

Financial Risk Mitigation in Insurance - *Time for Change*

The Chief Risk Officer Forum Risk Mitigation Working Group



Preface

The Chief Risk Officer Forum is delighted to be presenting the study “Financial Risk Mitigation in Insurance – Time for Change”. The Chief Risk Officer Forum comprises risk officers of the major European insurance companies and financial conglomerates, and was formed to address the key relevant risk issues for its industry. It is a technical group focused on developing and promoting industry best practices in risk management. The membership comprises:

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The report demonstrates that the use of derivatives offers insurance companies a more robust and efficient way to hedge market risk exposures, but there are definitive regulatory/accounting obstacles to the full deployment of these strategies, pervasively discouraging state of the art risk management practices. With this report the Chief Risk Officer Forum is proposing a set of principles and policies for insurers and their regulators which would encourage financial risk mitigation activities in the sector. The working group which wrote the report comprised representatives of Munich Re (chair), Winterthur and Zurich Financial Services. Special thanks are expressed to the following delegates of the CROs who assisted in compiling the report: Jan Willing (Munich Re), Robert Lempertseider (Munich Re), Daniel Brönnimann (Winterthur), Doug Niemann (Zurich Financial Services), Markus Spillmann (Zurich Financial Services) and Saeid Samiei (Zurich Financial Services).

We hope that this study will provide guidance for best practices in risk management, helping to improve risk management culture and facilitate the greater deployment of sound financial risk mitigation strategies in the insurance sector.

Chief Risk Officer Forum

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Executive summary

In many regulatory regimes risk mitigation activities of insurers are not adequately incentivised, or not even allowed; sometimes even perverse incentives are given to insurers. Along the example of life insurance we will describe how research in Asset/Liability Management (A/LM) evolved in the last years and what hurdles (regulatory and other) insurers encounter in the implementation of risk mitigation strategies. A particular focus is set on the measurement of interest rate risk and how insurers came to the conclusion that the mere linear approximation (duration) of A/L value changes for interest rate changes (i.e. ignoring convexity) was flawed and often led to inappropriate policies for managing those risks. More generally, more and more insurers realise the true financial nature of their core business. Given this development it is but a small step to the consideration of the necessary tools for interest rate risk management, e.g. swaps and swaptions.

Starting from these observations a series of principles is developed in this paper designed to allow the insurance industry to properly develop financial risk mitigation strategies as follows:

Principle 1: Provide the right incentives

Solvency II should provide incentives for sound risk mitigation strategies.

Principle 2: Sound risk management framework is a precondition

A precondition for the use of financial instruments for risk mitigation is a sound risk management framework for the company.

Principle 3: Focus on the process, not the instrument

The admissibility of financial instruments for risk mitigation should be based upon the soundness of the risk hedging process. Restrictions on the use of financial instruments for risk mitigation cannot follow a “one size fits all” approach (e.g. a list of admissible and inadmissible financial instruments).

Principle 4: Equal yardsticks for qualifying financial instruments

Qualifying financial instruments used for risk mitigation purposes should receive full and unrestricted capital credit under Pillar I of Solvency II. The credit given for financial instruments used for risk mitigation under Pillar I, should be based on the documented and evaluated economic effect on both the valuation of assets and liabilities and the determination of the MCR and SCR.

Principle 5: Supersede legacy rules

Determination of capital requirements for solvency purposes under Pillar I of Solvency II or under Solvency I should be based entirely on economic principles if the insurance company can demonstrate that it has a sound risk management framework (Principle 2) and that it is using financial instruments for risk mitigation satisfying the requirements of Principles 3 and 4.

Principle 6: Consistent treatment in statutory accounting

Under the statutory accounting regime, the asset valuation rules in respect of financial instruments used for risk mitigation purposes must be consistent with the valuation rules in respect of the liabilities they are designed to hedge.

In section 6 policies are developed, which are designed to give effect to these principles and result in sound risk mitigation practices in the insurance industry.

1. Introduction

1.1. Purpose of this paper

Regulatory and accounting rules in many European countries posed and often still pose a real hindrance to sound risk management practices in insurance companies. This hindrance usually comes in the following two forms:

- Inconsistent valuation of assets and liabilities and
- Restricted admissibility of risk mitigating instruments.

The scope of this paper is to encourage regulators to overcome these obstacles by introducing consistent valuation techniques for assets and liabilities and by fostering the admissibility and usage of any *financial instrument* for risk mitigation purposes in insurance companies. In its full generality, this could apply to all financial instruments (inflation linked securities, commodities, derivatives etc.) and to all sorts of insurance companies (life and non-life, primary and reinsurance). Nonetheless, our paper is inspired by the management of interest rate risk in life insurance and the usage of swaps and swaptions in this area. The usage of swap derivatives in life insurance, will serve as a case study, which accompanies the paper to motivate our principles and policies and to make the paper less theoretical. Hence, we often refer to *derivatives* or even *swaps* and *swaptions* instead of the more general term *financial instruments*. Since interest rate risk is one of the biggest sources of risk in insurance, we also think that this example per se has most relevance to risk officers.

1.2. Example to support motivation: interest rate risk in life insurance

The typical financial risk, which one encounters in a life insurance company is a duration gap between assets and liabilities, i.e. assets will typically have a significantly shorter duration than liabilities. This duration gap exposes the insurer (and hence its share holders, other investors and policy holders) to falling interest rates, but the net A/L position gains in value if interest rates rise.

Although unintended, this A/L mismatch was (and often still is) favoured by many regulatory and accounting regimes in Europe as liabilities are valued at a statutory interest rate, which does not flex with market interest rates. Fixed income assets on the other hand have to be valued at the lower of market value and acquisition cost. This method of asset valuation does give preference to shorter duration assets, which exhibit less price volatility if interest rates change. In addition, many regulatory environments prohibited or discouraged the use of certain financial instruments (e.g. derivatives) that are often vital for affecting a proper hedge. Hence the regulatory and accounting rules in many European countries hindered the introduction of sound interest rate risk management in life insurance.

Other reasons for this A/L mismatch reside in the historically scarce availability of longer duration assets in some jurisdictions and in the presumed policy holder expectation to participate in rising bonus rates if interest rates rise.

2. Case for change

In 2001 and 2002 the financial markets underwent a serious revaluation, characterised by falling equity markets and interest rates and rising volatilities and credit spreads. These market disruptions led to significant losses in the European life insurance industry. In addition to that, as was mentioned in the previous section, most regulatory and accounting frameworks aggravated the problem by incentivising A/L mismatches.

The need to improve A/LM capabilities became obvious after this turmoil. As a consequence, considerable improvements have been made in the area of A/LM throughout the European life insurance industry in the past 3 years, with a central focus on managing guaranteed benefits.

Driven by ever declining interest rates, many insurers had a closer look at the liabilities and learnt about the long duration of the guaranteed benefits. Also at around this time, the capital markets were undergoing rapid evolution offering liquid and targeted instruments for hedging certain risks (e.g. development of the derivative markets). Matching of guaranteed policyholder benefits with corresponding assets evolved as a credo in many insurance companies. As a result, considerable lengthening of fixed income portfolio durations took place in times of low interest rates.

(For the reader not familiar with the subject matter, Appendix A provides a primer on financial risk concepts including duration and convexity and describes the structure of important risk mitigation instruments such as swaps and swaptions).

2.1. Life insurance policy: Guarantee plus option for more...

While these efforts have clearly brought considerable insight to management, it has also left management with open questions. The reason for this is that significant options embedded in life insurance policies, such as policyholder expectations above guaranteed benefits, the surrender option, and a series of other options, were not always given their due attention. The central question is around the impact of these options on the “right” duration strategy.

Let us consider a typical with-profits life insurance policy to understand the impact of the embedded options. The policyholder is guaranteed a minimum rate of return on its paid premiums, and in addition is entitled to at least 90% of the surplus investment returns, i.e. returns exceeding the guaranteed rate. Since this guaranteed rate of return is always out of the money at inception of the policy, the policyholder is expecting surplus returns. Indeed, the surplus distribution is an essential selling point for this product and therefore much of the competition between life insurers centres around surplus (expectations and realisations).

The guaranteed interest rate and entitlement to surplus makes the insurance policy an asymmetric product: the policyholder is participating in (and expecting) the upside when markets (or interest rates!) rise and is protected when markets fall. This asymmetry can be expressed in the language of financial options. The policyholder is entitled to the investment returns of the insurer’s portfolio, and additionally holds a floor (set at the guaranteed interest rate) on these investment returns.

Hence, the insurer sold an option on its investments to the policyholder, but is free to choose an investment strategy. Clearly, the value of the policyholder's floor depends on the investment strategy chosen by the insurer. For example, the insurer could choose to:

- *Minimize the value of the policyholder's floor option:* Assume a portfolio of life insurance liabilities in run-off. In this case, management might focus on protecting the share holders' capital, i.e. reduce the risks arising from the guarantee part of the liabilities. The investment portfolio would then match the guaranteed cash flows as closely as possible. This strategy is clearly also increasing the protection of policy holders' interests.
- *Maximize the possibility of declaring attractive bonus rates:* Assume a portfolio of life insurance liabilities in a well-capitalized company managed on a going-concern basis. The asset/liability position of this insurer will exhibit some financial risks in order to increase the possibility of declaring attractive bonus rates. The typical financial risk which one encounters in this situation is a duration gap between assets and liabilities, i.e. assets will typically have a significantly shorter duration than liabilities. This duration gap exposes the insurer and its shareholders to falling interest rates, but allows the insurer to declare higher bonus rates as interest rates rise.

Of course other sources of financial risk (and hence potential upside for policy holders) are present in life insurance portfolios, e.g. real estate or equity investments.

The example illustrates that the insurer has to cope with two conflicting targets: securing guarantee risk versus fulfilling policy holder expectations (and hence enhancing the franchise value of the firm), although it is by no means obvious, what surplus (and hence what sort of A/L risk) policy holders do and reasonably can expect.

2.2. Dynamic duration strategy required

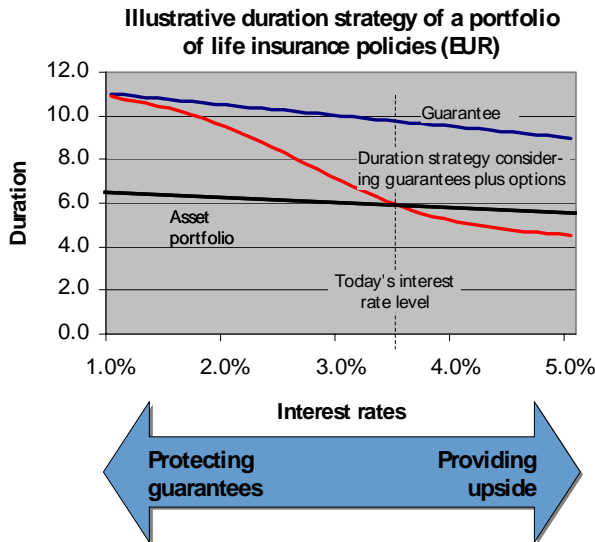
The life insurance industry has been increasingly adopting the more advanced technique called *market consistent valuation*. It has helped the insurance industry to quantify these embedded options in a manner consistent with what it would cost to hedge or insure these risks. The bases for market consistent valuation are risk-neutral valuation concepts commonly used in the capital markets for pricing of financial derivatives. Market consistent valuations have shown that the options embedded in life insurance policies may indeed have a significant impact on the duration strategy.

A central implication of the market consistent valuation work is that it is not always advisable to lengthen the duration of the investment portfolio to match the duration of the guaranteed benefits, but instead the duration gap has to be seen in conjunction with the capital base of the firm and the risk appetite of the management (see the last bullet point in the preceding section). The reason for this is the sensitivity (in opposing directions) of the value of the guaranteed benefits and the embedded options with respect to small interest rate changes. The resulting duration of the combined liability (i.e. guaranteed benefits plus embedded options) is thus shorter than the duration of the guaranteed benefits only.

In case of a drastic fall in interest rates, however, it is indispensable to lengthen the duration of the investment portfolio to bring it close to the duration of the guaranteed

benefits. The objective is to protect the guaranteed benefits, while the embedded options (on surplus) have little value. Vice versa, in the case of substantially rising rates, the value of the embedded options is rising steadily, requiring a shortening of the duration (Figure 1).

Figure 1

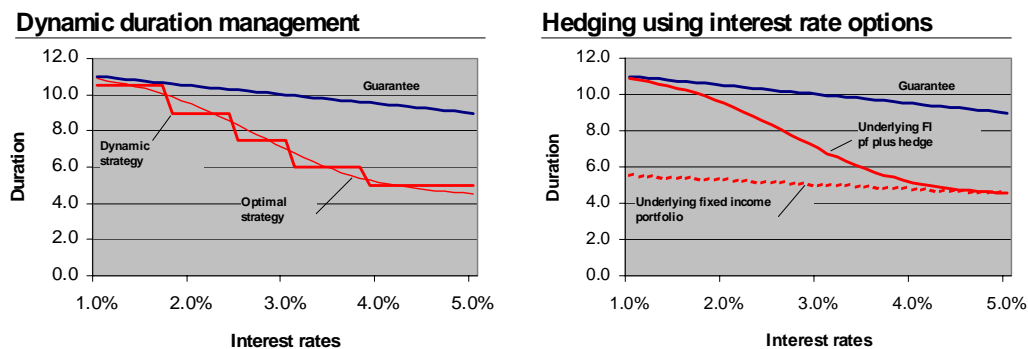


This lengthening of the duration as interest rates decline (and vice versa) is called *convexity*. The market consistent valuation allows a company to determine the most appropriate duration for every interest rate environment, and with this the convexity of the respective portfolio. The convexity risk has not been actively managed in the past by many life insurers, thus leaving life insurers with substantial interest rate risk.

2.3. Hedging strategies using derivative instruments evolved

There are generally two approaches to manage the convexity of life insurance portfolios, dynamic hedging and hedging using financial instruments (Figure 2). Combinations of the two approaches are also feasible.

Figure 2



2.3.1. Dynamic hedging

A dynamic hedging strategy is to adjust the duration of the fixed income portfolio when interest rates reach certain trigger levels. The duration can be adjusted either by sales of

bonds and subsequent reinvestment in bonds with a different duration, or through the use of interest rate derivatives like swaps. Dynamic hedging strategies require a great deal of management attention, since the fixed income portfolio is constantly rebalanced. Dynamic strategies sometimes require tough trade-offs by management. Imagine interest rates are low and have declined further, and are now next to a trigger point. Management's view is that interest rates will rise. Do you lengthen the duration in this situation? The A/LM strategy requires lengthening, but intuition tells you to stay shorter versus the benchmark – an unpleasant situation.

Dynamic strategies often lead to high transaction costs due to the constant rebalancing. Furthermore, rebalancing usually leads to profit or loss recognition and ultimately, to P&L volatility. The management of this volatility is demanding and may result in even higher transaction costs. For these reasons, dynamic interest rate hedging strategies are not widely used by life insurance companies.

Generally it can be said, that this dynamic hedging strategy is equivalent to the delta hedging technique, which a bank uses to hedge the linear risks of a short option position. The choice between dynamic hedging strategies and the use of the corresponding financial derivatives will also depend on the price of the latter, i.e. the implied volatility of their underlying. If the implied volatility is considerably higher than the estimated future volatility of the underlying, then a dynamic hedging strategy could look more attractive. There is clearly a risk of misestimating the future volatility and in fact banks also hedge this so-called vega risk in their option books.

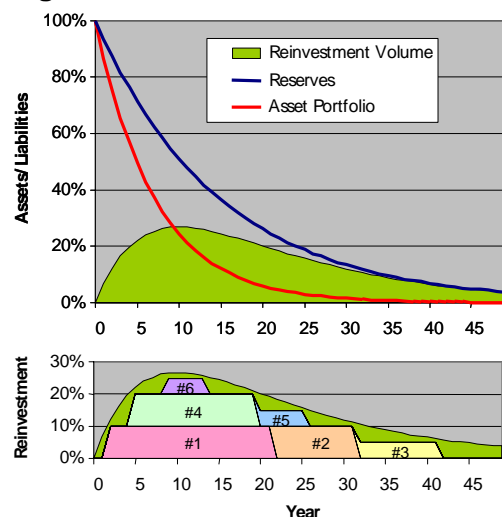
2.3.2. Hedging using financial instruments

A better way is to position the duration of the fixed income portfolio shorter than the duration of the guaranteed benefits (to account for the embedded options), and on top of it to enter into a series of interest rate options to hedge against convexity. The purpose of the options is to significantly lengthen the duration of the combined portfolio (fixed income plus options) as interest rates fall.

In order to determine this strip of options, the *reinvestment risk* (taking into account future premiums of the existing book) is considered. By positioning the duration of the fixed income portfolio shorter than the guaranteed benefits, a reinvestment need will arise in the future. The reinvestment risk is the risk of not achieving the technical interest rate at the time of reinvestment. The reinvestment risk can be hedged with a strip of corresponding receiver swaptions. The strip of receiver swaptions hedging the reinvestment risk introduces the precise convexity required to protect the guaranteed benefits in case of a material interest rate decline (Figure 3).

Depending on the life insurance portfolio to be hedged, the terms of the required receiver swaptions vary. Usually, the required options are of a long-term nature, just as the corresponding liabilities are. Depending on the currency, such options may be available in liquid markets (e.g. in the EUR swaption market), or may not be (e.g. in the CHF market). In the latter case, a company may choose to hedge the reinvestment risk in a different currency providing the required liquidity in long-term interest rate options, but leaving a certain basis risk. Based on the strong correlations of certain currencies (such as CHF and EUR), it is evident that the basis risk is only a fraction of the reinvestment risk hedged. (See also the case study below).

Figure 3



As opposed to the dynamic hedging strategy, this strategy does not require an ongoing rebalancing of the portfolio although it is advisable to monitor the effectiveness of the hedge periodically.

2.4. Some regulators give partial incentives for insurers to make use of hedging strategies

Some European insurance regulators recently introduced new solvency regimes making interest rate risks more transparent and hence provide an incentive for life insurers to hedge these risks.

The UK regulator, the FSA, introduced the “Realistic Valuation Requirement”, a form of market consistent valuation, for With-Profits Funds, as well as an “Individual Capital Assessment” requirement. These standards have encouraged many insurers to hedge their exposures to guaranteed annuity options (GAO) in recent years.

The Danish insurance regulator introduced a reporting regime based on market valuation of assets and liabilities in 2003, as well as a stress test based on the market value of assets and liabilities in 2001 (yellow test/red test). The consequence was a large-scale hedging of interest rate risk (duration matching, hedging of convexity from guarantees and mortgage bonds). The industry entered into Constant Maturity Swap floors, swaptions, and swaps on underlying in excess of EUR 70bn.

The Swiss insurance regulator introduced the Swiss Solvency Test in 2006. A field test was performed in 2004 with selected companies, and a second field test was performed in 2005. However, no significant trend towards hedging has yet been observed in Switzerland as yet.

2.4.1. Case study: The hedging activities in Denmark

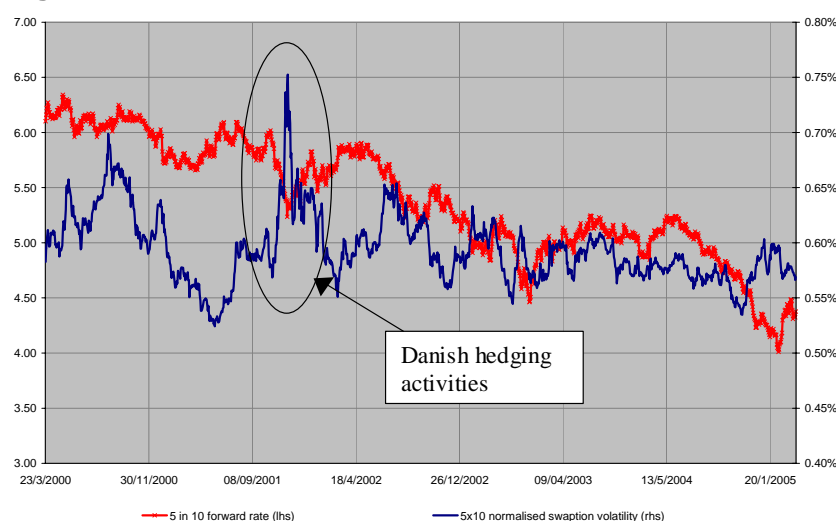
In the second quarter of 2001 the Danish regulator introduced a market stress test on assets and liabilities to ensure that life and pension companies had sufficient reserves to withstand substantial declines in interest rate and equity markets. The test consists of two parts:

- Red test: Equities down 30%, interest rates up/down 100bps
- Yellow test: Equities down 12%, interest rates up/down 70bps

In October 2001, it was announced that all Danish life and pension companies had to account for assets and liabilities on a market basis starting from 1 January 2003. It is worthwhile noting that the Danish regulator sets the accounting regime for the life and pensions industry and it could therefore introduce a “fair value” accounting regime and a “fair value” solvency regime at the same time. Under this “mark-to-market” solvency/accounting regime, insurers’ solvency would be hurt as interest rates fall due to the existence of minimum guarantees.

It is instructive to look at how the costs of derivatives changed during the hedging activities in Denmark. The Danes used the €market for hedging because the DKK-market is way too small and illiquid to absorb the hedging volumes. The currency risk between €and DKK can be regarded as limited. Two numbers characterize the costs of a swaption very well: the forward rate and the normalized volatility. The following graph shows the development for 5 in 10 year forward rates and 5Yx10Y normalized swaption volatilities for the €

Figure 4



As can be seen in the chart, the Danish hedging activities had a huge impact on the European interest rate markets and hedges quickly became more expensive.

2.5. Adequate accounting treatment for hedging strategies achievable

The principles laid out in this paper do not require or presuppose a move to fair value accounting.

Under specific circumstances, hedge accounting can be achieved for these receiver swaptions under both US-GAAP and IFRS and under some national accounting principles, avoiding substantial P&L volatility. It should be noted, however, that achieving hedge accounting for this type of strategy is a privilege rather than a right. It requires substantial documentation work and limits management's flexibility in trading the hedging instruments for a very long period of time.

The following review of local/international accounting standards is not intended to be exhaustive, but rather illustrates the range of treatments of risk mitigation strategies and the accounting hurdles that need to be considered.

2.5.1. US-GAAP and IFRS

Under both US-GAAP and IFRS, derivatives are generally carried at fair value in the balance sheet, and fair value changes are recognized in the Profit and Loss statement. In very few specific situations, an exception can be made from this important principle. One of these exceptions is the situation of a “Cash Flow Hedge”. A “cash flow hedge” situation indeed applies to the above reinvestment risk hedges.

In the context of these reinvestment risk hedges, the reinvestment of funds at a future point in time is considered a “forecasted transaction”. The purpose of the receiver swaptions is to ensure the reinvestment occurs at a minimum yield. The risk being hedged is the variability in the fixed rates obtainable on the market between the time of hedging and when the funds will be reinvested (or, in other words, the reinvestment risk due to fluctuations in interest rates).

The accounting standards FAS 133 (US-GAAP) and IAS 39 (IFRS) define the conditions under which a cash flow hedge is deemed to exist. While there are a number of requirements to be fulfilled, there are three that are of specific relevance.

1. Once established, the hedging relationship must be maintained over its entire lifetime. Discontinuing a hedging relationship without specific reasons usually has severe consequences for a company's financial disclosure. FAS 133 and IAS 39 name specific situations under which a hedging relationship can be discontinued legitimately.
2. The forecasted transaction must have a chance of occurring that is considered “probable”. In order to demonstrate this, management must project the guaranteed cash flows involved in the life insurance portfolio to be hedged, as well as the cash flows from the fixed income portfolio covering those liabilities. Scenario analysis is required to demonstrate that reinvestment will still likely occur in case of unexpected developments (such as variance of observed lapse rates versus expected lapse rates).
3. The hedge of the forecasted transaction by the corresponding derivative must be effective (which can turn out to be very difficult to prove). A hedge is considered effective if the fair value changes of the derivative used for hedging purposes vary in a range between 80% and 120% of the fair value changes of the perfect hedging instrument. Effectiveness must be demonstrated and quantified retrospectively and prospectively at each reporting period. In case a hedging relationship is perfect (i.e. all critical terms of the used and the perfect hedging instrument match), US-GAAP allows the company to demonstrate the effectiveness only once, namely at inception of the hedging relationship. IFRS does not allow this approach.

If a derivative is legitimately considered to be part of a cash flow hedge, its market value change shall not be entirely recognized in the Profit and Loss statement, but only the ineffective portion of its market value change. If the hedging relationship is perfectly effective, no market value change is recognized in the Profit and Loss statement. The

initial hedging premium is amortized through the Profit and Loss statement over the lifetime of the forecasted transaction.

2.5.2. Belgian GAAP

Under Belgian GAAP, the concept of cash flow hedge accounting applies along the same lines as under US-GAAP and IFRS. The conditions under which a cash flow hedge is deemed to exist are generally less restrictive.

2.5.3. HGB (German GAAP)

Under HGB, the concept of cash flow hedge accounting does not exist explicitly. However, relevant German accounting professionals and accounting firms believe that the concept of cash flow hedge accounting is consistent with the basic principles of HGB and should therefore be applicable. In a widely respected article¹, Dr. Edgar Löw outlined the way to apply cash flow hedge accounting under HGB.

2.6. Some considerations on market capacities for financial risk mitigation transactions

The usefulness of certain financial instruments (especially interest rate derivatives) for risk mitigation purposes was raised several times in this paper. Hence it is also important to consider to what extent the markets in these instruments are able to absorb the risk mitigation needs of insurers. We concentrate here on the interest rate derivatives like swaps and swaptions. Although the markets in €swaps and swaptions are deep and liquid it is not obvious that major hedging transaction for all European insurers could easily be absorbed. The Danish case study shows, that prices rose sharply because of the hedging transactions of Danish insurers. However, this was not so much because of the sheer size of the transactions but more because of the short period of time in which all these transactions were carried through. We believe that – if no time pressure for hedging is set for insurers by allowing enough time between announcements of new rules and full compliance – the markets can absorb the demand of the insurers. It might be that the prices (i.e. volatility) will increase, due to higher demand, but this will bring new sellers of protection (i.e. volatility) to the market.

This leads to the question of who ultimately is the provider of volatility for the market. Some of the hedging efforts of the UK and Danish life insurers have been leading to a risk transfer between nations. Investment banks have been the counterparties to the hedging activities of life insurers in the first place, and then wrapped their short option positions into financial products such as callable bonds. Institutional investors, among them life insurance companies outside the UK and Denmark², invest in those callable bonds, being attracted primarily by the scope for “yield enhancement”. With this, they further enhance their already material interest rate exposure for a little yield pick-up. Regulators of the respective nations cannot react sufficiently to this trend due to the lack of transparency of these risks.

¹ „Verlustfreie Bewertung antizipativer Sicherungsgeschäfte unter HGB – Anlehnung an internationale Rechnungslegungsvorschriften“, Dr. Edgar Löw. Die Wirtschaftsprüfung, Düsseldorf (Germany), 15 October 2004.

² In fact, primarily German life insurers have bought callable bonds. Other providers of volatility so far are the Treasuries of some European countries: they lock in funding rates at current levels, which are deemed to be low, and receive option premia.

Maybe systemic risks will increase if all life insurers think about interest rate risk in the same way and react accordingly. Perversely, German life insurers who buy callable bonds help to stabilise the market, but to their own detriment. We firmly believe that risks to the insurance industry (and the insured) are much higher in an environment with no incentives for risk mitigation and that the economic view is a precondition to real financial stability.

Very often the concern is brought forward, that huge counterparty risks are associated with derivatives transactions. We do not share this concern for the following reason: when carried out between banks, these transactions are always accompanied by collateral agreements. For example in a swap transaction, the party to whom the swap has negative market value has to post collateral to the other party. If the market value becomes very large, the swap can be closed with cash settlement and a new swap can be started. In case of a rating downgrade of one of the counterparties early termination clauses or increased hair cuts for the collateral postings are agreed. Similar rules are valid for options, with the difference being that only the option seller (usually the bank) has to post collateral.

So from our point of view, the counterparty risk is not an issue, if insurers stick to the same sound rules for collateralisation as banks do. Insurers will certainly never face difficulties in accepting collateral from banks, but one point merits attention. Insurers will usually not be able to use the encumbered policy holder assets for collateralisation, but only the free assets available in the company. This can therefore limit the usage of swaps in insurance companies.

2.7. Many regulatory regimes still hinder deployment of optimal hedging strategies

Appendix B provides a “state of the nations” overview of some of the largest European insurance regulatory regimes. It shows that while some regulators give partial incentives for hedging strategies, there are still many obstacles for the deployment of optimal hedging strategies in almost all regulatory regimes around Europe. Even worse, in some regulatory regimes perverse incentives are given to the insurers. For example the purchase of naked derivatives might not be allowed but the purchase of structured products is practically unrestricted and the options embedded in these are not reflected in the statutory accounting or solvency statements. In such a regime an insurer is not allowed to hedge its risk of falling interest rates, but can even increase this risk by purchasing callable bonds. In fact many life insurers, who did not understand their A/LM risk invested in callable bonds in pursuit of yield pick-up.

Although the regulatory regimes are currently in a state of continuous evolution, Appendix B highlights the “case for change” and the need for all stakeholders to rise up to the challenge of embracing consistent and coherent principles and policies for managing financial risks in insurance companies. We make a first attempt to develop such principles and policies in Sections 3 and 4 of this paper.

3. Recommended principles

3.1. Introduction

The crisis we've seen in the Life insurance industry in recent times, caused mainly by the downturn in equity markets, decline in interest rates and increased market volatility, has demonstrated the growing need for sound risk management practices within insurance companies.

The move towards market consistent valuation of liabilities is also presenting new challenges and opportunities for life insurance companies in regards to their risk management practices, especially in the management of convexity risk – a substantial element of their interest rate exposure.

This paper so far has described the current economic, accounting and regulatory environment for life insurance companies and the obstacles and issues faced in regards to the insurance industry's full deployment of the available financial risk mitigation strategies.

Out of the two broad approaches to manage interest rate risk, i.e. dynamic hedging and the use of derivatives, there are certain instances where it is clearly advantageous to look to the derivatives markets for risk mitigation vehicles.

Specifically, the use of derivatives offers hedging opportunities that:

- Do not require an ongoing rebalancing of the portfolio,
- Require less asset management technology,
- Can offer advantages in accounting,
- Offer more flexibility, and
- Offer choice of more diverse products.

The supposition therefore is that the use of derivatives offers insurance companies a more robust and efficient way to hedge market risk exposures, but there are definitive regulatory/accounting obstacles to the full deployment of these strategies, perversely discouraging state of the art risk management practices. With this in mind we consider a range of case studies to highlight the most pertinent issues within the current European regulatory and accounting regimes for life insurance companies using derivatives for financial risk mitigation. These issues are then addressed by the proposed principles that follow.

To summarise, the issues relate to:

- *Accounting treatment* – The various inconsistent hedge accounting rules has resulted in substantial documentation work for multi-national companies and has limited management flexibility.
- *Mixed regulatory incentives* – While some regulators give partial incentives for hedging strategies, the case studies demonstrated that there are still many obstacles in

the regulatory regimes around Europe. Notably, reference was made to Germany where there exists perverse incentives to use financial instruments in a sub-optimal fashion in regards to risk mitigation.

- *Pressure for compliance* - Denmark was used as an example to illustrate how pressure for speedy compliance may have an impact on market volatility, ultimately resulting in increased hedging costs.

The CRO forum supports the underlying objective of promoting a safe and efficient environment for insurance companies to conduct robust risk mitigation strategies.

With this in mind, we propose a number of principles and associated policies that may be used to form the basis of any remedial measures necessary to deal with the issues raised in this paper and ultimately lead to a safer and more efficient risk management environment.

3.2. Incentives for sound risk mitigation strategies

- The old solvency framework provided incentives to not reduce equity risk and was therefore partly responsible for the huge losses on equities incurred by European insurance companies in 2001 and 2002.
- In Germany there is no regulatory incentive to reduce the substantial convexity risk inherent in typical German life insurance products. The problem is even exacerbated by the tendency of some German life insurers to purchase callable bonds.
- The current solvency requirements do not capture the risks in high interest rate guarantees inherent in a typical life insurance policy and do not provide incentives to hedge those risks.

An economic approach is required to correct the above shortcomings of the old solvency framework.

Principle 1: Provide the right incentives

Solvency II should provide incentives for sound risk mitigation strategies.

The CRO Forum supports an “economic approach” to the valuation of assets and liabilities under Solvency II that adequately reflects guarantees and embedded options. This is considered as a necessary prerequisite to encourage the use of sound risk mitigation strategies involving derivative financial instruments.

The CRO Forum has published a paper that describes its preferred approach to the determination of the market value of liabilities for this purpose.³

The CRO Forum does not presuppose a move to fair value accounting as a prerequisite for this principle which relates to the Statutory Balance Sheet.

³ Refer discussion paper published by the CRO Forum titled “A market cost of capital approach to market value margins”, dated 17 March 2006.

3.3. Sound risk management framework as a precondition

- A life insurance policy is a highly complex structured financial product and requires sophisticated risk management techniques due to the complexity of the inherent options. A robust risk management framework can identify and assess the exact nature of the risks involved. This is a precondition for effective hedging.
- During the first wave of hedging activity in Denmark many insurance companies chose suboptimal hedges in terms of cost and quality of the chosen instruments. A robust risk management framework could have helped to choose more appropriate instruments in the first wave of hedging.
- Derivatives are complex products and continuous monitoring of these products requires a sound risk management framework.

Principle 2: Sound risk management framework is a precondition

A precondition for the use of financial instruments for risk mitigation is a sound risk management framework.

Risk mitigation needs to be embedded into sound risk management practices including the following:

- Appropriate management oversight (risk governance)
- Comprehensive and documented policies and procedures
- Robust valuation/risk systems
- Independent and effective risk management framework

3.4. Permission to use financial instruments (e.g. derivatives) for risk mitigation purposes

- With the introduction of incentives for risk mitigation, insurance companies should be allowed to mitigate the identified risk exposures using the optimal financial instruments.
- In certain jurisdictions structuring financial instruments into a bond can circumvent restrictions on admissible assets. Outright interest rate option positions are not allowed but callable bonds are - even if these instruments increase the convexity risk.
- The construction of structured notes consisting of a bond and a specific derivative instrument incurs additional costs for policy- and shareholders. These notes also tend to be very illiquid leading to high costs if the hedge needs to be adjusted.
- The problems above arise due to the tendency of some regulators to focus on the financial instruments without consideration of the reasons why financial instruments might be used. From this perspective a risk enhancing financial instrument used for

yield enhancement is treated in the same way as a risk mitigating financial instrument used for hedging purposes.

Principle 3: Focus on the process, not the instrument

The admissibility of financial instruments for risk mitigation should be based upon the soundness of the risk mitigation process. Restrictions on the use of financial instruments for risk mitigation cannot follow a “one size fits all” approach (e.g. a list of admissible and inadmissible financial instruments).

3.5. Unrestricted capital credit for financial instruments in a risk mitigation context

- Certain jurisdictions do not give full credit for economic hedges in their regulation. Not giving full credit for financial instruments for all relevant requirements reduces the incentive to use risk mitigation and generally favours suboptimal hedging strategies.
- If a structured note is not treated in exactly the same way as the combination of the stand-alone bond plus the stand-alone option, there can be an incentive to use the more expensive and less liquid structured note.

Principle 4: Equal yardsticks for qualifying financial instruments

Financial instruments used for risk mitigation purposes should receive full and unrestricted capital credit under Pillar I of Solvency II. The credit given for financial instruments used for risk mitigation under Pillar I, should be based on the certified and evaluated economic effect on both the valuation of assets and liabilities and the determination of the MCR and SCR.

Financial instruments that meet the requirements of Policies 3A and 3B (see 6.2.) should be given full credit in the determination of both the extent to which a company satisfies its minimum capital requirements (MCR) and its solvency capital requirements (SCR) under Pillar I of Solvency II.

At the same time, the counterparty credit risks associated with the use of such instruments should also be fully assessed in the MCR and SCR under Pillar I.

As risk mitigation is “core” to insurance companies’ management of risk and capital requirements, so too should its treatment be under the Solvency II regime. It is not appropriate to require Pillar I capital requirements to be set ignoring risk mitigation instruments in place, relegating these to be assessed only in Pillar II.

3.6. Economic view should supersede legacy rules

Principle 5: Supersede legacy rules

Determination of capital requirements for solvency purposes under Pillar I of Solvency II or under Solvency I should be based entirely on economic principles if the insurance company can demonstrate that it has a sound risk management framework (Principle 2) and that it is using financial instruments for risk mitigation satisfying the requirements of Principles 3 and 4.

3.7. Valuation consistency of risk mitigation instruments with risk mitigation context

Statutory accounting is often an important building block of legacy regulation such as tied assets. The reasonable treatment of new financial instruments in the legacy context can be very important, especially for insurance companies with a weakened capital base.

Principle 6: Consistent treatment under statutory accounting

Under the statutory accounting regime, the asset valuation rules in respect of financial instruments used for risk mitigation purposes must be consistent with the valuation rules in respect of the liabilities they are designed to hedge.

This principle would be achieved under Solvency II where all assets and liabilities are valued at their market value (refer Principle 1). However, in the lead up to Solvency II, regulators must find a pragmatic way of giving recognition to this principle if the local statutory accounting regime does not already do so.

A regime that requires the time value of financial instruments (assets) held for risk mitigation purposes to be amortised over time but leaves the value of the liabilities unchanged over this time period creates perverse incentives. It encourages firms that are exposed to interest rate guarantees or other financial market risks (e.g. falling equity markets or rising inflation) to either not hedge these risks or hedge using suboptimal forms of risk mitigation or to even increase their exposure⁴. This would be especially the case for firms with weakened economic financial resources.

⁴ As an example we would like to come back to the valuation of fixed income assets and liabilities. If the asset duration is shorter than the liability duration, then the statutory value of the assets increases for falling interest rates whereas the value of the liabilities does not change. So from the regulatory perspective this A/L mismatch does look favourable in a falling interest rate environment, which is contrary to the economic reality.

4. Suggested policies

4.1. Policies giving effect to Principle 1 (Provide the right incentives)

Achieving consistency between the economic value of the assets and liabilities requires a suite of policies that are discussed in the CRO Forum discussion paper titled “A market cost of capital approach to market value margins”, dated 17 March 2006.

4.2. Policies giving effect to Principle 2 (Sound risk management framework)

Policy 2A:

A sound risk management framework comprises the following components:

- 1. Appropriate supervisory/management oversight**
- 2. Comprehensive and documented policies and procedures**
- 3. Sound risk/valuation systems**
- 4. Independent & effective risk management function**

A detailed elaboration on these points can be found in Appendix C.

Policy 2B:

The CRO Forum supports the implementation of internal policies and procedures (refer Policy 2A) with a market disclosure standard consistent with the Pillar III requirements of Solvency II.

The CRO Forum will analyse current disclosure requirements, such as IFRS 7 (which is not applicable to insurance). It then intends to work, possibly together with regulators, on a disclosure standard template that may cover the following:

- A description of the company’s approach to meeting policyholder expectations and setting of policyholder bonuses (annual and terminal)
- A description of the policyholder and shareholder risk bearing funds available for cushioning the effects of changes in economic variables and how the Company expects to use these over the life of the insurance contract
- A description of the company’s investment policy
- A description of the company’s risk mitigation policy
- A description of the appropriate risk measures used for quantifying the dimension of different risk types (i.e. interest rate risk, currency risk, inflation risk, etc) and the limitations of traditional measures (e.g. duration) for capturing financial market risk. This includes the appropriate measurement for non-linear risks (i.e. importance of convexity to the asset & liability position) and volatility risks (i.e. risk of changing volatility regimes across time)
- A description and measurement of the economic risks before and after risk mitigation

- Description and measurement of the counterparty risks associated with all risk mitigation programmes
 - Key limitations of the risk mitigation programme including a description of basis risk and the limitations of the programme with respect to future unexpected developments in financial markets
 - A statement and measurement of the key risks that remain unhedged
- 4.3. Policies giving effect to Principle 3 (Permission to use financial instruments for risk mitigation purposes)

Policy 3A:

Insurance companies that can demonstrate and document the risk mitigation context in which financial instruments are used should be permitted to use such financial instruments.

The CRO Forum advocates the development of a “Risk Mitigation Statement” to be filed with the Regulator, in which the ALM and risk management policies of the company are laid down. In this statement could be mentioned for example policies for the usage of derivatives, ALM documentation (risks, limits, processes) etc. In any case the Risk Mitigation Statement should follow a customised approach that covers the material risk issues of the company.

The CRO Forum intends to develop minimum standards for such Risk Mitigation Statements as part of its further work on Pillar II.

Policy 3B:

Solvency II should allow a “Total Balance Sheet Approach” to risk mitigation without arbitrary restrictions on the components of the balance sheet assets (e.g. assets backing policyholder liabilities) that may or may not include such financial instruments.

- 4.4. Policies giving effect to Principle 4 (Equal yardsticks for qualifying financial instruments)

Policy 4A:

The certified economic valuation must take account of the enforceability of the financial instrument.

The institution should be able to demonstrate that due diligence has been exercised in evaluating the *enforceability* of contracts including an assessment of the following:

- Counterparty risk – A robust assessment of the counterparty (netting and settlement) risk and exposure
- Legal risk – Guidelines and processes should be in place to ensure the enforceability of counterparty agreements, especially in the case of any insolvency proceedings. The

institution should adequately evaluate the enforceability of its agreements before each major individual transaction is consummated.

- Political and sovereign risks – The institution should have knowledge of relevant laws and interpretations governing the use of derivative instruments in all jurisdictions that derivatives trading are permitted.

The institution should also ensure that intragroup contracts are done at arm's length and are in line with the principles of the CRO Forum diversification paper.⁵

Policy 4B:

The certified economic valuation must take account of the effectiveness of the hedge.

The following principles should be applied to assess *hedge effectiveness*:

- Documentation – The purpose and type of hedge must be fully understood and documented including a description of the extent and nature of any “basis risk”;
- Methodology – The methodology used to assess hedge effectiveness should be consistently applied and approved;
- Consistency – The methodologies should also be consistent with the company's risk management strategy;
- Accuracy – Ex-ante and ex-post assessments of hedge effectiveness should be conducted;
- Dependencies – dependencies must be diligently evaluated to ensure that they are representative and that the hedge remains effective in environments as expected.

Policy 4C:

Certification should be undertaken by the enterprise in a way that ensures:

- If an internal model is being used to assess capital requirements before risk mitigation, then the certified impact of the risk mitigation programme can be made as part of the overall audit, review and approval process applied to the internal model (refer CRO Forum paper on the requirements for the admissibility of Internal Models⁶).
- A clear separation of the party undertaking the certification from the party executing the risk mitigation programme
- Appropriate risk governance principles have been applied during the certification process (e.g. prior approval of a Risk Committee or the CRO)
- Assessment is undertaken by a process involving professionals who

⁵ Refer white paper published by the CRO Forum titled “A framework for incorporating diversification in the solvency assessment of insurers” dated 10 June 2005.

⁶ Refer study published by the CRO Forum titled “Principles for Regulatory Admissibility of Internal Models” dated 10 June 2005.

- are independent from the asset and liability side operations;
- have sufficient knowledge of the practical features of financial markets and instruments, the underlying insurance products and liabilities and their embedded financial options;
- have an understanding of the capital framework used by the company to evaluate financial market and asset/liability mismatch risks; and
- have practical experience/familiarity with the legal documentation used (e.g. ISDA documentation) in order to assess the enforceability of the financial instruments.

4.5. Policies giving effect to Principle 5 (Supersede legacy rules)

Policy 5A:

Regulators using approaches other than a full economic approach should assess any potential adverse impacts of their regime for their home regulated companies.

Such a review should consider the extent to which the retention of legacy rules for the determination of capital requirements is leading to perverse incentives (e.g. insurance companies perversely favour risk mitigation instruments that minimise rules based capital requirements as opposed to those instruments that are most suited to the characteristics of the liabilities with respect to duration and cost structure).

Policy 5B:

Companies should be permitted to apply for an “early adoption” of the Solvency II economic principles for the determination of their capital requirements under the Solvency I regime.

To the extent that the regulator can either implicitly or explicitly “overlook” a perverse impact of the legacy rules under Solvency I on that company’s disclosed statutory financial position, then the regulator should seek to as far as possible apply the economic principles and policies recommended by the CRO Forum for measuring the financial impact of the company’s risk mitigation programme.

An example of a perverse impact is a situation where a company enters into a comprehensive/sound risk mitigation programme to better manage its economic financial risks but is penalised under the local regulatory regime (e.g. it fails a rules based “stress test”) due to the inadequate recognition of that programme under the Solvency I regime.

4.6. Policies giving effect to Principle 6 (Consistent treatment under statutory accounting)

Policy 6A:

Regulators should apply a “look through” principle in determining the statutory value of the assets in respect of financial instruments used for risk mitigation instruments.

Risk mitigation instruments that are “wrapped” in complex bonds or other currently admissible assets should not be valued differently in the Statutory Balance Sheet relative

to equivalent “outright” instruments used for the same risk mitigation purpose (taking account of the value of the “wrap”).

The current regulatory regime in some cases encourages the “wrapping” of financial instruments for more favourable asset valuation treatment and leads to increased frictional costs for risk mitigation. These costs, to the extent they are borne by the policyholders, represent an inefficient use of financial resources (unnecessary transfer from policyholder surplus to risk mitigation counterparty). In addition to that, this “wrapping” allows for regulatory arbitrage, that a look-through principle would prevent.

5. Conclusion

With this study on “Financial Risk Mitigation in Insurance – Time for Change” the CRO Forum has as its principle objective the desire to encourage sound financial risk mitigation efforts in the insurance industry.

The study demonstrates that the use of derivatives offers insurance companies a more robust and efficient way to hedge market risk exposures, but there are definitive regulatory/accounting obstacles to the full deployment of these strategies, perversely discouraging state of the art risk management practices.

The comparison of the current situation in different European markets shows that the insurance industry and its regulators need to find a common understanding on the treatment of financial derivatives used for risk mitigation efforts. Especially admissibility rules and rules related to the accounting of financial derivatives need to be harmonized to provide for a level playing field in the insurance industry across Europe.

By achieving this common understanding on the treatment of financial derivatives for risk mitigation purposes, insurance companies are able to draw from a much bigger toolbox when mitigating risks. The insurance industry as a whole will be able to lay off risks that could be considered as systemic in insurance to the capital markets. This clearly benefits policyholders, as their interests will ultimately be better protected. Regulators will also be beneficiaries in this regard if they can assist their regulated entities to better manage their systemic risks.

The CRO Forum is encouraged by the discussions on the use of financial derivatives it has already had with regulators in most European markets. It therefore wants to contribute to the evolving regulatory framework by showing a consistent way forward for the use of financial derivatives for risk mitigation purposes. In this study, the CRO Forum proposes a set of common principles and policies that lay the foundation for a prudent use and regulation of financial derivatives in the insurance industry for risk mitigation.

The CRO Forum sees the adoption of the proposed Principles and Policies as an early, but very important, step towards a Solvency II regime that learns its lessons from the situation that plagued most European players during the capital markets crisis of 2001-2002.

Appendix A. Primer on financial risk concepts

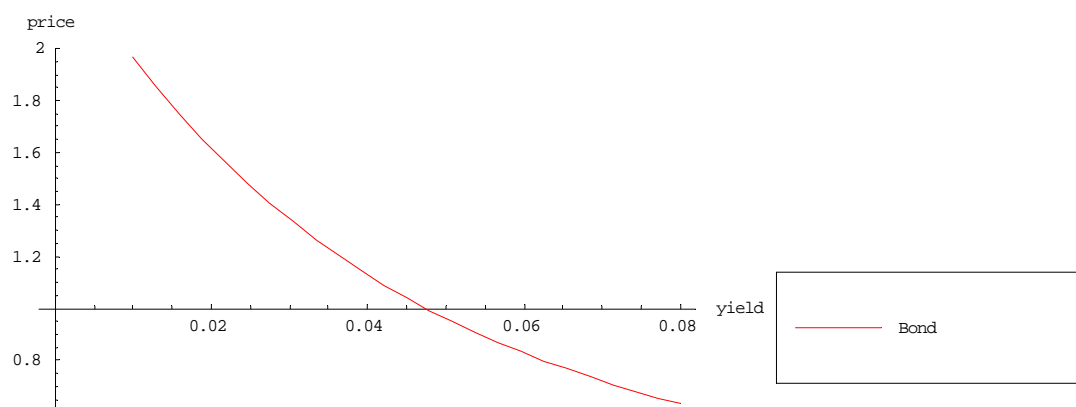
A.1. Duration and convexity

This part of the appendix is for the convenience of the reader who is not very familiar with the concepts of duration and convexity.

Very often duration is understood to measure in years the average “speed to pay back” of a bond. It is however, more instructive to think of duration (and also of convexity) as a measure of the bond price sensitivity to changes in bond yields.

The relationship between changes in bond prices and changes in bond yields typically looks as follows:

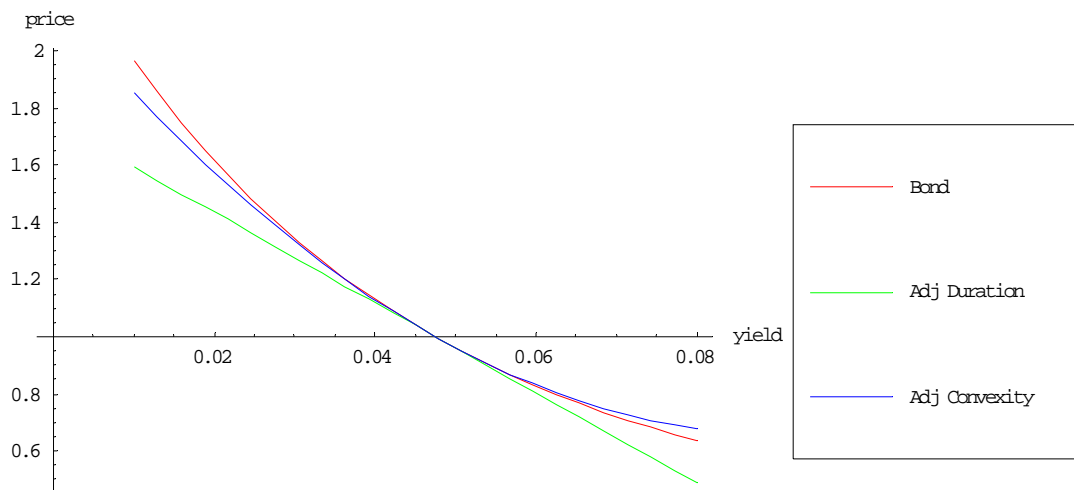
Figure 5



The duration gives a linear approximation of this relationship at one point of the curve, e.g. the current market price of the bond. Mathematically, it is defined as the first derivative of the bond price to the bond yield divided by the bond price.

Convexity measures approximately the error between the real price/yield relationship and the linear measure of duration. Mathematically, it is defined as the second derivative of the bond price to the bond yield divided by the bond price.

The following graph displays the relationship between bond prices, duration and convexity.

Figure 6

Theoretically, higher adjustments could be calculated using higher analytic derivatives of the bond price formula, but only duration and convexity are commonly used in the market.

Ceteris paribus, the following relationships hold:

- The higher the coupon, the lower the duration and the lower the convexity.
- The longer the maturity, the higher the duration and the higher the convexity.

Fundamentally, the same measures are used to calculate the sensitivities of derivatives prices to changes in the underlying of the derivative. Duration is then called the “delta” and convexity the “gamma”.

A.2. Swaps and options on swaps

Swaps are financial instruments where different interest payments are exchanged between two parties. The most widely used swaps are fixed for floating swaps, where one side is paying a stream of fixed interest rate payments and the other side is paying a stream of floating interest rate (e.g. EURIBOR) payments. Swaps have usually zero value at inception, i.e. no premium payment upfront is necessary. Clearly, after inception the swap value changes with the changing interest rate environment.

Swap markets are some of the largest and most liquid financial markets. Transaction costs are therefore very low, bid/offer spreads are typically in the range of 1-5 basis points and single transaction nominals of several billion € are considered to be large but not uncommon and can be digested easily by the market. The counterparty risk in a swap transaction is negligible, since all transactions are secured by collateral agreements between the two parties. Under such an agreement, the party to whom the swap has a negative value has to post collateral to the other party.

In a receiver swap the fixed interest payments are received and the floating interest rate payments are made. In a payer swap the situation is reversed. A fixed for floating swap is perceived by one party as a receiver swap whereas the other party sees it as a payer swap. Banks always take the clients’ perspective, when referring to a swap, i.e. a receiver swap means a receiver swap for the client and a payer swap for the bank. A payer swap gains

value if interest rates rise, and loses value if interest rates fall. For the receiver swap, the converse is true.

A swap which does not start immediately, but at a future point in time, is referred to as a forward starting swap.

Swaptions are options to enter into a swap contract. The holder of the option has the right (but not the obligation) to enter into a swap and he has to pay a premium for this option. This premium is usually paid upfront, but other payment modalities are possible as well. A payer swaption gives its holder the right to enter into a payer swap, a receiver swaption gives its holder the right to enter into a receiver swap. A payer swaption gains value if interest rates rise, and loses value if interest rates fall. The converse is true for receiver swaptions. Here is an example of how swaptions are referred to: a €2Yx7Y receiver swaption is an option to enter a 7 year receiver swap on €interest rates, where the maturity of the option is in 2 years.

Swaptions have much higher (positive) convexity than swaps or bonds, i.e. their sensitivity to interest rates can change very quickly. Positive convexity is a highly desirable feature for the investor as they gain more than they lose by changes in interest rates.

Appendix B. Many regulatory regimes still hinder deployment of optimal hedging strategies

While some regulators give partial incentives for hedging strategies, there are still many obstacles for the deployment of optimal hedging strategies in almost all regulatory regimes around Europe. Even worse, in some regulatory regimes perverse incentives are given to the insurers. For example the purchase of naked derivatives might not be allowed but the purchase of structured products is practically unrestricted and the options embedded in these are not reflected in the statutory accounting or solvency statements. In such a regime an insurer is not allowed to hedge its risk of falling interest rates, but can even increase this risk by purchasing callable bonds. In fact many life insurers, who did not understand their A/LM risk invested in callable bonds in pursuit of yield pick-up.

1. Germany

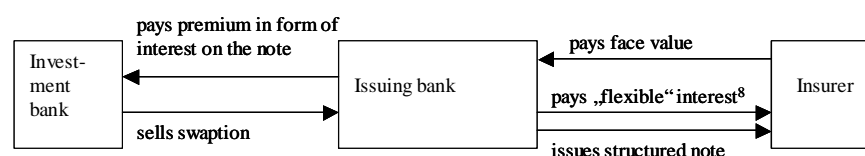
The permitted use of derivatives is defined in §7.2 of the VAG. According to this article, the use of derivatives in German life insurance is admissible so long as it is for one of three purposes:

- To prepare the acquisition of a cash asset (“Erwerbsvorbereitungsrecht”)
- To hedge a cash asset, which already exists in the asset portfolio
- To enhance the yield of existing assets

Under the VAG, the underlying of an admissible derivative must not be another derivative, e.g. a swaption, and the usage of outright swaptions was not admissible until very recently. The rules that permit the use of derivatives are focused on the hedging of asset risks, rather than the management of asset/liability mismatch risks.

Some German life insurers hence used structured products in order to hedge a share of their reinvestment risk. Banks offered a solution in the form of a bond or note in which the required derivatives are embedded:

Figure 7



The diagram above illustrates how in principle such a transaction could be set up. The insurer is buying the note but is receiving only a small amount of interest on it; the remaining interest is used to pay the option premium. The payouts of the option are done via “flexible” interest payments.

If properly structured, none of the obstacles above becomes material. The note solution however could have some other disadvantages to the insurer, namely:

- Since the face value of the note has to be purchased, it involves much more liquidity risk than the purchase of naked options, where only the premium has to be paid.
- The investor has to pay fees for the structuring and especially for the funding willingness of the bank, which issues the bond.
- The structure is relatively more illiquid than naked derivatives, which complicates later adjustments to the hedge.

Although “hedging via the backdoor” is permissible, there are material frictional costs associated with this approach, which ultimately result in a drag on policyholder bonus and shareholder returns.

BAFin recently permitted forward receiver swaps and swaptions for the purposes of A/LM. These instruments are admissible under the following condition:

Forward receiver swaps and swaptions in a hedging transaction: Here the intention is not hedging the present value of fixed income securities but their running yield. The fixed rate of the swap resp. the strike rate of the swaption is subjected to the restriction, that it must not be higher than the average crediting rate (“laufende Durchschnittsverzinsung”) of the reference asset or assets.

If this condition is not met, forward receiver swaps and swaptions could still be admissible *as a preparation for the acquisition of an asset*. Neither forward swaps nor swaptions lead compulsorily to the acquisition of a cash asset as is required by §7.2 VAG. But BAFin recognises that forward receiver swaps fix future cash flows of bonds, which are bought in the future, and that receiver swaptions hedge the risk of future bond acquisitions and as such both can be regarded as acquisition preparations (“Erwerbsvorbereitungsgeschäfte”).

These instruments are not admissible for the purposes of speculation, e.g. they must not be sold after a short holding period. The purpose of hedging or acquisition preparation has to be verifiable and documented. The notionals of these instruments (also in wrapped form) must not exceed the notionals of the bond portfolio.

BAFin also admitted credit default swaps for the purposes of credit risk mitigation.

2. *United Kingdom*

The FSA introduced a twin peak approach with the twofold intention to satisfy the existing Solvency I framework and to foster the economic view and the usage of internal models. Pillar I – Peak 1 (Regulatory Peak) is a rules-based approach, with capital requirements calculated by means of standard formulae, consistent with the requirements of Solvency I. For with-profits business with liabilities in excess of £500m, there is an additional Peak 2 (Realistic Peak) capital requirement that assets cover “realistic” liabilities plus a risk capital margin which ensures that specified adverse asset scenarios are also covered. The “realistic” liabilities are based on regulatory liabilities but adjusted to bring the values closer to a market consistent level. Under Pillar II, a company’s own “individual capital assessment” is performed, taking into account the nature of its liabilities and underlying risks. This assessment is reviewed by the FSA who then provides “individual capital guidance” of an appropriate minimum capital level for the company.

Regulatory Peak

UK admissibility rules⁷ permit the use of “approved” derivatives to reduce ALM risk. Derivatives are “approved” if they are held for the purpose of efficient portfolio management or reduction of investment risk, are covered (i.e. held in connection with other admissible assets), and issued in a regulated market or by an approved counterparty⁸. Investment risk is described in terms of ALM risk in the rules:

⁷ PRU 2 Ann 1R

⁸ PRU 4.3.5R

“...investment risk is the risk that the assets held by a firm ... might not be ... of a value at least equal to the amount of those technical provisions...”⁹

The FSA has also explicitly stated that it supports the use of derivatives for “risk management” purposes¹⁰:

“We have amended the calculation requirements for derivatives to place emphasis on the economic risk faced by a firm taking into account the combined effect of the derivative and associated assets. As a result, we hope that it is clear that we are not intending to introduce any disincentive to firms using derivatives for risk management purposes.”

However, a paper entitled “Derivatives and dynamic asset allocation in with-profits funds”¹¹ reveals shortcomings in the requirements for the regulatory peak, in particular, there are perverse incentives for the use of instruments that are suboptimal from an economic perspective:

- Although full value can be given under asset admissibility rules, the valuation of liabilities rules requires that the time value of purchased options is written off (treated as a decaying asset), but this approach does not apply to the embedded options in the liabilities to policyholders.
- Under the “regulatory” peak, sub-optimal hedging strategies can result in lower capital charges than optimal strategies. For example, the use of short-dated collars (targeted at reducing the resilience reserves) to hedge guarantees that are akin to long-dated puts offered to policyholders is more attractive than using a long-dated put hedging strategy.
- This all comes at substantial cost to the policyholder because the protection provided by short term put options is not well matched to the embedded guarantees and, in strong market scenarios, the drain from purchasing puts each year is considerable.
- Companies are incentivised to hold options outside the asset share from a capital charge perspective, even though this is uneconomic from the office’s point of view.

The paper also shows that using Constant Proportion Portfolio Insurance (CPPI) strategies to avoid the archaic rules regarding derivatives (which lead to unattractive capital charges for what are the most “economic” hedge structures) is not an attractive alternative. This is because CPPI strategies tend to perform better in the best and worst market scenarios but tend to under perform in the “middle ground”.

Realistic Peak

The realistic peak would support more economic strategies. The realistic value of the assets includes the value of any derivative held¹². The “realistic” value of liabilities is calculated on a basis which is closer to market consistent. The capital component, the risk capital margin ensures that the assets are sufficient to cover the realistic reserves even in

⁹ PRU 4.3.12R

¹⁰ FSA Policy Statement 04/16 July 2004, Annex 2, page 2

¹¹ Staple Inn Actuarial Society, June 2004

¹² PRU 7.4.33R

the event of specified adverse asset scenarios. In assessing the value of the derivative, the market value under that stress scenario would be used¹³.

Since life offices are currently assessed on the more onerous of the regulatory and realistic peaks, this means that the current regulatory regime may still encourage sub-economic forms of hedging.

3. *France*

Financial instruments (including derivatives) are explicitly allowed under French regulation for the purposes of risk mitigation. The regulations detail explicitly the unique circumstances in which financial instruments may be used and hence implicitly that they are not permitted for any other purpose (e.g. “speculation”, “stand alone trading”). The regulation also includes a series of specific limits, for example it forbids explicitly the “selling of options” which would create leveraged positions in underlying assets.

There are formal documentation requirements (definition of scope, strategy and on-going controls to be put in place) and prescribed efficiency tests that are required in order to qualify for hedge accounting treatment. Once hedge accounting treatment is granted for a particular strategy then generally the economic and accounting impacts of the strategy are aligned. There are however, some cases where a mismatch between the economic impact and the accounting treatment can occur (e.g. the pattern of recognition of profits from certain equity swap arrangements).

4. *Belgium*

Currently the Belgian regulator does not give direct incentives to hedge A/LM risks. At the same time the Belgian regulator is very liberal about the use of derivatives. Derivatives are allowed not only for hedging purposes but also for effective asset management. The market value of derivatives as well as tied assets can be used to cover EU Solvency requirements.

5. *Netherlands*

The Dutch insurance law (Besluit Technische Voorzieningen 1994) does not mention derivatives explicitly, but only mentions that “investments with a high risk profile” should be used and valued “prudently”.

Furthermore, the EU Third Life Directive states that the use of derivatives is permitted if they are held for the purposes of reduction of investment risks or efficient portfolio management. Also, the Third Life Directive states that free-standing derivative contracts are not acceptable investments for insurers.

Currently the Dutch Central Bank is revising its insurance supervision model. This new supervision model (nFTK) is based on market-consistent valuation for both liabilities and assets. The use of derivatives is permitted as long as they are properly valued in a market-consistent way. However, the implementation of the nFTK for insurance companies has been postponed. A new introduction date has not been announced yet.

¹³ PRU 7.4.43R, PRU 7.4.46R, PRU 1.2.11R to PRU 1.3.30R

6. *Italy*

The Italian Insurance Regulator set up general rules for the usage (allowance) of derivatives such as documented investment strategy, proper risk management framework, internal control, skilled people, and oversight by the Board of Directors. The amounts invested into derivatives have to be consistent with the financial situation of the Company i.e. derivatives should be only a fraction of the total assets, derivatives are only allowed if the Company has a solvency margin in excess of the minimum required capital. Derivatives have to be strictly connected with admissible assets for covering technical reserve. The derivatives alone are not an admissible asset, but the underlying plus the derivative have to be calculated and written together in the balance sheet.

7. *Spain*

The Spanish Insurance Regulator provides strong incentives to insurance companies to manage A/LM risk. Insurance companies can achieve this either by cash flow matching between assets and liabilities (monthly fixed income vs. liabilities cash flow within tight ranges/periods), or duration matching via partial duration of assets vs. liability matching within a range of +/- 1%. Derivatives are accepted or being considered appropriate for covering liabilities (admissible) when the objective is hedging risk in the assets and/or liabilities context. Futures, options, Forward Rate Agreements (FRAs)swaps, caps, floors are explicitly permitted. In addition a credit margin that accounts for the uncertainty of the asset cash flow is also considered. If an insurance company can not demonstrate cash flow or duration matching, then the mathematical reserve must be applied which is provided by the Spanish regulator (normally based on an interest rate equal to 60% of the 3 year rolling long term bond yield).

When derivatives are hedging a risk, symmetric accounting (hedge accounting) is allowed and goes through the P/L. The Spanish regulator is revising these regulations to allow derivatives which are not hedging any specific risks and to allow credit derivatives such as CDS.

8. *Switzerland*

With the Swiss Solvency Test, the Swiss insurance regulator FOPI¹⁴ has created strong incentives for interest rate risk hedges. While the use of derivatives is generally not restricted, there are still existing regulations that hinder the use of derivatives for hedging purposes, specifically regarding the admissibility of derivatives for coverage of tied assets (“Deckungsstock”). Derivatives are only admissible if used in the context of hedging an asset that itself is admissible for tied assets. Derivatives for A/LM purposes are hence not eligible.

In the context of the Swiss Solvency Test, this issue was discussed with the FOPI. The FOPI acknowledges the importance of the matter to the industry and has reacted accordingly. Due to the introduction of the Swiss Solvency Test, the FOPI has revised the Swiss Insurance Supervision Law¹⁵ and its related regulations. Following discussions with the industry, the FOPI adjusted the regulation such as to allow derivatives used in the context of A/LM considerations for coverage of tied assets on application. The FOPI determines the valuation basis of such derivatives and defines limits for eligibility.

¹⁴ Federal Office of Private Insurance

¹⁵ VAG (Versicherungsaufsichts-Gesetz)

9. *Summary and overview*

The following table summarizes the use of derivatives for A/LM purposes across Europe:

Table 1

Country	Solvency regime provides incentives for financial risk mitigation	Derivatives permitted for A/LM purposes	Derivatives admissible for tied assets/Solvency I
Germany	No	Yes in some circumstances	No
United Kingdom	Yes	Yes	Yes
France	Yes	Yes	Yes
Belgium	No	Yes	Yes
Netherlands	No	Yes	Yes
Italy	No	Not explicitly	Only in limited circumstances
Spain	Yes	Yes	Yes only in limited circumstances
Switzerland	Yes (SST)	Yes	On application

Appendix C. Essential components of a sound risk management framework

The following policies have been developed using the following source material. The CRO Forum wishes to acknowledge the original authors of these documents, but wishes to highlight that it has adapted these to the specific requirements of insurance companies using financial risk mitigation instruments.

- International Association of Insurance Supervisors, 'Supervisory Standard on Derivatives' (October 1998)
- The Futures and Options Association, 'Managing Derivatives Risk: Guidelines for end-users of derivatives' (2002)
- Bank of International Settlements, 'Risk Management Guidelines for Derivatives' (July 2004)

C.1. Policy 2A (I): Appropriate supervisory/management oversight

- The board should ensure that appropriate processes and mechanisms are in place to facilitate compliance with good corporate governance and practice, particularly in the context of its relationships with its stakeholders (i.e. its customers, shareholders and employees).
- The board should ensure that its trading activities comply with the organisation's Articles of Association (or their equivalent) and any applicable laws.
- Before any transactions are executed, the board should review their proposed general purpose and use to ensure that:
 - they are consistent with management capabilities and the financial position, strategy, commercial objectives and appetite for risk of the underlying business;
 - they (and the purposes for their use) are set out in an approved list;
 - the risks and rewards of their use have been assessed and documented by persons independent of those responsible for trading them;
 - the policies and control procedures developed by senior management are appropriate and documented.
- The board should set the policy for the organisation's use of derivatives.
- The board should ensure that the actual usage of derivatives is monitored and reviewed regularly by persons independent of those responsible for trading derivatives.
- The board should ensure that the management information presented to it is readily understandable, complete and sufficient to make informed judgements.
- The board should seek additional professional advice from external specialists to provide independent assessment and input where necessary.
- The board should consider carefully the role of external auditors and their capacity to fulfil that role.

C.2. Policy 2A (II): Comprehensive and documented policies and procedures

The content of operational policies and procedures will be different for each insurance company but the level of detail should be consistent with the complexity and volume of derivative usage and the strategy and objectives of the insurer.

A Group's strategy for derivatives trading and related control mechanisms should be based on the concept of using approved Derivative Programmes.

Additional derivative rules may be required under local law or business practice and should be drafted with the benefit of local legal advice in a local derivative policy. This local policy should be derived from the group policy and is subject to approval from the board member who oversees the relevant jurisdictions and the group CFO or CRO. All derivative programs related to the investment portfolio should be approved by the relevant senior management, e.g. Chief Investment Officer, Chief Risk Officer and Chief Financial Officer.

Each Derivative Programme should be re-approved at least on an annual basis. They should include, as appropriate:

1. the purpose for which particular derivatives are to be used, including the circumstances in which derivative transactions can be used and acceptable rationale for undertaking transactions;
2. procedures for seeking approval for the usage of new types of derivatives: these should include addressing the extent to which there will be any trading activity and who should take decisions in this regard;
3. procedures for the approval of counterparties and brokers;
4. details of who is authorised to enter into derivatives transactions;
5. procedures by which senior management exercises control over derivatives activities;
6. the quantitative limits to the use of each type of derivative;
7. the quantitative limits to credit, market and other risks;
8. procedures for monitoring liquidity risk;
9. internal procedures covering front office, back office, measurement of compliance with counterparty credit lines and limits, control and reporting;
10. valuation procedures for risk management purposes on a mark-to-market basis or equivalent for over the counter transactions; and
11. the identification of who should be responsible for the valuation. Valuations should be carried out by individuals independent of those responsible for trade execution or, if this is not possible, valuations should be independently checked or audited on a timely basis.

Accounting and taxation rules should also be taken into consideration in developing operational policies and procedures for the use of derivatives.

C.3. Policy 2A (III): Sound risk/valuation systems

The risk management process relies heavily on the valuation and risk measurement methodologies and applications employed to measure and report on market risk. Quality assurance procedures should be conducted to monitor the effectiveness of these systems and ensure an adequate process for identifying and evaluating market risks. Executing the Quality Assurance procedures may involve Audit (Internal & External), Investments, Risk and Information Technology departments. The procedures should address the following issues:

- *Data Quality* – ensure the coverage, consistency, accuracy, and timeliness of asset and liability data used;
- *Price verification* – regularly assess the accuracy of the parameters (instrument prices, data sets, interest rates, foreign exchange rates, etc) for integrity and reasonableness;
- *Coverage* – ensure comprehensive coverage of all types of risk exposures are identified, quantified and reported in a timely fashion;
- *Timeliness* – ensure that the risk information is delivered to the users in a timely manner;
- *Common Standards for Risk Measurement* – ensure consistency of methods across risk categories to enable comparisons to be made;
- *Gap Analysis* – the identification and notification of observable weaknesses in the risk process;
- *Benchmarking* – regularly benchmarking aspects of the risk process against best practice and available technology.
- *Backtesting* – formal validation of the models should be conducted on a regular basis.
- *Control Processes* – outcomes are regularly reviewed and appropriately reported.

In cases where the back testing or price verification results reveal inadequacies in the models (given the statistical confidence used), this should be documented and reported to the relevant Committee and, if required, remedial action taken.

C.4. Policy 2A (IV): Independent & effective risk management function

Competence

The Group must have sufficient expertise to understand the important issues related to derivatives and ensure that all individuals conducting and monitoring derivatives activities have sufficient levels of knowledge and experience.

Reporting

Periodic reports should be produced assessing the degree of compliance with the written strategies and policies and the scale of risks assumed, and that they are prepared by an

internal or external entity, independent of the entity that in practice executes the investment policy of the insurance undertaking.

The Board of Directors and senior management should receive regular information on risk exposure and derivatives usage in a form which is understood by them and which permits them to make an informed judgement as to the level of risk on a mark-to-market basis.

Limit setting and monitoring

The limit structure constitutes a quantitative expression of the company's pre-defined risk appetite. By establishing effective controls via clearly defined limits, the risk management function validates the risk principle of "no surprises" and endeavours to minimise instances where unacceptable losses are incurred from derivatives and other activities.

Overall organisation-wide risk limits should be developed to control exposure and monitor transactions and positions in accordance with the strategic appetite of the organisation and the nature and extent of its trading activity, the expertise of its individuals and the availability of netting or collateralisation techniques.

The policy should detail the escalation procedures for both limit breaches as well as policy violations.

References

“Risk Management Guidelines for Derivatives”, Bank of International Settlements, July 2004

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