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Discount rates: one size does not fit all

Introduction

In the second half of 2010, the IASB issued an Exposure Draft (ED) and the FASB issued a Discussion Paper (DP) containing proposals for a new recognition and measurement model for insurance contracts. Both the ED and DP require the use of current discount rates that are consistent with observable market prices for instruments whose characteristics reflect those of the insurance contract liability and exclude any factors not relevant to the insurance contract liability. Amount, currency, timing and uncertainty are examples of such cash flow characteristics.

Identifying financial instruments in the market and providing discount rates that adequately reflect the characteristics of insurance liability cash flows will be challenging, particularly for long-duration liabilities. Furthermore, explaining the impact on profit or loss from movements in the current interest rates will require insurers to consider the various components of a current interest rate.

In this paper, we identify and explore the following components that we consider fundamental: the risk-free rate, illiquidity premium, and credit spread (comprised of expected defaults and a default risk premium). The Boards require that discount rates for insurance liabilities should be determined in a way that is consistent with observable market information. Some of the fundamental components of discount rates have been identified and estimated from market information to a certain extent in recent years, particularly as a result of the 2008 credit crisis. However, in many cases, full observable market information does not exist for components of insurance liability discount rates, meaning that estimates by the insurers are often necessary; such estimates will inevitably require judgment.

Many consider the ED proposals to be a significant departure from current accounting practices, which, in their view, results in substantial earnings volatility that is not reflective of the long-term nature of many insurance contracts.

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Earnings volatility may arise as the result of accounting mismatches and economic mismatches. In their deliberations subsequent to the ED, the Boards have confirmed that the discount rate will be current. However, they have tentatively decided not to be prescriptive on requiring a method and only provide the overall objective, thereby allowing insurers to use a bottom-up or top-down type approach. While, theoretically, the two approaches should result in the same discount rate, we believe that the significant judgment required by insurers to estimate (components of) a discount rate will lead to discount rates that differ between companies, markets and geographical areas. This means that discount rates may depend heavily on the approach chosen by the insurer, which will place a high emphasis on understanding the impact of that choice on measurement and profit or loss and explaining it to the company's stakeholders through presentation and robust disclosure.

To understand how the fundamental components of discount rates may affect volatility, we prepared some examples showing the impact of the discount rate on a portfolio of life-contingent annuities. Each example illustrates the earnings volatility impacts that result from different discount rates in certain structured scenarios. The examples highlight that a small change in any of the components of discount rates often has a significant impact on insurers' profit or loss, and that analysis of the fundamental components is an important step within the process of determining and explaining discount rates.

In this paper, we focus on the discount rate for insurance contracts, where the future benefit payments do not depend on performance of specific assets (non-participating contracts).

Analysis of current interest rates

The Boards propose that discount rates for insurance liabilities should be consistent with observable market rates and reflect the characteristics of the insurance liability cash flows. Observable market rates are related to the market value of financial instruments. Such financial instruments often have one or more characteristics that do not reflect those of the insurance liabilities. It is important to understand the characteristics of the instruments, including any additional compensation demanded by an investor for bearing the risk of holding the instruments. This risk can be related to the fundamental components of a market interest rate. Figure 1 on page 3 illustrates those components for a debt instrument.

Although market observable prices in an efficient market conceptually incorporate all relevant information, financial markets do not provide explicit information about the components that make up those prices. Breaking

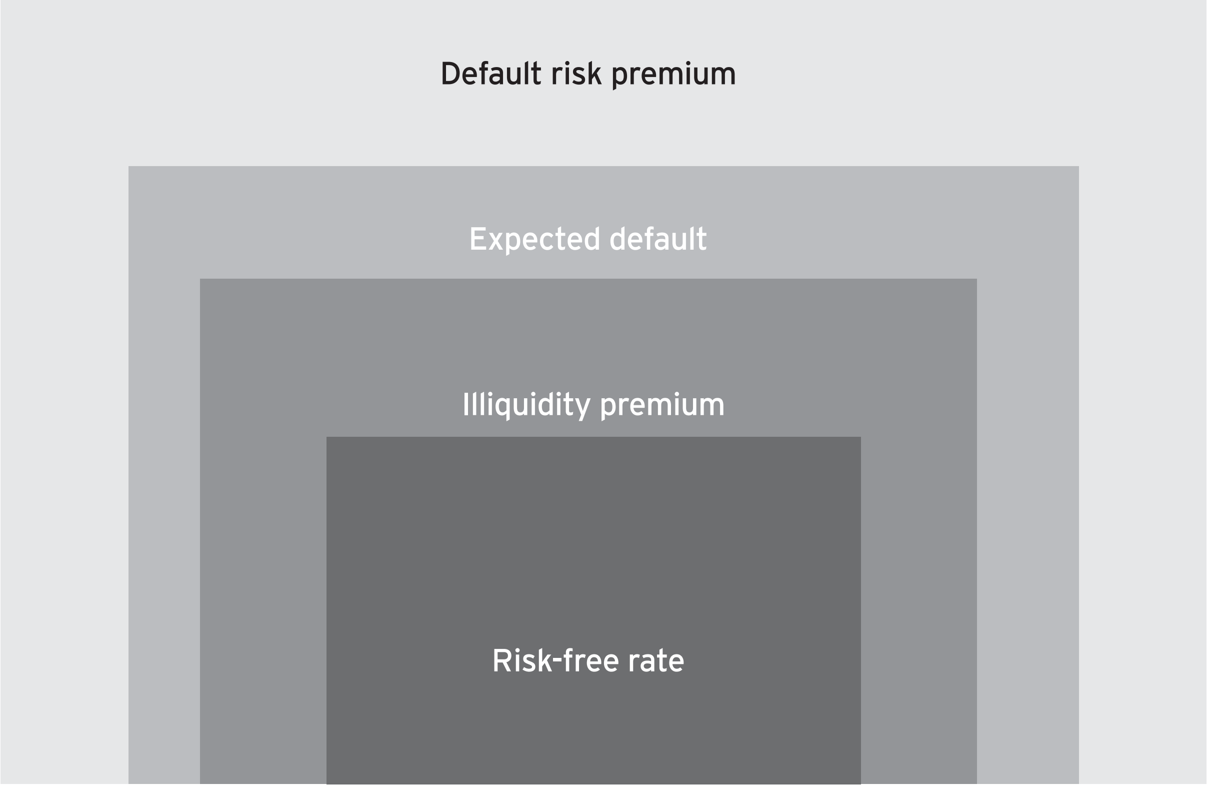

Figure 1

down observable market interest rates into their components may, therefore, involve significant judgment.

Risk-free rate

In the context of our paper, the risk-free rate should have the following feature: when an insurance liability cash flow is matched by a financial instrument with similar maturity and currency, a change in the risk-free rate would be expected to economically lead to zero-volatility. This is because the capital gains or losses due to the risk-free rate change for the financial instrument should always balance with the risk-free rate component change in the value of the insurance liabilities. In perfect financial markets, this should always be true, irrespective of whether the financial instrument (and/or the insurance liability) would be held or disposed of.

Government bonds, covered bonds and interest rate swaps are financial instruments that are often used as a reference for deriving risk-free rates. However, recent history has shown that none of these instruments are risk-free under all circumstances. Issuers of these instruments may not be able to fulfil all of their contractual obligations under extreme circumstances. In addition, the value of government bonds and covered bonds can be affected by deteriorating market liquidity.

Illiquidity premium

The second component of a market yield relates to the market liquidity of the instrument itself. If markets are sufficiently deep and liquid, there is always a buyer ‘at the right price’ for the financial instrument, and there would be indifference between selling and holding the financial instrument to maturity. However, markets are not always deep and liquid, and a seller may have to accept (and a buyer may require) a lower price for the instrument. To compensate for this risk, potential holders demand a higher market yield; the more illiquid the instrument is perceived, the higher this compensation will be.

Holders of insurance contracts (policyholders) in many cases, cannot lapse or surrender the contract without incurring a significant penalty, nor can they easily sell the contract to a third party. For that reason, certain types of insurance contracts could be seen as being relatively illiquid, and illiquid assets may better reflect the characteristics of the liabilities than liquid assets. As liquidity characteristics differ by class of insurance contracts, illiquidity premium may differ for different classes of insurance contracts.

Credit spread

Conceptually, credit spread can be broken down into two components:

- **Compensation for expected default** – this reflects the expected loss on contractual cash flows of a financial instrument (or portfolio of financial instruments) and is expressed in an annual percentage of its fair value.
- **Default risk premium** – this reflects compensation for the uncertainty in expected future defaults, i.e., in estimating the timing and amount of future cash flows. When uncertainty and/or the market price of risk increase, the default risk premium will rise.

Default risk premium typically is not directly observable, and many have measured this by subtracting the compensation for the expected default from the total credit spread. The latter may be derived from market prices of credit default swaps or from financial instruments like corporate bonds, but, in many cases, no reliable market observation can be found and development of 'level 3' input is necessary. In practice, there is not always a bright line between credit spread and illiquidity premium.

How we see it

Identifying the fundamental components of a market-observable interest rate is necessary to understand earnings volatility of insurers when the insurance liabilities are discounted at a current rate and investments are measured at fair value through profit or loss. Earnings volatility may arise as the result of accounting mismatches and economic mismatches. For economic mismatches, it is important to explain their meaning for the longer term.

Finding the value of the fundamental components and assessing their impact on the measurement of investments and insurance liabilities is complex, with many subjective aspects. The availability of information and the degree of its subjectivity determines whether accounting mismatches and the long-term meaning of economic mismatches:

- Can be dealt with in the measurement of insurance contracts (i.e., in the discount rate),
- Are addressed in presentation

and/or

- Need to be explained in the disclosures.

Methodologies for identifying and valuing them continue to develop and should be watched closely.

Approaches to determining the discount rate

The Boards have tentatively decided to permit a choice between a bottom-up, and a top-down approach for determining the discount rate for valuing insurance contract liabilities. The Boards have elected not to provide detailed guidance on how the techniques for determining the discount rate should be used.

Bottom-up approach

The bottom-up approach to determining a discount rate reflects the market-observable yield curve in the appropriate currency for instruments that expose the holder to no or negligible credit risk. Therefore, an insurer must identify and measure the risk-free rate and illiquidity premium in the financial markets under this approach.

Risk-free rate

The challenge in determining an appropriate risk-free yield curve is not always as simple as identifying an appropriate instrument (e.g., government bond or swaps) and matching the contractual currency, timing and amount of underlying cash flows. Some geographical areas may not have sufficiently deep and liquid (government) bond markets in the same currencies as the insurance contract liabilities being measured. Additionally, due to the long-term nature of many insurance contract liabilities, there may not be instruments with sufficient time to maturity to match the anticipated cash flows of those liabilities.

As a result, insurers will need to select the most appropriate instrument to use as a basis for a risk-free rate, adjust that rate for differences in maturity or other factors and sometimes even combine two or more instruments. They may also need to extrapolate yield curves beyond the contractual duration of the reference instrument's cash flows for periods long into the future.

Illiquidity premium

Insurers must determine an appropriate illiquidity premium to add to the risk-free rate. Currently, there is no single widely-accepted method of calculating an explicit liquidity premium, or discount in price, that the purchaser of an instrument would require due to an illiquid market. Many of the methods currently in place were developed during the recent financial crisis. During that period, government bonds, covered bonds and other financial instruments started to build spreads over the swap rate that could not all be attributed to credit risk. These spreads were used for some methods as a basis for illiquidity premium. For other methods, the market prices of corporate bonds adjusted for credit derivatives were used as a basis.

Market awareness of illiquidity premium is relatively new. It was not until the recent financial crisis that the phenomenon became obvious. At that time, market liquidity for financial instruments declined and the assumption of efficient markets became painfully incorrect. An example of the assessment of the impact of the illiquidity premium is the report of the task force that investigated the phenomenon in relation to Solvency II in Europe. The report[1] confirmed the existence of an illiquidity premium under certain market

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[1] CEIOPS Task Force Report on the Liquidity Premium, CEIOPS-SEC-34/10, 1 March 2010

conditions, but it concluded that it is only relevant to the measurement of insurance liabilities to the extent that it can be earned on assets that are available in financial markets (i.e., to the extent that the value of such assets can be affected by it). The report noted illiquidity premiums of 1 basis point until the end of 2006, increasing to nearly 200 basis points in the heat of the crisis at the end of 2008, and reducing again to nearly 50 basis points later in 2009.

Some argue that the market yields of financial instruments started building up spreads during the beginning of the financial crisis that were originally identified as the illiquidity premium, but some of those financial instruments revealed credit issues in a later stage. This illustrates the practical difficulty of drawing a bright line between the illiquidity premium and credit default spread.

Top-down approach

The top-down approach starts with the yield curve that reflects current market returns for the actual portfolio of assets the insurer holds or for a reference portfolio of assets. This allows insurers to determine discount rates from a familiar starting point and then adjust to reach an appropriate discount rate for insurance contract liabilities. Adjustments are made for the timing of the cash flows and risks inherent in the assets, but not in the liabilities, like a compensation for expected defaults and default risk premium. Reliable market observables for these adjustments are not always readily available. In this case, often an observation is used that represents the period of a comprehensive economic cycle, sometimes referred to as a 'through-the-cycle' parameter.

Some find 'through the cycle' parameters principally more relevant for assessing discount rates for insurance liabilities, because they better reflect the long-term nature of the insurance business. This particularly applies to the credit default risk premium. We find this view in certain existing top-down approaches, but we observe the Boards' current views that discount rates should, as much as possible, reflect the current market situation. However, the Boards also decided that, in a top-down approach, the liquidity premium can be considered a residual component of the discount rate. If no reliable market observables are available for 'topping down' to the discount rate, using 'through the cycle' parameters may leave the effects of market imperfections, situational market sentiments, etc., in that residual component.

How we see it

The Boards concluded that an exact determination of a discount rate that reflects the characteristics of insurance liabilities may not be directly attainable from available market information. Significant judgmental decisions are required to apply either the bottom-up or top-down methods. The Boards have not provided a prescriptive method to determine discount rates, preferring insurers to develop appropriate methods.

Theoretically, the bottom-up and top-down approach should result in the same discount rate. In practice, the Boards' proposals are expected to lead to discount rates that differ between companies, markets and geographical areas, especially in situations where reliable market observations are not available. However, the alternative of enforcing comparability by rigidly prescribed methods may lead to unreasonable figures under certain circumstances and, thus, reduce the relevance of financial statements. Therefore, disclosures will be paramount to users of financial statements to understand the selection of the discount rates and the impact on profit and loss. Disclosures could involve:

- The process of selecting discount rates
- The market references and 'level 3' estimates
- Sensitivities
- The relationship between investment income and changes in the discount rates (as required in par. 73 of the ED)

Such disclosures may trigger market pressure in the years after implementation that forces greater convergence with respect to selected discount rates.

Understanding volatility

A primary concern for insurers is the potential volatility that will be caused by current market observable interest rates, without being indicative of the long-term nature of the insurance business. To better analyse and understand how this volatility arises, we present an example. This is based on expected cash flows from immediate life-contingent annuities paid to a group of 65 year-olds, and different types of investment portfolios backing those insurance contracts. These annuity contracts cannot be surrendered by the policyholder, which makes them illiquid. Investments are carried at fair value through profit or loss to match with the use of current discount rates in the measurement of the insurance liability. The example does not address specific presentation alternatives for volatile items in the Statement of Comprehensive Income, although we are aware of the ongoing Board discussions on this issue. The example focuses on the effect of the discount rates only. The operational and demographic experience results, as well as the risk adjustment and residual margin (or single margin in the FASB model), are not relevant to our example and have been set to nil. Consequently, the presented annual results consist of the margin between total investment income (interest income as well as unrealised and realised capital gains) on the one hand, and interest accretion to the insurance liabilities and the effect of changes in the discount rate on the other. The opening present value of the best estimate insurance liabilities is approximately 1,200,000.

The two investment scenarios considered are:

- A portfolio of debt securities that closely matches the cash flows of the insurance liabilities (near-matched or scenario 1).
- A portfolio of debt securities with the duration of the liabilities exceeding that of the assets (duration mismatch or scenario 2).

Figures 2 and 3 on page 9 show the projected annual annuity cash flows against the projected cash flows of the respective investment portfolios. Figure 2 shows the near-matched cash flows, while Figure 3 shows the asset cash flows as skewed toward the early years, due to the duration mismatch. In both figures, the annuity payments are the same.

Figure 2

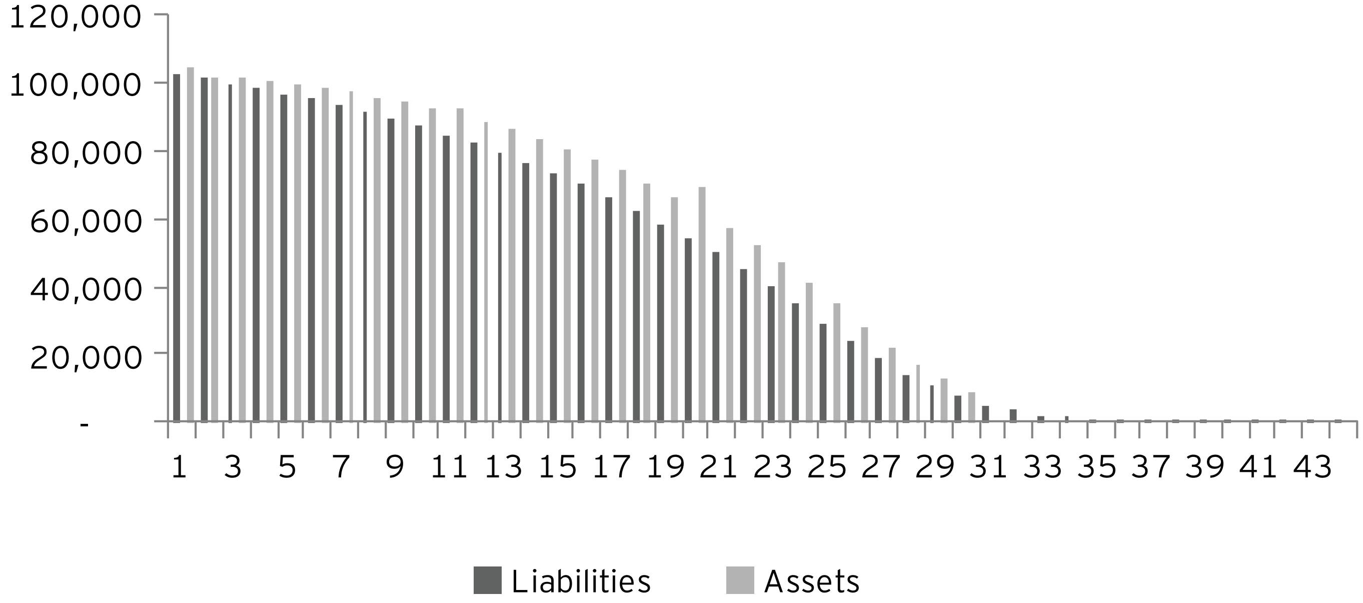
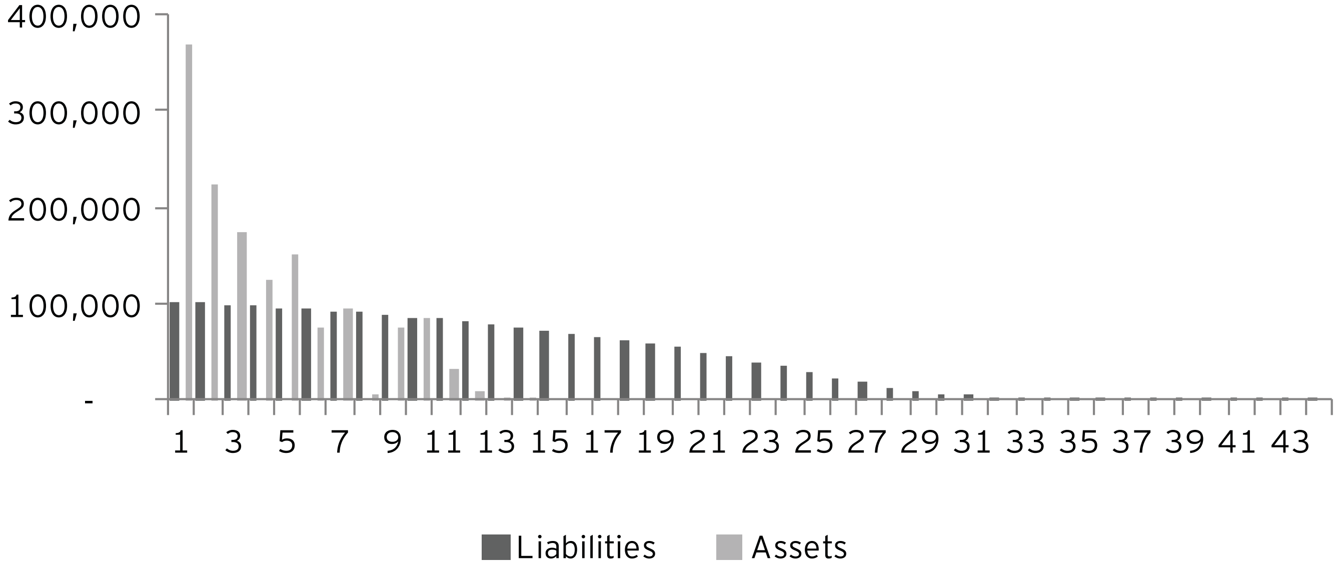


Figure 3



In the example, we analyse the results on investments in comparison to the interest accretion and the impact of changes in discount rates during year 1. At the beginning of that year, it is ‘business as usual’, with a moderate risk-free rate, liquid financial markets and moderate credit default spreads. At the end of the year, market conditions are stressed, reflected by a significantly reduced risk-free rate, illiquidity in financial markets, increased expected defaults and default risk premiums that are affected by the sentiment in the financial markets.

Figures 4 and 5 show the yield curves at the beginning and end of the period, respectively. Note the widening of the gray bands at the end of the year, representing the additional spreads implied by financial markets.

For illustrative purposes, we assume that movements in assets and insurance liabilities can be analysed at the component level as shown in the graphs above in all our examples. In practice, those components may not be identifiable in a straight-forward way.

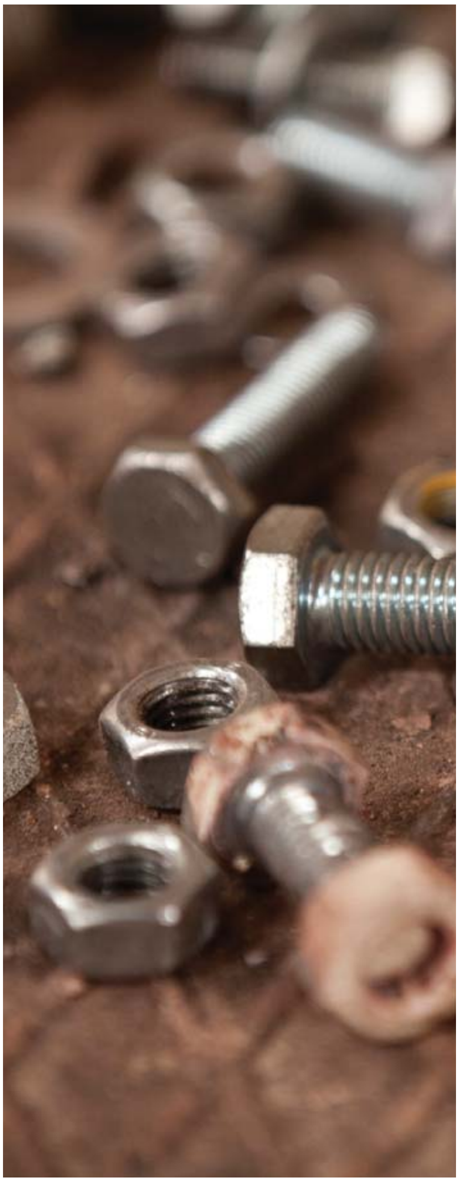


Figure 4. Yield curve - beginning of year

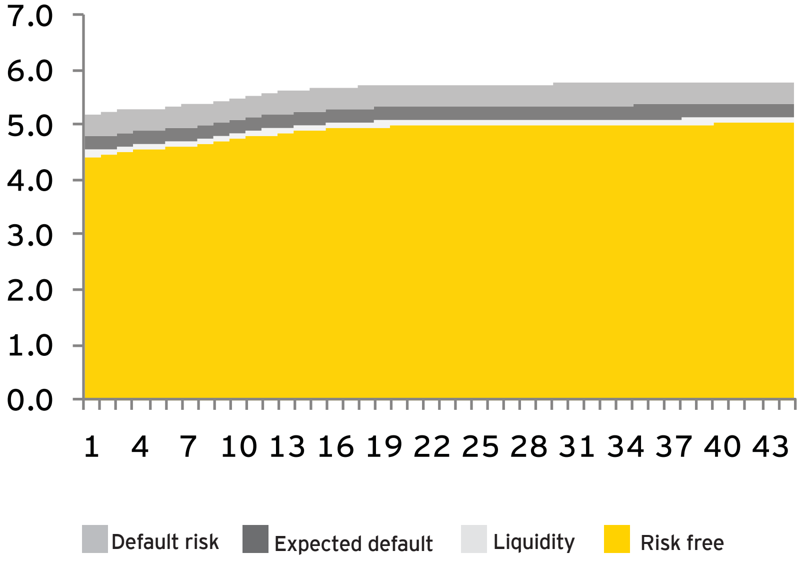
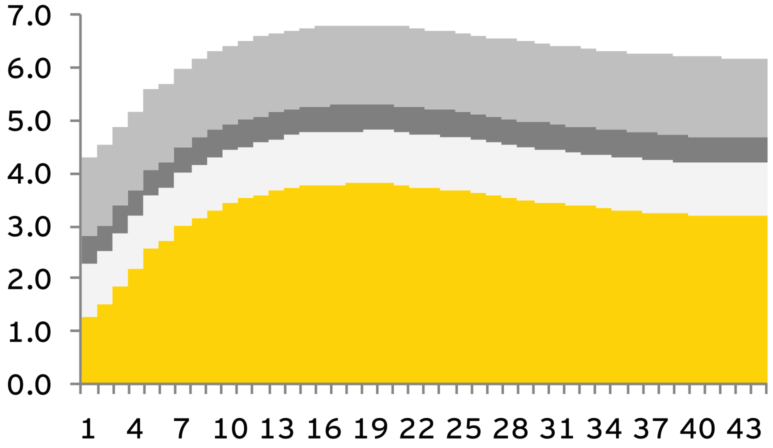


Figure 5. Yield curve - end of year



Near-matched vs. mismatched cash flows

Our first analysis, shown in Figure 6 below, presents the effects of changes in market yields for portfolios of assets that are remote from default risk, but are affected by the decreased market liquidity at the end of the period. We compare the results for the period of a portfolio of assets and liabilities with nearly-matched cash flows, with those whose cash flows have a significant duration mismatch as compared to the liability cash flows. To demonstrate the impact of market illiquidity, we use the risk-free rate as the discount rate.

Interest accretes on the assets and liabilities in broadly the same manner in either scenario 1 or 2. However, in scenario 2, the investment income in the portfolio of assets is lower than in scenario 1, due to the short duration of the assets. Yields for short durations are lower than yields for longer durations. In addition, the decrease in the risk-free rates produces a significant loss in the mismatch scenario, while the near-match scenario is hardly affected. This clearly reflects the economic impact of asset liability management.

Assets are affected substantially by the decline in market liquidity, but the liabilities are unaffected by market liquidity. The loss in value due to the illiquidity premium can be ‘earned back’ in the future by holding the assets to maturity and collecting all contractual cash flows. The cash flow pattern of the insurance liabilities allows the insurance company, in our example, to hold the assets and earn back illiquidity premium. Thus, the highlighted changes in illiquidity premiums in Fgure 6 may not be considered by all users to be relevant to the financial condition and, therefore, viewed as an accounting mismatch. Note that the effect of this difference is higher in the near-matched scenario than in the mismatch scenario, because assets with a long duration are often heavier affected by market illiquidity than assets with a short duration. In summary, the near-match scenario shows a low economic mismatch (net change in the risk-free rate) and a high illiquidity difference, while the mismatch scenario shows a high economic mismatch and a moderate illiquidity difference.

Figure 6

	Asset selection					
	Near matched liabilities			Duration mismatch		
	Investments	Liabilities	Net	Investments	Liabilities	Net
Interest accretion	57,815	56,651	1,164	55,818	56,651	(832)
Indirect results:						
Change in risk free rates	223,176	226,844	(3,668)	88,667	226,844	(138,177)
Change in illiquidity premium	(108,417)	-	(108,417)	(32,954)	-	(32,954)
	114,759	226,844	(112,085)	55,714	226,844	(171,131)
Total	172,574	283,495	(110,921)	111,532	283,495	(171,963)
	Scenario 1			Scenario 2		

Incorporating illiquidity premium in the discount rate

In our second analysis, shown in Figure 7 below, we include a change in the illiquidity premium component in the discount rate for each maturity.

To enable us to concentrate on the effect of the illiquidity premium, we also include a portfolio of interest rate swaps to hedge the asset and liability mismatch in scenario 2. The effect of changes in risk-free rates is represented by the grey-shaded amounts and balances to (15,222). In the near-matched scenario, this effect is (3,151), so in both scenarios the assets reasonably represent the duration characteristics of the liabilities.

In the near-matched scenario, the large movements in the market interest rates hardly cause volatility. Obviously, the asset portfolio mirrors the characteristics that have been attributed to the liabilities. However, the assets with the longer maturities in such a portfolio may not be available in practice.

In the mismatch scenario, the effect of increasing illiquidity premium in the measurement of liabilities exceeds that in the assets, because short-duration assets are less affected by market illiquidity than long-duration assets and the limited illiquidity effect is attached to interest rate swaps. Those who advocate the top-down method may use the mismatch portfolio as a starting point and consider the swaps as an adjustment for the timing difference between asset and liability cash flows. They would not make adjustments for the remaining differences in liquidity. Alternatively, those who advocate the bottom-up method may argue that no market observables exist for illiquidity premium for cash flows with a longer maturity and, consequently, it should only be applied up to a certain maturity. Under both views, the impact of the illiquidity premium on the change in the insurance liability would be limited to the change in a reference asset portfolio that would be realistically available in the market. Therefore, the net impact of the change in the illiquidity premium would become relatively small and the volatility of 76,136 noted in Figure 7 would not result.

Considering credit default risk

We complete our illustration with a third analysis that highlights the impact of credit spreads. This analysis uses an asset portfolio that nearly matches liabilities for duration and liquidity, but includes a risk that counter parties default on contractual payments. In Figure 8, we compare the results of using risk-free rates plus a liquidity premium (bottom up) with a top-down rate where the asset yield for each maturity is decreased by expected defaults and default risk premium. We assume in this variant of the example, that there is no reliable market

Figure 7

	Asset selection					
	Near matched liabilities			Duration mismatch, hedged by swaps		
	Investments	Liabilities	Net	Investments	Liabilities	Net
Interest accretion	57,299	57,333	(33)	55,334	57,333	(1,999)
Net cash on derivatives	-		-	9,551		9,551
Indirect results:						
Change in risk free rates	220,944	224,096	(3,151)	88,667	224,096	(135,428)
Change in illiquidity premium	(107,333)	(109,090)	1,757	(32,954)	(109,090)	76,136
Change in fair value derivatives	-		-	110,655		110,655
	113,612	115,006	(1,394)	166,369	115,006	51,363
Total	170,911	172,339	(1,427)	231,253	172,339	58,914
	Scenario 1			Scenario 2		

parameter for credit default risk. Consequently, expected defaults are projected based upon past entity and industry experience and for default risk premium, a ‘level 3’ parameter is used, based upon the ‘business as usual’ scenario of the beginning of the period.

For illustrative purposes, the change in the insurance liability under the top-down approach is broken down into the individual components of the discount rate. When applying a top-down rate in practice, those components are usually not identified separately, but as part of the total change in the adjusted asset rate.

Figure 8 indicates that the bottom-up method of adding illiquidity premium to a risk-free rate may lead to a different answer from the top-down method of deducting inapplicable elements from an asset rate.It is hard to tell from the current status of the Board discussions where they would draw the line between those outcomes that are acceptable and those that are not, especially when judgement is applied under imperfect market conditions. Is the volatility when using the bottom-up method mainly caused by statistical influences and is the top-down method, as applied in the example, the solution for this by leaving the effects of market imperfections and situational market sentiments in the discount rate? Or does the top-down method, as applied in the example, fail to reflect the current market situation?

This example highlights that there is no single answer to these questions, especially because there is no clear line between illiquidity premium and default risk premium. Furthermore, the outcome will probably depend on which approach the insurer selects for determining the discount rate. Effective governance over parameter selection, presentation and disclosures, should support relevance and reliability of this aspect of financial reporting.

How we see it

Our example demonstrates that there is no single solution for determining insurance liability discount rates. The selection of the discount rate will always be arbitrary to a certain degree. To manage and explain earnings volatility, it is important to know the fundamental elements of asset yields and liability discount rates. Quantifying these fundamental elements will incorporate subjectivity. Again, the importance of disclosures cannot be over-emphasised. Analyses like those presented in our example may enhance the understanding of the sources of volatility.

Figure 8

	Selection liability discount rate					
	Risk-free plus illiquidity premium			Through-the-cycle credit risk premium		
	Investments	Liabilities	Net	Investments	Liabilities	Net
Interest accretion	65,124	57,333	7,791	62,882	59,929	2,954
Indirect results:						
Change in risk free rates	225,224	224,096	1,128	217,716	213,544	4,172
Change in illiquidity premium	(109,544)	(109,090)	(454)	(105,892)	(103,437)	(2,455)
Change in expected future defaults	(28,167)	-	(28,167)	(27,228)	-	(27,228)
Change in default risk premium	(111,701)	-	(111,701)	(107,977)	(105,534)	(2,443)
	(24,188)	115,006	(139,193)	(23,381)	4,573	(27,954)
Total	40,936	172,339	(131,402)	39,501	64,502	(25,001)

Concluding remarks

We analysed current interest rates, discussed methods for determining discount rates for insurance liability cash flows and illustrated the impact that discount rates can have on volatility. No single solution will work in all circumstances, nor is there a compelling argument for why one approach is better than another.

The bottom-up method may have a more direct connection with market observable rates and prices and may be easier to explain, because users of financial statements can trace the market reference of those rates. On the other hand, the top-down method may provide a more intuitive insight into the fundamental components of current interest rates and a basis for mitigating earnings volatility caused by statistical noise in direct market observations. However, the process of adjustments to the top-down rate, especially when 'level 3' parameters are used, may be difficult to explain because it may be even harder to trace the resulting discount rate back to a market reference.

Our conclusion is that an analysis of the fundamental components and their impact on financial statements is an important step within the process of determining and explaining discount rates. A small change in any of the components of the discount rate often can have a significant impact on insurers' profit or loss, and capital position. Therefore, it is not surprising that the Boards have decided not to provide detailed prescriptive guidance, allowing insurers an element of judgment in determining the most appropriate discount rate for their business and circumstances.

Finally, there must be significant focus on the systems of governance around the parameter selection process, and the information and analysis used to enhance insurers' understanding of the earnings sensitivity to movements in interest rate components, in particular, to separate accounting mismatches from economic mismatches. Furthermore, the Boards and insurers must ensure that the disclosures relating to the process of assessing current interest rates, the relation to market observable inputs, sensitivity to movements in current interest rates, and explanation of profit and loss, are clearly set forth in financial statements and provide users with sufficient information to understand each of these key areas. It is essential that the focus is on better, rather than more, disclosures in order not to lose alignment with the users of insurers' financial reporting. Governance and transparent analysis are the pre-conditions for control over financial reporting and auditability.

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