

MILLIMAN REPORT

The Low Interest Rate Environment

Key challenges for life insurance companies

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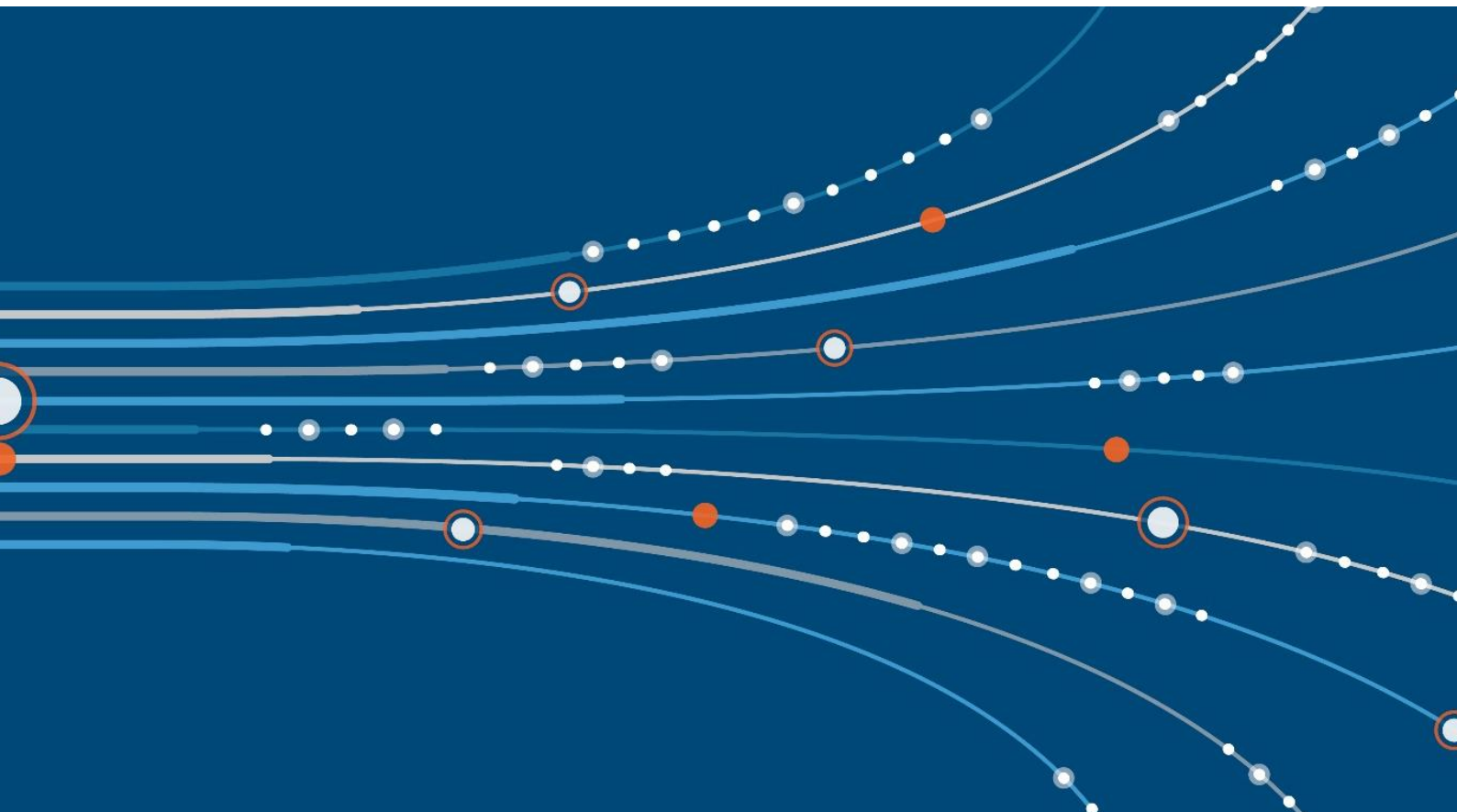


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Introduction

Why interest rates have fallen is an interesting, though far from simple question to address. Fortunately for the authors, the purpose of this paper does not require an answer but rather for us to look to the future and consider if it is plausible that the current low interest rate environment might persist and, if that is the case, to discuss the implications for insurers.

In this paper we aim to address the key challenges that insurers face related to the continuous decrease of interest rates over the past decades. In particular, how to deal with the current low interest rate situation in terms of risk, capital and balance sheet management, and investment strategies. In addition, we zoom in on the impact of product development, where we observe a clear reduction of guarantees and a transfer of risks towards the customer. The product section is concluded by a view on the road ahead, assuming that interest rates persist to be low in the medium term.

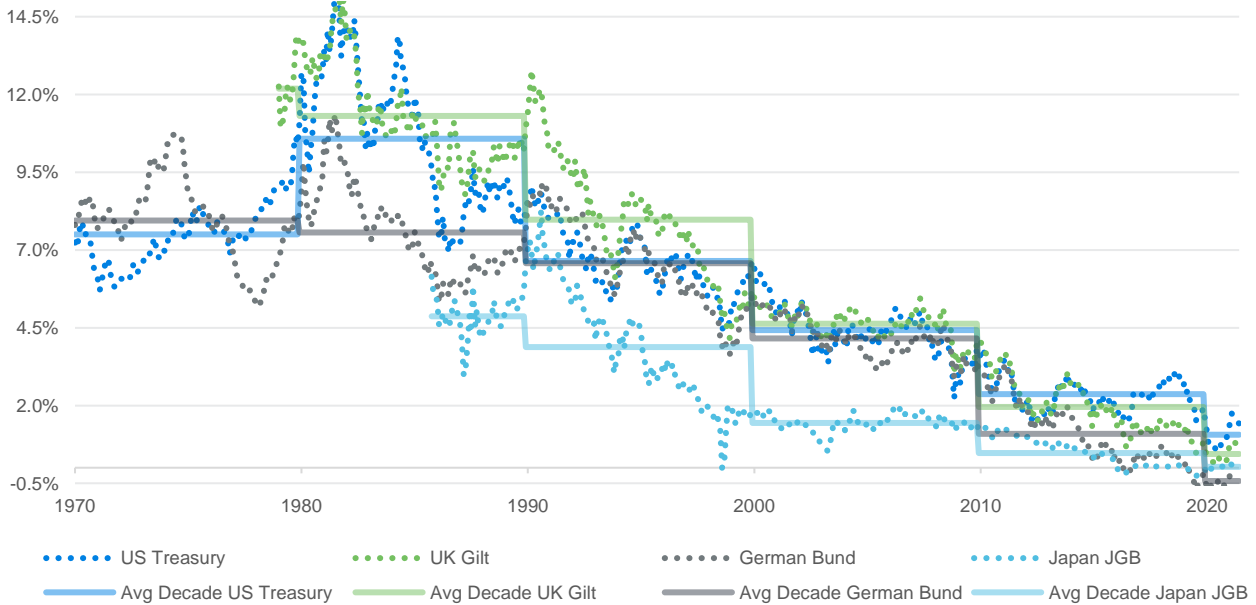
This paper starts with a chapter on the historical and current interest rate environment as well as expectations for future interest rates based on their most important economic drivers. Then, in Chapter 3 the impact of the current low interest rate environment on investment strategy and economic balance sheet management is analysed for portfolios of life insurers. Finally, in Chapter 4 we review of the impact of the interest rate environment on the design of life insurance and pension products. In this paper we aim to provide a thorough analysis of the global low interest rate environment and its consequences for life insurers. Throughout the paper, countries like the UK, USA and Japan are often used as examples to illustrate changes and developments that are discussed.

Economic background

We talk frequently about a “low interest rate environment” but our first task is to briefly consider what we mean by that, as the terminology itself is imprecise.

One lens we can use to explore this topic is historical. In the chart below we consider 10-year government bond yields in the UK, Japan, Germany, and the US for each decade since 1970. Note especially, the UK, US, and Japan, as these countries will be used as examples throughout the remainder of the paper.

FIGURE 1: PROGRESSION OF SELECTED AVERAGE 10-YEAR GOVERNMENT BOND YIELDS SINCE THE 1970S



Source: Refinitiv EIKON and Milliman.

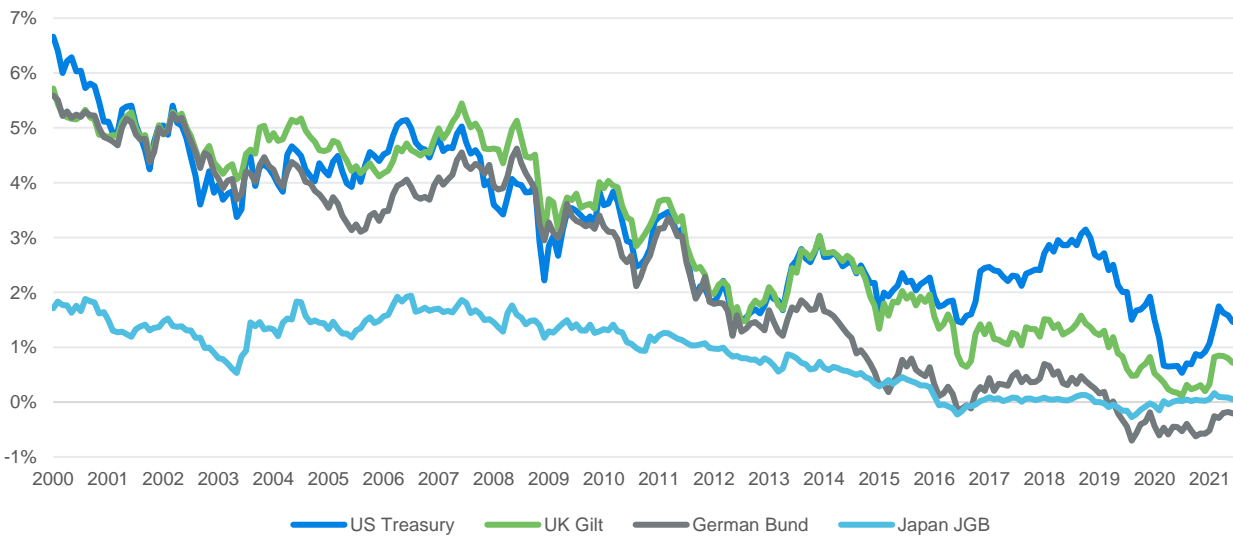
The average decade lines in Figure 1 show clearly the marked and persistent decline in nominal interest rates from the early 1990s to the present day. Furthermore, we can readily observe that this decline has been coordinated across multiple economies.

Another approach might be to consider the nature of the interest rate compensation required by investors for the risks of lending. Broadly we might take this as compensation for expected inflation, for the risk that inflation is higher than expected, for loss of utility from access to the funds lent (a term premium), and for exposure to the risk that funds will not be repaid (credit risk). If we consider lending to the governments of major developed economies, then we might take expected inflation as 2% being the target adopted by central banks in the UK, US, and Eurozone. Making some allowance for the other risks and assuming credit risk to be very low, then we might deem a 3% to 5% range for nominal interest rates to be a broadly “normal” range.

Very clearly, by either measure the current position justifies the description of a “low interest rate environment.”

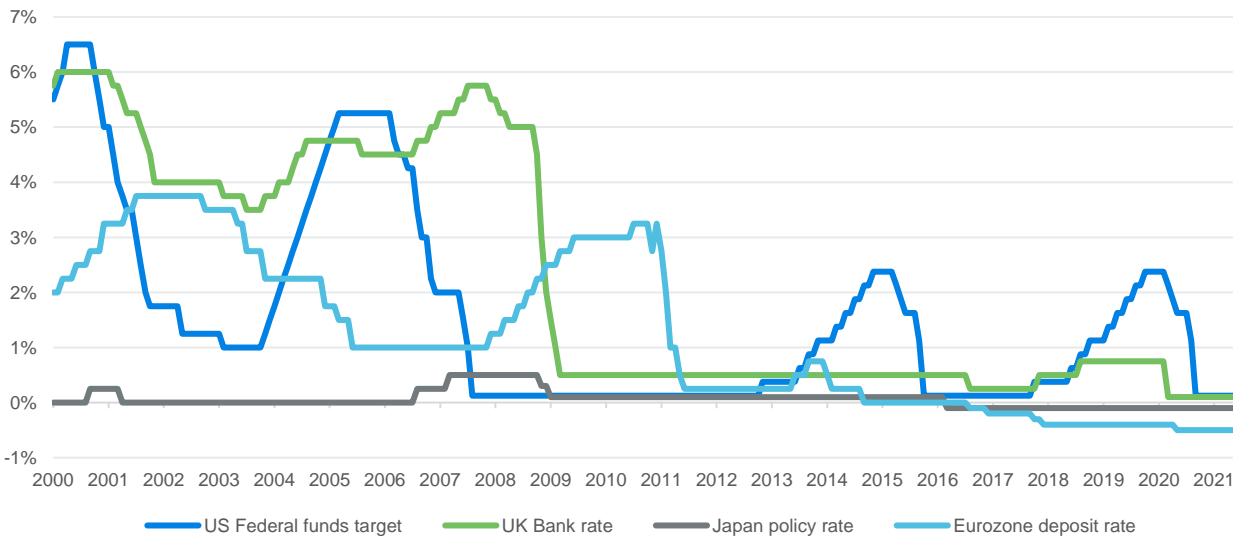
We have arrived at the current position via a long process by which, very broadly speaking, nominal interest rates have been in decline since we left behind the high inflation era of the 1970s and early 1980s. Figures 2 and 3 below provide some detail on more recent history since the turn of the millennium and, in particular, the marked and relentless decline in rates since the global financial crisis (GFC) of 2008–2009.

FIGURE 2: PROGRESSION OF SELECTED AVERAGE 10-YEAR GOVERNMENT BOND YIELDS SINCE THE 2000S



Source: Refinitiv EIKON.

FIGURE 3: RECENT CENTRAL BANK RATE HISTORY ACROSS THE US, UK, JAPAN, AND GERMANY



Source: Refinitiv EIKON.

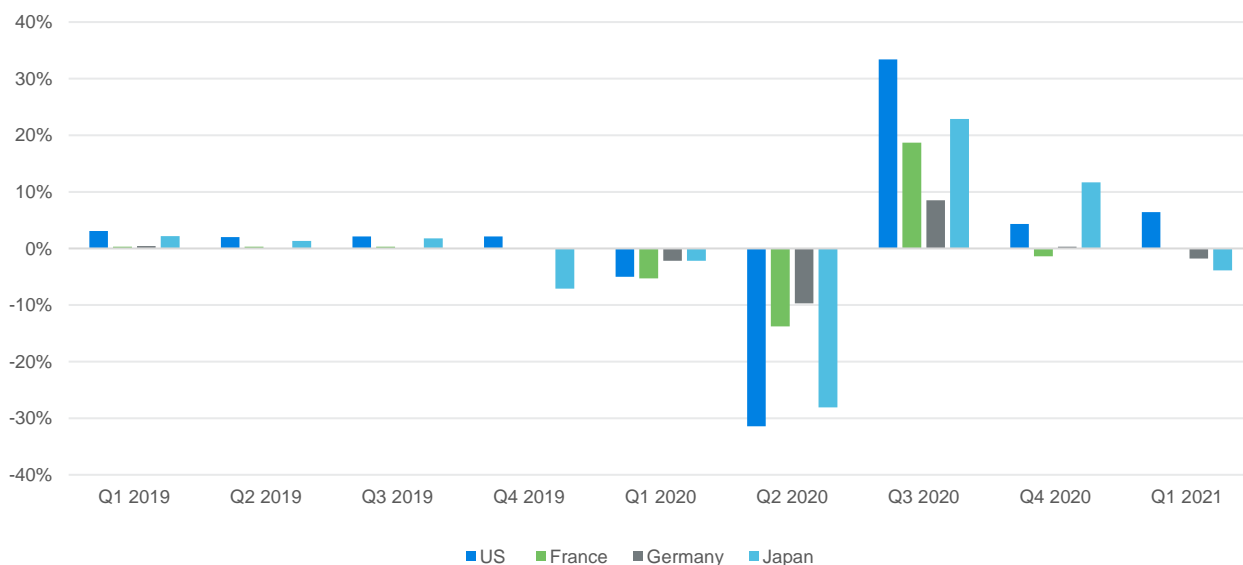
What to expect?

From where we stood in July 2021, the outlook was particularly uncertain; however, from the perspective of the future path of nominal interest rates over the next few years, we can summarise the key drivers as follows:

ECONOMIC GROWTH

Figure 4 shows the quarterly GDP growth (year-on-year) since 2019. The year 2020 saw a sharp recession in most economies as governments took various measures to contain the impact of the COVID-19 pandemic which resulted in negative shocks to both the demand and supply sides of the economy. During 2021, recovery is expected and, indeed in some economies such as the US, is already showing strong rebounds in GDP giving cause for optimism.

FIGURE 4: GDP IMPACTS OF THE COVID-19 PANDEMIC



Source: Refinitiv EIKON and Milliman.

However, the path ahead is far from clear and it is too early to judge just how robust the recovery will be. As government support schemes wind down over the coming months, the true impact on businesses and jobs will become more apparent and it seems likely there will be long-term damage, though this may be restricted to certain sectors such as travel, entertainment, and hospitality.

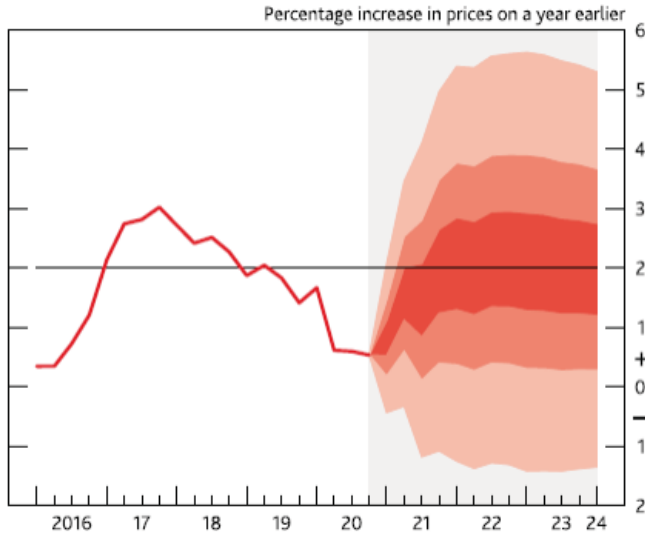
Turning to interest rates, *other things equal*, we can say that, should economic recovery prove robust, the scenario that interest rates will rise becomes more likely. On the other hand, central banks have made it clear that, should the recovery falter, they stand ready to provide further support through monetary stimulus. While the scope for such stimulus is undoubtedly much lower now, some reduction in rates could be effected via a combination of direct reductions in short rates and increases to quantitative easing (QE) programmes to depress longer-term rates.

INFLATION

Inflation has recently become extremely topical—the Bank of England (BoE) reports¹ that “for many years, the inflationary tiger slept. The combined effects of unprecedentedly large shocks, and unprecedentedly high degrees of policy support, have stirred it from its slumber. In this environment, the tiger-taming act facing central banks is a difficult and dangerous one.” The same speech noted a marked widening in the range of the BoE’s projected levels for Consumer Price Inflation (CPI) over 2021 to 2024, shown in Figure 5.

¹ Bank of England. Speech: Inflation: A Tiger by the Tail? Available at <https://www.bankofengland.co.uk/-/media/boe/files/speech/2021/february/inflation-a-tiger-by-the-tail-speech-by-andy-haldane.pdf?la=en&hash=78C0DB3A631A7B9E2DF6EFBCFE9B3D138D87C449>.

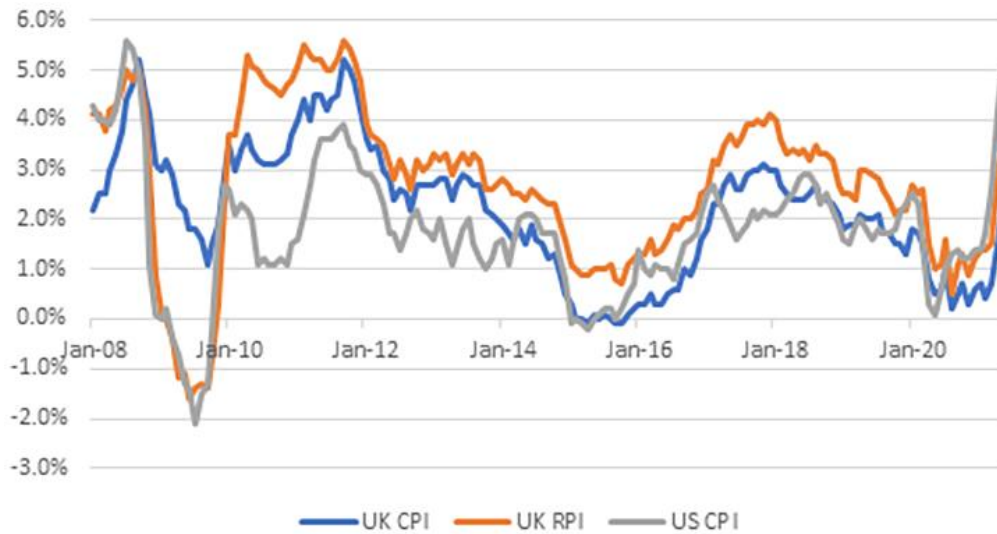
FIGURE 5: BANK OF ENGLAND PROJECTIONS FOR UK CPI AT FEBRUARY 2021



Source: Bank of England. Speech: Inflation: A Tiger by the Tail? Available at <https://www.bankofengland.co.uk/-/media/boe/files/speech/2021/february/inflation-a-tiger-by-the-tail-speech-by-andy-haldane.pdf?la=en&hash=78C0DB3A631A7B9E2DF6EFBCFE9B3D138D87C449> - page 2.

Since this speech by Andy Haldane of the BoE, there is certainly evidence that inflation is stirring. The latest results from both the UK and US indicate marked increases over recent months as shown in Figure 6.

FIGURE 6: REALISED INFLATION IN THE US AND UK 2008 – MAY 2021



Source: Milliman analysis using Bloomberg data.

The debate is currently ongoing between two camps:

1. Those who view the latest inflationary increases as purely a function of temporary demand-supply imbalances arising from the reopening of economies following the COVID-19 pandemic and therefore expect them to be transitory.
2. Those who see more persistent cost pressures in relation to both commodities and wages and therefore scope for inflation to run above central bank targets for a prolonged period.

In general, central banks are currently taking a dovish stance:

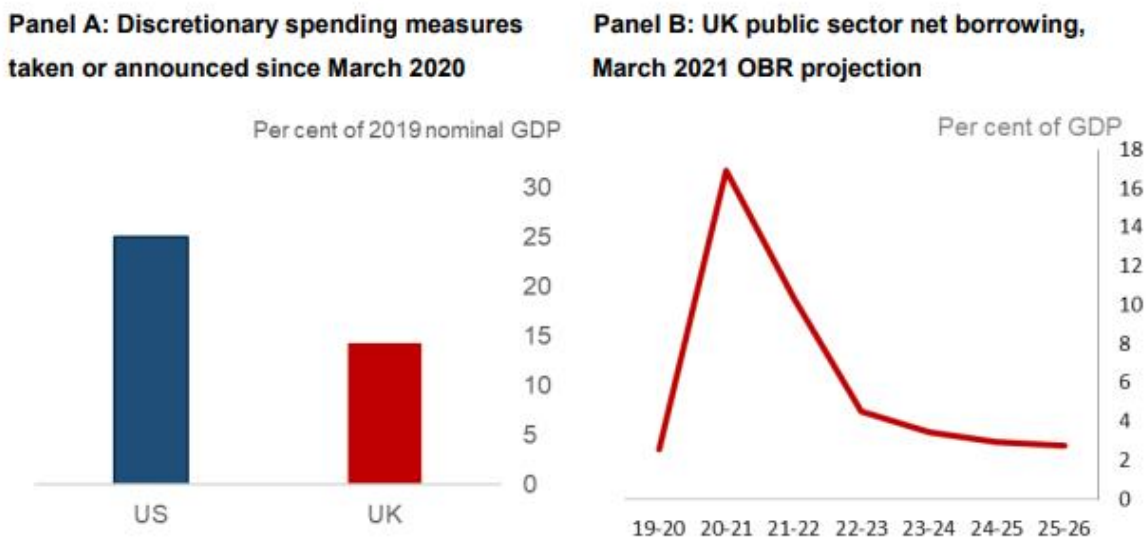
- **US** – The Federal Open Market Committee (“Fed”) moved in 2020 to a Flexible Average Inflation Targeting (FAIT) approach that aims to target 2% inflation on average over time. With inflation having run below the 2% target for some years, the Fed now appears comfortable with the idea that inflation may be allowed to run ahead of the target for a period of years consistent with the FAIT approach.
- **UK** – “The Committee does not intend to tighten monetary policy at least until there is clear evidence that significant progress is being made in eliminating spare capacity and achieving the 2% inflation target sustainably.”²

The reality is that only time will tell. However, turning to interest rates, what we can say is that, *other things equal*, an increase in inflation (if persistent) makes it more likely that interest rates will rise. On the other hand, if inflationary pressures subside, rates are likely to remain around current levels.

GOVERNMENT DEBT

The COVID-19 pandemic has prompted huge levels of fiscal support. In the US, a potential further USD 4 TN has been proposed by President Biden to target infrastructure development and to support American families. UK spending plans are perhaps less eye catching but imply significant budget deficits. This spending will need to be financed, leading to a huge amount of government bond issuance over the coming months and years. In addition, corporate investment is also expected to recover as economic activity picks up during 2021 and beyond.

FIGURE 7: FISCAL IMPACTS OF THE COVID-19 PANDEMIC IN THE US AND UK



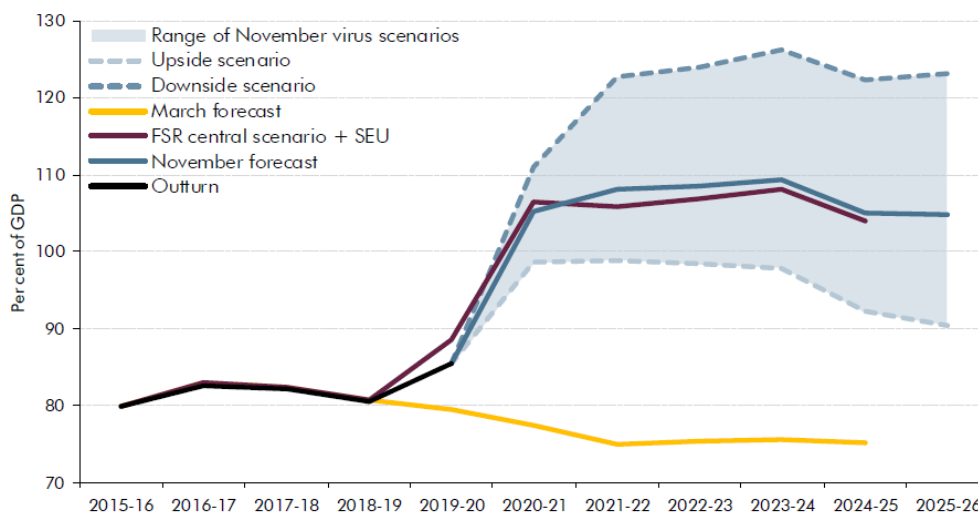
Source: Bank of England. Speech: Response to the Covid-19 pandemic: UK and US experiences, available at <https://www.bankofengland.co.uk/-/media/boe/files/speech/2021/march/silvana-tenreiro-response-to-the-covid-19-pandemic.pdf?la=en&hash=3EB9EBB5D1CCE587FA204DE2BE585E29028B9CC0> – page 14.

In its November 2020 Economic and fiscal outlook, the UK Office for Budgetary Responsibility (OBR) noted:

- “...debt reaches its highest level as a share of GDP since 1958-59”
- “Despite sharply higher debt, further falls in interest rates and further gilt purchases by the BoE under quantitative easing mean that the cost of servicing that debt is actually lower than we forecast in March.”
- “But the higher stock of public debt and the significant shortening in the effective maturity of that debt this year, - - -, has increased the vulnerability of the public finances to future economic shocks, in particular to a sharp increase in short-term interest rates.”

² Bank of England. Speech: Getting over Covid. Available at <https://www.bankofengland.co.uk/-/media/boe/files/speech/2021/march/getting-over-covid-speech-by-andrew-bailey.pdf?la=en&hash=6109B38B69A2520CEF38640E3687AF6915492BEC>

FIGURE 8: PROJECTIONS OF UK PUBLIC SECTOR NET DEBT AT NOVEMBER 2020



Source: OBR <https://obr.uk/efo/economic-and-fiscal-outlook-november-2020/> - Economic and fiscal outlook – November 2020.

The UK experience described here with public sector debt levels in relation to GDP being extremely high for a peacetime period is not at all atypical. Indeed, debt to GDP ratios are higher still in some other developed countries.

By classical economic theory, prices rise as demand increases, provided other things remain equal. Therefore, due to the increase in debt financing demand, interest rates should be rising. However, this scenario needs to be placed into context in that the increased financing is taking place against already very high levels of indebtedness in both the public and private sectors. In this situation, it is clear that rising interest rates are likely to place significant financial pressure on both governments and companies and provoke some serious questions over the sustainability of current debt loads.

CENTRAL BANKS AND MONETARY POLICY

Many central banks currently have explicit mandates to target price stability (e.g., 2% p.a. inflation) – *other things equal*, this would imply increasing interest rates when inflation rises. However, many central banks also have a wider mandate to support the real economy – *other things equal*, this might lean to keeping rates down to support recovery. The task of central bankers over the coming months and years will be to thread a path through the minefield of challenges noted above—we wish them luck as we all have a stake in their success or failure.

Bringing this together, there seems to be little evidence to expect a significant increase in interest rates over the short to medium term and so we should be prepared for the current low interest rate environment to continue for the time being. Having said that, in the light of the high levels of uncertainty surrounding many of the key interest rate drivers, it would not be a major surprise to see a general increase in the volatility of interest rates going forward.

Investment strategy and economic balance sheet management

In the early 2000s, insurance companies in Continental Europe and the UK developed a new view on their balance sheets, based on a market-consistent valuation approach. A well-known example was the introduction of Solvency II, but over time insurers have also increasingly introduced their own economic frameworks used for internal purposes.

The introduction has made interest rate risk more transparent and led to additional complexities on interest rate risk management. This holds in particular for life insurance companies, due to conflicting interests and technicalities for long-term liabilities due to the absence of a liquid market. The majority of life insurance products can be (more or less) classified into three groups with a distinction on the investment risk.

- **Non-linked products:** The first group of insurance products offers, post issue, no link to the investment return generated by insurance companies from investing premiums. From a customer's point of view, this means that the investment risk is taken by the insurers wholly. A typical life product from this group is guaranteed return life cover (many are closed to new business).

- **Linked products:** The second group offers a direct link to the investment return generated by insurance companies. Products falling into this group tend not to promise the investment return to customers, as a result, customers are bearing the investment risk. A typical product from this group is unit-linked policies.
- **Participating products:** The third group is somewhere between non-linked and linked groups. The investment return to customers is not fully guaranteed at inception. However, the linkage between the investment return generated by insurance companies and the return to customers tends to be looser than, say, unit-linked policies.

With the current low interest rate environment, life insurers offering these products have entered a new phase of challenges in which they have to consider investment strategies that will allow them to at least meet the required yield on liabilities while managing their economic value balance sheets in earnest. Clearly, the challenges are the biggest for the non-linked products and far more limited for the linked products.

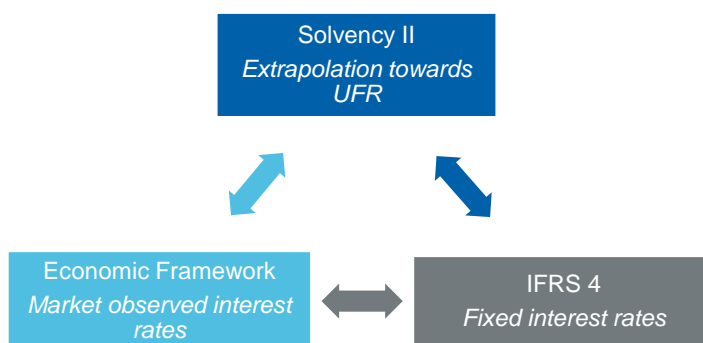
Complexities on interest rate risk management

In this section we aim to describe the complexity around interest rate risk hedging for life insurance companies and the contribution of low interest rates to that complexity. In addition, we discuss the impact on IFRS income statements as well as the impact of extrapolation and the impact of actuarial assumptions on the hedging strategy.

The complexity typically arises partly from the different treatments of interest rates in various regimes life insurance companies operate in, such as the regulatory solvency framework, the accounting framework, and a company's own economic reality.

As an example, we consider a set of long-term liabilities in Europe on an insurer's balance sheet. Firstly, on the regulatory Solvency II balance sheet these liabilities are valued using a discount curve based on a risk-free rate (RFR) curve extrapolated towards an ultimate forward rate (UFR). Secondly, at the same point in time, from an economic point of view an insurer can value the liability with a discount curve based on observed market rates. Thirdly, on the IFRS 4 balance sheet the liabilities are valued based on a fixed interest rate.³ These differences create a typical situation where not all frameworks can be optimised at once. As a result, a clear hedging objective including restrictions on all of the frameworks relevant to the insurer, is required to manage this situation.

FIGURE 9: REGULATORY REGIMES EU AND UK INSURERS OPERATE WITHIN



This complexity has increased due to the falling of the interest rates over the past decade. As market rates declined, the gap between these rates and the fixed interest rate used under IFRS has widened.⁴ Simultaneously the UFR effect has become an increasingly larger factor, also resulting in a strong negative drag that is itself sensitive to interest rates, on the capital generation of insurance companies. As forward rates implied by the valuation curve with the UFR are higher than the actual market forward rates, there is an ongoing increase of the liability value. In addition, the UFR reduces over time which also results in increasing liability values. Milliman has undertaken extensive analysis and published a paper on the long-term effects of the UFR Drag.⁵

³ This is a simplified representation of valuation under IFRS 4, however it is sufficient for the purpose of this paper.

⁴ IFRS 4 recognizes market valuation to some extent using the Liability Adequacy Test (LAT).

⁵ A series of practical papers on Interest Rate Risk Management under Solvency II Part 3: Solvency II hedging, available at <https://www.milliman.com/en/insight/a-series-of-practical-papers-on-interest-rate-risk-management-under-solvency-ii-part-3>.

The issue with the fixed interest rates is likely to be resolved by the introduction of IFRS 17, as the fixed rate is replaced by a more market-consistent set of discount rates. More details on setting the discount rates under IFRS 17 can be found in another Milliman’s research paper.⁶

IMPACT ON IFRS INCOME STATEMENTS

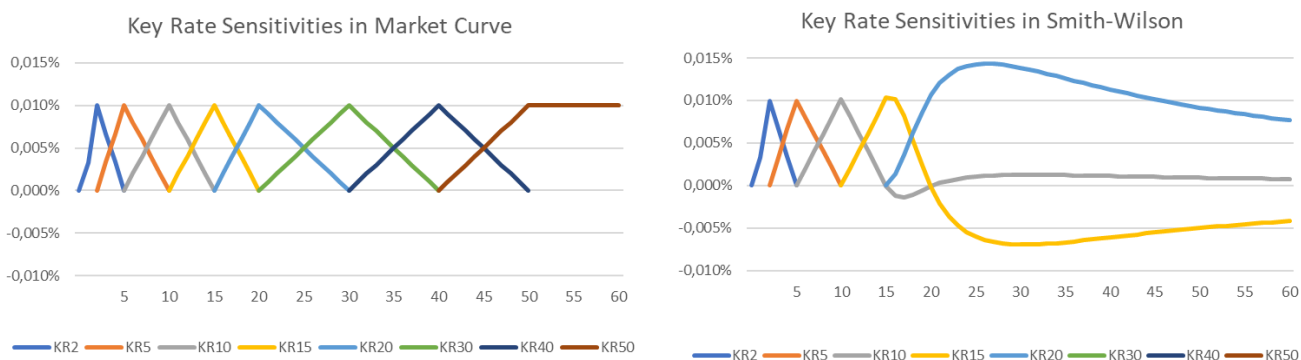
Over the past two decades, the lower rates have had a strong negative impact on the IFRS income statements. Mainly in northern Europe, this is due to two effects. The first occurred to reinvestments resulting from asset-liability management (ALM) mismatches where the assets typically had a shorter duration than the liabilities they were backing. Consequently, during the first few years of a product, assets and liabilities were well matched in terms of investment returns, but when the assets matured, the reinvestments took place at a lower interest rate. The second occurred when insurers got access to a wider range of assets to consider in their strategic asset allocation (SAA) studies. The proposed reinvestments from such studies improved the investment return based on an economic risk-adjusted return framework. However, the rebalancing typically came at a cost of IFRS income where an immediate investment result (below the line) was booked but the recurring operating return (above the line) was spread over time. From an economic perspective this transaction would have no significant impact on the economic profitability in terms of capital generation, however from both a disclosure and internal goal setting perspective, the impact on IFRS could be undesired.

ROLE OF EXTRAPOLATION

The low interest rate environment has put more emphasis on the exact technique to be used to extrapolate the risk-free curve at the long end. Various techniques and methodologies are used across the world’s different regimes. All techniques and methodologies have their pros and cons. For example, the Solvency II regime implemented the Smith-Wilson method, which is designed to extrapolate the yield curve from a last-liquid point (LLP) towards UFR.

One of the biggest issues with the Smith-Wilson method relates to the anomalies around certain key rates. Figure 10 shows the implied key rate sensitivities that are based on the pyramid vector approach. The anomalies of the Smith-Wilson, the inflated sensitivity for 10Y and 20Y, and the inverted sensitivity for 15Y are clearly visible from the right chart.

FIGURE 10: THE IMPACT OF THE SMITH-WILSON EXTRAPOLATION METHOD ON THE KEY RATE SENSITIVITIES



More details on the impact of extrapolation on hedging strategies can be found in another Milliman paper.⁷ Note that an alternative extrapolation methodology is proposed in the 2020 review of the Solvency II regulations. This alternative method has solved the issue for the 10Y sensitivity, but still contains the anomaly for the 15Y and 20Y although in a reduced size.

⁶ Setting discount rates under IFRS 17: Getting the job done, available at <https://us.milliman.com/en/insight/setting-discount-rates-under-ifs-17-getting-the-job-done>.

⁷ Introduction to the changes in the Solvency II yield curve and the implications for hedging, available at <https://www.milliman.com/en/insight/introduction-to-the-changes-in-the-solvency-ii-yield-curve-and-the-implications-for-hedging>.

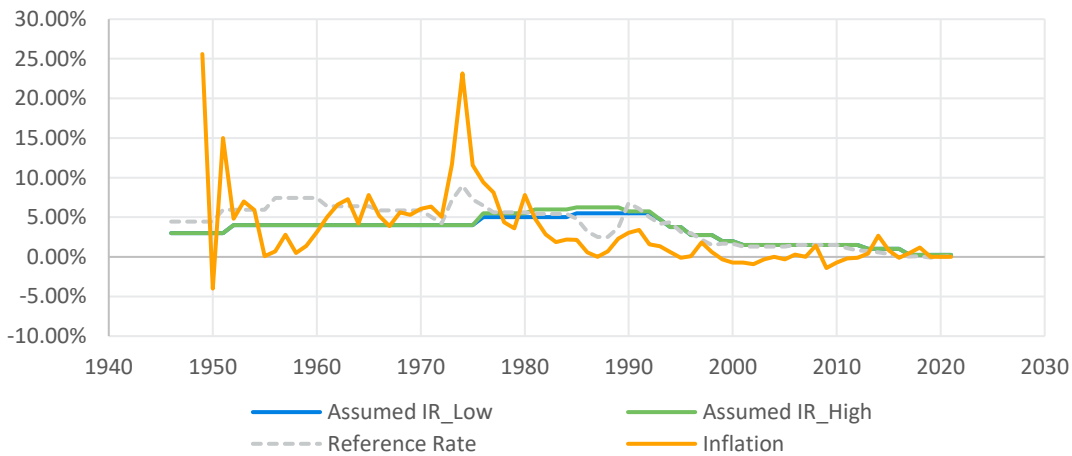
IMPACT THROUGH ACTUARIAL ASSUMPTIONS

Contrary to Europe and the US, interest rates in Japan were already very low at the start of the century, see Figure 2. Hence, Japanese insurance companies have dealt with the low interest rate environment for more than 20 years. Therefore, the Japanese case will be used as a precedent to consider the impact of the low interest rate environment on insurance companies through changes in actuarial assumptions, as well as future challenges.

Lapse and Surrender (L&S) and new policies' expected interest rates in a low interest rate environment

In an environment of low interest rates, changes in the preference, taste, and behaviour of customers and policyholders are expected to be a side effect. Figure 11 shows a graph of the guaranteed interest rate, the base rate used as a reference in setting the guaranteed interest rate, and the historical inflation in Japan.

FIGURE 11: HISTORICAL CHANGE OF GUARANTEED (ASSUMED) INTEREST RATE IN JAPAN

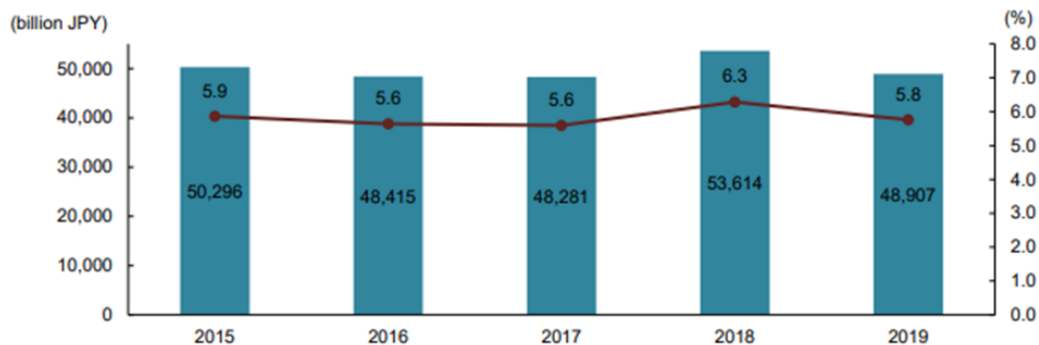


Sources:
 IMF data (<https://www.imf.org/en/Publications/WEO/weo-database/2021/April>)
 JA Kyosai Research Institute (<https://www.jkri.or.jp/PDF/2012/Rep125inoguchi.pdf>)
 Mitsui Sumitomo Aioi Life Insurance (<https://www.msa-life.co.jp/customer/info/pdf/10yearbondyield.pdf>)

Changes in new policies' guaranteed interest rates

The average guaranteed interest rate of current in-force policies is less than 2% per annum. This average has been gradually decreasing from over 4% in 1993 and before, which is the result of continuous efforts to reduce the guaranteed interest rate of new business for about 30 years. Since 2000, new contracts have been acquired with guaranteed interest rates lower than 2%. Considering the current level of interest rates, the L&S rate of the group of contracts with a guaranteed interest rate above 2% is expected to be lower than that of the most recent contracts. Figure 12 shows the L&S rate of individual insurance policies and individual annuities (right axis), and the investment yield (in JPY) of the general account since 1989 (left axis).

FIGURE 12: AMOUNT AND RATIO OF LAPSES AND SURRENDERS OF INDIVIDUAL INSURANCE



Source: The Life Insurance Association of Japan Life (<https://www.seiho.or.jp/english/statistics/trend/pdf/2020.pdf>).

Changes in L&S rates

In the low interest rate environment since 2000, a continuous falling in the L&S rate has been observed in Japan. This can be attributed to the impact of the relatively higher guaranteed interest rates on in-force policies as a result of the continuous reduction of the guaranteed interest rate offered on new policies. In general, blocks with a low L&S rate are contracts with so-called "negative profit interest margin policies" because the investment yield achieved does not cover the guaranteed interest rate of the insurance company. The L&S rate of these contracts is low since the consumer would nowadays pay more for the same product due to lower guaranteed interest rates.

Changes in the impact of L&S rates on earnings

It is usually desirable to keep the L&S rate as low as possible from the perspective of profitability. However, this is not easy to do, and controlling the L&S rate has long been a management challenge. In fact, before the year 2000, it was rare for the L&S rate to be below 7%. However, in the current low interest environment it remains to be seen whether a low L&S rate is desirable from an earnings perspective. Since, a decrease in the L&S rate of policies with a high guaranteed interest rate (i.e., negative profit interest margin policies), means an increase in interest losses, a decrease in the L&S rate does not necessarily mean an improvement in earnings.

Embedded risk in interest rate risk hedging

Figure 13 shows the breakdown of policy reserve balances for in-force policies at the end of 2019 averaged over major insurance companies that disclose embedded value (MCEV/EEV) in Japan, by expected interest rate.

FIGURE 13: THE RESERVE WEIGHT OF BUSINESS WITH GUARANTEED INTEREST RATE

PERIOD	GUARANTEED INTEREST RATE	RESERVE WEIGHT OF BUSINESS	DISTINCTIVE PRODUCTS IN GENERAL ACCOUNT
~1996	Over 3.75%	19.6%	Whole Life / Endowment / Individual Annuity
1996~2000	2%~2.75%	6.0%	Lapse Supported WL / Medical / Cancer
2001~2012	1.50%	37.6%	Cancer WL/ Medical WL (Lapse Supported/without)
2013~2016	1.00%	28.0%	Underwriting relaxation type products
2017~	0.25%	8.7%	Foreign currency denominated savings

Source: Annual report of FY2019 publication-based figures of 11 major companies that publish MCEV/EEV results in Japan, etc.

Stable L&S rate block

Policies written before 1996 with the guaranteed interest rate of 3.75% or higher have a relatively large burden of negative marginal profit and loss, which has been recognized and continuously dealt with by insurance companies as a management issue, mainly in terms of asset management, to date. Given the current level of interest rates, it is difficult to assume that interest rates will rise to the level of this block of contracts in the future, leading to a continually declining L&S rate. However, since the share of this block of contracts in the overall business is diminishing, the impact is expected to be limited in the future.

Blocks for which the interest rate sensitivity of the L&S rate may increase in the future

In the other blocks, especially the blocks from 2001 to 2012 and 2013 to 2016, there are many contracts that were signed for savings purposes despite the low guaranteed interest rates amidst the downward trend in long-term interest rates. This makes them more susceptible to cancellation and L&S due to interest rate fluctuations than the stable L&S rate block.

In the past, unlike savings products, protection and medical insurance were not considered to be highly sensitive to interest rate changes in terms of the L&S. However, as the internet becomes more and more used to purchase insurance and new coverage products are offered, it is expected that people will change their insurance policies more frequently than before.

For insurers, the impact of interest rate fluctuations on the L&S rate of relatively new block policies that were sold after the start of this low interest rate environment will need to be closely monitored in the future, as the balances are also large.

Review of dynamic L&S rate function for new hedging strategies of IR risk

Use of dynamic L&S rate function and future possibilities

With the spread of EV practice in the 2000s for the purpose of evaluating the internal management value of each company, it is not so unusual nowadays to incorporate the dynamic L&S rate function in the contract valuation model for the measurement of time value of options and guarantees (TVOG). The discussion of the dynamic L&S rate function is

often discussed for savings products. Against the background of the loss of policyholder dividend-paying practices in the prolonged low interest rate environment and the increase in the launch of non-participation contracts, it has not become a major discussion in the industry, and the practice of each company deciding to adopt the function based on its own judgment has taken root. There is a wide range of discretion in which blocks to apply it, and what functions to set.

Also, in an environment such as Japan's, where interest rates have been low for a long period of time, it is difficult to set up functions calibrated based on actual experience rates. This may lead to an optimistic assessment of risk. As a result, the incentive to actively use dynamic L&S rate function is generally not high, especially in the valuation of new policies. Therefore, the adoption of the dynamic L&S rate function in the determination of the value of non-participation insurance and medical insurance policies, which have become the mainstay of new policies after the low interest rate environment, is expected to vary from company to company.

In an environment where there is no significant change in the level of interest rates, there is a certain rationale in not adopting a dynamic L&S rate function for non-participating insurance and medical coverage products. On the other hand, if the interest rate level rises, and pricing competition among companies again raises the guaranteed interest rate and offers lower premiums, the L&S rate may rise due to an increase in demand for transfers, even for non-participation insurance and medical products.

Re-validation and re-examination of dynamic L&S rate function

From an ALM perspective, in controlling the interest rate risk of a company's value, long-term liabilities are generally hedged against interest rates by purchasing long-term assets with limited flexibility in the maturity date. In this case, the accuracy of the duration and convexity of the liabilities being hedged is critical. In general, the non-adoption or the adoption of an optimistic dynamic L&S rate function can lead to a larger evaluation of the value of the contract, but at the same time has the side effect of overestimating the duration and underestimating the convexity. Designing and adopting a dynamic L&S rate function that at least takes into consideration the impact of future forward rate movement and other factors used in the economic valuation may result in a more conservative valuation, but will also allow for a deeper analysis of the risk of potential interest rate hikes.

In recent years, many insurance companies in Japan have been purchasing fixed-income assets to reduce the duration gap, and as a result, the impact of a decline in interest rates has decreased significantly compared to the past, as evidenced by the published MCEV and EEV figures. On the other hand, the increase in company value when interest rates rise has also become limited. If a company overestimates the realization of the value of new business under low interest rates, it is taking on the risk of further loss of value if interest rates rise.

The future of the economy after the COVID-19 pandemic remains particularly uncertain. However, considering that the discussion about the possibility of rising interest rates has already started, it will be important to take stock of the dynamic L&S rate movement before there is a major change in interest rates. Moreover, the dynamic L&S rate functions should be reevaluated based on a comprehensive judgment that includes, not only the judgment of the value of new business, but also asset management measures to control interest rate sensitivity. In the current fiscal year (2021), some mutual insurance companies have started to restore policyholder dividends after a long absence. This can be attributed to the fact that measures to maintain solvency even in the long-lasting low interest rate environment have come to an end, and that companies are returning part of the surplus that has been generated in excess of necessity to policyholders. In setting the dynamic dividend rate function in the case of par policies, it is very important to be consistent with the dynamic L&S rate function that is set at the same time.

In this section, we have examined the impact of the low interest rate environment on actuarial assumptions by looking at the situation in Japan as a precedent, which has probably been suffering from the ultra-low interest rate environment for the longest time in history. Of course, it is not certain that other countries suffering from low interest rates will find this situation useful in the future. However, in any case, an appropriate liability valuation enables a comprehensive ALM strategy for interest rate risk control, utilizing not only fixed-income assets but also derivatives such as interest rate options. The consideration of the dynamic L&S factor will also be important in assessing the illiquidity of insurance liabilities, which will be referred to in the process of determining the adjustment spread to be considered in the discount rate for the economic valuation of insurance liabilities. In this sense, we recommend that insurers re-examine and revalidate the dynamic L&S rate, where applicable, as a point of discussion in actuarial modelling with a view to potential future interest rate hikes.

Other challenges on investment and ALM strategies

WHY IS THE RETURN OF INVESTMENT IMPORTANT TO INSURERS?

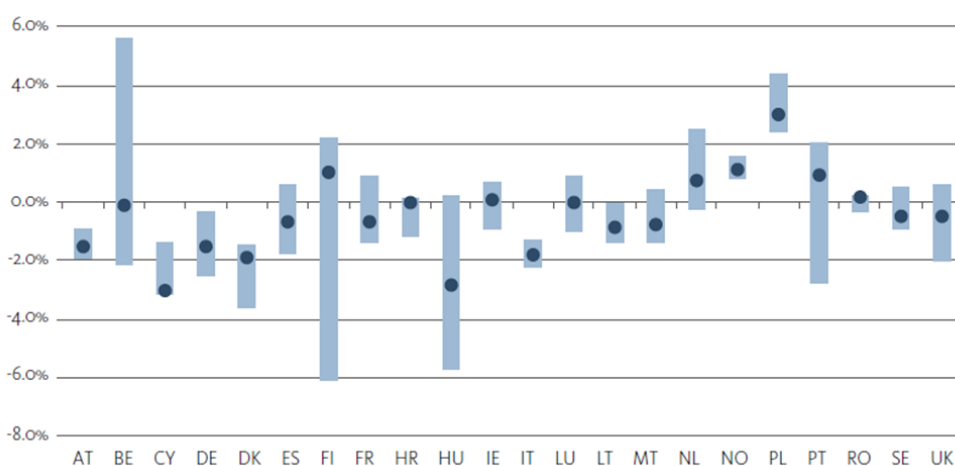
The return of investment is viewed as core to the business model of many insurance companies in the modern financial world, particularly for those which offer longer-term protection to customers. For most life insurance products, typically there is a relatively large period of time between an insurer receiving premiums and paying claims. In some cases, such as annuity products, insurance obligations due to a claim can last for decades. To be able to meet these obligations now and in the future, insurers need to invest appropriately and wisely, while taking into account the risks that may arise from the day-to-day running of the business, such as liquidity risk. COVID-19 showcased very recently that a single risk event can cause problems which can, directly or indirectly, cause many insurers difficulties if their business had not been carefully managed. Besides meeting claims from customers, the return of investment helps an insurer meet operational expenses incurred for running the business, meaning only what has been left can be kept by the insurer as profit.

PUBLIC YIELD AT HISTORICAL LOW

From an insurer's perspective, investment return generated for non-linked products is generally more important than for linked products. Take the guaranteed return life insurance plan as an example (that is largely closed to new business in UK and European markets), beside the life risk protection this product usually also offered a guaranteed interest rate on these policies. These guaranteed returns stay constant over the duration of the policy, which can be over a decade, or in some cases the whole life. The common investment practice to achieve these promised returns is to invest in a mix of assets with an expected return compatible with (or a bit above) the guaranteed interest rate at the time the policy is issued. However, many years following the issuance of these policies, the market has seen returns decrease significantly. This has led to the situation in which the promised returns have become high compared to the current investment yields. Figure 2, presented in the second chapter, also shows the trend of decreasing returns from bonds issued by major European governments since 2000. This is significant since government bonds are usually an important part of the asset portfolio used by insurers to back the insurance liability of this type of product. Also, yields on government bonds are used as a reference point for setting the yields offered on corporate bonds, another asset class used to back insurance liabilities.

Consequently, many insurers which offered this product in the past have suffered some significant extra cost of continually servicing these policies on their balance sheet because the current market rate had dropped significantly below the guaranteed interest rate (that was used in pricing the product), causing a drag to the profit they are able to earn. Figure 14 below shows that, in many European markets, the spread of investment return over guaranteed rate has turned out to be negative (measured by the medium return).

FIGURE 14: SPREAD OF AVERAGE INVESTMENT RETURN OVER GUARANTEED INTEREST RATE FOR EU LIFE INSURERS (IN %; MEDIUM, INTERQUARTILE RANGE AND 25TH AND 75TH PERCENTILE)

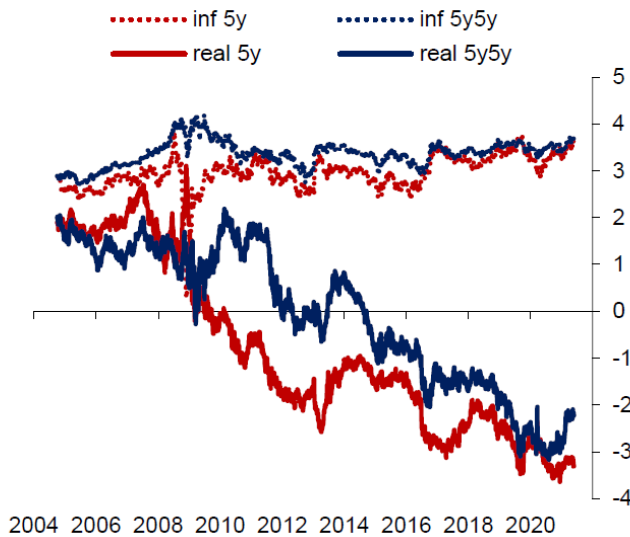


Source: EIOPA Financial Stability Report (December 2019) - https://www.eiopa.europa.eu/document-library/financial-stability-report/eiopa-financial-stability-report-december-2019_en.

While the nominal return from investment has decreased significantly in the past decade, inflation has been relatively stable meaning that the real investment return has absorbed most of the adverse movement.

The chart below shows that in the UK the real rate gradually went into negative territory soon after the 2008 financial crisis. Inflation-linked assets are commonly used by insurers to back real liabilities. With a negative real rate, the cost of providing insurance products offering real benefits in the UK has significantly increased in the past 10 years⁸.

FIGURE 15: UK REAL AND INFLATION RATES

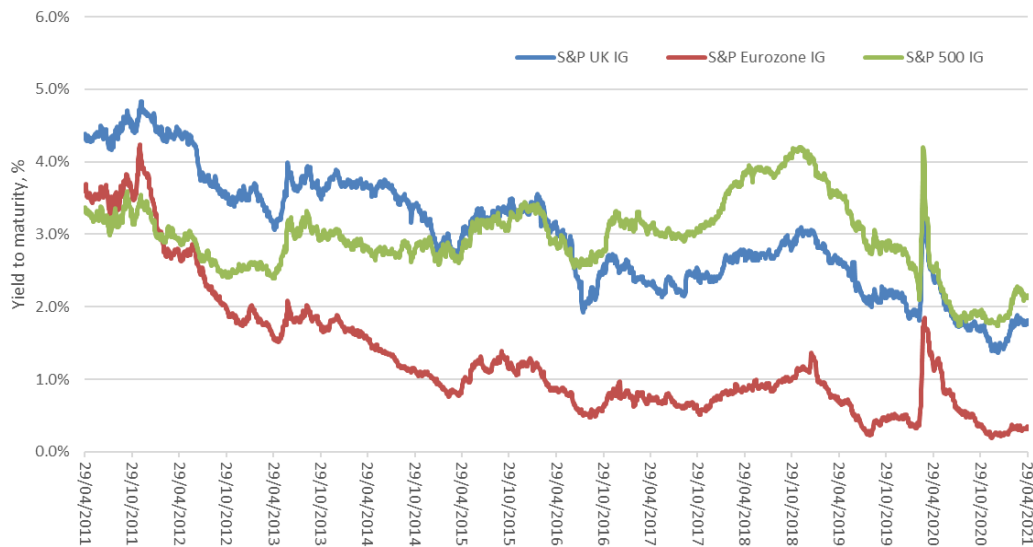


Source: Bank of England - What are government bond yields telling us about the economic outlook? – Speech by Gertjan Vlieghe, available at <https://www.bankofengland.co.uk/-/media/boe/files/speech/2021/may/what-are-government-bond-yields-telling-us-about-the-economic-outlook-speech-by-gertjan-vlieghe.pdf?la=en&hash=12CD87677EE126D04A0F831672D18190E1410F74>.

In addition to government bonds, corporate bonds are also a traditional investment by insurers in order to back insurance reserves and own funds. With an appropriate governance around the credit risk management, corporate bonds can offer a substantially higher risk-adjusted return for investors compared to (high-quality) government bonds. In order to achieve that, the majority of corporate bonds purchased by insurers are those investment grade (rated BBB or above, based on Fitch/S&P), and publicly traded.

However, as shown in Figure 16, the performance of standard corporate bonds over the past decade has been going down. The yield-to-maturity has reduced by about 60% for a typical investment grade corporate bond portfolio denominated in GBP, by about 90% if denominated in Euro, and by about 40% if denominated in USD.

⁸ Fig15 – “5y5y” refers to the 5 year rate in 5 years’ time.

FIGURE 16: INVESTMENT GRADE (BASED ON THE ISSUER RATING) CORPORATE BOND YIELD TO MATURITY

Source: S&P Dow Jones Indices - For UK IG corporate bonds: S&P U.K. Investment Grade Corporate Bond Index - S&P Dow Jones Indices (spglobal.com). Available at <https://www.spglobal.com/spdji/en/indices/fixed-income/sp-uk-investment-grade-corporate-bond-index/#overview>.

Nonetheless, we recognize that there is still some yield differential observable in different regions. For example, we can see a sizeable gap between the expected return offered by bonds denominated in Euro, compared to those denominated in either GBP or USD.

THE SEARCHING FOR YIELD

As a consequence of the general trend in market observed in the past decades (as discussed and shown in the last section), insurers have adapted their investment strategies. The two most notable developments in current investment strategies used to achieve better investment performance, compared to that of 10 years ago, are:

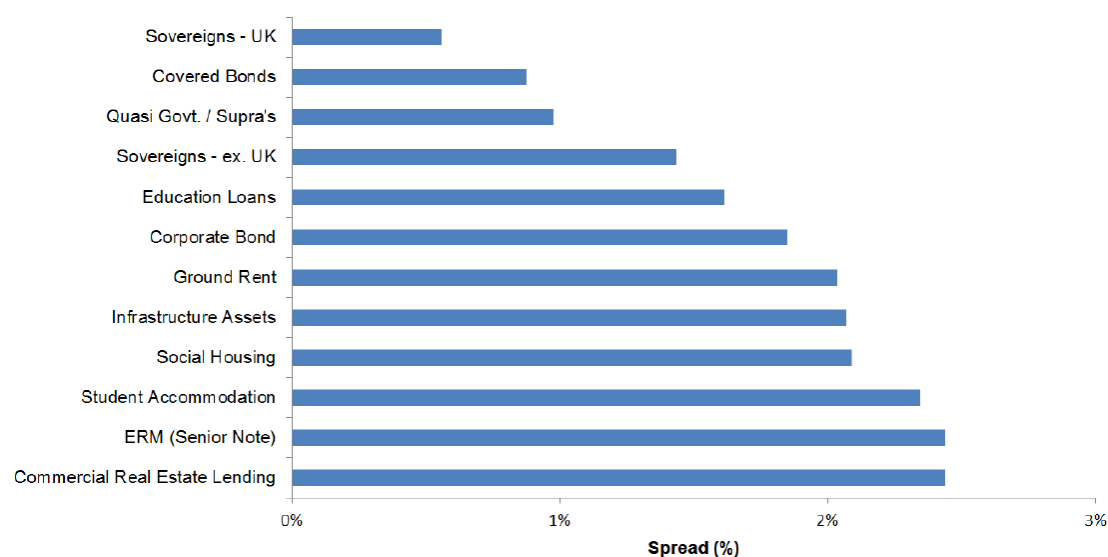
1. A trend of moving from publicly traded to non-publicly (or privately) traded credit
2. A trend of investing in foreign currency assets to back domestic liabilities (with appropriate currency risk hedge)

Privately traded assets

In contrast to the assets that are publicly listed and traded, private assets can cover a broad range, and can include any assets with features of not being quoted publicly and/or without a standard structure. These assets may not be sourced as easily as publicly traded assets, and hence require specialized investment knowledge and skills. Some assets may involve complex asset structuring or a lock-in period.

Due to these unfavourable features, i.e., illiquidity and idiosyncrasy, private traded assets tend to offer attractive returns to willing investors. Take the UK's annuity market as an example. Life insurers who are active in the retail and corporate annuity business market are long-time investors in private assets, or illiquid assets as referenced by the BoE. A speech from the BoE (back in 2018) has highlighted the significant extra spread insurers expect to earn from investing in these types of assets, compared to more traditional assets like government and corporate bonds.

FIGURE 17: AVERAGE SPREAD BY UK MATCHING ADJUSTMENT ELIGIBLE ASSET CLASS



Source: Reference date: 31 December 2016, speech by David Rule, Bank of England, available at <https://www.bankofengland.co.uk/-/media/boe/files/speech/2018/annuity-is-a-very-serious-business-speech-by-david-rule.pdf?la=en&hash=A2AA2FCD12D5C39CFAB94068EB2183CFF1FC3E29>.

Based on the supervisory information submitted by insurers, the BoE estimated that the total illiquid assets to be held by annuity providers in the UK would reach about £110 BN by year 2020, this would also see the illiquid asset backing ratio increasing from 25% in 2016, to 40% by 2020.⁹

Foreign currency investments

In addition to entering into the private credit market, insurers have also increased their investment footprints in regions away from their home countries. Foreign currency investments are attractive to institutional investors for broadly two reasons:

1. They can offer diversification benefits, especially for those asset class thinly traded in the domestic market.
2. They can offer additional yield pick-up, despite the cost of hedging the currency risk.

ASSET AND LIABILITY MANAGEMENT CONSIDERATIONS

It is probably fair to say the extra investment yield is not likely to come without taking extra risk. Some risks can be hedged, partly or fully, by using certain financial instruments, such as currency forwards. Some risks cannot be hedged through the market, so minimizing the risk exposure though relies on certain specialized skills of subject matter experts, or by implementing a well-design risk monitoring framework to make sure the extra risk taken is within the appetite.

Foreign currency risk

Inevitably, by investing in foreign currency assets used to back domestic liabilities, insurers will be exposed to the market volatility of the exchange rate of the foreign currency, i.e., the risk of the foreign currency depreciating in value against the home currency. For insurers mainly operating in the domestic market, generally there is no appetite to take on this type of risk, and hence the risk is normally fully hedged by using currency forwards, for example, by setting up a rolling programme depending on the duration of the assets in question. There is a financial cost associated with buying those hedges, which will reduce the extra investment return expected to be generated. In addition, it requires an insurer to either set up a team to manage those hedges internally or outsource the operational activity to specialists externally. Insurers should be cautious; even though the foreign currency risk is fully hedged, part of the risk exposure may get transformed into another form to re-emerge on the insurers' risk registers, one of which could be liquidity risk.

⁹ Bank of England, workshop: UK Insurers Investments in Illiquid Assets – A Perspective from Supervision, available at <https://www.bankofengland.co.uk/-/media/boe/files/events/2017/july/workshop-for-heads-of-insurance-adam-mckay-july2017.pdf?la=en&hash=FD7E30334848ABD9F700BF604609D6622EBA3360>.

Liquidity risk

The liquidity risk profile of an insurer may change as a result of the searching for yield activities. The additional liquidity risk taken on by the insurer can be a result of investing directly in illiquid/private assets, where a regulated active market to trade may not exist; or transformed from another risk, for example, by taking out currency hedges and exposing them to the risk of extra collateral being called. Insurers that choose to invest in either privately traded assets or use derivatives to hedge the currency risk, need to assess the effect on liquidity and the consequences for the liabilities. If necessary, a holistic review of their existing liquidity risk management frameworks should be undertaken to ensure all the on- and off-balance sheet liquidity risks have been taken into account in managing their liquidity risk exposure.

Idiosyncratic risk

Most privately traded assets expose the asset holders to non-standard risks, or idiosyncratic risks, to some extent. This is one of the main reasons why those assets may not be traded publicly in the first place. Examples of those idiosyncratic risks are:

- Direct debts or loans to property development companies may expose an insurer to the property development risk.
- Infrastructure investments may expose an insurer to the risk in the construction phase, or the change in the price of energy supply.
- Mortgage loans may directly/indirectly expose an insurer to the change in the price of commercial or residential properties.

Idiosyncratic risks need to be managed by subject matter experts equipped with relevant knowledge and experience. Furthermore, insurers may find it a complex task to fully identify all sources of the idiosyncratic risk and quantify them in an appropriate manner to allow for them in the valuation of the underlying assets.

Product development

In this section, we review how the low rates environment has, thus far, influenced features of life insurance and pension product design. We then look ahead and consider the further impacts we might expect under our working hypothesis that interest rates remain low for some years to come.

Historical overview

Nominal interest rates have been falling for about the last 30 years. We recognise these are not the only driver of changes to the design of life insurance products over this period, but they have been a key influence. Hence, in this section we lay out the main changes that have occurred that we believe have a strong linkage to interest rates. We will illustrate the changes that have taken place with examples from different national markets, in particular France, Japan, and the UK.

REDUCTION OR ELIMINATION OF HARD GUARANTEES¹⁰

We explore this through the lens of the Japanese market, where one remarkable change in product design has been a marked shift from savings-type products (as offering hard guarantees became unsustainable for insurers as interest rates fell) to protection type products less impacted by interest rates. From the insurer's perspective, it became difficult to earn interest margins so they had less incentive to develop new savings-type products. On the other hand, from the consumers' perspective, there was less incentive to buy savings-type products as a high return investment. The key points here are:

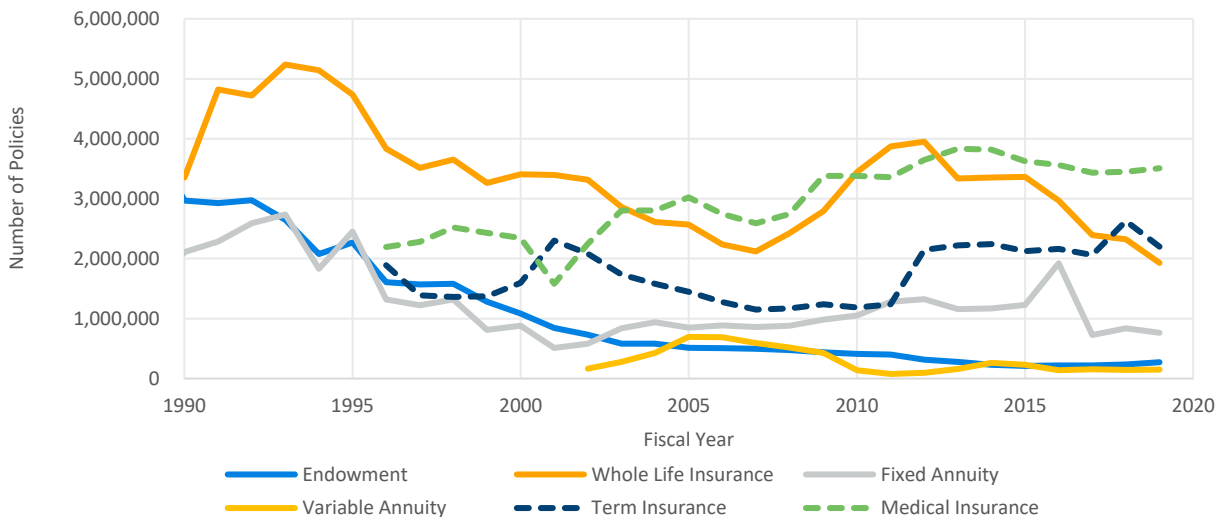
- Before 1990, endowment and whole life insurance, which have a large savings component, dominated the Japanese life insurance market.
- During the 1990s, as interest rates declined, the major savings product shifted away from whole life with a term rider, which had an additional protection component. The importance of the savings component became relatively small.
- In the 2000s, medical insurance began to dominate the market as more profits could be generated from morbidity margins. On the other hand, insurers started selling variable annuity (VA) and individual annuities through the bank channel. Single-premium whole life products through the bank channel also became popular. These changes occurred, not only because of low interest rates but also deregulation. The deregulation of the bank channel cultivated new consumer demands due to the synergistic effect. Lapse supported products, which have low/no cash value, were also expanded.

¹⁰ By "hard guarantees" we mean explicit contractual commitments defining a minimum benefit(s) to the policyholder, for example, a return of premium or a minimum level of investment return.

- Most recently, in 2010s after the global financial crisis, VA products declined. Instead, sales of foreign currency-denominated products (mainly whole life insurance and individual annuities) increased. Insurers also offered tontine annuities putting more emphasis on living benefits¹¹. Because consumers continue to worry about public pension and longevity risks, individual annuities have remained somewhat viable. Regarding medical insurance, various protection-type products are now common and expanding such as cancer, critical illness, and guaranteed/simplified issue.

Figure 18 shows number of policies of new business by product type in the Japanese life insurance market for the last 30 years.

FIGURE 18 – HISTORICAL CHANGES IN PRODUCT MIX SINCE 1990 (JAPAN)



Source: The Life Insurance Association of Japan <https://www.seiho.or.jp/english/>.
Note: excluding Japan Post Insurance Co., Ltd. which was privatized in 2017.

SHIFTING THE INVESTMENT RISK FROM INSURERS TO THEIR CUSTOMERS

Another important trend in product design has been a significant shift regarding where the risk of poorer-than-expected investment performance lies. Part of this shift derives directly from the reduction in guarantees described in the previous section, though it has two other important aspects:

- Full exposure to market volatility** – Putting aside guarantees, many products historically offered customers a degree of insulation from the full force of investment market movements through the use of smoothed returns. When markets fell, smoothed prices fell less, thus providing cushioning with the quid pro quo being a degree of underperformance in smoothed price when markets rose. The approach resonates well with our general understanding that customers are generally risk averse and weigh losses more heavily than gains. Thus, even if smoothing is completely neutral over time, there is an overall enhancement of the perceived utility of the product.
- Explicit choice of asset allocation** – Many traditional products provided customers with participation into a single-pooled managed fund diversified across multiple asset classes and within these classes by individual holdings. Such funds were not expected to “shoot the lights out” in terms of returns but sought to offer customers, with typically little knowledge or even interest in investments, the realistic prospect of a modest positive real return over the long term with risk mitigated through broad diversification.

Taking the UK as an example, we now consider how this trend has manifested in both life insurance and private pensions markets.

¹¹ Tontine annuities provide more living benefits as long as the insured lives longer instead of relatively lower death benefits.

Life insurance

Looking back to the 1980s, not only were the New Romantics topping the music charts, but traditional with-profits contracts were the dominant savings vehicle offered by life companies. These products provided a smoothed return in the form of a non-negative annual bonus used to increment a customer’s existing benefits. Once declared, this bonus was guaranteed¹² so benefits ratcheted gradually upward over time even if, below the surface, there was some turbulence in investment markets.

A number of factors outside the scope of this paper have driven the decline of with-profits business in the UK. However, the cost of delivering the guaranteed benefits and investment smoothing in the face of relentlessly declining nominal interest rates has certainly been a contributory factor. The result is that with-profits business accounted for only about 6%¹³ of new direct business by 2019.

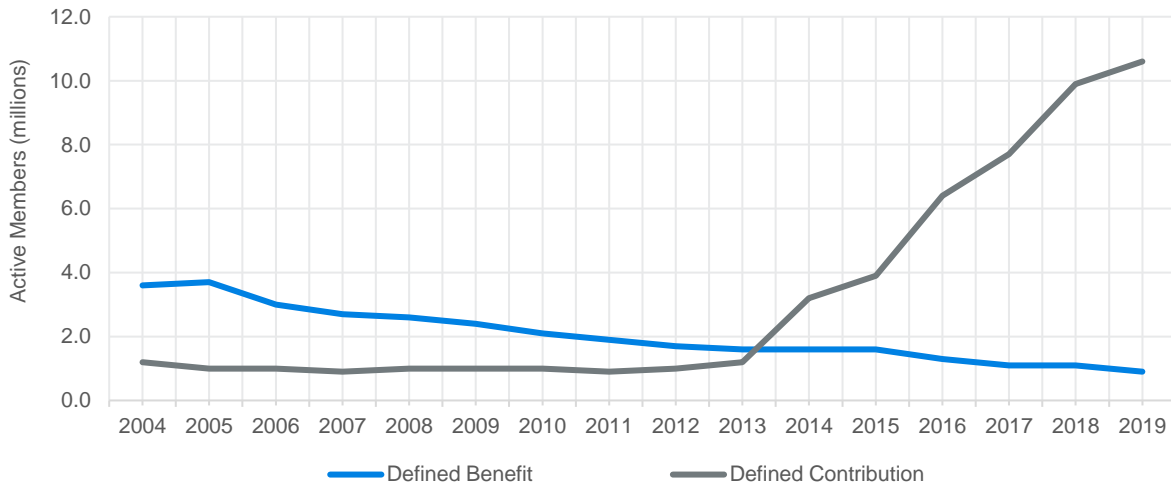
Replacing traditional with-profits has been the steady rise of unit-linked business. While variations exist, the typical unit-linked contract offers no investment guarantees or smoothing of investment returns so that the contract value is exposed fully to market volatility arising from the underlying investments. This volatility will inevitably depend on the asset class exposures selected with this selection now in the hands of the customer. The approach offers increased flexibility and choice to customers with the knowledge and confidence to navigate what can be a bewildering range of investment options. For customers not in this position, managed funds continue to offer diversification via exposure to a broad range of asset classes and are a popular choice.

In summary, product trends have transferred investment risk from life insurers to individual customers.

Private pensions

The trend already described for life insurance has also manifested in the private pensions market. Here, employers have progressively moved away from providing guaranteed pensions under so-called defined benefit (DB) schemes towards defined contribution (DC) arrangements that look very much like the unit-linked life insurance contracts already described. We illustrate the shift from defined benefit provision towards defined contribution in Figure 19.

FIGURE 19 – THE CHANGING FACE OF UK PRIVATE PENSIONS



The chart clearly shows the steady decline in the number of active members within DB schemes. The rapid acceleration of DC scheme membership from 2012 relates to the introduction of auto-enrolment whereby individuals automatically join a workplace pension scheme offered by their employer unless they explicitly opt out.

¹² Typically, subject to the product being held until its intended maturity date.

¹³ Source: Statista.com and Milliman analysis.

An analysis undertaken by Milliman on a typical customer fund, illustrates the potential volatility of these customer funds, see Figure 20. Even though the UK Master Trusts are well diversified, investing in equities, property, bonds, and cash, they have incurred significant losses in Q1 2020. In absolute terms, the worst downside outcomes might be partially mitigated by, for example, increasing contributions; however, experience has shown that contributions are being cut.

FIGURE 20 – ILLUSTRATIVE INVESTMENT EXPERIENCE FOR Q1 2020 BASED ON TYPICAL ASSET ALLOCATIONS HELD BY UK MASTER TRUSTS FOR MEMBERS WITH RESPECTIVELY 5 AND 30 YEARS TO GO UNTIL (EXPECTED) RETIREMENT

Period Statistics	Master Trust (5Y)	Master Trust (30Y)
Q1 2020 Return	-11.21%	-17.32%
Standard Dev (Annualised)	20.65%	31.67%
Max Drawdown	19.60%	27.49%

The final point we make here applies equally to life insurance and pensions products. The reduction in the extent to which insurance products shield individual customers from the full volatility of investment markets will inevitably increase the uncertainty and dispersion of outcomes. Similar customers with similar contracts and contribution histories might achieve quite different results from small variations in cash-flow timing—i.e., pure luck will play a greater role.

ASSET ALLOCATION

The low interest rate environment has undoubtedly driven changes in insurer asset allocation over the past 30 years or so. However, the changes vary across markets reflecting different historical and cultural underpinnings and are also tied up with other ongoing changes such as the evolution of product mix and design. In this section, we provide some illustrations from different markets.

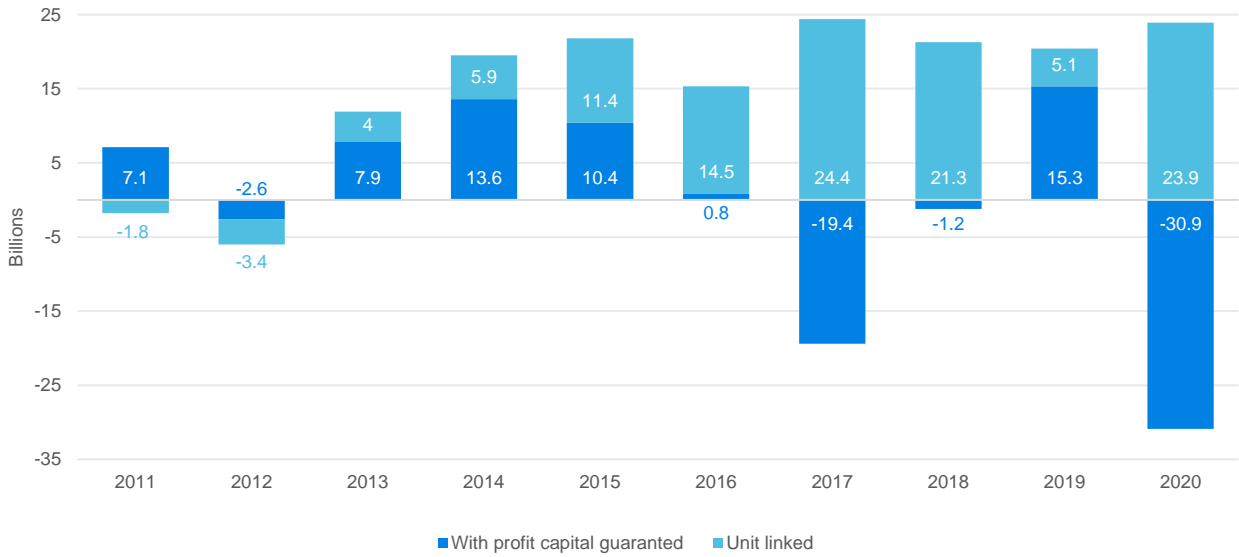
In the late 1990s, equity backing ratios (equities as a percentage of total backing assets) for UK with-profits business were often in excess of 50% and, indeed, significantly higher in some cases. From there, equity backing ratios fell back significantly and by the mid-2010s had settled at around 30%. The switch reflected capital pressures from the transition towards mark-to-market valuations and risk-based capital requirements, alongside the rising cost of the guarantees embedded in this business as interest rates continued to decline.

In 2017, EIOPA carried out a survey¹⁴ to identify changes and trends in the investment behaviour of insurers over the previous five years to illustrate a potential ‘search for yield,’ given the persisting low-yield environment. A trend towards lower credit ratings was observed as well as more exposure to illiquid investments and an increase in the average maturity of bond portfolios. Nonetheless, EIOPA concluded that these changes were only marginal and that structural asset change could be viable and significant only if it went hand in hand with a gradual transformation of the nature of the liabilities.

In many markets though, transformations in the mix of liabilities are in progress with changes to new business premium flows providing a leading indicator. Considering France as an example, in Figure 22 we highlight the evolution of the net inflows between the “euro contract” with-profit/capital guaranteed and unit-linked products. Since 2016, the with-profits component has presented a negative net inflow overall and illustrates the necessity for players in the French market to move away from euro-based products offering both capital protection and daily liquidity.

¹⁴ EIOPA, Investment behaviour report, available at https://register.eiopa.europa.eu/Publications/Reports/Investment_behaviour_report.pdf.

FIGURE 22 – SHIFT IN NET INFLOWS (PREMIUM MINUS CLAIMS) FROM GUARANTEED PRODUCTS TO UNIT-LINKED (FRANCE)

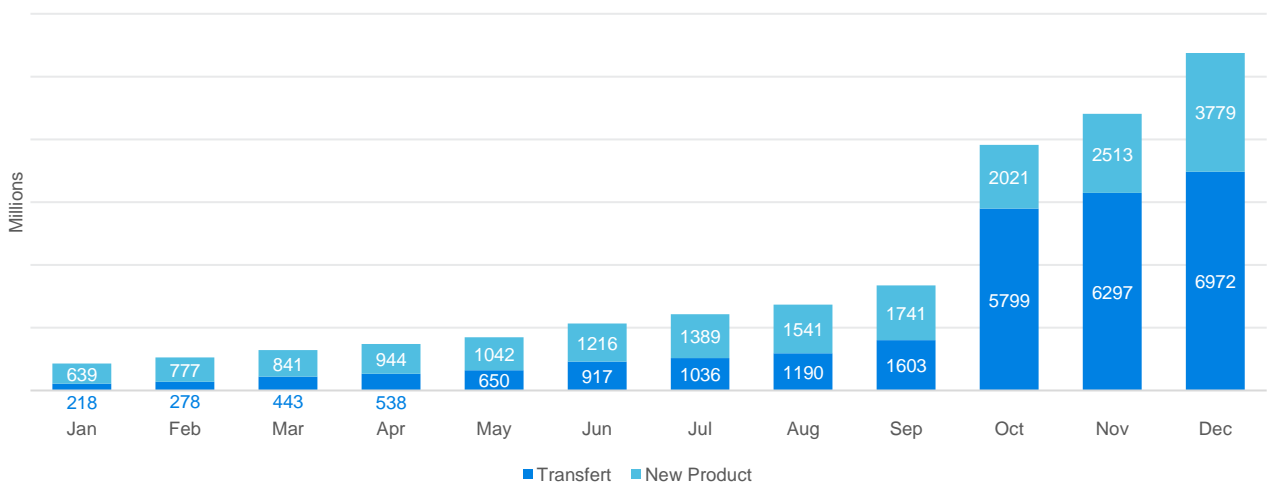


Source: ACPR.

This change in product mix is a direct function of lower interest rates because the with-profits products are backed primarily by fixed-income assets to cover the capital guarantees and deliver the daily liquidity of the mathematical reserve. Shifting from with-profits to unit-linked products is a way to cut capital requirements by decreasing the cost of financial options. How far this trend can progress will depend on the willingness of the French saver to bear the higher financial risk.

A notable development is the “loi PACTE”¹⁵ that was adopted in France in 2019 to fund future growth and innovation. Concretely, pension reforms will take effect to harmonize the structure of existing private schemes, redefine features of the benefits (lump sum and/or an annuity, potential earlier withdrawal and so on), and improve pension portability. This new retirement product (PER) would be managed in a segregated fund (FRPS) governed by a specific solvency regime which should result in lower capital requirements and therefore may orientate French citizens’ savings more towards companies’ equity capital. As presented in Figure 23 below, adoption is already underway and is expected to progressively reshape the landscape of the saving/retirement business in France, giving more options to the policyholders.

FIGURE 23 – IMPACTS OF THE “LOI PACTE” / EVOLUTION OF RESERVE OF NEW PER PRODUCT (FRANCE)



Source: FFA.

¹⁵ The Plan d’Action pour la Croissance et la Transformation des Entreprises (PACTE – Action Plan for Business Growth and Transformation).

REGULATORY CHARGE CAPS ON SOME PRODUCTS

The downward drift in nominal interest rates over time has not surprisingly put the charges levied by insurance products under the spotlight. Charges that reduce the yield achieved by a customer by say 2 percentage points p.a. might have been tolerable in the past when expected returns were say 8 per cent p.a. However, when such returns fall to 3 or 4% p.a., things look rather different.

The result in the UK market at least, has been the introduction of charge caps for some classes of product. As the name suggests, these caps define a maximum amount that a life insurer or pension scheme can charge to its customers for certain products. Regulators set the caps and monitor compliance.

So far, charge caps apply for two products in the UK market:

- **Stakeholder Pensions** – These were introduced as a basic private pension product in 2001. The product initially had a charge cap of 1% p.a., but in 2005, this was changed to 1.5% p.a. for the first 10 years of the contract and 1% p.a. thereafter.
- **Auto-enrolment Pensions** – From 2012, the UK commenced a program of auto-enrolment whereby employees are automatically enrolled into a private pension arrangement made available by their employer. Many arrangements offer a selection of funds but the great majority of contributions flow into so-called “default” funds as many members steer away from making specific fund choices. Default funds have a charge cap of 0.75% p.a.

CHOICE REDUCED AS FIRMS CONSOLIDATE AND SIMPLIFY PRODUCT RANGES

The increased financial pressures on life insurers driven by the persistent low interest rate environment, at least in part, have made scale and / or specialization increasingly important to survival. In particular:

- We have seen firms exit some capital-intensive product lines such as payout annuities. For those that remain, scale is a factor as there is a need for systems and expertise to invest in an increasingly wide range of assets to seek extra returns to help offset the decline in risk-free rates.
- More generally, economies of scale are needed to bring down unit costs as there is an increased focus on these when investment returns are low.
- Simplifying product lines is another approach to help streamline administration and reduce costs while maintaining or improving levels of customer service to meet rising expectations.

Investment in technology is often mentioned as a route for insurers to respond to current challenges. Our sense is that the impact of this factor on market consolidation is difficult to call. On one hand, the up-front capital investments needed mean scale can be important to get an attractive return. However, in some areas, technology may reduce barriers to entry and facilitate new entrants to the market.

Overall, the general direction is that fewer insurers are able to compete in any particular product segment resulting in reduced choice for the end customer.

Cost vs value for money

As already noted, there has been a relentless drive to bring costs down across the insurance and pensions industry. To the extent to which this has pushed firms to eliminate waste and become more efficient, there is no tension with value for money (VFM) and customers should benefit from lower prices and improved affordability of products.

However, taken too far, and without appropriate balance with other objectives, the drive for cost reduction may not serve customers well. For example:

- **Innovation** – There may be a stifling of innovation if product margins are too low to make an attractive return on the up-front investment.
- **Systemic risk** – The drive for economies of scale to reduce costs results in investments increasingly allocated to a limited range of passive funds run by a relatively small number of global asset managers. The convergence of investment strategies implied by this outcome opens up potential for systemic risk as many seek to execute very similar trades as markets move. In a September 2019 paper, the CRO Forum noted this issue in the context of liquidity risk.¹⁶

¹⁶ The CRO forum, Managing liquidity risk: Industry practices and recommendations for CROs, available at https://www.thecroforum.org/wp-content/uploads/2019/09/CRO_Forum_Managing-liquidity-risk_2019_Final-1.pdf.

The focus on costs is understandable as they are typically the most readily quantifiable element of VFM. Assessment of VFM, in a more rounded sense, requires us to account for softer factors such as “peace of mind” and flexibility. Producing a robust and workable assessment framework will be challenging though—the Financial Conduct Authority (FCA) in the UK launched a consultation on this subject in 2020. Milliman contributed to the consultation and we await the FCA’s proposals.

The road ahead

In this section, we make the assumption that low nominal interest rates persist over the medium term (next 3 to 5 years). Of course, “low” is not a precise definition and here we take it to mean by comparison to long-term historical levels and also in relation to inflation such that real rates remain negative.

With this in mind we consider some key areas that we expect will have a significant influence on the range and take-up of insurance products in the years ahead. To provide some structure, we present our thoughts in the form of a simple strengths, weaknesses, opportunities and threats (SWOT) analysis:

STRENGTHS

Areas where the insurance industry has existing capabilities that should help it adapt and survive in a continued low rates environment:

- **Breadth of industry experience** – As already noted above, the industry has actively adapted its product offerings in a number of markets in response to shifting economics and consumer demands. This willingness and ability to address a broad range of customers’ needs from pure technical risk to saving will be critical over the coming years’ supporting adaptation.
- **Trust** – This is essential for an industry where customers pay in advance of receiving benefits. We have positioned trust as a strength because that is where it should be, but we appreciate that there have been episodes in the past that have challenged that trust..
- **Capital** – Insurers are able to deploy capital available on their balance sheets to cover the risks of providing certain benefits to customers that are difficult, if not impossible, for them to access by other means. The key benefit here relates to the ability to provide guarantees to differentiate insurer offerings from those of competitors such as asset managers. In our view, this remains a key insurer strength though we fully recognise the challenges posed by the current low interest rate environment in shaping guarantees that are simultaneously viable for the insurer and delivered at a cost acceptable to the consumer.
- **Existing infrastructure and relationships** – For example, around distribution (agent networks, independent adviser relationships). While unadvised “direct to customer” sales have gained significant ground there is still evidence to suggest that customers in some segments continue to value more personalised advice delivered face-to-face.
- **External incentives** – Examples of these would include tax advantages or forms of compulsory purchase such as minimum levels of motor cover or buildings cover required to support mortgage lending. Such incentives are certainly a strength while they are present, but their nature and impact can change over time and vary considerably between markets. As an example, we can contrast the presence of tax advantages for saving via life insurance vehicles between the UK and France. In the UK if we look back to the 1980s, tax relief was available on certain “qualifying” life insurance premiums and on mortgage interest payments which encouraged the growth of interest-only mortgages backed by endowment savings plans. This did not last though as the former incentive was removed in 1984 and the latter in 2000. By contrast, in France, there has been recent reform to develop private pensions through a life insurance vehicle (loi PACTE).

WEAKNESSES

areas that comprise aspects such as legacy baggage and other constraints that may limit flexibility and innovation and undermine the industry’s future role:

- **Financial challenges** – As already noted, the environment of persistent very low interest rates has reduced yields available on the traditional asset portfolios held by insurers, reducing profit margins. In addition, regulatory regime changes such as the introduction of IFRS 17 and Solvency II have brought significant implementation costs for insurers and have increased capital requirements for some product segments.

Both of these areas of financial challenge have converged to make it increasingly difficult for insurers to provide meaningful financial guarantees to their customers—previously a key selling point for the industry.

- **Legacy products and systems** – Many insurers have large back-books of old products with a myriad of features administered using a variety of legacy systems and processes which can be complex and costly to maintain. This can result in increased costs and absorb large amounts of skilled resource into relatively low value-adding activities, thus impairing an insurer's ability to innovate and react quickly to market changes. However, we note a number of insurers have embarked on major transformation projects to help tackle this issue.
- **Customer communication** – A criticism frequently levelled at the insurance industry is that it has often struggled to clearly explain its products to end customers and thus convey a proper appreciation for the benefits of the products offered and also their limitations. These factors open up scope for misunderstanding and dissatisfaction. As the low interest rate environment drives changes to traditional product offerings, effective communication and customer engagement are likely to be significant drivers of success or failure.
- **Asset management costs and capabilities** – In the savings market, one response to the financial challenges noted has been a shift to simpler products with investment risks passed to customers, thus reducing the regulatory capital burden. However, having removed insurance features, such products are then competing directly with those offered by asset managers with the implication that insurers may need the scale and capabilities of the likes of Blackrock and Vanguard to be serious players in these markets.

OPPORTUNITIES

factors that have the capability of delivering a boost to the industry in future:

- **Population dynamics** – Many developed economies are now in a phase where their populations are aging as life expectancy has improved and birth rates have been falling. A well-known result of this population aging has been the increasing pressure on the sustainability of public pension and social security systems. The result is a desire by governments to transfer, at least partially, the burden back to individuals to address as best they can via private provision. Insurers are well placed to benefit from this transfer through the provision of both protection and savings products. In particular, the private pensions industry in some countries remains relatively underdeveloped and may offer significant scope for expansion (<1% of the GDP in Italy, France, Germany comparing to USA, UK, or Canada >5% of GDP).
- **Big data** – Improved industry capabilities to collect, link, and analyse large data sets from disparate sources may offer the prospect of making some risks that were previously uninsurable due to excessive uncertainty viable for cover. This would expand the customer needs that the industry is capable of addressing.
While listed as an opportunity for the industry, this is certainly not a “home-run.” In particular, ethical issues abound in this new territory¹⁷ and the way insurers resolve them may well shape customer views of and trust in the industry for years to come.
- **Environmental, social and governance (ESG)** – Awareness of ESG issues among issuers, investors, and the general public has never been higher. Competition to incorporate “green” or “sustainable” criteria into investment strategies is already intense and a trend that is likely to continue. In our view this could represent a great opportunity for insurers through an ability to provide patient capital on a long-term basis to support the major social and economic transitions required over the coming years.

THREATS

factors that left unaddressed may pose serious challenges for the future role and / or profitability of the industry in future:

- **Population dynamics** – Current population dynamics are not unequivocally good news as, in the longer term, it seems likely that population aging will result in absolute population decline with obvious consequences for aggregate demand including that for insurance products.
- **Ability to pay** – Earlier we touched on the opportunity presented by the partial transfer of responsibility for pensions and other social security benefits from the state to the individual. However, the extent of the opportunity for insurers depends critically on the ability and willingness of individuals to pay for these benefits themselves. There are serious headwinds to consider here, not least that in many developed economies GDP growth has been anaemic for many years and real wages largely stagnant. This, despite the deployment of historically low interest rates and quantitative easing.

¹⁷ Milliman article: Artificial Intelligence: The ethical use of AI in the life insurance sector, available at <https://uk.milliman.com/en-GB/insight/artificial-intelligence-the-ethical-use-of-ai-in-the-life-insurance-sector>.

We recognise that this threat could be mitigated by effective government support in the form of new incentives, such as tax concessions, or via outright compulsion. However, the room available to manoeuvre feels very limited for many already highly indebted governments to provide the kind of support that costs them real money. Indeed, in the UK, the latest indications are that the government may reduce the tax benefits currently available to incentivise private pension provision.

- **Inflation** – Inflation in most developed countries has been low and stable for many years with many central banks pursuing explicit inflation targeting policies with target rates often around 2% p.a. As a result, inflation has not been front and central on the risk agenda of investors or consumers. However, this may be changing and, as we write this paper, the future path of inflation is becoming a very hot topic with rates in countries such as the UK and US rising to levels not seen for some time. In a recent article, Andy Haldane, Chief Economist at the BoE, said:

"In my view this is the most dangerous moment for monetary policy since inflation-targeting was first introduced into the UK in 1992 after the European Exchange Rate Mechanism debacle."¹⁸

We cannot know what the future holds for inflation but higher rates of inflation, if persistent, may undermine the incentive for individuals to save as it makes current consumption more attractive. This may be mitigated if adequate compensation is offered to savers via higher interest rates, but given the current high levels of both public sector and private sector debt we question how realistic this is.

- **Government policy changes** – Some tax incentives are strengths for insurers as noted above. However, the government policy changes sometimes put insurers at a disadvantage. For example, in Japan, the tax incentives on small amount investments NISA started in 2014. This aim is to promote individual investment and asset formation. But, since insurance products are not eligible, it is beneficial only to banks and other financial institutions. As another example in Japan, the regulator recently gave insurers the guidance that excessive and intentional tax-saving products are not allowed. This pressure made some insurers stop selling such products mainly to small business owners. Also, in Japan, the statutory standard policy reserve regulation will be extended to foreign currency-denominated products in 2022, which will impose a large burden on insurers who have many foreign currency-denominated savings products.

¹⁸ The New Statesman, The beast of inflation is stalking the land again, available at <https://www.newstatesman.com/2021/06/dangerous-moment>.

Summary

Although we cannot predict the future with certainty, we believe that having a well-thought-out prescription for the future and acting on it with courageous decision-making is an effective way to cope with this unprecedented situation.

Below is a brief summary of the issues discussed in this paper that should be considered in each direction of future interest rate movements.

	DOWN	UP
Balance Sheet	<p>Solvency ratios will be stable on the short term, but will lead to significant losses in the future due to the UFR drag.</p> <p>An increasing pressure on the search for yield, with a likely further re-risking effect. Potentially leading to a step further down the credit and liquidity ladder of the asset universe.</p>	<p>Ratios will be stable on the short term, but increasing rates with reduce the impact of the UFR drag on EU insurers and will increase the opportunities to optimize the risk return profile of the balance sheet.</p>
Risk Management	<p>Typically more hedging needed due to convexity, but is anyone willing to lock in even lower rates?</p> <p>It is important to construct hedge positions that take into account the certainty of the cash flows of liabilities with changing future interest rate increases. Therefore, reassessment of liability models and management actions, including dynamic L&S rates and dynamic dividends, will be more important factors.</p> <p>Regarding market or credit risk, the importance of Idiosyncratic risk management will further increase as the demand for yield increases while the number of relatively attractive investment projects decreases. It can be more challenging to maintain the profitability of the product while keeping the business liquidity position under control.</p>	<p>Increasing rates will lead to a situation that companies feel they might have lost due to their interest rate hedges.</p> <p>Increased cash settlement opportunities due to not only the unwinding of over-hedged positions or closing repo trading positions, but also increased demand to switch savings products that have lost their relative attractiveness will increase the importance of liquidity management.</p> <p>In addition, until the rise in interest rates stabilizes, volatility is expected to increase in the short term. It will be important to build the necessary hedging positions in options before volatility increases.</p>
Product Management	<p>Continuing to reduce hard guarantees which became unsustainable for insurers and unattractive to consumers as interest rates fell.</p> <p>Building economies of scale by simplifying product lines and investing in technology.</p> <p>Promoting product attractiveness using tax incentives and other government policies and targeting policyholders' needs. Capacity to build hybrid products where premiums flow from financial components into different types of protection as policyholders age would be a significant competitive hedge.</p>	<p>Resurrection of old products with certain guarantees, but with a requirement to make them innovative and suitable for the 21st century.</p>



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