer significant losses of capital. While this does not affect the life insurer directly, it is likely to damage its brand and may lead to charges of misselling[26].

Structured products also include capital protected funds which operate in a similar fashion to GEBs but are mutual funds rather than life policies. While more capital efficient, this is because the life insurer isn't guaranteeing the return of capital – instead the investor is reliant on the underlying portfolio returning capital and generating stockmarket growth. The insurer is not responsible for OTC counterparty and other risks which may lead to the underlying portfolio not delivering capital security or growth. The capital efficiency comes from the transfer of risk to the investor, and there may be TCF issues in how this is communicated to investors.

A final variant worth mentioning is structured funds which operate like rolling GEBs, guaranteeing a certain percentage of capital after say 6 months plus a percentage of stockmarket(s) growth.

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[25] An alternative to a bond plus call option may be an equity portfolio plus a put option to guarantee capital, but this would be vulnerable to tracking error on the portfolio relative to the index.

[26] An example of what can go wrong with precipice bonds is the £100m loss suffered by Lloyds Banking Group from misselling its Extra Income and Growth Plan (EIGP) - see http://news.bbc.co.uk/1/hi/business/3137872.stm

This forms the revised capital amount, which then gets re-invested for another 6 months with a similar guarantee but with stockmarket participation dependent on market conditions at the time. An issue with these funds is that protracted stockmarket falls could lead to successive losses of the proportion of capital that isn't guaranteed. Also, falling bond yields and rising option prices / implied volatilities could lead to falling stockmarket participation rates. These may generate TCF issues in terms of how well these risks are explained to customers.

In summary, aside from transient risks while underlying assets are "warehoused" prior to being sold, most structured products do not give rise to significant market risk to life insurers but policyholders and mutual fund investors may be exposed to these, giving rise to reputational and operational risks.

3.1.5 Conventional annuities

Writing conventional annuities gives rise to market risk, principally interest rate and bond spread risk. Interest rate risk arises from the sensitivity of the value of annuity liabilities to interest rates used to discount liabilities. It is possible to construct a portfolio of bonds to hedge this interest rate risk.

The simplest variation of this is "immunisation" in which bonds are selected so that they have the same average duration as the annuity liabilities. Duration is a proxy for the sensitivity of a portfolio to a change in interest rates, and this approach will hedge modest changes in rates across all terms. However it does not work so well for non-uniform changes in yield curves e.g. a steepening of the curve due to a fall in short-term rates and a rise in long-term rates. Furthermore, as the average duration of the bond portfolio will itself be sensitive to interest rates[27], there will be second order impacts from large changes in rates which may not be fully hedged. This variation in duration also requires the bond portfolio to be regularly rebalanced to ensure the annuity portfolio remains immunised to changes in rates.

A more sophisticated approach is to broadly match annuity cashflows by term. This involves splitting annuity liability cashflows into different term bands (e.g. 12 months or less, 1-3 years, 3-5 years etc.), and buying bonds with cashflows that match annuity liabilities in each term band. This is a more robust approach to matching which can cater for non-uniform changes across the yield curve.

[27] As interest rates fall, the value of longer term bond cashflows increases, and hence the greater the weighting given to these in the average duration calculation. Duration is a proxy for sensitivity – for a small change in interest rates, the change in value = duration x change in interest rate.

Even then, there still can be problems matching annuity cashflows. Often annuity liabilities stretch out longer than the term of available bonds. This is particularly the case for pension scheme buy out business where deferred annuities for those yet to reach retirement age may not become payable for another 20-30 years, and then be payable for a further 20-30 years. If bond investments are shorter than the term of liabilities, then the insurer will need to reinvest maturing bond proceeds in another bond at an uncertain rate. This gives rise to reinvestment risk that the rate at which bond proceeds are reinvested are lower than current rates. This risk could be addressed by entering into long-term interest rate swaps to "lock in" future risk free rates, but there will be residual uncertainty regarding the amount of liquidity premium available on future investment in corporate bonds.

Another problem relates to differences between statutory and realistic (/economic) annuity liabilities. The former will include margins for life expectancy being greater than expected, and thus the term of annuity liabilities assessed on a statutory basis will be longer than that on a realistic basis. Thus matching statutory liabilities will lead to a mismatch on a realistic basis, and vice versa. The former will give rise to an economic exposure to rising yields as assets will be longer in duration than realistic liabilities, whereas matching realistic liabilities will give rise to regulatory strains with falling rates as assets will be too short relative to statutory liabilities.

Aside from interest rate risk, writing annuity business will also give rise to corporate bond spread risk. Typically annuity liabilities will be backed for the most part by corporate bonds. The spread of corporate bonds over risk free rates represents partly the credit risk on these bonds (see 3.2.1 below), partly the lower liquidity of corporate bonds. The latter element of the spread – the "liquidity premium" – is not required for an annuity book as the annuity liabilities themselves are illiquid (UK annuities are payable for life and cannot be surrendered). As such the liquidity premium can be described as a "free lunch" for annuity funds, and there is an economic benefit to backing annuities with corporate bonds. To be competitive in the annuity market, pricing will generally make some allowance for the liquidity premium. This will boost annuity rates, which is fair as it is policyholders who are tied into annuity contracts they cannot surrender or otherwise liquidate.

Current Solvency I regulatory capital rules reflect this economic benefit, allowing annuity liabilities to be discounted at corporate bond rates less an allowance for credit risk i.e. including liquidity premium in the discount rate. Going forward, however, Solvency II may restrict the level of liquidity premium in the discount rate for regulatory capital calculations relative to current permitted levels.

This will lead to higher values of liabilities on a regulatory basis and greater new business strain.

Investing in corporate bonds will expose the life insurer to increases in corporate bond spreads which will reduce the value of corporate bond assets. To the extent the increase in spreads relates to an increase in liquidity premium, there will be an offsetting increase in the rate used to discount liabilities, reducing the value of these. In general, however, this will only partially offset the fall in the value of assets. Thus writing annuity business will increase a life insurer's exposure to the corporate bond market and to rising corporate bond spreads.

3.1.6 Equity release

Writing equity release business such as lifetime mortgages gives rise to two significant market risks. The first relates to funding: typically the lifetime mortgage rate will be fixed, leading to a mismatch if the life insurer funds the mortgage by borrowing at floating rates – rises in base rates could lead to funding costs exceeding the interest generated. If on the other hand, the loan is funded by borrowing at fixed rates, there is a potential mismatch as the borrower has the option to repay the accumulated loan at face value. They may do so when bond yields are low and they can refinance at a cheaper rate, but in such circumstances, it may cost the life insurer more than face value to redeem its fixed rate borrowings.

In a lot of cases, lifetime mortgages are used to back liabilities such as annuities, with annuity premiums providing the funding. In this case, repayment when bond yields are low could leave the life insurer short relative to the value of liabilities discounted at the lower bond yields.

The risk of loss on early repayment could be hedged with swaptions. Alternatively, a lot of equity release business is written with no monthly repayment, and with the loan simply rolling up with interest. The insurer may take the view that there is less incentive for such lifetime mortgage borrowers to refinance, and that they do not need to hedge the risk.

Note there is an associated liquidity risk from a lifetime mortgage where interest rolls up. With no cash coming in initially, the life insurer may still have to meet loan repayments or pay annuities and claims (if the loan is funded from other business), causing a liquidity strain.

The other major market risk relates to house prices. When the borrower dies or goes into long term care, the house will be sold to repay the (accumulated) loan but the price obtained may not be sufficient to cover this.

Generally lifetime mortgages and other equity release products have a "no negative equity" guarantee (NNEG) whereby the excess of the loan over the value of the property is written off i.e. the life insurer rather than the borrower bears the risk of a shortfall in the property value. While the initial loan may be only 20-30% of the property value, this loan may roll up over time if interest is not paid regularly.

If the initial loan is 25% of value, and the loan rolls up at 7% p.a., then it will exceed the original property value after 20 years. If the borrower is 65 and lives to 88 in line with typical life expectancies, the loan would be 119% of the original house value meaning the life insurer would have to write off over 15% of the loan if there were no increase in house prices. Of course, if the house price grows in line with long-term nominal GDP growth of say 5% p.a., then it would take over 70 years for the accumulated loan to exceed the property value and the borrower is likely to have died or gone into long-term care, and the loan repaid, long before then.

However, there is a risk of long-term declines in house prices. For example, Japanese residential property prices have fallen by 45% since 1990[28]. Such a fall in UK house prices would give rise to significant losses on equity release business. NNEGs amount to a significant bet on long-term house prices.

Exacerbating general falls in house prices, the house could fall into a dilapidated state prior to the borrower dying or going into long-term care, resulting in a lower house value and higher NNEG cost.

As well as the NNEG losses arising in the long-term, there is also a market risk associated with the present value of the guarantee, depending on how this is assessed. If this had to be valued like unit-linked or with-profit guarantees for example, the resulting option value would be volatile, fluctuating with house price levels and risk free rates, with falls in either leading to rises in the NNEG value. There is no market for long-term house price options at present, so the value of the NNEG would have to be valued on a "mark to model" basis with a subjective house price volatility assumption, but depending on the model and assumptions used, the value of this option could be significant.

[28] Source: Japanese Real Estate Institute, based on nationwide urban residential property indices up to 2012. Note the equivalent fall for the 6 largest urban areas was 65%.

A 2007 Actuarial paper calculated option values for accumulating lifetime mortgages of between 15-25% of the original loan value on a pseudo-market consistent basis, depending on assumptions used, while under a "real world" model, the value was ca.3%[29].

It should be noted that this exposure to house prices is more of a risk for equity release loans that roll up. For those equity release loans where interest is paid regularly by the borrower, the loan will not build up relative to house value and there is less exposure to NNEG costs. However, there could still be exposure if the loan to value advanced is higher for interest paid loans than loans where interest rolls up, particularly if the borrower isn't able to keep up interest payments and the loan has to revert to a roll up basis.

3.1.7 Protection business

Market risk is generally not significant for protection business as the generally the build up of reserves to be invested is small. Such reserves as there are tend to be invested conservatively in cash and bonds. Market risk may only be significant for whole-of-life and very long-term policies, and for income protection where claims are spread out over a number of years.

3.1.8 Pension scheme market risks

While pension schemes may be considered peripheral to strategy, defined benefit schemes give rise to significant market risk exposure. Typically scheme assets will be invested in part in equities and other risky assets such as property and hedge funds to deliver superior returns and reduce the ultimate cost of pension promises to the employer. However this introduces a mismatch with the value of defined benefit liabilities, which under the IAS19 accounting standard are valued using AA-rated corporate bond yields, with earnings- and index-linked benefits rolled forward using implied inflation rates based on the difference between nominal and index-linked gilt yields or swap rates (plus a margin to allow for excess earnings growth over inflation).

[29] See section 7.3 of "Pricing and risk capital in the equity release market" (Hosty et al), http://www.actuaries.org.uk/research-and-resources/documents/pricing-and-risk-capital-equity-release-market . The pseudo market consistent basis assumed house price growth plus rental income would produce a total return in line with risk free rates (similar to the assumptions of fund growth under MCEV), whereas the "real world" model allowed for a residential property return over the risk free rate.

Falling bond yields – either from lower risk-free rates and/or lower AA-rated corporate bond spreads – and rising implied inflation rates will increase the value of liabilities. Assets may also fall in value, leading to a reduction in surplus or (more commonly) a widening of the deficit of liabilities over assets. Such increases in deficit will generally not come through the Profit and Loss account, but will impact the balance sheet under IAS19.

Nearly all life insurer defined benefit schemes will be closed to new members and increasingly schemes are being closed to future accrual of benefits by existing members. Over time, pension scheme liabilities will decline as benefits are paid out though often liabilities can stretch out for decades. For example, a 40-year old member may retire at 65 and could receive a pension for a further 25 years or more.

Two key strategic choices that NEDs may face in relation to defined benefit schemes are (a) whether to close the scheme to future accrual (if it hasn't been closed already), and (b) to what extent should the scheme move out of equities and other risky assets to reduce the mismatch between assets and liabilities.

With regard to closure to future accrual, NEDs should be aware that, depending on scheme rules, this could trigger a wind-up of the scheme. Under current legislation, this may require scheme liabilities to be valued on a "buy out" basis which seeks to replicate what another life insurer may charge to insure liabilities (annuities to cover pensions in payment; deferred annuities to cover benefits for pre-retirement members). Due to margins for market, longevity and other risks that the other insurer may charge, the value of liabilities on a "buy out" basis could be significantly higher than under a "going concern" IAS19 basis, placing a strain on financial strength. NEDs should seek independent legal advice to confirm that any closure to future accrual will not trigger a wind-up of the scheme.

As for reducing the mismatch and hedging exposure to falling bond yields and rising implied inflation rates, a key issue is timing. Hedging generally limits gains as well as losses, so hedging will "lock in" the current level of deficit with little prospect of improvement. It will also lock into current nominal and index-linked yields which are currently low by historic standards – at the time of writing (early 2015), long-term index-linked gilt yields are close to 0% p.a., which is not a particularly attractive real rate of return to lock into. Boards face the unattractive choice between locking into current deficits and low current yields, or continuing with a mismatch between assets and liabilities and the potential for further deterioration in deficits. Hedging of pension scheme liabilities and options to improve risk-adjusted pension scheme returns are considered further in Appendix II.

3.1.9 Other market risks

Aside from market risks associated with insurance and pension scheme liabilities, there may be market risk associated with the value of future expenses included in balance sheet liabilities. These will typically be rolled forward with an allowance for inflation, and discounted at risk free rates. The inflation assumption will typically be based on implied inflation: the difference between nominal and real risk free rates. Falling real rates can lead to an increase in implied inflation and hence an increase in the value of expenses[30].

Many life insurers will have issued subordinated debt to boost regulatory capital. This is often at a fixed rate in which case falling nominal yields could increase the balance sheet value of this debt (though it should not affect regulatory capital as this is subordinate to policyholder liabilities). The fixed coupons payable on this debt may be swapped for floating obligations, perhaps linked to LIBOR, but this will in turn expose the life insurer to variations in LIBOR and other short-term rates leading to variations in interest costs.

3.1.10 Interactions between market risks

It is worth considering how market risks arising from writing new business interact with each other and with market risks in respect of legacy business. In general new business risks such as those relating to variable annuity or with-profit guarantees, or unit-linked PVFP, will add to the existing quantum of market risks.

If the life insurer is closed to new business, the term of liabilities would gradually shrink. This would have an impact on variable annuity "greeks" and with-profit guarantee costs sensitivities – gamma tends to increase as term shortens, whereas rho and vega decrease. As annuity and other liabilities shorten over time, they become easier to hedge. Writing new business is likely to maintain if not increase the average terms of liabilities which will offset these effects.

There could be some diversification benefits between new business risks and pension scheme liabilities. Pension scheme liabilities are often not fully hedged with respect to interest rate risk, with a fall in rates increasing liabilities more than the value of bonds held. As noted in 3.1.1, unit linked PVFP tends to be exposed to rising yields so there is an economic hedge, though not in accounting or regulatory capital terms (as PVFP generally does not count in these calculations).

[30] Falling nominal rates will reduce the rates used to discount expenses, increasing the value of these, but the impact may be offset if real rates remain the same as the difference between nominal and real rates will narrow and implied inflation of expenses will reduce.

There may be net exposure to falling rates for with-profits and variable annuities if the negative impact of lower rates on the option calculation (which implicitly assumes assets grow at risk free rates) offsets the benefit from higher bond values on asset shares and fund values. This would add to pension scheme exposures though again PVFP exposure would partially offset this on an economic basis.

IAS19 pension scheme liabilities are sensitive to AA-rated yields used to discount these. Falling spreads will reduce the discount rate and increase liabilities but annuity portfolios may gain from falls in the spread of its corporate bond portfolios. Similarly there may be balance sheet gains from the impact of widening AA-rated bond spreads on pension scheme liabilities which may offset the impact of rising spreads on annuity portfolios, though such gains will generally not benefit P&L.

3.1.11 Back-book initiatives

Back book initiatives can be split into hedging initiatives to reduce market risk and initiatives to improve risk adjusted returns. These are covered in more detail in Appendix II but the following points should be noted:

- Generally hedging equities just hedges general market falls – the life insurer will still be exposed to basis risk relating to underperformance against benchmarks which can be significant.
- Interest rate swaps can be an effective way of hedging interest rate movements, but these result in obligations to pay LIBOR which cash assets may struggle to match.
- Many initiatives to improve risk adjusted returns exploit apparent anomalies between swap and gilt rates; or corporate bond and credit defaults. While over time these may be profitable, the life insurer will be exposed to short-term, mark to market, widening of the anomaly.
- Often the reward generated is due to the life insurer taking on liquidity risk, but this may not be a significant problem if the insurer has illiquid liabilities such as annuities.
- Investment in alternatives such as private equity and hedge funds can be highly leveraged; difficult to dispose of; and/or prone to valuation error.

Finally, it should be noted that hedging limits profits as well as losses, typically reducing the expected return on assets.

3.2 Credit risk

3.2.1 Bond credit risk

As noted in 3.1.5, annuities will be substantially backed by corporate bonds to avail of the liquidity premium on these and to offer competitive prices. Thus writing new annuity business will increase exposure to bond credit risk. As well as outright defaults, downgrades will require increased allowance for credit risk. The higher allowance for credit risk will reduce the proportion of the spread relating to liquidity premium i.e. the fall in value of bond assets on downgrade will not be offset by a higher liquidity premium and liability discount rate.

There will also be exposure to bond credit risk when writing unit linked business where the underlying funds are invested in corporate bonds, with defaults and downgrades on these adversely impacting fund value and hence PVFP, as well as the cost of guarantees on variable annuities.

With-profits business will also be backed in part by corporate bonds which offer a match for guarantees whilst delivering a higher return than gilts. Defaults and downgrades will affect the cost of with-profit guarantees. Writing new with-profits business will add to credit risk, though this may be offset by overall declines in the with-profit portfolio.

3.2.1.1 Structured bonds

Part of the universe of bonds in which a life insurer may invest in to back annuity and other liabilities is comprised of "structured bonds". These include mortgage- and other asset-backed securities (ABSs) and more complex structures such as collateralised debt obligations (CDOs). The latter takes a portfolio of bonds and "slices" the credit risk into tranches, with lower equity and then mezzanine tranches bearing credit losses in the first place before these fall on senior tranches. Equity tranches will yield more than mezzanine tranches which will yield more than senior tranches, reflecting the credit risk.

Both ABSs and CDOs have attracted criticism as investment as a result of losses incurred on these during the financial crisis. This was triggered by losses on US sub-prime mortgage backed securities which were then amplified through CDOs linked to these. This highlighted weaknesses in both types of bonds.

Mortgage- and other loan-backed ABSs are generally hived off from the balance sheet of the lender who no longer bears any exposure to credit losses on these loans. This creates a moral hazard as lenders may let lending standards slip if they know they will not be exposed long-term to credit risk. This is precisely what happened in the run-up to the financial crisis with a marked deterioration in US mortgage lending standards. It is important in investing in ABSs to ensure originating lenders retain some exposure to defaults in the securitised portfolio to ensure it does not let standards slip.

While ABS have something of a bad name following the crisis, this perception has been based on the poor performance of US mortgage-backed securities. UK ABSs are different – while residential mortgage-backed securities (RMBSs) predominate in in the US, in the UK these are far less important, with UK ABSs broadly split between commercial mortgage backed securities (CMBS), ABSs issued by utility companies and "whole business securitisations (WBSs)" where a company securitises a section of its business[31].

A type of security related to the ABS is the "covered bond" which like an ABS securitises a portfolio of loans or other assets. However the bond remains on the lenders balance sheet, and where assets backing the bond are impaired, they are replaced to ensure asset quality of the backing portfolio is maintained. Covered bonds have been used in Germany since the time of Frederick the Great, and such "pfandbriefe" have a very safe track record with no defaults in over a century[32]. Many UK lenders are now issuing covered bonds, though there have been concerns expressed that the superior security granted to such bonds may reduce the security of other bonds issued by banks.

Like ABSs, CDOs have gained a bad reputation during the crisis. While senior tranches should be very secure – being protected by equity and mezzanine tranches – if credit losses wipe out these lower tranches the losses can escalate dramatically. Unlike a traditional bond, where there is generally some recovery on default, a CDO tranche can be wiped out in its entirety depending on the extent of credit losses. Even if a tranche is not affected by losses, the exhaustion of lower tranches will increase the likelihood it will be affected in the future, and so could trigger a downgrade.

[31] An example of such a WBS would be Dignity plc which securitised a subset of its chain of funeral homes to provide both the income to service the bond and security for bondholders on default.

[32] Though like all German fixed interest holdings, these would have become worthless during the hyper-inflation of 1923 highlighting that inflation can be as much a threat to bonds as default.

A particular problem for US CDOs during the crisis was the increasing concentration of the underlying portfolios in sub-prime RMBSs. The downturn in the US housing market and rising defaults on sub-prime mortgages lead to large-scale, correlated losses across portfolios. This exhausted equity, mezzanine and in many cases senior tranches. Ultimately the underlying portfolios of CDOs need to be diversified. Otherwise losses in a particular bond sector could wipe out investors.

Notwithstanding the default and downgrade losses incurred during the crisis, ABSs and CDOs have a place in the bond portfolios of life insurers. ABSs represent a significant part of the universe of investable bonds and offer diversification against other types of bond. Properly constructed and with adequate diversification in the underlying portfolio, CDOs can be very safe investments and/or have superior risk adjusted return characteristics.

3.2.1.2 Hybrid securities

Hybrid securities are bonds which have some characteristics of equity. On default, they are sub-ordinated to the claims of more senior bonds and other creditors such as bank depositors. The issuer may also have the right to defer or skip coupons and/or to defer redemption if it is in financial trouble. These types of securities form part of the Tier 1 / Tier 2 capital of banks as well as insurers capital. Banks in particular have been heavy issuers of these as covering capital requirements with hybrids generally increases returns on the banks' shareholder capital through gearing.

Hybrid bonds thus form a significant part of the universe of investable bonds, particularly for lower credit rating bands as they will typically be rated a couple of notches below non-hybrid bonds to which they are subordinated. Life insurers are likely to have exposure to these in annuity and other bond portfolios.

There are two issues to be aware of. Firstly, the degree to which hybrid bonds absorbed losses was found wanting in the financial crisis – a bond may be subordinated, but this is relevant only if the bank goes bust, which regulators are loath to allow happen. The extent to which existing hybrid bonds can count towards bank capital requirements will be restricted under new Basel III rules. Going forward, hybrid bonds are likely to be issued as "contingent convertible" or "CoCo" bonds which will convert into equity capital once the bank's equity capital ratio falls below a certain level (i.e. prior to default). While the returns on such bonds will be high, there will be a risk that a fixed income asset becomes an equity holding in a distressed bank, and life insurers need to judge whether such an asset is appropriate to back annuity and other liabilities.

Another issue relates to the term of hybrid securities. While ostensibly these may be long-term or undated, they generally come with an "early call" option that allows the bank to redeem the bond after say 5 years. In practice the bond is redeemed at the earliest opportunity, not least as coupons will generally increase ("step up") after this date. However, the bank has the option not to redeem early, which it may exercise if the cost of raising alternative finance is greater than paying the increased coupon. Some banks did this during the financial crisis and while others refrained from doing so for fear of damaging investor confidence, there is no guarantee they will not defer in the future. Such deferrals could disrupt cashflow matching for annuity and other portfolios and life insurers should monitor this situation.

3.2.1.3 Credit default swaps (CDSs[33])

While not bonds, these swaps allow a life insurer to either hedge its exposure to bonds by buying protection under the swap; or to gain effective exposure to bonds by selling protection against an individual bond or bond index. As such they can either reduce or increase bond credit risk, and it is often easier to trade CDSs rather than the underlying bonds. However there are a number of points to be aware of with CDSs:

- CDSs will give rise to credit risk relating to the CDS counterparty (see 3.2.5 below);
- CDS premiums and the spread of the underlying bond will not move in tandem – there will be a difference between the two and this difference, or "basis" can vary so that changes in bond values may be under-/over-compensated by changes in the CDS position (see II.2.2 below).

3.2.2 Loan counterparty risk

A life insurer may make loans as an investment or to further strategic objectives. With regard to the former, some annuity writers advance loans as an alternative to backing annuities with corporate bonds. This could be done as part of a syndicate of lenders, or the loan may be in the form of a commercial mortgage. Either way, the insurer will be exposed to the risk of default on the loan, which needs to be carefully underwritten to determine the terms of the loan (or whether the loan should be advanced at all). Appendix II.2.6 discusses the credit risk associated with such loans in greater detail.

[33] In essence the CDS acts as insurance against the bond defaulting in return for a certain yearly premium – for more details, see the attached Actuarial profession paper on credit derivatives: http://www.actuaries.org.uk/research-and-resources/documents/credit-derivatives.

Equity release loans are effectively issued on a non-recourse basis, with the "no negative equity" guarantee (NNEG) limiting the borrower's obligation to the value of property on death or entry to long-term care. Credit risk is more of an issue for equity release loans where the borrower pays interest regularly – there is a risk they will not be able to continue meeting regular interest payments out of retirement income, particularly if this income is not fully indexed; and/or energy, medical and other pensioner living costs outstrip inflation. The life insurer will then need to decide between re-possessing the property – potentially facing negative publicity in doing so – or allowing the loan to revert to a roll-up basis, which would increase the exposure to NNEG costs as discussed in 3.1.6 above.

For equity release loans where interest rolls up, there is no question of default on the interest payment. For both types of equity release, however, there is a risk that borrowers do not uphold their obligation to maintain, repair and insure the property. Dilapidations could lead to NNEG losses even in benign housing markets, and there needs to be systems and processes in place to monitor the state of repair of equity release properties as well as buildings insurance on these.

Aside from loans advanced as an investment, loans may also be advanced to further strategic aims e.g. a loan to a joint venture partner. While the risk : reward profile of the loan may be secondary to the strategic benefits, it is best practice to underwrite such loans in the same way as investments. There needs to be compelling benefits elsewhere if the insurer finds it would not lend on a stand alone basis.

3.2.3 Bank deposit counterparty risk

Life insurers may have significant amounts of cash on deposit and/or investments in money market instruments such as commercial paper. Often capital backing new business will be invested in such cash assets. This will expose the insurer to the default of the deposit bank or the money market issuer. Such exposure will be short-term, and it may be possible to move funds in advance of any default event, but if the insurer is one of many depositors looking to withdraw money, this "run" on the bank may itself trigger a default. Key controls to mitigate this risk are to have minimum credit rating criteria and to diversify counterparties. These may prevent the insurer placing deposits with banks offering attractive rates of interest and reduce cash returns, but in general those banks offering the highest rates of interest are also the weakest.

Many insurers invest in money market mutual funds which invest in commercial paper and other money market instruments. These offer exposure to a diversified portfolio of instruments and seek to beat short-term benchmarks such as 7-day LIBID. Many funds market themselves as having a stable net asset value i.e. a static unit price of £1, but in the aftermath of the Lehmans default in 2008, however, many funds "broke the buck" with the unit price falling below £1 leading to a loss of capital. This was driven by both losses on monies placed with Lehmans and also falls in the market value of other instruments i.e. a mixture of credit and market risk. While some funds were supported by parents and so avoided breaking the buck, this was on a discretionary basis to preserve reputation. Ultimately there are no guarantees in terms of capital – just as money on deposit with a bank is not guaranteed in the event of the bank's default.

Bank deposits may form part of a SIPP or a Wrap offering. This will expose the customer to the risk of a bank default but there is a residual operational risk that the insurer could be liable for losses on bank default if it fails to explain this risk to customers properly and/or fails to manage the risk in line with its fiduciary duties as a manager of customer funds. A similar risk exists for unit linked cash funds.

3.2.4 Reinsurer counterparty risk

As noted in 2.1.11, protection business is extensively reinsured. It follows that writing protection business will increase exposure to reinsurance counterparties. There are two aspects to the exposure: economic and regulatory capital. In economic terms, the life insurer is exposed to the reinsurer defaulting where (a) claims under the treaty plus (b) the cost of additional economic capital from being exposed to risks formerly reinsured exceed (c) reinsurance premiums payable by the insurer. This would be the case in a pandemic for instance, where the surge in reinsured death claims may itself be the driver for the reinsurer defaulting. However reinsurers could also be driven to default by hurricanes and other general insurance catastrophes.

Often future reinsurance premiums payable exceed expected claims and economic capital costs, particularly if the reinsurer offers an initial period where no premiums are payable (as it adds a loading to future reinsurance premiums to recoup this). In such a case, it is the reinsurer who is exposed to the counterparty risk of the life insurer defaulting.

As well as the economic angle, there are also regulatory capital considerations. Any regulatory capital benefit will be lost and the increase in regulatory capital requirements is likely to exceed economic exposure as the increased reserves that need to be set aside will need to incorporate margins for prudence.

Reinsurance may also be relied on for annuity business, with a proportion of annuities written reinsured to limit the growth of longevity and other annuity-related risks; manage new business strain; and/or benefit from the reinsurers expertise on longevity risk. Alternatively, annuity reinsurance may be undertaken as a back book initiative to reduce longevity exposure, or the insurer's own pension scheme may buy annuities in bulk from another insurer to cover its own longevity risk exposure to member's pensions.

Either way, exposure will be considerable – after the reinsurer receives its share of the annuity single premium, cash flows one way from the reinsurer to the insurer (or for the pension scheme, from the alternative insurer to the scheme). To mitigate reinsurer counterparty risk, the reinsurer may deposit back some of the funds it receives with the life insurer, with the latter having first call on these assets on default of the reinsurer. Alternatively, there may be a system of collateralisation whereby the reinsurer posts assets to a collateral account in respect of its liabilities under the treaty, with this account ring-fenced for the benefit of the life insurer on default.

The reinsurer may be required to top up amounts deposited back or the collateral account depending on the performance of assets and, for annuity reinsurance, where increases in life expectancy increase the reinsurer's obligations. With regard to the latter there needs to be an objective mechanism by which increases in life expectancy can be agreed on e.g. by benchmarking against other life insurers' annuitant mortality assumptions in PRA returns and/or embedded value disclosures. Note that if life expectancy decreases, the reinsurer would usually be entitled to get some of its money returned from a deposit back arrangement, or to move assets out of the collateral account

An alternative to annuity reinsurance may be longevity swaps whereby the life insurer locks into a prescribed schedule of payments in exchange for the swap counterparty making payments dependent on either the actual mortality experience of annuitants or some proxy such as population mortality rates i.e. the counterparty will bear the risk of people living longer. The fixed schedule will be based on expected mortality rates with a margin to compensate the swap counterparty for bearing the longevity risk.

An advantage of this arrangement is that rather than ceding premium up-front and being exposed to counterparty risk in respect of this, the life insurer's exposure is only to differences in actual payments over those prescribed. From the swap counterparty's point of view, there is no need to invest the reinsurance premium and be exposed to market and other risks on investments – it is only exposed to longevity risk.

However, there still needs to be a system of collateralisation whereby changes in life expectancy and hence the respective obligations of the life insurer and swap counterparty to each other can be agreed on, with assets flowing from either the life insurer or the counterparty into the collateral account to protect whoever is expected to gain from the swap from the default of the other party.

3.2.4.1 Reinsured fund links

While not reinsurance in the traditional sense of risk transfer, many life insurers access external funds through a unit linked policy issued by a life insurance subsidiary of the external fund manager in what is termed a reinsured fund link. Generally the investment management fees will be lower under a reinsured fund link than the alternative of investing in mutual funds of the fund manager, as there will be none of the trustee or depositary costs associated with mutual funds. The lower investment management fees can be critical for corporate pensions business where charges are low and a savings of a few basis points can make a large difference to profitability.

However there are counterparty risks associated with reinsured fund links. While the life insurance subsidiaries of fund managers generally only write linked business without guarantees and have limited exposure to market, credit and insurance risks, they are exposed to operational risks such as misselling, unit pricing errors and rogue trading. They tend to be thinly capitalised and a large operational loss could easily lead to a shortfall in assets relative to unit linked liabilities – unlike mutual funds where assets are ring fenced from those of the fund manager and thus protected from losses incurred by the manager. Under the FCA's Conduct of Business sourcebook rules for permitted links, 21.3.3 specifies that this shortfall can only be passed on to policyholders if (a) the risk has been properly explained to policyholders and (b) the life insurer takes steps to manage the counterparty risk on their behalf.

Thus the life insurer is potentially exposed to a shortfall on default of a reinsured fund link counterparty. Worse the life insurer's policy with the fund manager's insurance subsidiary will be classed as reinsurance and so will rank below non-reinsurance policies (e.g. a policy issued by that subsidiary to a pension scheme).

This will mean that the shortfall will be borne first by reinsurance policies such as the life insurer's policy unless the life insurer has a legal charge agreed with the subsidiary so that it ranks parri passu with non-reinsurance policies.

To be fair, the types of operational risk which could cause a fund manager's life insurance subsidiary to default are somewhat extreme, and the likelihood is very low. Furthermore the fund management group may indemnify its subsidiary against such losses, adding a further layer of protection against default. Still it is best practice to assess what operational risks the subsidiary may be exposed to, the extent of indemnities given by parent and the financial strength of the parent in order to assess how material the tail risk of default is, and whether the gain in terms of a few basis points reduction in annual investment fees adequately compensates for this.

3.2.5 Derivative counterparty risk

Counterparty risk for derivatives can be distinguished between the risk arising on centrally cleared derivatives and that on bespoke "over the counter (OTC)" deals with individual investment banks. OTC derivatives can be tailored to the life insurer's particular requirements, but there is a risk that the counterparty will go bust, like Lehmans in 2008. This risk is mitigated through collateralisation of amounts owed to each counterparty, with the OTC documentation having a Credit Support Annexe (CSA) governing how counterparty obligations to each other are to be calculated, how much of the obligation should be covered by collateral posted to a ring-fenced account, and the types of asset that can be posted. In theory the collateral should cover existing amounts owed and cover the cost of buying a replacement derivative.

However there are still residual risks on default of the OTC counterparty. Firstly the collateral could fall in value and not cover the value of obligations. This is mitigated by a system of "haircuts" applied to collateral so that only a percentage on of a risky asset posted will count towards the collateral requirement. For instance, only £80 out of every £100 of investment grade corporate bonds posted may count towards the collateral requirement, with the £20 difference acting as a buffer against falls in the value of the bonds. The CSA will also restrict what types of asset can be offered – while historically corporate bonds may have been acceptable collateral, most new CSAs limit the collateral posted to just cash and highly rated government bonds[34].

[34] Note that for futures, forwards and swaps, the life insurer could owe the investment banks money under the transaction, as it will if it also writes options. Often the drive for higher quality collateral may come from the investment bank rather than the life insurer.

The second risk arises from the time lag between the valuation and posting of collateral, the default of the counterparty and the eventual purchase of a replacement derivative. The Lehmans default was accompanied by a spike in the value of options, so the cost of buying a replacement option increased at a time when collateral values were falling, exacerbating losses on default to Lehman's counterparties. Thus collateral only partially mitigates OTC counterparty exposure.

The problems caused by Lehman's default on OTC derivatives has led to a push towards centrally cleared derivatives. Exchange traded derivatives are already centrally cleared but there is a push to have traditionally OTC derivatives like interest rate swaps centrally cleared. Centrally cleared trades benefit from the backing of a central counterparty (CCP) which guarantees the deal and manages the "margin" (i.e. collateral) due from different parties to cover obligations under the deal.

While counterparty risk is reduced by going through central clearing, it is not removed completely. There is a tail risk arising from the default of the CCP itself. While remote, this is not entirely without precedent – the Hong Kong derivatives exchange narrowly avoided default in the aftermath of the 1987 stockmarket crash[35]. Also life insurers generally deal in derivatives through brokers and the CCP only guarantees trades between brokers, not broker's obligations to their clients. So even for centrally cleared derivatives, life insurers may have still have counterparty exposure to derivatives brokers.

Another issue with centrally cleared and exchange traded derivatives is that they are standardised and may not be suitable for the life insurer's needs, particularly with regard to term: life insurance guarantees often have terms outstanding of 5 years or more, while generally exchange traded derivatives rarely go beyond 2 years (though the term of centrally cleared options is gradually increasing). While there may be greater counterparty risk with OTC derivatives, these may provide a closer fit to liabilities and reduce residual market risks arising from imperfect hedges.

Considering derivative counterparty risks for different products:

- Variable annuity – generally there will be a reliance on exchange traded, centrally cleared derivatives which can be traded frequently as required for dynamic hedging.

[35] See for example: http://www.numa.com/ref/c-risk/cr-hk.htm

- With-Profits – these may dynamically hedged, in which case these will rely on exchange traded, centrally cleared derivatives but in a lot of cases, these may only be partially hedged using a static portfolio of put options which will typically be OTC with terms of 5 years or more to match guarantees of similar term.
- Structured products – with a typical term of 3-5 years, these will be backed by bespoke OTC call options of the same term to deliver stockmarket participation[36].
- Annuities and defined benefit pension scheme interest rate risk relating to nominal and real yields may be backed by interest rate and index-linked swaps, which used to be OTC but are now increasingly cleared centrally.
- Credit exposure for annuity and other funds may be managed using CDSs which again used to be dealt with OTC but which are increasingly centrally cleared, particularly for those CDSs based on market indices.
- Defined benefit equity risk exposure generally contains no option-like characteristics and can be easily hedged by exchange traded futures.

3.2.6 Other counterparty risk

Life insurers may have significant property investments, particularly in unit-linked and with-profit funds. These face credit risk in the form of tenant default on rent and other obligations. The loss depends on the strength of rental markets, but in 2014, over 10% of UK high street shops were vacant. If a retail tenant were to default, it is likely that it would take some time to re-let, during which there will be a loss of income, and/or that the revised rent will be significantly reduced. That said, this risk will be borne mostly by unit-linked and with-profit policyholders. Shareholder exposure will be second order in terms of reduced annual management charges and a reduced share of with-profit bonuses.

Most life insurers will lend securities in their portfolios e.g. to hedge funds wishing to short a stock, or to market makers wishing to complete a buy order. In return the life insurer will receive a fee which will boost returns. This lending will be carried out by fund managers who will take a cut of the stock lending fee, and this will be implicit in the investment fees charged by fund managers. Lending securities does give rise to counterparty risk if the borrower does not (buy back and) return the security.

[36] Note the return of capital may be delivered through a synthetic bond built from derivatives which will also be OTC.

This will be mitigated by collateral in the same way as OTC derivative counterparty risk, but as for OTC derivatives, there will be residual risk relating to falls in the value of collateral and rises in the value of the security to be returned.

A related issue to consider is who bears the risk of default – the shareholder ? or unit-linked and with-profit policyholders ? To the extent policyholders bear the counterparty risk they should benefit from the stock lending fee, and the life insurer has a fiduciary duty to ensure the risk is properly managed.

Another area of counterparty risk relates to indemnity commission where the life insurer advances initial commission up-front to an IFA / agent contingent on receipt of future premiums. If the policy lapses, part of the advance will be repayable by the IFA /agent, but there is a risk they will be unable to repay this. This risk is less significant nowadays with restrictions on commission imposed by the Retail Distribution Review but it may still be significant for protection business.

These risks aside, life insurers will also face credit risks such as those relating to trade debtors as well as prepayments to outsourcers and other suppliers. There is also a transient exposure in respect of policyholder premiums but in general policies will be cancelled shortly after premiums are not paid, and the issue is more one of persistency risk (see 3.3.4 below). These residual risks should be modest.

3.3 Insurance and demographic risk

Insurance and demographic risk relates to adverse variations in claim rates on insurance policies including variations in persistency / early termination rates. It also includes higher than expected costs of administering insurance business, as well as the impact of adverse demographic trends on defined benefit schemes.

In general, each risk in this category can be broken down into the following elements:

- Random fluctuations in experience – for large portfolios this will not be significant, but it could be significant for portfolios where a large part of liabilities is accounted for by an individual or a small group e.g. a CEO living longer than expected could adversely impact a small defined benefit scheme.
- Trends in experience differing from expected – for instance trends in life expectancy (see 3.3.1.1 below).
- Parameter estimation – expectations of future rates will be based on estimates derived from past data, but there will be a certain level of statistical error possible with such estimates.

- Shocks to experience – which could lead to a step-change in rates. This could be driven by internal changes e.g. by a deterioration in service quality leading to higher lapses; or by external factors e.g. a competitor refining rates exposing the insurer to anti-selection (see 3.3.1.2 below).
- Catastrophe – the prospect of mass claims such as from a flu pandemic or mass lapses and surrenders where policyholders lose confidence in the life insurer.

3.3.1 Longevity risk

Longevity risk is a key risk for annuity business including variants of traditional annuities such as with-profit and unit-linked annuities[37]. It will be significant for variable annuity products which offer income guarantees for life. It will also affect equity release business – the longer borrowers live, the longer it will take for the loan to be repaid, and where interest accumulates, the larger the accumulated loan and the greater the risk it will exceed the value of the underlying home, triggering the NNEG.

There may also be considerable legacy longevity risk relating to with-profit policies with guaranteed annuity options (GAOs). These guarantee the annuity rate at which a maturing policy's value can be converted into a pension. The longer people live, the more costly annuities and hence these options become. Another legacy exposure relates to conventional pension policies: these typically return premiums on death, which is generally less than the asset share of the policy. For such policies, deaths before retirement are a source of surplus, so lower than expected mortality rates will result in less surplus from this source.

Another source of longevity risk exposure is that arising from defined benefit pension schemes. Obviously the longer pensioners live, the greater the cost of pension promises. This may not come through the P&L account, but will impact the balance sheet under IAS19 accounting rules.

[37] With-profit annuities guarantee a certain level of income topped up with bonuses depending on investment returns and (in some cases) longevity experience. Unlike conventional annuities which are backed by bonds, the with-profit fund backing the annuity may be invested in equities and other real assets to generate higher returns and hence income for the annuitant.
As opposed to paying a fixed sterling amount like conventional annuities, unit-linked annuities pay a certain amount of units, with the income to the annuitant dependent on the unit price. Through the unit funds on offer, the annuitant can invest in a broader range of assets and benefit from the higher expected returns on say equities albeit with a higher level of risk.

Often the economic exposure to longevity risk in pension schemes dwarves that of annuity and other insurance liabilities. What may seem a modest exposure to longevity risk in terms of the existing annuity book may become one of the top risks faced by the insurer when pension scheme liabilities are taken into account. Therefore any strategy that envisages adding to longevity risk exposure should have regard to defined benefit scheme exposures.

A particular issue with smaller defined benefit schemes is the proportion of liabilities that may arise from a handful of executives with large pension rights. If these individuals live longer than expected then the impact on the scheme could be significant. A similar comment can be made for small annuity books where an individual or group may have a disproportionate impact on experience. However, as more annuities are written, the "law of large numbers" will start to apply and the risk associated with these individuals will get diversified away.

Note the value of annuities, GAOs and other liabilities linked to life expectancy will depend on long term interest rates. Longevity and falls in interest rates are "super additive": the combination of both is greater than the sum of the parts, with falling long term rates exacerbating longer than expected lifespan.

Longevity risk can be mitigated by reinsuring annuity business, or for pension scheme exposure, through the purchase of annuities for scheme members from another insurer. Another risk mitigation technique which is becoming increasingly common is the use of longevity swaps. This involves the insurer paying a set schedule of payments in exchange for the swap counterparty making payments dependent on either the actual mortality experience of annuitants or some proxy such as population mortality rates. The counterparty will bear (most of) the risk of people living longer than expected, though where the counterparty's payments are based on population mortality rates or some other proxy, there will be a residual basis risk relating to differences between actual and proxy rates of mortality improvement. The fixed schedule will be based on expected mortality rates with a margin to compensate the swap counterparty for bearing longevity risk. Aside from basis risk there will also be counterparty risk to the reinsurer or swap counterparty – see 3.2.4 above.

There are two main longevity risks which NEDs should consider in assessing strategy: trend risk and anti-selection.

3.3.1.1 Trend risk

Trend risk relates to trends in mortality rates and the risk that these fall faster, and so people live longer, than expected. In recent years life insurers have had to strengthen annuity reserves as the "super" cohort of lives born between 1926 and 1945 have experienced faster rates of mortality improvement than previous generations.

Projecting future mortality rates is difficult. For one thing, there is a need to consider many different trends affecting mortality ranging from smoking rates to obesity, and from cancer to alcohol consumption. For another, there are many different models for extrapolating mortality rates that can give very different answers. Lastly, there are tail risks relating to medical improvement. For instance, current research into genetics and the causes of aging could lead to cures extending life expectancy well beyond 100 years. The only certainty about trend risk is that projections of mortality rates are unlikely to turn out as expected.

At least trend risk is symmetric – while falling smoking rates are leading to rises in general life expectancy, rising obesity levels could reverse this trend[38] as may a new disease emerging like AIDS in the 1980s. Indeed, writing annuity business can act as a hedge against flu and other pandemics, as the higher mortality arising in pandemics will result in gains on annuity portfolios.

Similarly, while improvements in healthcare[39] could further improve life expectancy, the difficulty of funding healthcare for an aging population could lead to a deterioration in NHS care reversing this trend. Mortality gains from lower than expected lifespan may be just as likely as losses from where lifespan turns out to be higher than expected.

3.3.1.2 Anti-selection

Aside from trend risk, another big issue for annuity writers is anti-selection. If rating structures are not refined enough, a life insurer could end up attracting healthier lives than average who will be less profitable as they live longer. This is particularly true for those life insurers actively participating for open market option (OMO) business from the maturing pension funds of other insurers. Customers and/or their advisers will actively exploit any weakness in the insurers rating structure.

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[38] As appears to be the case in the US, where mortality rates are starting to deteriorate at some ages after more than a century of improvement.

[39] For example the prescription of statins (anti-cholestrol drugs) to all over 50s could lead to a marked reduction in cardio-vascular deaths.

Those actively participating in the annuity market will typically rate by postcode. This acts as a proxy for socio-economic status in addition to reflecting regional differences[40] in life expectancy. They will also rate by smoker status, and offer enhanced terms to those with medical conditions such as having suffered a stroke or a heart attack.

Those insurers writing bulk buy-out and other bulk annuity business for pension schemes will have regard to the nature of the sponsoring employers business. They will also factor in the occupations of those for whom annuities are being purchased, noting that while the workforce may be predominantly blue collar, a large part of the annuity liabilities insured could be in respect of a handful of executives giving rise to a concentration of risk that these executives live longer than average.

Underwriting annuities can be complicated. While it is clear that say smoking or obesity reduces life expectancy, it less clear how much by. To further complicate matters, different risk factors often overlap – for instance, regional differences may be due in part to different proportions of smokers, so in offering an annuity to a Glaswegian smoker, care needs to be exercised to ensure the effect of location and smoker status are not overstated.

Expertise in longevity risk is required to set an appropriately refined rating structure which properly reflects different mortality rates and avoids anti-selection. It may be difficult to build up such expertise in house but it could be sourced through an external consultancy. Alternatively, insurers could enter into a reinsurance arrangement with a reinsurer with the requisite expertise. An insurer would not be wise to enter the OMO market without such expertise as it could otherwise find itself systematically writing unprofitable business.

Anti-selection may also affect passive annuity market insurers only offering annuities to their own customers. Typically passive participants are not as keen on price as active OMO insurers. Inertia is one reason maturing pension policyholders take out an annuity that can be 10% worse than the most competitive rate if they had shopped around. However the rating structure of passive annuity insurers is generally unrefined. It could be the case that the healthiest lives find that the terms on offer are as good as those offered on the open market. Passive writers should monitor the socio-economic profile of those taking out annuities (e.g. by postcode analysis) in case the insurer is being selected against by such healthy lives.

[40] For example, male life expectancy in Glasgow is 71 years while the equivalent in Kensington and Chelsea is 85 years – see http://www.bbc.co.uk/news/uk-scotland-glasgow-west-15368400.

It should also monitor the source of annuity business: if it suddenly finds itself writing significant volumes of OMO business, the chances are it is being selected against.

One rating factor which can no longer be used in pricing is sex due to the Test-Achats ruling by the European Court of Justice. With no difference between the annuity rates of women and men permitted, annuities on female lives will be less profitable as women live significantly longer than men even when other factors such as smoker status are allowed for. The proportion of females purchasing annuities will be a key assumption in projecting annuity profits and this should be monitored in case the proportion is higher than anticipated. There is a risk that defined benefit pension schemes could selectively buy annuities for female members only, exploiting unisex rates which do not reflect the likely life expectancy of such members. Therefore the source of business should be carefully monitored and if there are large amounts of annuities being bought by defined benefit pension schemes for female members, the insurer should take corrective action by declining to write business from such schemes or alternatively pricing assuming all such annuities relate to females.

3.3.2 Mortality risk

The reverse of longevity risk, mortality risk relates to the risk of loss from higher than expected mortality rates. It is particularly important for term assurances. It is also important for endowment and whole-of-life assurances, though as the asset share builds up under these policies, the exposure or "sum at risk" on death – the difference between the sum assured payable on death and the asset share – will decline, reducing the impact of higher mortality rates later in the policy term.

Mortality risk can also affect the cost of guarantees under with-profit and variable annuity products if guarantees apply on death. There may also be exposure to higher than expected death in service benefit costs for pension scheme members, though there will be a corresponding benefit from retirement benefits no longer payable.

Note some life insurers specialise in group life insurance, insuring pension scheme death in service costs and other corporate death benefits. Insurers participating in this field should have expertise in underwriting life cover by industry, understanding how death rates vary for different occupations and also concentrations of exposure e.g. to a catastrophe like the Piper Alpha oil rig disaster.

As noted in 3.3.1.1 above, the recent trend of mortality rates is downwards which is positive for assurance business. However rising obesity levels and other secular factors could reverse this trend.

There is also the risk from new diseases (similar to AIDS in the 1980s), and flu and other pandemics which could generate a large increase in death claims.

3.3.2.1 Mitigating mortality risk

Mitigating this risk, most term assurance exposure is reinsured (though this does give rise to residual counterparty risk – see 3.2.4 above). Given the favourable trends, rates for reinsuring mortality are keen and generally reinsurance does not impair and may actually improve profitability. Consequently life insurers tend to reinsure up to 90% of term assurance cover.[41] As well as taking on risk, reinsurers can also give advice on underwriting and on pricing those with health conditions.

Life insurance cover will also be medically underwritten, with unhealthy lives identified by this process having to pay an extra premium (or "loading") or in extremis not being offered cover at all. The extent of underwriting will vary. For low sums assured, the life insured[42] will need to complete a health questionnaire. If this highlights potential problems, the underwriters may seek a report from the life insured's GP and/or ask the life insured to undergo a medical examination. Beyond certain limits, GP records and medical examinations may be required as a matter of course. The level of these medical limits can be a key differentiator between term assurance providers. Medical underwriting can be supplemented in certain circumstances by financial underwriting e.g.to ascertain whether the level of cover asked for is excessive in relation to the life insured's income and wealth.

Customers would obviously prefer not to have to undergo medicals or have their medical and financial history probed. The underwriting process is costly for the insurer, who also faces the risk the customer may not proceed with the policy due to underwriting requirements.

If underwriting is inadequate, however, unhealthy lives can get through the screening process at normal terms, and the claims experience of those written on standard terms is likely to be worse than expected as a result.

[41] Reinsurers will generally not cover the full 100% but insist the life insurer holds on to 10% so that it has "skin in the game" and is incentivised to underwrite and manage claims properly.

[42] There is a distinction between the life insured, on whose death the sum assured will be paid out, and the person assured who benefits from the policy.

An extreme example of the value of underwriting – or more pertinently the cost of omitting this – arose in the early 1980s when life insurers waived underwriting for mortgage endowment policies at a time when mortgage endowment sales were booming. Amid stories that some IFAs got terminally ill patients to switch from repayment to endowment mortgages and exploit the life cover on the latter, death claims in the early years of such business were significantly higher relative to policies which had been underwritten.

Ultimately balance needs to be struck between the cost and inconvenience of underwriting on the one hand, and the effective screening of lives for health problems. One constraint will be reinsurers who quite naturally will specify minimum underwriting requirements before they will reinsure life cover. However reinsurers can also help in arriving at a suitable underwriting policy. Reinsurers have been at the forefront of developing automatic underwriting systems (like Swiss Re's Magnum system) which can carry out initial underwriting and usually offer a decision at the point of sale, streamlining the underwriting process and reducing costs.

3.3.2.2 Non-disclosure

An underwriting issue that is becoming more prominent is non-disclosure of medical information by customers. Sometimes this may be accidental e.g. where the customer does not understand the question, or has forgotten. Whether accidental or deliberate it leads to underwriting decisions being based on incomplete information, typically with customers receiving normal terms when they should have been loaded or refused cover. In the past, life insurers could void claims where non-disclosure was detected on grounds of a breach of the legal principle of "uberrima fides" ("utmost good faith") which underpins insurance contracts and requires full disclosure by the customer. However recent legal changes have reduced the scope for insurers to void claims on non-disclosure grounds, and in many cases a part of the claim may still be paid. In any case, not every incidence of non-disclosure will be picked up.

High levels of non-disclosure are likely to result in higher than expected death claims as the population of lives on standard terms will include those who should have been loaded or refused cover. Any insurer writing protection business should have controls in place to monitor non-disclosure (e.g. requiring additional medical evidence for a sample of lives). If this is significant, action needs to be taken e.g. by improving the wording of underwriting questions to make these clearer; and working with sales forces to ensure they highlight the importance of full disclosure to customers.

3.3.2.3 Unisex rates

Finally, as for annuities, premiums for life assurance cover can no longer differentiate by sex. In this case, however, male assurance contracts will be less profitable due to the higher probability of males dying. The proportion of males taking out assurances will be a key assumption in new business profit projections, and this needs to be monitored in case it is higher than expected.

3.3.3 Morbidity risk

Morbidity risk relates to the risk that sickness and disability claims are higher than expected and, for income protection[43] business paying an income on disability, that recovery rates are lower than expected. As well as income protection, UK life insurers may offer critical illness which pays out on diagnosis of a critical illness such as cancer. With term assurance, income protection and critical illness form the core of the protection market.

As for group life insurance, there is a market in group critical illness and income protection to cater for employers covering their employees for these benefits. Again, this is a niche market requiring specialist expertise in pricing individual policies according to the circumstances of the employer and the cover offered.

Beyond protection, pension policies are often sold with contribution protection benefit, a variant of income protection which maintains pension contributions when the customer suffers from a long-term disability. Endowments may also have critical illness as a supplementary rider policy.

Some life insurers also offer long-term care products which pay out when a person is unable to perform certain activities of daily living (ADL) such as bathing or getting dressed. This cover is intended to help cover the cost of employing care help or the cost of going into a care home. The benefit under the policy could be fixed, or could be paid for the rest of the person's natural life. There will be morbidity risk in respect of higher than expected incidence of lives insured needing care and/or from people surviving in care longer than expected.

The rate of incidence of people going into care homes may also affect equity release products as the "no negative equity" guarantee applies on entry into care or death.

[43] Also known as Permanent Health Insurance or PHI

Morbidity risk will also be present in a life insurer's own pension schemes in the form of ill health early retirement rates, and the impact ill health has on these retirees. The life insurer may also offer income protection benefit to its staff on long-term disability which is another source of morbidity risk

In terms of morbidity trends, while mortality rates have been falling in recent years, the picture is more mixed for critical illnesses. With falling smoking levels, incidence rates of lung and other smoking-related cancers are declining, but rates for other forms of cancer are increasing. Advances in medical care have improved the survival rates for cancer, heart attacks and other critical illnesses, contributing to falling mortality rates but not necessarily the underlying rates of incidence of these critical illnesses. Indeed, more refined diagnostics have led to critical illnesses being diagnosed which may previously been missed; or lead to earlier diagnosis meaning conditions which may have only been diagnosed after the policy expired now arise during the period of cover. All told, working age adults who form the core of the protection market are now more likely to suffer a critical illness claim than die.

For income protection, in general the benefit will only become payable after 6- or 12-months so the key risk relates to incidence of long-term disability rather than critical illness which people may recover from (or die). An important issue is the definition of disability, which is framed in terms of the ability to carry out one's own or any profession. The distinction is important: a builder may be unable to carry out his trade, but could undertake clerical duties. Under an "own occupation" definition he may be classed as disabled whereas under an "any occupation", he might not be able to claim.

Whereas under a critical illness policy cover will relate to a number of tightly defined conditions, the causes of long-term disability are more varied and may include mental health as well as physical conditions. These conditions may not be as clear cut as say cancer – for instance chronic back pain – and there is a risk of fraudulent disability claims.

There is also a risk of lower than expected recovery rates. Recovery rates may be affected by economic conditions – there may be little incentive to try and recover if there is no job to go back to. They will also be affected by social security benefits payable on disability which may act as a disincentive to return to work.

3.3.3.1 Mitigating morbidity risk

In terms of risk mitigation, income protection and critical illness will be more tightly underwritten (i.e. more frequent recourse to GP records and medical examinations) than term assurance as ailments which may not affect mortality rates significantly could give rise to a claim under these policies. Like term assurance, non-disclosure is an issue for critical illness and income protection, though tighter underwriting means there is a greater likelihood of this being picked up.

Underwriting will also be carried out at claim stage to confirm the claim meets critical illness or disability criteria. Although the proportion of claims accepted has improved in recent years and often exceeds 90%, this still means 10% or more claims may be invalid. For income protection, medical evidence will be sought periodically throughout the period of the claim to ensure the claimant still satisfies disability criteria – while expensive, this will not be as costly as continuing to pay out when the claimant may have recovered.

Critical illness and income protection business will also be reinsured, but there tends to be larger margin in reinsurance rates for morbidity risk, in part due to the less favourable trends. This leads to reinsurance reducing profitability so insurers do not reinsure as much as they would of mortality risk.

Most income protection and critical illness policies are also written on a reviewable basis, which means that premiums can be reviewed every 5 years or so and increased if claim experience deteriorates. This is an important mitigant of risk, though there is a risk that it may fall foul of regulators. Regulators will need to be assured that the option to review has been clearly been explained at point-of-sale and as part of ongoing communications with policyholders. They may also want to see that premiums are reduced when experience is better than expected. It is advisable that premiums are reviewed regularly in line with policy conditions; the results communicated to policyholders; and premiums reduced/increased as appropriate.

3.3.4 Persistency risk

With the exception of annuities which cannot be surrendered (in the UK at least), all life insurance products will be vulnerable to persistency risk relating to early termination of contracts. Term assurances and other protection policies can lapse. Endowments and unit linked life insurance contracts may be surrendered. Likewise mutual funds and structured products can be encashed.

Pension policies can either be transferred out to another policy, premiums may cease (giving rise to a "paid up policy" or PUP), or if the pension policyholder is over 55, they may take early retirement, taking part of the fund value as cash with the rest being used to buy an annuity or an income drawdown policy.

In general higher than expected termination rates will damage PVFP. Less annual management and other charges will be received on unit-linked business, while margins in term assurance and other non-linked premiums will not materialise as expected. The impact on the P&L may be modest as PVFP may not be reflected in this, but in economic terms, persistency risk is likely to be one of the top risks faced by a life insurer.

In some cases the risk may be of lower than expected rates. At certain stages of a term assurance policy, the value of future claims and expenses may exceed future premiums, so the insurer will benefit if the policy lapses as the policyholder gets nothing back on lapse.

For with-profit and variable annuity policies with valuable guarantees, surrenders (/transfers out) will lead to the policyholder losing those guarantees. PUPs will lead to a lower fund value to which guarantees (including any GAOs) apply. Lower than expected rates will increase the proportion of policyholders lasting until maturity and increase guarantee costs. For such contracts, termination rates may be dynamic in the sense that they will vary with financial market levels: as markets fall, the guarantee becomes more valuable and policyholders may be more inclined to hold on to their policies[44].

For term assurances and other protection contracts, lapse rates may vary with the terms on offer in the market. As premium rates fall, existing policyholders or their advisers may re-broke, letting policies lapse to secure cover elsewhere at a cheaper price. There may be a corresponding new business benefit if the insurer can attract its share of those re-broking cover. This highlights that a lot of new business isn't really "new" but existing business being recycled, with the added cost of underwriting proposals as well as reduced premium levels.

Note that while healthy lives may re-broke, unhealthy lives may retain existing cover as they may not pass underwriting at standard terms. There is a risk that mortality experience could deteriorate over time as a result of such selective re-broking.

[44] Dynamic termination rates are more of an issue for US and continental insurers where policy terms are often based on current bond yields while surrender values are guaranteed. When yields rise, policyholders may surrender and reinvest in a new policy on more advantageous terms.

Lapses on protection policies linked to mortgages may vary with the state of the mortgage market. If this is buoyant, people may re-broke their mortgage to get better terms. This is often an opportunity for advisers to re-broke cover as well. Once again, there will be new business opportunities in such a market, but there will also be pressure on lapse rates.

For corporate pensions, PUP rates will depend on staff turnover: employer contributions will cease when the member leaves employment (though it may be possible to persuade departing employee to maintain their own contributions). This in turn will depend on economic conditions – if the jobs market is buoyant, staff turnover and PUPs will rise, whereas in depressed conditions employees will be more likely to stay where they are.

To the extent new employees are recruited to replace leavers, there will be an offsetting new business benefit, though once again such "new" corporate business is just existing business being recycled – albeit with costs of processing PUPs and adding new members (including any initial commission in respect of the latter). Staff leavers may not be replaced if the employer is trying to downsize, so this new business benefit may not come through. The employer could also decide to make people redundant which would increase PUPs and also early retirement rates if those let go are over 55.

Note that while staff turnover rates will affect corporate pensions' persistency and profitability, the life insurer will also be exposed to staff turnover rates on its own defined benefit scheme. Typically the benefits payable to those who leave employment are less valuable than those who continue in the scheme as the benefits will be rolled forward with inflation rather than salary. Thus higher than expected rates of scheme members leaving will be beneficial to the scheme, whereas lower than expected rates of leavers will place a strain on scheme finances.

Returning to corporate pensions, profitability will be also affected by rates at which policies are transferred to other providers, as this will cut the stream of annual management charges. Such transfer out rates will differ between active members of the scheme and those who have left – the transfer out rate will be significantly higher for PUPs who may move their fund to their new employer's scheme or alternatively consolidate this and other pension "pots" in a policy of their own. It is important that the analysis of transfer rates differentiates between PUPs and active policies. Otherwise a misleading picture will be created of transfer rates.

Transfer out rates will also be affected by advisers re-broking schemes and moving these to a new provider to avail of better terms. Generally the new provider will seek for existing funds as well as future contributions to switch over in the terms they offer, leading to bulk transfers out. In recent years, charges have reduced significantly so that the average annual management charge for new schemes is typically 0.5% p.a.. Schemes with higher charges will be vulnerable to being re-broked, particularly with regulatory pressure on charges following the introduction of auto-enrolment. Once again, re-broking creates a new business opportunity but also poses a threat to the existing book of business.

Note that while many legacy products have high charges (> 1% p.a.), a lot of these will be with-profit policies with valuable guarantee, including GAOs and guaranteed growth rates higher than current bond yields. Advisers may be reluctant to re-broke such schemes for fear they may be accused of misselling as customers will lose these guarantees.

Recent persistency experience has also been volatile for individual pensions and life insurance contracts. Advisers have used changes in tax legislation and regulation such as pensions simplification and the RDR to re-broke policies, switching between providers to consolidate holdings and/or improve terms, but also generating additional commission and fee income.

Persistency rates often assume that future experience will be more benign, not least as RDR has got rid of commission for most products going forward. However commission has been replaced by fees and advisers may see re-broking as an opportunity to generate additional fee income. As new business profitability is dependent on persistency assumptions, any assumed reduction in termination rates from recent levels should be robustly challenged.

3.3.4.1 Mitigating persistency risk

In terms of mitigation, historically persistency risk was mitigated by surrender charges on unit-linked policies; and by the discretion the life insurer has in setting surrender values for with-profits policies. These days however, most unit-linked pension contracts will just have a single annual management charge with no surrender penalty. Meanwhile the ability to vary with-profit surrender values may be constrained by TCF and PPFM considerations.

With the scope to address persistency risks in product terms limited, many life insurers have taken a more active approach to managing terminations, seeking to engage with those looking to lapse or surrender and try persuade them otherwise. Such customer loyalty schemes can be quite successful in improving persistency and adding value to the existing book of business.

3.3.4.2 Mass lapse / surrender risk

A life insurance policy is in essence a promise to pay. Customers need to have confidence that promise will be kept. Otherwise they will terminate their policies en masse. Thus there is a catastrophe element of persistency risk linked to customer confidence and the life insurer's reputation (see 2.2.6 above).

Equitable Life gives a sobering example of what can happen when policyholders lose confidence in a life insurer. When it lost its court case over GAOs in 2000, it experienced a sharp rise in surrenders: while at the start of 2001 it had ca.£30bn in assets, over the next two years, £7.5bn (or 25% of assets) was surrendered[45].

Mass lapses and surrenders on this scale would significantly impair PVFP. It may not have the same impact on regulatory capital and IFRS accounts as at present these generally do not allow for PVFP. If those surrendering are forgoing valuable guarantees, there may even be a benefit in terms of guarantee costs. Still, in economic terms, there is likely to be significant impairment of shareholder value. Moreover, any goodwill value will be destroyed as there will be little prospect of selling new business. This highlights the broader threat of reputation damage to the enterprise value of an insurer.

3.3.5 Expense risk

Expense risk relates to the risk of expenses being higher than expected. Life insurance contracts are particularly vulnerable to this risk as the cost of servicing and processing claims could rise significantly over the term of a policy. Costs may rise with inflation, particularly salary inflation, which will affect the insurer's staff costs. Costs per policy could also increase due to contraction of the insurer's portfolio of policies, leading to a loss of economies of scale.

[45] For more details see section 4.1 of "Liquidity Management in UK Life Insurance - a discussion paper" (Kelliher et al, 2005) – http://www.actuaries.org.uk/research-and-resources/documents/liquidity-management-uk-life-insurance-discussion-paper-version-20

As noted in 2.1.6, regulations may impose further costs e.g. by changing or adding to the ongoing information to be communicated to the policyholder. Regulations can also add to indirect costs such as the cost of risk management and compliance functions which will ultimately need to be covered by unit linked charges or margins in premiums for expenses.

There is also the risk that the cost of servicing policies is underestimated. This is particularly true of new products where there is little past experience to guide how much effort may be required to service these. Often system functionality will be incomplete for newer product lines, and the corresponding need for manual intervention will increase costs.

Even for well established products, there is still a risk that the cost will be underestimated. While life insurers carry out detailed expense analyses, the allocation of costs between new business, ongoing and claim processing is often approximate. Over-allocating costs to new business and claims processing while under-estimating ongoing maintenance costs is a particular problem, as maintenance costs are recurring – meaning the under-estimate will be repeated over the lifetime of the policy – whereas the other costs are one-off.

There will also be issues with allocating costs between different product lines. Over-estimating costs for a declining business line while under-estimating costs for a business line which is expected to grow significantly will lead over time to a significant under-estimate of expenses, as well as distorting the profitability of different product lines.

In general, servicing costs will be affected by the complexity of products, how well systems cater for this complexity, and the resulting need for manual processing. This need may not be fully appreciated, with the result that processing effort is systematically underestimated.

3.3.5.1 Overheads

The allocation of overheads such as the finance function or the executive office between product lines is an area of subjectivity. The profitability of different products could be sensitive to how overheads are allocated to each product line. This sensitivity should be quantified for the Board, who should vigorously review and challenge the allocation of overheads.

Overheads will also need to be allocated between new business, maintenance and claims processing. Following on from above, the greater the allocation to maintenance costs, the greater the present value of future expenses as maintenance costs are recurring.

On the other hand, increasing the allocation to new business processing will increase new business costs and reduce new business margin.

Furthermore, if new business volumes are lower than expected, charges and/or margins in premiums to cover the new business allocation of overheads may prove inadequate. Once again there is a need to review and challenge how overheads are allocated to different stages of policy processing to ensure this allocation is reasonable, noting that there is often no right answer as to how overheads should be allocated.

3.3.5.2 Project costs

For monitoring the profitability of business and the return on project spend, there is another question as to how project costs associated with say a new product development should be reflected in expenses. One approach would be to calculate new business profit based on expenses which include an allowance for project costs. The problem with this approach is that the allowance for project costs could be under-/over-stated depending on volumes written.

Another approach would be to calculate profit based on expenses without any allowance for project costs, and to assess whether these new business profits are recouping project costs. This may be a more transparent way of tracking whether project benefits – the new business profits excluding project costs – exceed project costs.

3.3.5.3 *Mitigating expense risk*

In terms of mitigation, most life insurance policies have clauses that allow the insurer to vary charges with expenses. However the extent to which charges can be increased to reflect increased costs is constrained by TCF and also by the 1999 Unfair Terms in Consumer Contracts Regulations (UTCCR). Driven by an EU Directive, UTCCR is often interpreted as limiting increases in charges such as fixed per policy fees to earnings inflation. When reviewing any increase in charges, NEDs should query to what extent the proposed increase is consistent with TCF and UTCCR.

Insurers may also undertake projects to drive down costs e.g. migrating to more efficient systems; or automating manual processing. The delivery of lower costs is dependent on the successful completion of the project which as noted in 2.2.7 is not a given. Still insurers often take credit for such projects in expense assumptions e.g. for embedded value calculations, even before these projects have been delivered.

Unfortunately if the project fails, then insurers will need to "back out" these reductions with a negative impact on embedded values and other calculations which took credit for the project benefits.

Ultimately expense risk needs to be mitigated by rigorous expense controls. Even if charges and/or margins in premiums cover expenses, if the insurer has a higher cost base than its competitors, it will offer uncompetitive products and/or suffer lower new business margins. The loss of competitiveness could see the insurer in a destructive cycle of lower new business volumes in turn leading to a shrinking portfolio, a loss of economies of scale, higher per policy costs, increasingly uncompetitive terms and shrinking margins.

3.3.6 Other insurance and demographic risks

Life insurers may offer valuable options and guarantees on with-profit and variable annuity products such as guaranteed surrender values and (for legacy pension products) GAOs. There is a risk that the rates at which these guarantees and options are taken up may be greater than expected, increasing the cost of these guarantees and options. Typically the assumed rate will be quite high (80%+) for guarantees and options that are in the money, and the scope for adverse variation will limited as there will be more scope for beneficial variation in terms of lower than expected take-up. High take up rates will be assumed for GAOs which are very valuable, but still take up rate may be less than 100% as policyholders may not convert their full fund into an annuity, taking instead part of this as tax free cash. The recent abolition of the need to convert pension funds into annuities may also have a positive impact on GAO costs if policyholders take their pension policy as cash, notwithstanding the attractiveness of converting into an annuity on GAO terms.

Another demographic risk relates to the proportion of defined benefit scheme members married and the age of their spouses which will affect the cost of spouse's benefits; while the number and age of children will affect children's benefits (which mostly relate to death in service). Most annuities will be either single life or written as joint-life on a named spouse, but some may be payable to any spouse, in which case they may have similar exposure as the insurer's defined benefit scheme.

Finally some life insurers may offer general insurance benefits as part of an overall package e.g. unemployment cover may be offered with life insurance as part of a mortgage protection product. In general, these will either be immaterial and/or they will be reinsured with a general insurer.

3.3.7 Back-book initiatives

For mortality and morbidity risk, reinsurance is often in place up-front and so there is little need for back-book initiatives for these. Historically annuities have not been reinsured, but the size of annuity liabilities has been growing as pension policies mature and are converted into annuities. Coupled with recent adverse experience with annuitants now expected to live longer, there is an increasing demand to hedge longevity risk on existing annuity books. This could be done by reinsurance or longevity swaps as described in 3.3.1 above.

Two other areas for adding value from existing business are (a) customer loyalty programs to improve the persistency of existing business; and (b) projects to drive down costs for this business. NEDs should be aware that often credit is taken for such initiatives in long-term expense and persistency assumptions even if these have yet to be delivered. NEDs should challenge whether this may be a case of "counting chickens before they are hatched".

3.4 Liquidity risk

Historically liquidity risk has not been a significant issue for UK life insurers. Unlike banks, which take in deposits on a short-term basis and lend long-term (e.g. mortgages), UK life insurers generally take money in on a long-term basis and invest this in marketable securities. Furthermore, mortgage endowments in the 1980s and personal pensions in the 1990s lead to strong new business growth, with premium and investment income comfortably exceeding claim and expense outflow.

This situation has reversed with endowments written in the 1980s currently maturing, leading to large outflows. Pension maturities are also growing. Furthermore, increased hedging of with-profit and other market risks has also increased the potential for margin and collateral calls on derivatives, creating liquidity strains.

Still liquidity risk is modest. Maturity outflows can be projected with reasonable confidence (though the actual outflow will fluctuate with markets). Insurers should be able to arrange to have enough cash to meet these claims well in advance.

Maturities also offer a new business opportunity, allowing the life insurer to retain some of the outflow. Maturing endowments could be reinvested in investment products while a large part of pension maturities can be reinvested in either annuity or income drawdown products.

To the extent these are reinvested in annuities, they lead to a liability which is illiquid as in the UK annuities generally cannot be surrendered.

The main area of concern is surrenders which are at the option of the policyholder, with uncertainty about the number and amount of surrenders. A mass surrender event like that suffered by Equitable Life (see 3.3.4.2 above) could cause a liquidity strain for a life insurer forcing it into a "fire sale" of assets or, in extremis, insolvency if there is not enough cash to meet surrenders and other claims arising.

3.4.1 Liquidity risk mitigation

Even in a mass surrender scenario, however, there are options available to the life insurer to manage outflows. Unit linked policies are generally written with a deferral clause allowing it to defer surrender for one month typically, or six months where the fund invests in property. While with-profit policies may not be deferred, the insurer may be able to reduce surrender values to reflect "fire sale" asset prices, though setting penal surrender values to deter surrenders may be contrary to TCF and PPFM.

In terms of resources to meet outflows, as well as cash holdings, life insurers will also have significant holdings in gilts which can be used to generate cash through "repo"[46] to meet claims and other cash demands.

It should also be noted that a mass surrender event may be a more protracted affair than a run on a bank. While the run on Northern Rock could be measured in days if not hours, Equitable Life's surge in surrenders was measured in months. While depositors can withdraw funds from ATMs, most insurers would lack the capacity to process a large surge in surrenders over a short space of time[47].

Given the longer timeframe, it should be possible to put in place a program for the orderly disposal of assets i.e. without recourse to fire sales of assets, but there needs to be enough cash and gilts to cover the first few weeks outflow until the disposal program can take effect. Therefore life insurers should hold a minimum amount of cash and gilts to cover the initial phase of the crisis.

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[46] In essence repo is a form of collateralised borrowing, though instead of advancing a loan, the repo counterparty would buy gilts at a discount (to cover falls in the value of these with rising gilt yields); while instead of repaying a loan, the insurer would buy the gilts back at a pre-agreed price based on the original sale price plus the counterparty's interest. Banks can generally repo gilts with the Bank of England.

[47] This creates problems of its own – for more details on the impact of dealing with a mass surrender event, see section 4. of "Liquidity Management in UK Life Insurance - a discussion paper" (Kelliher et al, 2005).

They should also have controls to pick up on abnormal surrender volumes, as the sooner the surge in surrenders is detected, the quicker the disposal program can be put in place.

3.4.2 Property and other funds investing in illiquid assets

Liquidity crises can arise in individual funds, particularly unit-linked property funds. These are open ended and can experience significant inflows and outflows. Part of the fund will be invested in cash to deal with the latter, but if too much of the fund is invested in cash rather than property, returns may suffer and policyholders won't be getting the exposure to property they desire. In some cases the fund may have to close to new business if the fund cannot invest all inflows in property.

Conversely, large outflows could exhaust cash balances, leaving the fund having to liquidate property holdings which can take some time. At this stage, the insurer would have to invoke deferral clauses to give it time to dispose of properties in an orderly manner, thus ensuring remaining investors do not lose value through fire sales of the properties. If it does not defer realisation, the insurer would need to effectively buy the surrendered units itself to meet policyholder claims as they fall due. This would expose the insurer to market risk in respect of the fund's properties. In extremis, if the fund cannot liquidate property assets within the deferral period, the life insurer will have to buy surrendered units, and thus the underlying property assets, off of policyholders anyway.

During the financial crisis from H2, 2007 – Q1, 2009, life insurers experienced a surge in property fund surrenders after having experienced strong inflows in the preceding years. In response most invoked deferral clauses, though there were issues to be addressed in terms of whether systems could cope with deferral (in many cases, system functionality for this contingency was not built); and whether deferral was consistent with TCF (arguably not deferring would be unfair on remaining investors in these funds).

Note that as well as the liquidity challenge, a change from net inflows to net outflows will necessitate a change in the pricing basis for unit linked funds. When the fund is expanding, unit prices will be based on the cost of buying more of the underlying assets ("offer basis"), whereas when it is shrinking it will be based on the how much the underlying assets can be sold for ("bid basis"). There can be considerable difference between the "ask" price at which assets can be bought and the "bid" price at which they can be sold, particularly where the fund invests in illiquid assets and/or markets are stressed.

Moving from an offer to a bid basis could lead to a significant drop in unit price. There may be TCF issues regarding how well the risk of such step changes in unit price have been explained to policyholders, as well as reputation damage from moving to a bid basis.

Looking forward, there is a risk that non-property unit-linked funds could experience liquidity strains similar to those experienced by property funds. A particular area of concern would be funds investing in corporate bonds. During the financial crisis, some bonds such as ABSs become effectively illiquid as the market in these collapsed. Furthermore, following the financial crisis, and in response to higher capital requirements, market makers have cut inventories of corporate bonds, reducing market liquidity[48]. Were corporate bond funds to suffer a surge in surrenders, some funds could struggle to realise bonds at a fair price even if the deferral clause was invoked. In any case, large bid/ask spreads will lead to a significant fall in unit price on moving from bid to offer bases.

Another area to be wary of is funds investing in overseas assets. These can be vulnerable to currency restrictions which prevent assets proceeds being repatriated e.g. restrictions imposed by Malaysia during the 1997 Asian financial crisis. These may last longer than any deferral period on the unit fund. Furthermore, financial markets in emerging markets are still developing and liquidity may dry up, making it difficult to sell assets even if proceeds could be repatriated[49].

Beyond unit linked funds, liquidity crises could emerge in individual subsidiaries or sub-funds of the insurer's business. For example, a legacy with-profit fund may be experiencing significant net outflows with maturing policies exceeding premium and investment income. In this circumstance, a surge in surrenders and/or margin and collateral calls on derivatives used to hedge the fund's market risks could trigger a liquidity crisis for that sub-fund. It should be possible to arrange a loan from other sub-funds to deal with this, though to the extent other policyholders are providing the money, consideration needs to be given to whether these are being treated fairly and are not being unduly exposed to risk.

[48] According to data compiled by the Federal Reserve Bank of New York, the inventory of corporate bonds held by primary dealers plunged from a high of $235bn billion on October 17, 2007 to just $55.9bn as of March 27, 2013, a fall of over 75% – see http://www.risk.net/digital_assets/6892/Risk_0813_cover_story.pdf

[49] For an example of an emerging market mutual fund which had to suspend redemptions see: http://www.moneymarketing.co.uk/trading-suspended-on-new-star-heart-of-africa-fund/178092.article

To manage potential liquidity strains from individual funds, there needs to be a program of regular scenario testing to identify which funds may be vulnerable, how the liquidity strain may be managed, and how to manage any residual risks e.g. exposure to market risk where assets cannot be sold within the deferral period, with the insurer having to pay the policyholder while it is left with the illiquid assets.

3.5 Operational risk

Operational Risk may be defined as the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. It is one of the largest risks faced by life insurers, if not the largest. It is also a broad category, covering everything from misselling to fires, and from process failures to fraud. The Institute and Faculty of Actuaries work on risk classification identified over 300 sub-types of operational risk[50].

Strategy can add to the operational risks faced by a life insurer. New products can add to servicing complexity and the risk of process failures; while new product literature may not be consistent with regulations.

It is important to note that operational risk also has a long "tail" – it can take many years for operational errors to emerge. While current processes may be robust, legacy failings could still give rise to significant losses, for example the mortgage endowment misselling losses incurred by life insurers after 2000 in respect of endowments written in the 1980s and early 1990s.

3.5.1 Conduct risk

A key area of operational risk focus at present is on conduct risk. This is due to the large losses banks have suffered due to PPI misselling and LIBOR manipulation which come under this category. Conduct risk may be defined as the risk of customers suffering poor outcomes as a result of a firm's actions.

This covers a wide range of risks such as:

- Misselling – historic examples include mortgage endowment and pensions misselling for life insurers, and more recently, PPI for banks;

[50] Not all of these may be applicable to life insurers. For more details, see: http://www.actuaries.org.uk/research-and-resources/documents/underlying-spreadsheet-discussion-paper-common-risk-classification-

- Disclosure failings – giving inaccurate and/or incomplete information to policyholders;
- Data protection failure and breach of confidentiality;
- Failure to manage conflicts of interest; and
- General failure to treat customers fairly (TCF).

It also includes risks to the integrity of the UK financial system or which may damage competition. The former would include risks such as market manipulation (e.g. LIBOR); tax evasion; money-laundering; sanctions breaches; and bribery and corruption. The latter would include breaches of competition law.

Some conduct risks are not that relevant to a life insurer. For example a life insurer may not be in a position to manipulate markets (though this may be relevant for its fund manager). Unless it operates globally, sanctions breaches may not be a material risk.

However, insurers need to ensure that strategy does not introduce weaknesses in controls. For example, a new product may be underpinned by e-servicing, but the insurer will need to ensure internet portals are secure so that policyholder data is not compromised or worse, policyholders defrauded[51]. The insurer also needs to be on its guard to ensure its products cannot be used for tax evasion or money laundering. While it is normal for employees to have contact with employees of other insurers (e.g. at industry conferences), the insurer should be scrupulous about ensuring these contacts do not lead to collusion and breach of competition law.

Failure to prevent breaches of data protection, money-laundering, competition and other laws may result in regulatory fines. In addition there may be costs such as external ("section 166") reviews of the business mandated by the regulator in the event of a breach, as well as the time and effort involved in rectifying the problem.

For both new and existing products, information given to the customer must be clear and not misleading. Marketing literature should explain the risks involved while key features documents and illustrations should set out the charges under the policy. If risks are not properly explained, then the insurer may have to compensate policyholders for losses as a result of these risks crystallising. It may also have to refund charges not properly disclosed.

[51] The US health insurer Anthem recently suffered a breach affecting up to 80m customers – see for example: http://www.zdnet.com/article/anthem-data-breach-cost-likely-to-smash-100-million-barrier/.

Note that regulators expect potential customer outcomes to be modelled so the life insurer knows the risks it is exposing its customers to, and whether the product is likely to offer value for money. They also expect products and literature to be appropriate for the intended market, and for sales to be monitored to ensure products are being sold to the intended market. Failure to do so could lead to regulatory sanctions.

3.5.1.1 Misselling

Pensions and mortgage endowment misselling has cost the life insurance industry billions in recent times. By and large these losses arose from appointed representatives such as banks who were tied to a life insurer, and for whom the insurer bore responsibility for sales. Life insurers no longer appoint representatives on this scale which will reduce exposure to misselling going forward, but further legacy misselling issues could still arise (e.g. in respect of contracting out of SERPS).

It is worth noting the pensions misselling review was a proactive affair, with insurers and advisers writing out to customers to see if there was a problem with the sale. By contrast, a passive approach was adopted for mortgage endowments: insurers and advisers waited for the policyholder to complain. A large proportion of endowment policyholders didn't complain even though their endowment was likely to fail to repay the mortgage at maturity, let alone deliver the additional lump sum many were lead to expect. Further complaints are assumed to be "time barred": the statute of limitations prevents legal action 3 years after when an individual might reasonably have become aware there was a problem with the product they bought. During the noughties, insurers wrote out to policyholders making them aware of the possibility of a shortfall at maturity, and it is generally assumed this is the point at which the policyholder should be reasonably aware of the problem. If not, then future complaints may not time barred which could result in serious additional losses for life insurers responsible for mortgage endowment sales.

While life insurers have limited their direct exposure to the risk that advice given may be flawed, they may still be indirectly exposed to misselling by IFAs and other advisers. In 2007, the FSA published "Responsibilities of providers and distributors for the fair treatment of customers"[52]. Amongst other things this makes life insurers responsible for ensuring advisers have sufficient information to explain risks to customers.

[52] PS07/11 – see http://www.fsa.gov.uk/pubs/policy/ps07_11.pdf

If life insurers supply inaccurate or inadequate information to advisers, who in turn use this information to make a flawed sale, then the insurer could potentially be liable for misselling[53].

3.5.1.2 Enhanced / incentivised transfers

One particular area of concern regards enhanced or incentivised transfers from defined benefit schemes. Under these exercises, an employer either enhances the transfer value or offers a cash incentive to deferred members who have left employment to encourage them to transfer to a personal pension. In general, the transfer value plus the enhancement or incentive payment is less than the IAS19 value of deferred benefits, resulting in a balance sheet gain. Furthermore it is no longer exposed to market or longevity risk in respect of benefits transferred out.

The employer gains from such transfers out, but what about the member ? a case can be made that the IAS19 value represents a "fair value" of benefits, so if the transfer value plus enhancement / incentive is less than this, then the member is losing out. Furthermore, switching to a personal pension, the member will be exposed to fluctuating market returns and annuity rates i.e. the member is now taking on the market and longevity risks formerly borne by the employer.

Enhanced / incentivised transfer value exercises can generate significant sales for life insurers, and some have sought such business despite the potential detriment to members / customers. The insurers would not be responsible for advice given, but they need to ensure the advisers have sufficient information to explain risks to members.

In terms of an IFA advising on defined benefit transfers, a "critical yield" is calculated which the transfer value needs to earn in order to replicate benefits foregone. This illustrates market risk pre-retirement: the higher the yield, the less likely the transfer value will replace benefits. However, the value of benefits in the critical yield calculation is based on assumptions for bond yields, life expectancy and hence annuity rates at retirement. The actual annuity rates may differ, and the critical yield does not capture this risk. Unless supplementary figures are given on the impact of fluctuating annuity rates, then risks cannot be said to be properly explained and the transfer will have been mis-sold.

[53] A potential precedent may be Seymour v Ockwell (2005) where Zurich IFA Ltd. had to pay 2/3rds of the £500,000 compensation due to a customer advised to invest in an offshore fund which collapsed. Zurich had provided the IFA with information on the fund that was flawed. See http://www.moneymarketing.co.uk/news/court-rules-zifa-must-share-missale-liability-with-adviser/105571.article

Furthermore, critical yields are often calculated by the insurer in support of the IFA, which may implicate the insurer in the missale.

It is my opinion that enhanced / incentivised transfers from defined benefit schemes is a misselling scandal waiting to happen. Just because they are not responsible for advice does not mean life insurers will be "off the hook": unless they take steps to ensure all risks are properly explained to the end customer, they may have to pay a significant part of any compensation bill, which could run into billions, not to mention the reputation damage they may suffer from being associated with such misselling[54].

3.5.1.3 SIPP and Wrap

Conduct risks is particularly important for SIPP and Wrap. These offer thousands of different funds, each with its own set of annual management charges and other expenses. For many funds, the insurer will be able to negotiate charge rebates. Accurate charge disclosure will be challenging. There is also a challenge in communicating the risks associated with the myriad of investment options on offer.

A particular problem for SIPP and Wrap is compliance with segregation of client funds rules. Apart from life insurance policies, the SIPP or Wrap will also encompass mutual funds, direct investments in shares and property and deposit accounts. It is important that ownership of these non-insured assets, and the income from these, are attributed to ring-fenced client accounts and are not "co-mingled" with the assets of the insurer. If not, the client could be exposed if the insurer went bust as the assets may be caught up in the insolvency process. If the regulator finds failings in segregation of client assets, it may impose substantial fines[55], as well as requiring external reviews of controls and remedial action

[54] For further details see: http://www.crystalriskconsulting.co.uk/how-exposed-are-life-insurers-to-enhanced-transfer-value-misselling-6.html.

[55] Two of the largest fines imposed by the FSA were £33m for JP Morgan and £9.5m for BlackRock £9.5m for failing to properly segregate client assets (see http://www.theguardian.com/business/2010/jun/03/jp-morgan-fined-33m-by-fsa?guni=Article:in%20body%20link and http://www.theguardian.com/business/2012/sep/11/blackrock-fined-by-fsa-client-money).

3.5.2 Product risk

Conduct risk covers risks posed to the customer by a product, but there are also product related operational risks relating to the insurer. Chief among these is errors in the pricing of products, which may result in charges and premiums being set too low e.g. a flaw in a spreadsheet used to set charges for corporate pension schemes. Such errors will lead to expected profit not materialising or worse, that new business written will be intrinsically unprofitable. Economic capital would need to allow for loss making business arising because of pricing errors.

As well as errors in pricing, there may be errors in policy documentation and marketing literature which may result for example in unintentional guarantees. Ambiguity in these could triggers a legal challenge as to the nature of the product. Even if the insurer wins, it may still face legal costs as well as reputation damage.

Other documentation issues include flaws in reinsurance treaties[56]; with derivatives used to back structured products; or in fund management agreements which could give rise to unexpected costs. All documentation should be subject to legal scrutiny to ensure contracts operate as intended.

3.5.3 Processing risk

Process failures represent a significant source of operational risk. One can distinguish between manual and automated processing errors. Manual processing will always be vulnerable to human error, particularly if staff are inexperienced, which may arise if there is high staff turnover. Ideally, as much processing will be automated as possible, but there is also a risk that there may be flaws in automated processing. In contrast to occasional manual processing errors, this risk is more systematic with hundreds if not thousands of transactions compromised.

As an example of how badly things can go wrong, in 2010 the FSA fined Scottish Equitable £2.8m for numerous process failings including errors in charge rebates affecting 25,000 policies, and failure to process DWP contributions to contracted-out pension policies correctly, affecting a further 2,500 policies[57].

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[56] …or failure to have a signed treaty in place: often a life insurer will write business on the basis of an informal agreement with the reinsurer, pending completion of a formal treaty. However there have been instances in the past where it took years for the treaty to be completed, and where the reinsurer walked away from the arrangement when rates in the reinsurance market hardened. Insurers should ensure treaties are completed as a matter of urgency.

[57] http://www.fsa.gov.uk/pubs/final/scottish_equitable_plc.pdf

At the time, the estimated cost of remediation was estimated at £60m, but by 2012, this had risen to over £170m including associated administration costs[58].

Key sources of processing risk facing life insurers are:

- Unit linked pricing, allocation and deduction;
- SIPP and Wrap accounts;
- With-profit payouts; and
- Underwriting errors.

3.5.3.1 Unit linked pricing, allocation and deduction

Historically life insurers offered a choice of 20-30 unit-linked funds managed by their own fund manager, but starting from the late 1990s, insurers started offering other managers funds. Such "open architecture" broke the link between the life insurer and the fund manager. Policyholders could select which fund manager they wanted to invest with without having to switch insurer; and the insurer was not tied to one fund manager's performance. Now a life insurer may offer hundreds if not thousands of funds under a unit linked product, with different fund ranges for life and pensions products. This increase in the number of funds has dramatically increased life insurer's exposure to errors in the setting of unit prices. In recent times, many insurers have lost millions rectifying such errors[59].

Aside from the need to compensate the policyholder where they have suffered from an error, insurers may have to write-off over-payments due to pricing errors which cannot be reclaimed. They will also incur significant costs in respect of actuarial and other staff required to conduct a remediation exercise. Offsetting these losses, it may be possible to recoup costs from the fund manager if they made the mistake.

As well as the unit price on which unit transactions are based, there may be flaws with the transaction itself: the wrong proportion of premium could be allocated to buy units; there may be errors in the amount of charge deductions; or the transaction may be based on prices on the wrong date.

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[58] http://www.moneymarketing.co.uk/pensions/aegon-redress-costs-for-scoteq-leap-by-£70m/1046677.article

[59] For example, Clerical Medical had to pay £17m compensation to policyholders in 2006 - see http://www.theguardian.com/business/2006/nov/28/5

3.5.3.2 SIPP and Wrap

Whatever the complexities of linked life insurance policies offering access to hundreds of unit linked funds[60], a SIPP or a Wrap product will be far more complex as it will also offer access to thousands of mutual funds as well as allowing direct investment in shares and property. Valuing SIPP and Wrap accounts for the purposes of annual management charges, statements and claims will be a difficult process requiring price feeds from scores of fund managers, share price details and property valuations.

There will be a need to process charge rebates as well as mutual fund distributions, share dividends and rental income. These will generally be credited to a deposit account with charges coming off this account, though assets may need to be liquidated if there are insufficient funds to cover these. Errors can arise at any stage of these processes.

Wrap also involves investments spread over different tax regimes, with sub-accounts for assets held as pensions, ISAs, life insurance policies etc.. This will add further complexity in terms of allocating contributions and assets between accounts in accordance with the client's instructions, again increasing the risk of processing error, as well as the risk that tax rules relating to different sub-accounts may be broken.

Income drawdown will be an integral part of most SIPPs, though it may also be offered as an ordinary unit linked pension product. In both instances, there is a need to ensure income paid out is in accordance with tax rules and regulations. Sometimes the retirement or "vesting" process is staggered, spreading out the tax-free cash available at retirement so that income is a mixture of tax-free cash and (taxable) pension income. This "drip feed" drawdown is prised by advisers but also introduces further complexity and the scope for error.

3.5.3.3 With-profit payouts

Non-linked products are generally simpler and less prone to processing error than unit linked. An exception is with-profits. Traditional with-profits maturity payouts are based on a basic sum assured increased with regular bonus additions plus a terminal bonus to reflect the difference between these and smoothed asset share.

[60] In this context, a unit linked fund relates to a unit linked insurance policy, whereas a mutual fund will be structured as either an OEIC or unit trust, subject to different tax law and regulation.

However the basic sum assured and bonuses assume all premiums are paid to the original maturity date. Complex adjustments are often required where premiums vary or other alterations are made to the policy, sometimes requiring manual calculations by actuarial or other numerate staff. Surrender values will be based on scales which vary in complexity, and which also vary over time with different market conditions. Errors can creep into alteration and surrender value calculations.

As premiums on pension policies vary, traditional policies were mostly replaced in the 1980s by unitised with-profits. This works like a unit linked policy though the unit price grows at a guaranteed minimum rate (which may be 0% p.a. i.e. no fall in price) plus regular bonus additions. This unit value will differ from the underlying asset share.

Where the asset share is greater, an additional terminal bonus will be paid but where it is less, a "market value reduction" or MVR may be applied on surrender (i.e. the guarantee represented by the unit value only applies on maturity). Terminal bonus and MVR rates will vary with market conditions, and again errors could creep into the calculation of these or when they are applied.

As well as errors in the application of bonuses, errors can also creep into the core calculation of bonuses. While life insurers have considerable scope in the calculation of payouts, these still need to be consistent with the Principles and Practices of Financial Management (PPFM). For example, the PPFM may restrict what expenses can be deducted from the asset shares which underpin payouts. It may also stipulate that asset shares and with profits payouts share in certain sources of surplus such as new business profits. To the extent the calculation of asset shares and payouts is inconsistent with PPFM, then a rectification exercise may need to be undertaken to compensate policyholders[61].

3.5.3.4 Underwriting errors

While term assurance and other protection products are relatively straightforward, these need to be underwritten. Underwriting will follow a process to ensure the correct medical evidence is sought and that the correct underwriting decision is made. Failure to follow this process could lead to incorrect decisions including customers passed at normal terms when they should have had a loading applied; or offered cover when they should have been refused.

[61] For example, see http://www.moneymarketing.co.uk/investments/scot-life-repays-17000-with-profits-policyholders/1039646.article

Failure to follow the correct process could affect reinsurance cover. Reinsurers will audit underwriting decisions and if they detect a policy which has been incorrectly underwritten, they may refuse to reinsure the policy, leaving the life insurer with all the exposure in respect of the incorrectly underwritten policy.

Furthermore, the reinsurer could pull out of the treaty altogether if it finds persistent underwriting process failings. The life insurer may be compelled to re-absorb reinsured risk or face a significant loss as replacement reinsurance is likely to be more onerous, if it is available at all.

3.5.3.5 Other processing risks

Practically everything the life insurer does is vulnerable to some form of process failure. As well as the risks covered above, other material processing risks relate to:

- Collection and processing of premiums, particularly for corporate pensions where the premium may vary from month to month;
- Reinsurance premiums and recoveries;
- Commission payments;
- Tax deductions and remittance to HMRC;
- Salary, benefits and reimbursement payments to staff;
- Pension and other payments to members of the insurer's own pension scheme, as well as processing of deaths, retirals etc.;
- Payments to suppliers; and
- General customer service such as the failure to capture customer instructions properly.

This list is not exhaustive.

3.5.3.6 Management information and financial reporting

One aspect of processing risk that is frequently over-looked is the need to generate management information (MI) in respect of transactions. To take a surrender as an example, the correct surrender value may be calculated and the payment made to the correct account, but there may still be an error in updating MI on surrenders. This could lead to surrenders being understated. This in turn could lead to surrender assumptions which are too low, overstating PVFP and new business profitability. Correcting this will lead to a write down of PVFP and projected new business profitability.

Transaction details should flow into finance systems to enable the accurate reporting of premiums, claims etc.. If this does not happen then there is a risk of a material misstatement in the Report and Accounts and/or in PRA returns. Correcting this might lead to a write down in the value of assets or an increase in the value of liabilities. This in turn could lead to regulatory fines; additional audit expenses; other costs to rectify mistakes; and in the case of flawed shareholder reporting, lawsuits from shareholders.

Despite the serious consequences of errors in MI and feeds into finance systems, these elements of processing are often accorded low priority in the development of new products and systems. They may be among the last of a project's deliverables and among the first to be de-scoped if the project falls behind.

3.5.3.7 System development and testing

Following on from above, flawed project management of system development can contribute to a wide range of process errors. To the extent that system functionality is not delivered, there will be a need to rely on manual workarounds, increasing the chance of errors and operational losses. More serious losses arise where system functionality is delivered but is flawed. This will give rise to systematic losses as opposed to occasional manual processing errors. As well as process losses, losses could arise under conduct risk. For example, a system error could mean that not only are the wrong charges taken from unit funds (process risks) but also that the wrong charges are disclosed to the customer (conduct risk).

It is vital that system developments are properly tested to ensure there are no material errors affecting the system. This testing should include regression testing to ensure that the parts of a system which should unconnected with a development are not compromised by this. It should also include production monitoring to ensure the development is successfully promoted from the test to the production environment.

Unfortunately testing is often skimped, increasing the risk that errors are undetected. Aside from the cost of testing, it may hold up delivery as it is one of the last stages of the project. Frequently, earlier delays lead to pressure to cut back on testing in order to ensure the project "delivers" on time (though what is delivered may be flawed). NEDs may hear of "risk based" testing. In my opinion this is a euphemism for only partially testing systems, focussing on key areas which may go wrong but skipping over other areas. To my mind, it is "risk based" more in the sense the insurer is taking a risk by not properly testing systems.

Given the size of losses that may arise (see the Scottish Equitable example above) there is no substitute for complete testing, and NEDs should push back at attempts to compromise on this.

3.5.4 Financial reporting risk

Even if the correct MI and finance data are in place, there is a risk that material errors are made in the reporting process itself e.g. accounting systems may err in aggregating information between different systems. Errors may also be made in the interpretation of accounting rules.

A key source of error in financial reporting relates to actuarial values of liabilities. With-profit guarantees costs are difficult to model due to the complexity caused by varying investment mixes and bonuses. They may be viewed as exotic options, with a further complication that while options are written on a stand-alone basis, the investment mix of policy A may be affected by the regular bonus added on policy B, while both may be affected by the payout on policy C. Complex models are therefore required to value guarantees on a market consistent basis, and there is a risk these models may be flawed.

Errors can creep into other actuarial models. Calculating the balance sheet liability for even simple products like term assurance requires a cashflow projection allowing for persistency, deaths and other contingencies as well as expenses, inflation and investment returns. Similar cashflow projections are required to calculate PVFP for supplementary embedded value reporting. Even if the correct MI is supplied, flawed analysis of mortality, persistency and other assumptions may mean assumptions for these rates are flawed, with a knock on impact on cashflow projections.

The potential size of accounting and actuarial errors is enormous, as will be the restatements required to correct these. Perhaps more than any other industry, life insurers need robust financial controls in place to guard against such errors.

3.5.5 Outsourcing

As the life insurance industry consolidates and funds close, many insurers have outsourced administration and systems maintenance to providers who may have the economies of scale that closed funds would otherwise lose. Some operational risks would also be transferred e.g. if the outsourcer indemnifies the insurer against processing errors it makes. Note, however, the insurer would usually be responsible for compensating policyholders in the first instance, and needs to reclaim this back from the outsourcer.

Two things stand in the way of a reclaim. First of all, there may be ambiguity over whose fault it is e.g. if the process failure involved the insurers own staff. Another source of ambiguity would be poor wording of the outsourcing agreement. It is vitally important that the outsourcer's responsibilities are set out in detail in the agreement as otherwise they may not be liable for errors they may be responsible for.

The other factor preventing reclaim may be insolvency of the outsource provider. Indeed, operational failings and the need to compensate clients could be the driver for insolvency. Ideally outsourcer errors would be minimal so there is no need to compensate policyholders nor have exposure to outsourcer default. Outsourcer operational errors should be monitored and the life insurer should arrange for audits to ensure no significant problems are building up.

If the outsourcer becomes insolvent, as well as amounts owed under indemnities, the life insurer will need to either insource tasks previously outsourced or arrange an alternative outsourcing arrangement. Either way, there will be project costs involved in the transfer from a defunct outsourcer e.g. in recapturing policy data and migrating these onto the new system. Life insurers should have contingency plans in place to ensure the transition runs as smoothly as possible. Note the ongoing cost may be higher for an insourced operation; or the alternative arrangement may be more expensive; both of which will have an impact on expense assumptions. This will in turn adversely impact balance sheet liability values and supplementary embedded value figures.

Outsourcing also changes the nature of other risks:

- Business continuity – offshoring may involve work being transferred to less politically stable countries and/or countries which may be more prone to natural disaster (e.g. Phillipines). This may increase the risk of business disruption.
- Employee relations – the life insurer will be indirectly impacted by strikes and other industrial relations issues affecting the outsourcer, while high staff turnover may compromise service.
- The insurer may transfer administration staff to the outsourcer as part of the outsourcing agreement. It needs to comply with Transfer of Undertaking (Protection of Employment) regulations (TUPE) in respect of this transfer.
- Fraud – the insurer will now be exposed to fraud by the outsourcer's staff (though this should be indemnified by the outsourcer).
- Data protection – there are restrictions on transferring personal data outside the EU and any outsourcing agreement needs to comply with these.

Lastly, both UK and EU regulators require outsource arrangements to be properly governed. Life insurers will need to have staff capable of overseeing and challenging outsourcer performance as well as contingency plans for outsourcer failure[62]. Failure to properly manage outsourcing arrangements could result in regulatory fines.

3.5.5.1 Fund management

Most life insurers outsource fund management to either a separate group company or an external manager. This will be governed by an investment management agreement (IMA), in which the fund manager will generally indemnify the insurer for the errors it makes.

The risks run by fund managers are considerable and include:

a) Dealing errors e.g. "fat fingers"[63] or failure to execute trades in accordance with the insurers instructions;
b) Failure to allocate income and expense to the correct funds, and ensure title to assets is properly assigned;
c) Errors in valuations supplied to the insurer, and errors in other information supplied e.g. market data used by the insurer in calculating liabilities;
d) Failure to communicate material changes in risk profile e.g. in mutual funds the insurer may invest in;
e) Failure to follow IMA limits e.g. exceeding limits on with-profit fund equity exposure;
f) Rogue trading;
g) Fraudulent transactions (e.g. using the insurer's funds to purchase an asset at an inflated price from a connected party);
h) Breach of permitted links rules (investing in assets which are not allowed to be held in unit linked funds);
i) Failure to segregate client funds (including the insurer's assets);
j) Failure to manage conflicts of interest properly with regard to the insurer's funds;
k) Market manipulation (though most fund managers will not be big enough by themselves to manipulate markets);
l) Insider trading;
m) Documentation errors;
n) Unit pricing errors (where this is done by the fund manager on the life insurer's behalf) including failure to communicate the correct unit price (e.g. by an external fund manager in respect of a fund to which the insurer links to); and

[62] See for example Guidelines 14 and 44-47 of EIOPA's September 2013 Guidelines on the System of Governance (sections 4.and 5.): https://eiopa.europa.eu/Publications/Reports/EIOPA-13-413_Final_Report_on_CP8.pdf#search=Final%20Report%20on%20CP8

[63] e.g. http://www.chinadaily.com.cn/english/doc/2005-12/10/content_502260.htm

o) Over-/under-charging of fund management fees (the former may be rebated but the latter could trigger a demand from the fund manager to pay the difference).

Particular operational risks arise with the management of derivatives on the insurer's behalf:

p) Errors in the valuation of derivative positions and in reporting of these to the insurer;
q) Failure to follow derivative exposure limits (may follow from (o) above);
r) Dealing with non-approved counterparties;
s) Collateral management failings (see 3.2.5 above) including failure to:
    - value positions in accordance with the CSA;
    - ensure the counterparty posts collateral where required;
    - post collateral to counterparty where required;
    - ensure collateral meets CSA criteria (e.g. collateral may be restricted to cash and gilts, precluding other assets);
    - ensure the correct "haircut" is applied to collateral i.e. that the amount of collateral is correct; and
    - in the case of exchange traded or centrally cleared derivatives, failure to manage margin calls as they arise.
t) Documentation errors in OTC derivatives contracts; and
u) Failure to ensure derivatives are in keeping with regulatory requirements for life insurers[64];

Again this list is not exhaustive. The fund manager is exposed to considerable operational risks in the management of funds on behalf of the insurer and also other clients. The insurer should be satisfied that the fund manager has adequate controls to manage these risks, particularly in relation to derivatives. If not, large operational losses could threaten the viability of the fund manager and in extremis affect the life insurer if the fund manager cannot compensate for errors made.

3.5.6 Fraud

Fraud is a growing issue for life insurers. In the past fraudsters have targeted banks but improvements in bank risk controls (e.g.chip and PIN) have forced them to look elsewhere, including life insurers.

[64] In particular INSPRU 3.2 – see http://fshandbook.info/FS/html/PRA/INSPRU/3/2

Regulators are concerned about fraud affecting policyholders and are looking for life insurers to have appropriate controls in place to manage this. Failure to manage fraud could result in regulatory fines[65].

Fraud risk can be subdivided into internal and external fraud – the former involving the insurer's own staff, the latter external parties. There is some overlap: external fraudsters may collude with internal staff.

Internal fraud may include staff defrauding policyholders by directing policy funds to their own accounts, or by selling their personal details. The insurer would then have to compensate policyholders. Staff may also defraud the insurer directly e.g. through fictitious or over-inflated asset purchases, or simply transferring the insurer's money to their own account. They may also sell the intellectual property of the company and other confidential information such as strategic plans.

A sub-set of internal fraud covers unauthorised activity by staff. This would include rogue trading though this arises more in fund managers (see 3.5.5.1 above). It also includes amongst other things:

- deliberate falsification of accounts to hide losses or trigger performance bonuses;
- reckless misselling, breaching sales guidelines to generate sales commission; and
- money laundering by circumventing the insurer's controls.

External fraudsters may try to steal policyholder's money and/or their details through impersonation, but increasingly they are resorting to online fraud using techniques such as "phishing" (impersonating insurer's sites), hacking or viruses. As life insurers make increasing use of e-commerce, there is a commensurate increase in online fraud risk. Life insurers will need to be able to demonstrate to regulators that any e-commerce initiative (e.g. accessing policy details via smartphones) has appropriate safeguards against cyber-crime. As well as policyholder funds, the life insurer's own assets may be vulnerable to cyber-crime.

There are numerous other ways in which the insurer could be defrauded including:

- Fraudulent death and disability claims;
- IFAs creating fictitious policies to generate commission;
- Fraudulent investment schemes (e.g. Madoff); and
- Supplier fraud e.g. over-billing for services provided.

[65] For example Norwich Union was fined £1.26m for exposing policyholders to the risk of fraud – see http://www.fsa.gov.uk/library/communication/pr/2007/130.shtml

Like processing risks, most activities of the insurer are vulnerable to fraud at some stage.

3.5.7 Other operational risks

3.5.1 – 3.5.6 above cover some of the most important operational risks faced by life insurers, but there are many others including:

- Employee relations – including:
  - loss of key staff;
  - strikes and other industrial action;
  - breaches of employment law and employment contracts;
  - lawsuits taken under employment law (e.g. recent challenges on including commission and overtime in holiday pay);
  - breaches of health and safety rules;
  - discrimination and harassment;
- IT system failures – due to system crashes; utility failure (e.g.power cut); or malicious actions such as hacking or viruses. Inter alia this may result in loss of data and additional costs in re-entering data.
- Damage to physical assets e.g. damage to an office due to fire or other perils such as terrorism.

Insurers should have business continuity plans (BCPs) in place where strikes, system failures or damage to premises affects normal operations to ensure the insurer can continue to function. This may involve moving to an alternative site or using a back-up system. There will be costs involved in having access to such spare capacity, but the cost of the insurer not being able to administer policies, produce financial reports etc. would be far higher. In any case both UK and EU regulators expect insurers to have BCPs in place to cover contingencies and failure to have robust BCPs could result in regulatory fines.

Finally, under the heading of external events, life insurers are exposed to the risk of their peers becoming insolvent. Aside from any damage this might do to policyholder confidence, the insurer may have to pay Financial Services Compensation Scheme (FSCS) levies. The FSCS covers 90% of the benefits payable under individual insurance policies and to the extent the assets of the failed life insurer cannot meet this, the FSCS can levy other life insurers for the difference up to a maximum of £690m p.a. across the life insurance industry[66].

[66] See: http://www.fscs.org.uk/industry/funding/

3.6 Tax, regulatory capital and frictional risks

As noted in 2.1.4 and 2.1.6, tax and regulatory capital requirements can have an adverse impact on sales, but they can also have an adverse impact on the existing business of insurers.

Higher tax rates will adversely affect the present value of future profits for most business, though the situation is more nuanced for ordinary life insurance (as opposed to pensions) business. This is taxed on an "I-E" basis, with tax on investment returns ("I") offset by tax relief on expenses ("E"). Life insurers could be vulnerable if the life insurance tax regime were to change to something like Ireland's for example, with gross roll-up of investment returns and an exit tax on maturity or surrender. The benefit of the 0% tax on investment returns might accrue to policyholders, but the life insurer might no longer be able obtain relief on expenses. As charges will have been set allowing for such relief, the move to a gross roll-up basis could perversely have a negative impact on the insurer as charges may no longer be adequate to cover expenses once tax relief is lost.

To counteract this and other adverse changes in taxation, most life insurance policies will have clauses allowing them to vary the terms of the contract in the event of any relevant change in tax legislation (though some legacy contracts may not have these clauses).

Higher regulatory capital requirements will also have an adverse impact on the economics of the existing book of business. This is likely to increase the amount of shareholder funds tied down backing regulatory capital requirements which will increase the opportunity cost of capital[67].

Solvency II aims to align regulatory Pillar I capital requirements with underlying risks and may allow an element of PVFP to be allowed against regulatory capital. While this will bring benefits, other aspects of Solvency II could increase regulatory capital requirements. For example, the liquidity premium that can be allowed for in assessing Pillar I liabilities for annuity business may be restricted. There are also issues with "contract boundaries" regarding how long polices are assumed to continue paying premiums for. While term assurance policies may be assumed to continue until expiry (or earlier death or lapse), for pension policies, the assumption may be no future premiums which will have an adverse impact on the Pillar I PVFP calculation. At the time of writing, there is still uncertainty about final Solvency II rules and hence its impact on regulatory capital requirements.

[67] …though the increased regulatory capital requirements need to be considered against economic capital already held to cover risks.

Regulatory capital changes may be considered a "frictional" risk as regulatory capital may change with no change in the underlying risk profile of the business. Other frictional risks are possible. For example, the sum of economic capital requirements for individual subsidiaries is likely to be greater than if all business was written in one entity as diversification benefits (see below) will be less at an individual subsidiary level. Economic capital requirements will thus vary with group structure. Note there is often a trade-off between capital and tax efficiency. While writing business in separate subsidiaries may be less efficient from an economic capital point of view, it may make sense from a tax perspective.

There is also a question of fungibility of capital. There may be excess capital in a subsidiary or sub-fund, but this may not be available to offset losses elsewhere e.g. if the capital was held in a with-profit fund and earmarked for the policyholders of that fund; or if it was held in an overseas subsidiary where the regulator was not prepared to allow capital to be repatriated.

To the extent that accounting rules do not reflect the economic reality (e.g. if they rely on conservative valuation methods such as book value), they could understate the financial strength of the life insurer or its subsidiaries. This could force it to retain assets to preserve balance sheet solvency, preventing the distribution of these to shareholders. Accounting rules could be as significant as regulatory capital rules in how much shareholder capital gets tied up in the business.

Lastly, life insurers will wish to preserve a minimum credit rating. Like changes to regulatory capital and accounting rules, changes to credit rating agency criteria could again lead to higher capital requirements, increasing the opportunity costs of capital and reducing the amount available for distribution to shareholders.

3.7 Aggregation and diversification

It is important to look at risks not just on a stand-alone basis but also how they interact as a whole. Some risks can be super-additive, meaning the combination is greater than the sum of the parts. An example of this is longevity and long-term interest rates. Falling rates will exacerbate the impact of a rise in life expectancy, increasing the present value of the benefits payable during those extra years of life.

By and large however, most risks are sub-additive in that the whole is less than the sum of the parts. There will be diversification benefits between risks as extreme events are unlikely to arise in all categories at the same time. Such diversification benefits are a key driver of shareholder value in insurance business, allowing insurers to write more business for a given level of economic capital.

Considering the diversification benefits available on different risk types, market risk will be key for shareholders as these will already be exposed to equity market movements on other shares in their portfolio. There will be some diversification within market risk between equity, property, credit spread, interest rate and currency risks.

However, it is important not to overstate diversification benefits. While correlations between markets may be modest in normal trading conditions, in stressed conditions like 2007 – 2009, markets can move in tandem: equity and property markets will fall; spreads on corporate bonds will rise; while a "flight to quality" may push down risk-free rates.

In such circumstances, adverse feedback loops may develop. Falling asset values and interest rates may place pressure on the financial strength of life insurers, pension funds and other financial institutions, forcing them to de-risk by selling risky assets, further driving down markets[68]. Falls in value will generate margin and collateral calls on long derivative positions, creating liquidity strains. Liquid assets may need to be sold to finance these, further driving down the market.

In the run-up to the financial crisis of 2007 – 2009, many investment banks financed holdings in ABSs and other bonds through short-term borrowing. They then found themselves unable to roll-over these borrowings leading to "fire sales" of these assets to repay borrowings. They also sold more liquid assets to address the liquidity strain, pushing down markets for these assets. In this way, problems with ABSs spread to other asset classes.

The circumstances giving rise to stressed market conditions will also affect credit risk. Market falls may be triggered by economic downturns which will also affect corporate earnings, leading to downgrades and defaults on corporate bonds. If banks are facing difficulties in rolling over short-term borrowing, the result may be a credit crunch as they rein in lending to businesses, further exacerbating the economic downturn and corporate defaults.

[68] A fuller discussion of this and other systemic risks can be found in "Systemic risk in financial services" (Besar et al, 2009 - http://www.actuaries.org.uk/research-and-resources/documents/systemic-risk-financial-services).

In extremis, banks themselves could fail and as noted in 3.2.3, falls in the value of money market instruments could lead money market funds to "break the buck".

Stressed market conditions could lead to a major investment counterparty to default, like Lehmans in 2008. This could in turn lead to further falls in markets as well as rises in option prices as institutions looks to replace options at a time when capacity has fallen. It is hoped, however, that increased use of CCPs will limit the impact of derivative counterparty default in future.

While other counterparty risks will be strongly correlated with market crashes and bond defaults, reinsurance counterparty risk may not be as strongly correlated. Reinsurer credit worthiness is likely to be driven more by natural catastrophes and life insurance losses than markets, though Swiss Re suffered a SFr1.2bn loss on sub-prime credit default swaps in 2007 with a further SFr0.3bn loss on other investments in 2007[69], highlighting they are not immune from market crises.

Considering insurance and demographic risk, insurance risks such as longevity, mortality and morbidity risk are unlikely to have a high correlation with market and credit risk. However, there are some linkages:

- Flu and other pandemics are likely to lead to market falls as well as higher mortality claims;
- Increasing longevity will adversely affect defined benefit schemes and hence corporate balance sheets, possibly affecting their credit rating; and
- Income protection claims may rise and recovery rates may fall in an economic downturn.

An assumption of low to medium correlation between these insurance risks and market and credit risks may be justified.

A higher correlation assumption may be appropriate for persistency risk, market risk and credit risk. Surrender rates on saving and investment products often rise as markets fall, though they may fall as guarantees become more valuable. Persistency rates on other products may be unaffected, but if a financial crisis threatens the financial strength of the insurer, it may trigger a mass surrender event.

[69] See http://www.theguardian.com/business/2007/nov/20/subprimecrisis.insurance

In terms of dependencies between insurance and demographic risks, it may be assumed that longevity risk and mortality risk have a strong negative correlation relating as they do to mortality improvement and deterioration respectively. However, it is important to note that exposure relates to different age groups: longevity risk mostly relates to pensioners, while mortality risk relates mostly to protection products held by working age adults. It is possible for mortality rates to be improving for pensioners while deteriorating at younger ages. That said, there would be a natural offset between mortality risk on say funeral expenses plans sold to those over 50 and longevity risk on annuitants. Annuities would also offset mortality losses from flu and other pandemics[70].

There may be a linkage between mortality and persistency risk: as noted in 3.3.4, healthy lives are more likely to switch to another provider offering cheaper rates as they would pass underwriting. High lapse rates could leave the insurer with lives that are less healthy than average, adversely affecting mortality experience.

Considering liquidity risk, there is a strong correlation between stressed market conditions and liquidity risk. As well as the potential to trigger mass surrenders, stressed market conditions will result in reduced liquidity in terms of the ability to sell assets and/or to borrow from banks. Falling property markets could also trigger property fund outflows and require deferral clauses to be invoked for these funds.

The level of dependency between operational and other risks varies. Falling markets could expose deficiencies in literature and/or sales in terms of explaining the risk of losses to the policyholder. However other risks e.g. IT system failures and processing errors may be unaffected by markets. From 3.5.3.4, underwriting process errors could compromise reinsurance cover leading to greater mortality risk exposure, but this impact should be considered under process risk than mortality risk.

In conclusion, there are diversification benefits between risks as these are not perfectly correlated. With the exception of persistency risk, insurance risk can be viewed as idiosyncratic given the limited linkage with market and credit risk. This will make it a useful component of shareholders portfolios.

[70] Though again the impact may differ: while typically flu epidemics affect the sick and elderly disproportionately, the 1918/19 flu pandemic had a much greater impact on working age adults.

It is important not to overstate the benefits of diversification however. Assumptions for correlations should be robustly challenged, noting these can change in stress conditions. Life insurers need to be aware of the often complex linkages between risks when setting assumptions for diversification, and reappraise these in light of events such as the financial crisis.

4. Mutuals

The question of shareholder value is irrelevant for mutual life insurers who are owned by member policyholders[71]. This begs the question: what should be the strategic objective of the mutual ? how should it deliver value for its members ? For some, it may be about maximising returns for with-profit policyholders. Others may seek to deliver value by offering a wide range of financial services at attractive terms[72].

Whatever their strategy, mutuals will be constrained by capital limitations: by definition, they cannot raise share capital unless they demutualise. While they can raise sub-ordinated debt, by and large, the costs of new product developments and other strategic initiatives, as well as losses from existing business, will need to be borne by with-profit policyholders, either directly in terms of lower payouts or indirectly through losses being charged to the "inherited estate".

4.1 The inherited estate

The inherited estate represents the excess of assets over those required (a) to meet non-profit and unit linked liabilities and (b) satisfy the expectations of the current generation of with-profit policyholders. The latter would comprise of asset shares plus the value of guarantees and any future smoothing costs as payouts are based on the higher of smoothed asset shares and guarantees. Often the estate has arisen through historic underpayments to with-profit policyholders either by accident or design[73].

Regardless of how it has arisen, the inherited estate serves as a valuable buffer to fund strategic initiatives and absorb losses. With-profit policyholders implicitly benefit from the estate as without it strategic costs and general losses would impact their payouts directly. The buffer provided by the estate also allows a more adventurous investment policy to be pursued by the with-profit fund. This should boost investment returns, asset shares and payouts. It follows that costs and losses which erode the estate will ultimately result in lower payouts for with-profit policyholders.

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[71] Generally with-profit policyholders, but depending on the mutual's constitution, membership may encompass other policyholders as well.

[72] For example, in addition to offering life insurance products, LV= also offers motor and buildings insurance.

[73] For instance, before the introduction of terminal bonus in the 1960s, life insurers often struggled to distribute surplus from equity investments in full. Most insurers also had a policy of building up the estate with each generation of with-profit policyholders adding to this for the benefit of the next generation. Finally, some part of the inherited estate may have arisen when formerly shareholder-owned insurers converted to mutuals: shareholders generally got bonds in return for their stake in the business, but high post-war inflation eroded these bond obligations.

While the estate provides a source of strategic investment and a means of absorbing losses, it also poses a question as to how it should be used going forward. There are two schools of thought. The first contends that the estate belongs to the current generation of with-profit policyholders and should over time be distributed to them through higher payouts.

The second school of thought contends that the estate was built up from past generations of with-profit policyholders, often as part of a deliberate policy. While it can support the current generation of with-profit policies, it should be passed on to benefit future generations in the same way as the current generation are benefitting from having the estate handed down to them from previous generations. An analogy that may be used is that of a golf club: the golf course and clubhouse may be quite valuable, but do current club members have the right to sell this off ?

4.2 The decline of with-profits

If mutuals are like golf clubs, most are suffering a membership crisis. As noted in 3.1.3, realistic balance sheet reporting has lead to a marked increase in capital required to support with-profit guarantees. This has undermined the concept of with-profits as an investment product backed in part by equities but with guarantees and smoothing reducing volatility for the policyholder. Now with-profits policies either have low levels of guarantees or low levels of equity investment. With profits has been further undermined by criticism over a lack of transparency. Sales have collapsed and many mutual have now closed to new business[74]. With little or no sales, the number of policies will contract and gradually economies of scale will be lost, resulting in higher per policy costs and poorer returns for with-profit policyholders.

In terms of options, closure to new business at least settles what should happen to the estate: with no future generations of with-profit policyholders to consider, this should be distributed to the current generation of with-profit policyholders, but as policy maturities are spread out over time, this is easier said than done. If too much of the estate is distributed up-front, then there may be little left to support those policies which have longest to run. On the other hand, if distribution is held back there is a risk of a "tontine" effect where the last few policies benefit disproportionately from what is left of the estate. Often estate distribution will be carried out with hedging of with-profit fund risks (see Appendix II.1.2) to provide a more stable basis for estate distribution.

[74] Except perhaps for increments to existing policies.

4.3 Realising goodwill

Mutuals don't just write with-profit business. They usually write non-profit and unit-linked business. The term "non profits" is a misnomer – such business is priced to generate a profit (the term comes from the fact it does not participate in profits, unlike with-profits). Mutuals can have significant embedded value in respect of non-profit and unit-linked business. They may also have significant goodwill in respect of the value of future new business that may arise given the mutual's product range and market standing.

The embedded value of existing business plus goodwill are intangible elements of the estate. If this is being wound down and distributed, the mutual will need to consider how to realise this implicit value. The problem is that the term of with-profit business is often shorter than the term over which profits may emerge on other business, particularly annuities. Future new business profits will take even longer to emerge – it can only start to emerge after the business is written after all. Realistically the only option is likely to be to sell off the embedded value and the new business franchise, transferring non-profit and unit-linked business to a new life company along with the mutual's rights to new business and potentially its brand[75].

Many mutuals have dynamic leadership teams who have managed to carve out valuable niches in the life insurance market. For instance, Scottish Friendly built up a highly regarded Wrap administration business. Even for a continuing mutual, however, sharing the benefits of this success between different generations of policyholder can be difficult. Amounts invested in developing the business will have an opportunity cost for policyholders as this investment could otherwise have been used to boost their payouts, but the benefits may disproportionately accrue to future policyholders. There may be a case to sell the business developed to shorten the payback period on investment and realise value quicker for the current generation of policyholders[76].

4.4 Re-inventing with-profits

For those mutuals which choose to remain open to with-profits, there is a question as to which form it should take. As noted the traditional form with significant equity exposure and guarantees is no longer tenable.

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[75] A recent example is MGM Assurance's sale of its new business rights plus existing enhanced annuity business to TDR Capital – see http://www.marineandgeneralmutual.co.uk/members/egm-2013/

[76] Scottish Friendly sold their Wrap business to Citi in 2011 – see http://www.heraldscotland.com/business/company-news/reassurances-over-jobs-after-Wrap-sale-to-citi.15752694

The mutual could retain guarantees with a low equity content, but prospective returns for policyholders will be low. If the policy is backed entirely by bonds, it may struggle to beat cash returns: the expected return on gilts will be similar to that on cash, and while corporate bonds may yield more, life insurance claim costs and expenses will offset this.

The alternative would be to eschew guarantees and retain a significant degree of equity exposure to deliver competitive returns to the policyholder. While there will be no guarantee underpin, the smoothing of returns should still reduce payout volatility. With-profits would in effect be reinvented as a smoothed managed fund, offering the equity exposure and diversified portfolio of a unit-linked managed fund policy but with smoothing of returns reducing risk while maintaining a comparable level of expected return.

Such smoothing results in the sharing of market risk between different generations of policyholders, with those maturing in benign market conditions cross-subsidising those maturing in falling markets. However, with-profits can be used to share other risks. Historically, when with-profits policies were first issued, they shared in mortality risks: with-profits policies had a higher premium than non-profit policies for the same basic sum assured to provide a buffer against higher than expected death claims. In return, mortality surpluses were credited as bonuses as a reward for providing this buffer. While with-profit term assurances would struggle to compete in today's price conscious protection market, some life insurers offer with-profit annuities which share in longevity risk as well as market risk. These have a lower guaranteed income relative to non-profit annuities which provides a buffer against these risks, with favourable investment and mortality experience resulting in bonus additions to income.

Another idea may be to share expense risk. Going beyond a smoothed managed fund, a mutual life insurer could offer unit linked funds in the normal way but with rebates of annual management charges depending on the excess of these over expenses[77].

In summary, while traditional with-profits may be in decline, there may be scope for a mutual to continue to offer the benefits of mutuality to future generations albeit in a different form.

[77] The US fund management firm Vanguard operates as a "mutual" mutual fund provider which provides mutual funds like other fund managers but which is ultimately owned by investors in the mutual funds rather than shareholders.

4.5 Demutualisation

Of course many mutuals re-invent themselves a shareholder owned companies through demutualistion. This has many attractions, particularly for a mutual faced with a declining with-profit portfolio, who may not have any other option. The compensation generated for with-profit policyholders will reflect embedded value, crystallising this for their benefit.

It may be also be possible to crystallise the inherited estate, selling the rights to estate assets as part of the demutualisation. Typically, however, part of the estate will be retained to provide support to with-profit policyholders before being released to shareholders as policies run off. The full amount of the estate is unlikely to be realised due to this tie-in. That said policyholders will see immediate value in terms of compensation, whereas if the insurer remained a mutual and distributed the estate to policyholders, it could do so only gradually.

Many demutualisations involve closed with-profit funds. The aim will be to distribute the estate to policyholders and shareholders while realising value through improved fund management and by managing expenses. Some companies specialise in buying up a number of closed funds and merging these to create economies of scale.

Where a mutual has a valuable franchise, it may be demutualised as a going concern. The goodwill value will form part of the compensation to policyholders, realising the value of new business streams which otherwise could take years to emerge. Demutualisation will open the door to raising share capital, permitting investment in new products and allowing management to realise the full potential of the franchise. While with-profits is unlikely to be a core offering, the demutualised insurer will aim to continue writing non-profit and unit-linked business, maintaining economies of scale and keeping per policy costs down for with-profit policyholders.

Notwithstanding the benefits, demutualisation involves the transfer of ownership to shareholders whose aims and objectives are likely to differ from with-profit policyholders. One reason why with-profits has fallen out of favour is the lack of transparency and in particular the degree of discretion afforded to the insurer in areas such as investment policy and bonuses. There is ample scope for conflicts of interest and policyholder detriment. For example, with-profit policyholders may require significant equity exposure to maximise returns, but this will increase guarantee costs which may affect the estate and ultimately any shareholder distributions from this. Shareholders may therefore seek a less risky investment policy.

Care needs to be exercised that such conflicts are identified and managed so the policyholder is treated fairly. The fact remains, however, that the business is no longer being run solely for their benefit.

5. Concluding remarks

It is instructive to compare life insurance to a nuclear reactor. A reactor may take 25 years to build, and then be in service for another 30 years. Similarly, a deferred annuity written by a life insurer on a 40-year old pension scheme member may not become payable for 25 years when the member reaches 65, and then may be payable for a further 25-30 years – or longer if benefits are paid to a surviving spouse. Nuclear reactors can take decades to be decommissioned, but legacy problems can similarly affect life insurers, for instance mortgage endowment misselling losses in the 2000s in respect of policies sold in the 1980s.

A nuclear reactor will be built to withstand multiple catastrophic risks from aircraft collision to terrorist attack. Life insurance will be subject to a wide range of market, credit and insurance risks, to say nothing of conduct, process and other operational risks it faces. Admittedly life insurance risks are nowhere near as significant to society as nuclear reactor failure, but many of these risks nonetheless threaten the long-term future of the insurer.

This is not to say life insurance is as complex as nuclear reactors which may have millions of parts and dimensions specified in micrometers. Yet life insurance involves projecting and discounting cashflows allowing for a wide range of interest and demographic variables. The Actuarial profession grew out of the life insurers' need for skilled mathematicians who could handle such calculations. Life insurers were among the first businesses to adopt computers to deal with the volume of calculations involved in assessing long-term insurance liabilities – and this was before the introduction of unit-linked business with all its complexity (see 2.2.3). The introduction of "open architecture", SIPP and Wrap have added to the complexity of life insurance operations.

In short, life insurance is a complex long-term business facing a wide range of risks. Being a non-executive director of a life insurer is a difficult task, as the director will be part of a Board ultimately accountable for the management of these risks.

This paper can only give a flavour of the risks faced. It is impossible to address all the risks faced by life insurers as each will have its own risk profile with its own particular idiosyncrasies. However it is hoped this guide will help non-executive directors in reviewing and challenging strategy, as well as helping them fulfil their risk management responsibilities.

Appendix I – Sample strategy challenge questions

I.1 New business plans

Question 1: what is the projected growth rate in the overall market for a product ? what is the rationale for this growth ?

- Past history can give an indication of future growth but there is a need to be mindful of recent changes e.g. the impact of the 2014 budget changes on annuities.
- For many markets it may not be unreasonable to base future growth on expected GDP growth but often there can be a disconnect between the GDP growth assumptions of those developing strategy and economic projections elsewhere. GDP and other economic assumptions should be benchmarked against external sources wherever possible.
- An aging population may drive growth in markets like retirement income but growth rates should be benchmarked against demographic projections[78], as well as the retirement profile of the insurer's own book of pension policies.
- The size of the market for newer products like Wrap can be very sensitive to assumption such as the rate of adoption by IFAs. NEDs should query what assumptions have been made and the sensitivity to alternative scenarios for how these new markets may develop.

Question 2: what is the projected split of the market by distribution channel ?

- A starting point will be the current split but the insurer should have regard to recent developments e.g. banks moving out of advised sales.
- In assessing volumes coming through the insurer's own direct sales force, this should be benchmarked against current and planned salesforce numbers and their average productivity, noting that high turnover could lead to a drop in productivity.
- Similarly volumes from tied agents and other distribution partners should be benchmarked against any data available on the size and productivity of their salesforces.
- The split of sales by product line needs to be checked against the incentives and the effort involved in selling different products.
- At a macro level, IFA market volumes should be benchmarked against available data on adviser numbers and the rate at which IFA firms are going bust.

[78] For example in 2013 there was a 16% fall in annuities partly because the number of people reaching 65 fell by 9% in that year.

Question 3: what is our projected share of the market by channel ?

- A starting point would be current shares, but this should have regard to any new entrants – whose share may still be growing – as well as exits.
- NEDs should be wary of significant increases in assumed share, particularly if it is based on the assumption that competitors may leave the market – competitors may be assuming the same thing.
- Similarly, any large increase due to new products should be challenged. While the insurer will have a "honeymoon" period where share may increase, this advantage may shrink as competitors respond to product innovations.
- NEDs should elicit what assumptions are being made regarding competitors responses to new developments and whether the assumed speed of response is realistic.

Question 4: what are the projected profit margins by product and channel ?

- Again, a starting point would be current margins. Any significant increase would need to be justified in terms of improvement in customer proposition.

I.2 New products

The following are some examples of more recent product developments but is not exhaustive.

I.2.1 SIPP, Wrap and platforms:

Question 5: how do we ensure the costs and risks of the multitude of funds we offer are properly explained ?

- Insurance groups offering SIPP, Wrap and other platforms have provider responsibilities under PS07/11 to ensure the risks involved in a fund are properly explained to customers and distributors.
- There is also a COBS requirements in terms of charge disclosure which can be challenging when offering a wider range of funds with different annual management charges, rebates and total expense ratios.
- A possible precedent of what can go wrong is Seymour v Ockwell where the IFA countersued Zurich over flawed information given on an offshore fund which turned out to be a Ponzi scheme. Zurich had to bear 2/3rds of the resulting £500,000 compensation bill.

Question 6: how do we ensure client funds are properly segregated ?

- SIPP, Wrap and platform offerings span not just insurance policies but also mutual fund and direct holdings in shares and property. Ensuring income from these and cash balances are properly segregated is a key area of regulatory scrutiny.

I.2.2 Variable annuity and other products backed by dynamic hedges

Question 7: what modelling has been carried out on customer outcomes ?

- Often guarantees can prove worthless in prolonged market downturns e.g. with a floor of 95% of fund value over a six month period, there is a chance of the customer losing 5% of their fund every six months in a protracted downturn. If this is not properly explained, then it could give rise to Conduct Risk issues.

Question 8: what stress and scenario testing has been carried out on hedging strategies ?

- As noted in 3.1.2, it is a question of when, not if, a dynamic hedging strategy will fall short. The insurer needs to understand how much it could lose if for example it cannot respond to a crash similar to October 19th 1987.
- Another scenario to consider is sharp spikes in option prices and the cost of rolling over option protection in distressed markets like those seen in the months after Lehmans default in 2008.

Question 9: do we have the operational capabilities to manage the dynamic hedge and the risks associated with guarantees ?

- There are two operational challenges: the first is whether the Actuarial / Finance function have the capability to re-calculate the "Greeks" associated with guarantees and determine whether the hedge needs to be re-balanced.
- The other challenge is whether the insurer and its asset manager have the operational infrastructure to handle frequent rebalancing of hedges. How does it ensure that re-balancing instructions given to the asset manager are correct ? and that the asset manager can deal with frequent trading ?

I.2.3 Equity release

Question 10: how are Conduct Risk issues being addressed ?

- Equity release may not be the most suitable option for retirees – often trading down to a smaller home may be a better option. Strong controls are need around ensuring equity release sales are suitable.
- Borrowers also need to be made aware of how much an accumulated loan can grow to and the risk that equity can be wiped out.
- There is a linked question as to what extent should potential beneficiaries of the borrowers estate be made aware of the adverse consequences of the loan for their inheritance.
- Finally for loans where interest is paid, the insurer needs to be clear about how it is going to deal with those who can no longer afford payments. Are they to be repossessed ? or should the loan be allowed to accumulate (giving rise to similar NNEG risks as accumulating loans) ?

Question 11: how are NNEG costs assessed ? what assumptions are made ?

- One key assumption is house price volatility. The standard deviation of historic UK house price data is ca.5% p.a. but this data is affected by implicit smoothing in property valuations. Adjusting for this can double the volatility assumption and lead to an even greater increase in NNEG costs.
- Another key assumption is the assumed future house price growth and linked to this the assumption for future rental income. A "market consistent" NNEG cost would assume a future house price growth rate based on the risk free yield less rental income after an allowance for rental costs.
- Even this "market consistent" cost may understate what it may cost to hedge or otherwise pass on NNEG risks given the lack of a liquid market in instruments to hedge house price risk.
- With repayment on death, mortality rates will be significant, but it should be noted that typically repayment is on a "last survivor" basis so there is a need to consider the longevity of both spouses.
- There is also a need to consider rates of entry into long-term care which is also another trigger for repayment.

I.3 Back book initiatives

I.3.1 Hedging

Question 12: does the insurer have the operational capability to undertake complex hedging ?

- Following on from question 9., with-profit guarantees and options can be difficult to value, let alone calculate sensitivities to determine appropriate levels of hedging. If an insurer was to try to hedge 100% of risk, it could very well end up over-hedging given the time taken to assess the sensitivities of the option and guarantee costs hedged.
- Similarly for variable annuities, unless there is major investment in actuarial systems and resourcing, the sensitivities ("greeks") of guarantees and options might only be calculated weekly or less frequently, increasing the likelihood that these will not be fully hedged or that market risk exposure will arise from over-hedging.
- Another issue is the ability of the insurer's asset manager to handle frequent rebalancing of hedges, including managing margin/collateral; valuing the varying positions; and feeding greeks and other data back into the insurers own systems.

Question 13: how are counterparty risks managed ?

- One aspect of this is the quality of collateral offered; the degree to which this is ring-fenced in case of counterparty default; and the ability of the insurer to take possession of this.
- Another aspect is the valuation of counterparty obligations. This may be easy for assets which are widely traded, but it may be less clear what the value of a corporate bond is, and hence the size of a counterparty's obligation under a credit default swap. There needs to be a clear process for resolving valuation disputes.
- This is particularly the case for annuity reinsurance and longevity swaps where there could be large differences in opinion on life expectancies and hence counterparty obligations.

I.4 System developments

Question 14: how much effort is involved ?

- NEDs should be wary of estimates for "off the shelf" systems as while there may be less effort involved than building a bespoke system from scratch, often the effort involved in customising a system for the insurer's needs is underestimated.
- Another system development where effort is frequently underestimated is systems migration, particularly if new systems need to be able to unwind and re-process historic transactions.

Question 15: how will the system be tested ?

- Gaps in testing can result in expensive operational losses years down the line. NEDs should look for evidence of a comprehensive test plan, and monitor that this is adhered to.
- Changes can also have adverse impacts on existing systems, so there needs to be extensive regression testing to ensure existing systems are not compromised.
- NEDs should be wary of "risk based" testing. While ostensibly focussing testing on areas of greatest risk, in my experience it is often a euphemism for not properly testing developments.

Question 16 *[on project completion]*: how much functionality remains outstanding ? has there been any gaps in testing ?

- Too often, the functionality to support long-term product features such a loyalty bonuses is de-scoped from product launch and assumed to be picked up as part of future BAU development. Unless such outstanding functionality is actively managed, it is likely that systems will not support products and either costly manual "work-arounds" will be required and/or that the product fails to deliver what is promised, giving rise to operational losses.

Appendix II – Hedging and other investment initiatives

This appendix looks at back book exposures and initiatives to manage these. They can be broadly split into (a) initiatives to hedge risk; and (b) initiatives to improve the risk adjusted return on assets.

II.1 Hedging

Back book hedging initiatives tend to be undertaken more for legacy with-profit exposures and pension funds. Variable annuity and new with-profit sales are typically hedged from the outset, generally on a dynamic basis.

II.1.1 Unit Linked PVFP

While there is considerable exposure to market risk in respect of unit-linked PVFP, this tends not to be hedged at present for two main reasons:

- Regulatory capital: the PVFP does not count for regulatory capital so there is no regulatory capital benefit for hedging this. Worse there may be strains if losses on hedges in rising markets affect regulatory surplus while the gain on PVFP is excluded.
- Cost: while it may be possible to hedge PVFP using futures and forwards, this would effectively lock-in the growth of fund related charge income to the risk-free rate. Equity and other risk premiums would be foregone, which may have a negative impact on operating profit. Put options might preserve some upside in terms of fund growth and its impact on charges but this would have an upfront cost in terms of the option premium.

II.1.2 With-profit Funds

With-profits fund hedging will limit the volatility of the mark to market value of guarantee and option costs. Aside from protecting against increases in guarantee costs, they may also stabilise the financial position of the with-profit fund, allowing the distribution of surplus assets (see section 4.above).

However hedging with-profits exposures will be complex as hedges need to allow not just for market falls, changes in risk free rates and changes in implied volatility, but also for persistency and other non-market risks which will affect the number of policies in force and the amount of hedging required.

As well as guaranteed policy payouts, many legacy with-profit pension plans have guaranteed annuity options (GAOs) which guarantee the annuity rate at which the pension fund can be converted into a pension. These were issued in the 1970s and 1980s when interest rates and annuity rates were much higher, but in the current low inflation, low interest rate environment, annuity rates are lower than those guaranteed under the GAO.

As the guarantees started biting, most life insurers hedged out the risk of further falls in interest and annuity rates by using swaptions. However annuity rates may also fall if life expectancies increase, and this longevity risk will generally not be hedged. GAO costs are also sensitive to the proportion of the fund converted to pension as opposed to taken as tax free cash. Pre-retirement mortality rates and persistency rates will also affect costs (though given such a valuable guarantee, surrender rates on GAO policies are low).

As well as variations due to demographic variables like mortality, rising markets will lead to higher payouts which will lead to higher GAO costs. This will offset other guarantee costs relating to the payout, which are triggered by falling markets and asset shares.

GAO costs add a further layer of complexity to the complex picture of market risk exposures set out in 3.1.3. Given the complexity of with-profit exposures to be hedged and the degree of discretion available to the life insurer in managing these (e.g. varying bonus rates or asset mix), hedging tends to be more approximate than with variable annuities. Rather than seeking to dynamically hedge exposures, hedges tend to be more static. For instance, rather than hedging delta exposures with varying futures positions, equity exposure may be hedged using a portfolio of bespoke, OTC put options with a similar term to guarantees. This might only be infrequently rebalanced to address with changing market conditions and demographic experience. In between re-balancing, the with-profit fund could end up significantly under- or over-hedged.

Crucially, the hedge will only cover general market movements. There will also be basis risk relating to differences in the performance of with-profit fund assets and the indices used by hedge derivatives.

This can be significant – assuming a standard deviation of performance relative to benchmark (or "tracking error") of 3%, the portfolio could underperform benchmarks by ca.7.5% at a 99.5% confidence level[79]. For an unhedged portfolio, basis risk tends to get diversified away as there is usually a low or negative correlation between tracking error and general market movements, but on a hedged basis this diversification is lost and basis risk emerges as a significant risk.

While interest rate risk can be hedged using swaps, exchanging floating cashflows for fixed, another risk will arise from the need to generate LIBOR (or a similar cash benchmark) to meet the floating rate obligation arising. There will be an obvious mismatch where equity and other assets are being used to generate LIBOR, but even cash assets may fail to deliver LIBOR. This is after all a lending rate not a deposit rate. A 6-month LIBOR obligation will include a liquidity premium given the money is to be lent for 6 month, so cash assets invested overnight are unlikely to meet LIBOR.

An important question for any with-profit hedging program to consider is the degree of property exposure. Typically with-profits funds have significant holdings of property, often including the offices of the life insurer. However as a fund shrinks, property holdings will increase as a proportion of the fund unless a program of sales is undertaken. As more property is sold, the portfolio will become less and less diversified. A time will come where the with-profit fund will need to consider divesting itself of its holdings – including the life insurer's own premises – and either (a) reinvest in collective schemes such as Property Unit Trusts which offer exposure to a diversified property portfolio; or (b) move out property altogether.

Last but not least, a crucial issue for hedging with-profits is its impact on policyholders and TCF. While policyholders may bear some guarantee costs, there is generally a conflict of interest between policyholders looking for return based in part on equities and other risky assets, and shareholders who may bear a disproportionate amount of the guarantee costs. Moving out of equities into bonds – either physically or synthetically by selling equity futures – reduces risk but it will also reduce prospective returns for policyholders. Similarly, if put option premiums are to be paid for by the with-profit fund, there will be a drag on the performance of the fund, while the benefit may chiefly accrue to shareholders in the form of reduced guarantee cost exposure.

[79] This is based on a normal distribution of tracking error, where the 99.5th percentile is roughly 2.5 times the standard deviation. Fatter tailed distributions would give higher potential shortfalls at a 99.5% level, while on top of underperformance relative to benchmark, there may also be differences between the benchmark (e.g. FTSE All Share) and the index on which hedges are based (e.g. FTSE100).

These conflicts need to be squared with the parameters of TCF as enshrined in the with-profit fund's Principles and Practices of Financial Management (PPFM). Issues may not be resolved in favour of the shareholder, and the benefits of the hedging program may be curtailed as a result.

Note that hedge calculations may assume management actions such as equity sales in falling markets. TCF and PPFM considerations may prevent these being realised in practice, as could practical issues such as the speed at which markets change and the time taken to react. This would be another reason why a hedge will fail to meet its objectives, and may require a further adjustment to the hedge program.

II.1.3 Pension Schemes

Hedging pension scheme exposures should be easier than with-profits funds as there are less embedded options. Equity exposure can be hedged using futures while interest rate exposure may be hedged either by matching with bond or using swaps.

A common strategy is a "swap overlay", whereby interest rate swaps are used to hedge future cashflows with receipts from the swap matching projected cashflows. A problem is that projected cashflows will be based on expectations for future pensioner mortality and other demographic assumptions which may not be realised, leading to under- or over-hedging. Also the LIBOR obligations on these swaps will have to be met from scheme assets. There will be an obvious mismatch between these obligations and equity and other risky assets held, but as noted above, even cash assets may fail to generate LIBOR.

On the other hand, it is not unreasonable to expect equities and other risky assets to outperform LIBOR over time, generating a surplus relative to cashflows hedged and reducing scheme costs. There is a cost to hedging equities and other risky assets – either up front in terms of an option premium or the reduction in prospective return from hedging using futures. The lower the return, the greater the ultimate cost of the scheme to the employer. A balance needs to be struck between the volatility of equities and other risky assets, and the benefit they bring in terms of prospective returns.

A key issue with pension scheme hedging is that scheme assets are ultimately controlled by the trustees of the scheme, not the life insurance company sponsoring the scheme. A hedge proposal could come to nought if, for instance, trustees were uncomfortable with the use of derivatives.

II.1.4 Conventional Annuities

Conventional annuities will tend to be well matched, but where exposures are only "immunised" (see 3.1.5) there will be a need to continuously rebalance the portfolio to ensure the duration of assets is in line with that of liabilities. Even where liabilities are more closely matched, changes in life expectancy assumptions will invalidate the match and necessitate a rebalancing of the bond portfolio.

II.1.5 Equity Release

As noted in 3.1.6, there is no liquid market for long-term options linked to house prices at present. A market may be developing for shorter-term contracts which could hedge falls over say a year, but these would need to be rolled over to provide protection against further falls – housing market downturns can be protracted. Derivatives will also be based on house price indices like the Nationwide and Halifax indices, and will not address idiosyncratic factors such as dilapidations and local market downturns.

Alternatively a life insurer may divest itself of equity release risks by securitising its portfolio of lifetime mortgage loans and other equity release assets. Depending on their risk appetite, investors may be prepared to accept NNEG and other risks on terms which are acceptable to the life insurer.

II.2 Improving risk adjusted returns

As well as hedging initiatives, some initiatives may be undertaken to improve risk adjusted returns. Some, such as liquidity swaps and basis trades, seek to exploit transient anomalies. Others look to improve risk adjusted returns by investing in alternative investments such as private equity and hedge funds which purport to offer diversification against listed equities while also delivering a premium over risk free rates.

II.2.1 Liquidity Swaps

One initiative that might be considered is a liquidity swap where the life insurer swaps liquid assets such as gilts for illiquid bonds with a bank. The bank would pay a liquidity premium to the insurer reflecting the reduced liquidity of the bonds. This reduced liquidity may not be a problem for the insurer e.g. if the gilts were held as part of an annuity portfolio where there is little need for liquidity.

The bank would generally retain the credit risks on the illiquid bonds including any spread risk, though this gives rise to counterparty risk – if the bank defaults, the insurer may be left with illiquid assets instead of gilts. Life insurers should be particularly wary where assets swapped are originated by the bank as default of these assets will be correlated with the bank itself going bust.

Careful scrutiny of the assets swapped is essential, and the insurer should have the right to insist that assets swapped which become impaired are replaced by assets of higher quality.

Ultimately the return on the swap will be broadly risk free rates plus a liquidity premium less counterparty default costs which should hopefully be modest. As such, liquidity swaps could serve as a means to take advantage of the liquidity premium benefit to annuity and other portfolios with illiquid liabilities.

II.2.2 Basis Trades

Another initiative would be basis trades. These may seek to exploit anomalies between swap and government bond markets; or between corporate bonds and credit default swaps (CDSs) written on these bonds.

Typically swap rates will be higher than gilt yields. There will be counterparty risks associated with swaps that are not present on gilts. However swaps can be more flexible in terms of hedging liabilities, and there is a natural demand for swaps from pension schemes looking to hedge risks. Meanwhile, on the supply side, investment banks' ability to write these depend on the capital they need to hold. Variations in supply and demand can cause swap rates to fall below gilt yields.

A life insurer could exploit this by entering into a swap exchanging fixed for floating and buying gilts. It will receive LIBOR plus the excess return on gilts over the fixed amount it has to pay under the swap. Note that this is not quite a "free lunch": while over time the trade will be profitable, there will be mark to market volatility in the value of the position due to variations in the spread between swaps and gilts, with losses arising if swap rates fall further relative to gilts.

A CDS basis trade involves a corporate bond where the spread is greater than the cost of buying protection against that bond defaulting using a CDS. The life insurer could buy the bond, hedge out the default risk using a CDS and still be left with a margin over risk free rates. Once again this is not quite a "free lunch" as the spread could increase relative to the CDS premium, leading to a fall in the value of the corporate bond which won't be covered by a gain on the CDS position. Such increases in spreads hit many banks hard during the financial crisis, leading to significant losses on bond plus CDS combinations that they had thought to be risk-free.

It should be noted that part of the reason for the higher spread on corporate bonds relative to CDSs is due to liquidity risk: corporate bonds may be difficult to sell, whereas CDS gives exposure to the bond without any outlay of cash. To this extent, the difference represents a liquidity premium which may benefit annuity and other portfolios which have no real need for liquidity.

In general, while life insurers may profit from anomalies, NEDs should be aware that they are not always free from risk, and should treat with caution claims they are. However in many cases the reward on offer is due to the life insurer accepting liquidity risk, and to the extent it has illiquid liabilities this should not be a problem.

II.2.3 Private Equity

Private equity is typically classed as a distinct asset class from listed equity, thus offering diversification benefits. I believe the distinction can be over-stated however. If the investment is to be realised by floating on the stockmarket, the exit value will be dependent on stockmarket levels. The relative stability of private equity valuations may be more a function of infrequent valuations than anything else. If stockmarkets fall, private equity valuations are likely to fall in due course.

There are other risks associated with private equity, namely:

- Leverage – private equity investments tend to be extensively financed through borrowing and will be more volatile as a result.
- Valuation error – private equity valuations are subjective. Revisions to valuation methodology could lead to sharp changes in the value of private equity investments. Oversight of the valuation process is important.

- Illiquidity – if may be difficult if not impossible to dispose of private equity holdings until the underlying companies float or are sold. This may not be a problem for a with-profit fund if there are other liquid assets to meet outgo, but not being able to scale back holdings may be a problem for a shrinking fund as it would lead to an ever greater proportion of the fund invested in private equity.
- Idiosyncratic risk – depending on the amount allocated to private equity and the size of individual investment, a life insurer's private equity portfolio could be unduly concentrated in individual companies and/or sectors.

That said, while private equity does seem to be more volatile than listed equities on a stand-alone basis, there does appear to be some diversification against listed equities and other assets which should offset this[80].

There should also be a liquidity premium from investing in such illiquid assets which may be of benefit to a life insurer which has a strong liquid position and for whom tying money up in private equity investments would not cause significant problems.

II.2.4 Hedge Funds

Investment in hedge funds may also offer diversification for insurers, potentially involving exposure to a wide range of esoteric asset classes and markets. While returns can be enticing, the risks being run could wipe out any money invested in the fund: Long-Term Capital Management (LTCM) and Bear Sterns' leveraged credit funds are just some examples of hedge funds that made handsome returns for many years before failing spectacularly. It is important to understand what the hedge fund invests in, what risks it is exposed to and how this could change over the future. Tail risks are particularly important – often the strategies adopted produce stable profits in normal market conditions but fall apart in stress conditions if the hedge fund cannot trade assets, hedge exposures and/or roll over funding, leading to large and sometimes catastrophic losses. NEDs need to be acutely aware of such asymmetries in returns.

[80] Solvency II standard formula proposals specify a higher stand-alone stress for private equity as opposed to listed equity – 49% as opposed to 39% – but allows for diversification between the two, with a 75% correlation assumption. After allowing for diversification, there is not a significant difference to just applying 39% to the combined portfolio so long as private equity exposure is 30% or less of listed equity.

Hedge funds share some of the risks of private equity. Many funds are highly leveraged. A lot of funds invest in illiquid assets, and either impose restrictions on redemptions, or reserve the right to do so. Being invested in unlisted assets, there is a risk of errors in the valuation of such assets. There are other operational risks associated with hedge funds ranging from dealing errors; rogue trading risks arising from extensive use of derivatives; lack of regulation; and sometimes outright theft and fraud, as in the case of Bernie Madoff's (fund of) hedge funds.

Hedge funds are ultimately about the quality of the fund manager. A life insurer investing in a hedge fund is not investing in a particular asset like a company, a property or a bond, but in the skill of the manager. There may be a case for spreading hedge fund investments across managers to guard against the risk of one manager under-performing.

However a drawback of investing in hedge funds is the extent of fees charged, and investing in funds of hedge funds will add a further layer of fees. The choice of whether to invest in a hedge fund or funds boils down to whether the prospective return after fees is ample compensation for the risks being run by the fund, particularly at the tail.

II.2.5 Infrastructure

Investment in infrastructure offers diversification against other asset classes and markets, often at attractive rates of return. Like private equity and hedge funds, infrastructure investments can be illiquid and so may be inappropriate for funds which are shrinking. They may also prove difficult to value, giving rise to the risk of valuation error.

There are three main considerations regarding the risk of infrastructure investment. The first is the stage of development of an infrastructure asset: does it need to be developed or has it already been built ? Obviously there will be greater risk attaching to an infrastructure development project rather than an existing asset – while rare, there have been instances of development projects where the entire investment has had to be written off, while too many projects suffer from cost overruns which lower the return on the investment.

The second consideration is the nature of the income arising from the infrastructure asset. A hospital may be run for a fixed fee rising with inflation, which will be more certain than the income arising from a toll road for instance. The revenue from energy infrastructure projects could be particularly volatile: in recent years, there has been considerable fluctuation in wholesale energy prices partly due to precedence given to green energy sources on the grid. In Germany, wholesale prices have sometimes become negative due to limited demand and a surge of solar and wind energy coming onto the grid.

This links in with the third aspect of infrastructure investment: political risk. Often private sector infrastructure investments are undertaken where the public sector is unwilling or unable to directly finance infrastructure investment. As an alternative, it may offer incentives to encourage private infrastructure investment, boosting returns. Often there may be implicit guarantees e.g. of the income available from developing and running a hospital for the NHS. However incentives can be reduced or withdrawn – witness the recent reduction in the price guaranteed for onshore wind energy by the UK government. Running public infrastructure like roads and hospitals could also expose infrastructure investors to reputation damage from failure to manage these properly; financial loss from fines, remediation costs and higher ongoing running costs; and in extremis the loss of a franchise due to mismanagement.

II.2.6 Syndicated loans and commercial mortgages

As noted in 3.2.2, many annuity writers are now using loans and commercial mortgages to back annuity portfolios as an alternative to bonds. While less liquid than bonds, this is not a significant issue for annuity portfolios where liabilities are illiquid, and there is often scope for higher risk-adjusted returns and/or diversification against the insurer's bond portfolio.

However, most life insurers do not have the loan underwriting skills of banks, and this lack of expertise should be addressed as part of any proposal to invest in loans. Loans are less liquid than bonds – the insurer should assume that it will be stuck with the exposure for the term of the loan[81], highlighting the importance of getting initial credit decisions right. The insurer also needs the ability to properly provision for bad debts under loans and manage any breaches of loan covenant.

A life insurer may leverage off the credit pricing, provisioning and management skills of a bank leading a syndicated loan, but its needs to be confident that the bank itself can properly price the credit risk on the loan. It should also be wary of conflicts of interest e.g. if the bank has hedged its exposure under the loan, reducing its incentive to properly manage the loan.

[81] It may be possible to securitise a book of loans depending on the size of the portfolio and the quality of the loans, though this will be difficult if the credit quality is poor, highlighting once again the importance of properly assessing risk at outset.

Commercial mortgages have collateral in the form of commercial property, but this can be volatile. The life insurer could be exposed to loss if the value of the property falls below the value of the loan. For example, while the loan to value (LTV) will generally be no more than 75% of the value of the property, during the financial crisis, UK commercial property fell by more than 40% from peak (mid-2007) to trough (mid-2009). A 75% loan advanced at the peak would have had a LTV ratio of 120% at the trough. Collateral can be no substitute for careful vetting of the borrower.

Diversification of the properties underpinning the mortgages will also be important, otherwise problems in a particular sector or even with an individual borrower could lead to significant losses.

Finally, as unquoted investments, loans will not be subject to the same degree of mark-to-market volatility of bonds resulting in a more stable balance sheet position. However provision will need to be made for defaults and there will be a degree of subjectivity in such provisions, along with the potential for valuation error.

Glossary

The following covers terminology non-executive directors may encounter in the context of UK life insurance business.

Activities of daily living (ADL) – standards by which the need for long-term care is defined such as the ability to cook, clean and dress oneself.

Annuity – in the UK context (it has a very different meaning in the US), a contract where payment of a single premium secures an income, generally for life. The income is generally fixed but can escalate at a fixed-rate; be index-linked; grow with bonuses from a with-profit fund (*with-profits annuity*); or be linked to the value of units in a unit-linked fund (*unit linked annuity*).
Annuity rates will be linked to interest rates and life expectancy, with falling rates and higher life expectancies leading to falling annuity rates.
UK annuities generally cannot be surrendered making these among the most illiquid of financial institution liabilities.

Asset share – the share of a **with-profit fund** that can be attributed to an individual **with-profit** policy. It is a notional figure in the sense that policyholders don't have a prescribed share of assets like a mutual fund, but is generally the basis for estimating fair with-profit payouts. It is typically estimated by considering the roll-up of premiums at rates of investment return earned by the with-profit fund less expenses and claims incurred.

Bulk buy-out – in the context of defined benefit pension schemes, the process of transferring obligations to a life insurer through the purchase of **annuities** for existing pensioner and **deferred annuities** for those still to retire. An alternative is the *bulk buy in* where the pension scheme will retain the obligation to pay pensions but will purchase annuities to help meet these.

Chargeable gains – in the context of the personal taxation of UK life insurance contracts, while payouts on *qualifying* policies are tax-free in many circumstances, otherwise additional tax may be payable on a *chargeable gain* calculated based on the excess of the payout over premiums paid.

Conventional with-profits – a traditional **with-profit** policy where premiums secure a basic sum assured plus regular (*reversionary*) bonus additions and a final **terminal bonus** payment on death, or in the most common **endowment** version, on survival to a certain date. Other variations are **whole of life** and **pure endowment**. Few insurers still write conventional with-profits policies as payouts are linked to premiums being paid for the term of the policy which few customers will commit to. There may still be significant in-force books of however.

Critical illness – a policy which pays out on diagnosis of certain critical illnesses such as heart attacks, cancers or strokes. Often there can be issues with the definition of what constitutes critical illness where, for example, minor heart ailments arise. Critical illness can often be offered with life insurance as an *accelerated benefit* with the sum assured payable on death or earlier diagnosis of a critical illness.

Deferred annuity – an **annuity** that comes into payment on survival to certain date. At one stage conventional pension contracts were written on this basis but following the introduction of the **open market options**, most were written instead as **pure endowments** with the fund transferred to other insurers if their annuity rate was better. Now it is mostly written on a **non-profit** basis in the context of pension scheme **bulk buy-outs**, securing the benefits of pension scheme members who have yet to retire.

Embedded value – net assets on an accounting basis plus the *present value of future profits (PVFP)* projected to arise on in-force business (see section 1.4).

Endowment – an old-style contract, generally **conventional with-profits**, where a sum assured plus bonuses were payable on death or survival to a fixed date in exchange for regular premiums. Endowments were commonly used as a mortgage repayment vehicle in the 1980s and early1990s with millions of policies sold. They were often sold on the basis of a projected surplus over the loan at maturity, but falling long-term interest rates in the 1990s lead to projected shortfalls instead, giving rise to a collapse of sales and substantial misselling losses. Typically written for a term of 25 years, many offices still have substantial back-books of mortgage and other endowments, though these are in the process of maturing, giving rise to large outflows.

Equity release – there are two types of products to release equity built up in customer's homes. The first involves a **lifetime mortgage**. The second is *home reversion* where a financial institution buys a property but agrees to lease it back to the customer at a nominal rent for the rest of their days. Lifetime mortgages are the most common way for UK insurers to participate in equity release involving as it does a loan as opposed to a reversionary interest in property.

Guaranteed Annuity Option (GAO) – an option offered on many traditional pure endowment[82] pension contracts to convert the accumulated fund into a pension at guaranteed rate e.g. £1 p.a. for every £9 of fund for a male aged 65. With falling interest rates and rising life expectancy, the current cost could be £20+ for every £1 p.a., making these a very valuable benefit to the policyholder. They are sometimes referred to as *Guaranteed Annuity Rates (GARs)*.

Individual Capital Assessment (ICA) – a Pillar II / economic capital assessment (see 1.3) which the PRA, under its current *Individual Capital Adequacy Standards (ICAS),* requires UK insurers to perform in addition to holding regulatory minimum capital under the current Solvency I regime. If this risk-based assessment, or the PRA's review of this, indicates the insurer needs to hold capital over and above the regulatory minimum, the PRA may specify an additional capital requirement under *Individual Capital Guidance (ICG)*.

Income drawdown – a pension contract from which an income can be drawn from in retirement as an alternative to buying an annuity with an accumulated pension fund.

Income Protection (aka *Permanent Health Insurance (PHI)*) – a protection product which pays a regular benefit if disabled, typically after the first 6-12 months of disability. Variants include *mortgage protection* contracts with a benefit linked to mortgage outlays; and *contribution protection* which is typically added to pension policies and which maintains contributions to the pension plan on disablement.

[82] For deferred annuity contracts, the pension itself is guaranteed but there was generally an option to convert this into cash at guaranteed terms. There is not much difference in underlying risk profile in terms of exposure to falling interest rates and rising life expectancy.

Lifetime mortgage – a loan extended against a percentage of the home's value to be repaid on death or earlier entry into long-term care. This is the most common **equity release** product in the UK. It will either be advanced on interest only basis or with interest accumulating. Following scandals in the 1980s where increases in interest rates and falling house prices lead to many pensioners' homes being repossessed, most lifetime mortgages will be advanced on the basis of a fixed interest rate and with a **no-negative equity guarantee**.

Longevity risk relates to the risk of people living longer than expected and may be considered to be the opposite of **mortality risk** relating to greater than expected numbers of deaths on assurance contracts, though both relate to mortality rates.

Long-term care (LTC) products aim to pay out when a customer is in need of long-term care defined in connection with **activities of daily living (ADLs)**.

Long-term fund – by law, life insurance business must be written in a long-term fund ring-fenced from general insurance and other business, with rules governing the distribution of surplus from the fund in the form of bonuses and dividends to shareholders.

Market value reduction (MVR) – for **unitised with-profits**, a reduction applied to the face value of the **UWP** fund where this exceeds **asset share**. It would not generally be applied on maturity or death but would be applied on surrender / transfer out to protect the **with-profit fund** (and hence other with-profit policyholders) against systematic losses where assets shares are below the face value of UWP policies.

Morbidity risk – the risk relating to higher than expected sickness rates under critical illness and income protection policies, and in respect of the latter, lower than expected recovery rates.

No-negative equity guarantee (NNEG) – for **lifetime mortgages**, a guarantee that any excess of the accumulated loan over the value of the home will be written off when the loan comes to be repaid on death or on entry into a long-term care home.

Non-profit is a term generally applied to conventional (as opposed to unit-linked) business which does not participate in the profits of the insurer. It does not mean that the insurer does not aim to make a profit on this business – it is often a key source of surplus to be distributed as bonuses to with-profit policyholders and dividends to shareholders. On the other hand non-profit policies are cheaper than **with-profit** policies due to the lack of participatory rights. Non-profit business includes protection and conventional annuity business.

Non-profit fund – a subset of the **long-term fund** where non-profit business is written, distinct from the **with-profit fund** in terms of the rights of with-profit policyholders to participate in the surplus of the fund. Often all the profits of the non-profit fund go to shareholders as opposed to with-profit policyholders.

Open Market Option (OMO) – the right of pension policyholders to use their pension fund to purchase an annuity with another insurer.

Pure endowment – a variation of the **endowment** where the sum assured plus bonuses are only payable on survival to retirement. On earlier death, contributions are generally refunded, perhaps with interest, but generally there is a cross subsidy from those dying to those surviving. Like other conventional with-profits policies, these have been supplanted by **UWP** and **unit-linked** policies.

Principles and practices of financial management (PPFM) for a **with-profit fund** set out how the fund is to be run included how assets are to be invested and bonuses calculated.

Paid-Up Policy (PUP) – a policy (generally a pensions policy) where the policyholder has ceased paying premiums (as opposed to taking a **surrender/transfer value**).

SIPP (Self Invested Personal Pension) – a UK personal pension product encompassing not just insurance policies but also mutual funds, direct holdings of shares, bank deposits etc. in a diversified portfolio with the tax advantages of personal pension plans.

Smoothing is the process whereby **with-profit** payouts are smoothed with payouts reduced in benign market conditions but boosted when markets are depressed. In the long-term, smoothing should be a "zero sum" exercise not resulting in systematic gains or losses for the insurer but in less volatile policyholder payouts.

Spread business generally involves offering life insurance contracts with a fixed rate of return to policyholders and investing in corporate bonds and other risky assets to earn a higher rate of return than that offered to policyholders, and profiting from the spread between the two rates after expenses and other costs[83].

[83] By contrast, while UK unit linked business does earn a "spread" in the form of an annual management charge on unit linked funds, it is more akin to mutual fund business with generally no guarantees and both the policyholder's fund and annual management charges fluctuating with market movements.

Surrender value – the amount payable on a life insurance policy being encashed before the end of the contract term. Pension policies generally can't be surrendered but a *transfer value* can be taken to another pension plan or alternatively the policyholder may take early retirement ("vesting").

Term assurance is perhaps the simplest and cheapest life insurance product, paying out a benefit on death only within a certain term. Nothing is payable on lapse or on survival to the end of term.

Terminal bonus – a final bonus payment on **with profit** policies, generally designed to bring guaranteed payouts up to the level of the smoothed asset share where there is an excess of the latter.

Treating customers fairly (TCF) – key regulatory principles governing how insurance and other financial products are to be designed, sold and administered.

Unit-linked business relates to insurance policies where benefits are linked to the value of assets in a unit fund. Note that while similar to mutual funds (unit trust, OEICs etc.), the underlying assets are held by the life insurer and not in a ring-fenced fund.

Unitised with-profits (UWP) – a variation of **with-profits**, similar to a **unit-linked** policy where the unit price is either guaranteed not to fall or grow at a certain rate and is supplemented by regular bonus additions to the unit price. This may be supplemented by a **terminal bonus** but if surrendered/transferred before certain dates there may be a **market value reduction**. UWP is more flexible for pension contracts with variable premiums than conventional with-profits which are based on a fixed premium to be paid for the full term of the policy.

Variable annuity – not an annuity[84] as such but a **unit-linked** policy with guarantees on the amount paid on regular withdrawal, death and/or survival to a certain date.

Whole-of-life – conventional contract paying a sum assured (plus bonuses for with-profits) on death only. Premiums are often payable for life but may be restricted to 85 or some other age.

[84] The term comes from the US where annuities have a different meaning from the UK.

With-profits relates to policies where policyholders share in the profits of the insurer. These are generally split into **conventional with-profits** or **unitised with-profits**. Note UK with-profits contracts have evolved differently from those in continental Europe and the US (where they are known as participating business), with historically higher equity investment and terminal bonus.

With-profit bond – a single premium **with-profit** policy. The one off nature of premium payments, and different market levels on investment and divestment, can cause difficulties in terms of managing guarantees and ensuring fairness between different groups of policyholders.

With-profit fund – a ring-fenced fund maintained on behalf of **with-profit** policyholders who will share in the profits of the fund.

Wrap – a product which allows investors to manage their entire portfolio holistically covering different asset types – **unit linked** funds, mutual funds, direct holdings in shares, cash deposits etc. – and different tax "wrappers" such as assets held in ISAs, personal pensions etc.. At its simplest it may be simply a means of collating information across products held with different providers but could expand to cover the management of the investor's entire portfolio in a single product, potentially encompassing borrowings and protection cover as well.

List of abbreviations

The following is a list of abbreviations / acronyms used in this paper or in UK life insurance more generally:

ABS	Asset Backed Security (see 3.2.1)
ADL	Activities of Daily Living (see 3.3.3)
AMC	Annual Management Charge
BBO	Bulk Buy Out
CCP	Central Counterparty (see 3.2.5)
CDO	Collateralised Debt Obligation (see 3.2.1.1)
CDS	Credit Default Swap (see 3.2.1.3)
CoC	Cost of Capital
CSA	Credit Support Annexe (see 3.2.5)
DSF	Direct Sales Force
EC	Economic Capital
EV	Embedded Value
FSCS	Financial Services Compensation Scheme (see 3.5.7)
GEB	Guaranteed Equity Bond (see 3.1.4)
HNW	High Net Worth
ICA	Individual Capital Assessment
ICAS	Individual Capital Adequacy Standard
ICG	Individual Capital Guidance
I-E	UK tax regime for life insurance – income less expenses
IRR	Internal Rate of Return (see 1.6)
LTC	Long Term Care (see 3.3.3)
MCEV	Market Consistent Embedded Value (see 1.4)
MVR	Market Value Reduction
NEST	National Employment Savings Trust (see 2.1.7 & 2.1.9)
NNEG	No negative equity guarantee
NPF	Non-Profit Fund
NPV	Net Present Value (see 1.6)
OEIC	Open Ended Investment Company (i.e. a mutual fund)
OMO	Open Market Option
OTC	Over-the-counter (derivative – see 3.2.5)
PHI	Permanent Health Insurance (aka Income Protection)
PPFM	Principles and Practices of Financial Management
PVFP	Present Value Future Profits
PUP	Paid-Up Policy
RBC	Risk Based Capital
RDR	Retail Distribution Review
SERPS	State Earnings Relate Pension
SIPP	Self Invested Personal Pension
TCF	Treating Customers Fairly
UWP	Unitised With-profits
WPF	With-Profit Fund