

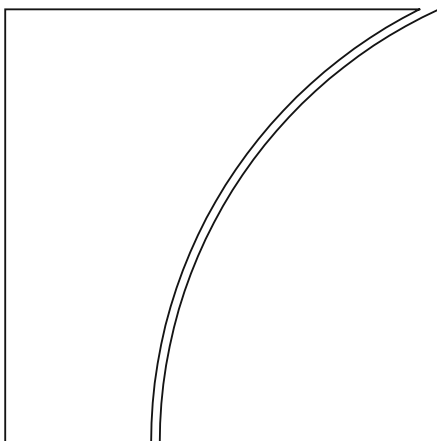
Financial Stability Institute

FSI Insights on policy implementation No 4

Insurance supervisory strategies for a low interest rate environment

By Gunilla Löfvendahl and Jeffery Yong

October 2017



BANK FOR INTERNATIONAL SETTLEMENTS

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ISSN 2522-2481 (print)

ISBN 978-92-9259-102-1 (print)

ISSN 2522-249X (online)

ISBN 978-92-9259-103-8 (online)

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Insurance supervisory strategies for a low interest rate environment¹

Executive summary

Protracted low interest rates have put significant strain on some life insurers. While monetary expansion at the major central banks has helped to bolster the relevant economies, life insurers in these jurisdictions have suffered unintended consequences particularly through the mismatch between the duration of assets and liabilities. Life insurers with significant annuity business are likely to be the most vulnerable.

Although only five jurisdictions have reported life insurer insolvencies due to the low interest rate environment, the risk of insolvency remains an issue that supervisors and insurers in many large insurance markets need to consider. Insurance supervisors in jurisdictions that are not in a low interest rate environment also need to be vigilant in case they face a similar problem in the future. Although interest rates may still be high, there is no guarantee that this will continue to be the case. Life insurers in those markets may be offering high guaranteed returns. These insurers and their supervisors need to be prepared to react if interest rates and investment returns were to fall. Furthermore, some insurance supervisors could benefit from additional powers that may require legislative changes.

The surveyed supervisors have a broad range of powers to deal with life insurers in difficulties due to low interest rates. Requiring benefit cuts or deferrals is usually considered a last resort since such measures harm the interests of policyholders. Taking such supervisory actions may involve a trade-off between conflicting objectives, namely prudential aims versus consumer protection. Insurance supervisors need to exercise sound judgment by striving for the fairest possible outcomes for policyholders. Most of the surveyed supervisors consider requiring life insurers to hold more technical provisions as being the most effective measure for addressing the low rates problem. On the other hand, certain jurisdictions have introduced measures that dampen the impact of low interest rates on life insurers' solvency. Insurance supervisors should nevertheless be able to assess the solvency position of life insurers without such adjustments. Some insurance supervisors may wish to seek certain powers that they lack but consider effective in addressing the low rates issue, for example, the ability to impose a cap on guaranteed rates. Views are mixed on the usefulness of macroprudential tools to assess risks arising from low interest rates.

Life insurers themselves have taken various measures in response to low rates. For new business, most life insurers no longer offer investment guarantees or have scaled them back. For in-force business, life insurers have taken measures such as incentivising policyholder surrenders and investing in higher-yielding assets; both steps warrant close supervisory scrutiny. In several major jurisdictions, life insurers have in-force business that has many more years to run before the policies mature or expire.

¹ Gunilla Löfvendahl, Jeffery Yong, Bank for International Settlements.

The authors are grateful to Maik Schwarz (Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin, Germany)) for his instrumental role in supporting this paper, Keith Chapman (former Executive General Manager, Australian Prudential Regulation Authority) for reviewing this paper and the insurance supervisory authorities for responding to the survey on which this paper is based.

Stress tests are a favoured supervisory tool for assessing the potential future impact of low interest rates on insurers. However, it is important to recognise that no single tool is ideal or appropriate for use in isolation. Insurance supervisors should therefore consider using multiple tools to assess the impact of low interest rates on life insurers. The main challenge faced by the surveyed insurance supervisors in identifying and quantifying the impact of low interest rates is the lack of sufficiently granular data. Insurance supervisors should take steps to obtain the data they need to address low interest rate-related issues.

Insurance supervisors are looking ahead and preparing for potential interest rate hikes. Most of the surveyed supervisors think that a sudden rise in interest rates could potentially have adverse effects on life insurers, mainly through depressed asset values or mass policyholder surrenders.

Introduction

1. **Unconventional monetary policy in the advanced economies has kept interest rates at unprecedentedly low levels, with unintended consequences for the insurance sector, particularly in life insurance.** Some long-term life insurance products sold many years ago offered policyholders guaranteed returns at what are now unsustainably high rates. In the new environment of persistently low interest rates, life insurers with such products are struggling to meet those returns.
2. **This paper outlines how low interest rates can adversely impact insurers² and how supervisors can monitor and remedy potential problems.** The relevance and impact of low interest rates vary significantly from jurisdiction to jurisdiction. This is due to differences in macroeconomic profiles and the variety of life insurance products. These differences mean that it is difficult to draw general conclusions or advocate specific supervisory strategies that would be applicable in all jurisdictions. This paper presents a range of supervisory practices for supervisors to consider if they find themselves in a similar situation. The conclusions drawn in this paper should not be interpreted as being applicable to all insurers or jurisdictions.
3. **This paper is based primarily on survey responses from 27 insurance supervisors,³ covering 91% of the global insurance market (measured in terms of 2016 premium volume).⁴** Of these, 19 jurisdictions are currently in a low interest rate environment while three were previously in such an environment. The remaining jurisdictions have not been in such a situation. This paper focuses solely on life insurers, given that they are currently the chief concern of insurance supervisors. Occupational pension and non-life insurance business are not covered, although low interest rates can also affect these businesses adversely, albeit in different ways.
4. **The structure of the paper is as follows.** This paper first describes how low interest rates can put stress on the balance sheets of insurers, focusing on asset-liability mismatches. It then outlines the different supervisory tools that can be used to identify and assess such effects. Finally, the paper sets out a range of measures that supervisors can consider when dealing with insurers in difficulties due to low interest rates.

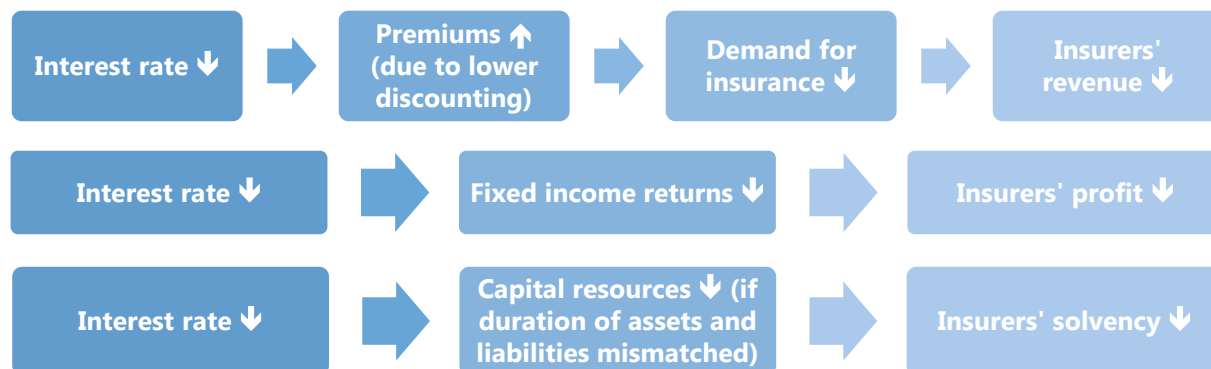
² In this paper, unless otherwise specified, “insurers” means “life insurers”; and “supervisors” means “insurance supervisors”.

³ Australian Prudential Regulation Authority, Superintendencia de Seguros Privados (Brazil), Office of the Superintendent of Financial Institutions (Canada), Superintendencia de Valores y Seguros (Chile), China Insurance Regulatory Commission, Financial Supervisory Commission (Chinese Taipei), Czech National Bank, Finanstilsynet (Denmark), Autorité de contrôle prudentiel et de résolution (France), Bundesanstalt für Finanzdienstleistungsaufsicht (Germany), Insurance Authority (China, Hong Kong SAR), Insurance Regulatory and Development Authority of India, Central Bank of Ireland, Istituto per la Vigilanza sulle Assicurazioni (Italy), Financial Services Agency (Japan), Financial Supervisory Service & Financial Services Commission (Republic of Korea), Bank Negara Malaysia, Comisión Nacional de Seguros y Fianzas (Mexico), Namibia Financial Institutions Supervisory Authority, Netherlands Bank, Polish Financial Supervisory Authority, Monetary Authority of Singapore, Financial Services Board (South Africa), Dirección General de Seguros y Fondos de Pensiones (Spain), Finansinspektionen (Sweden), Prudential Regulation Authority (United Kingdom), National Association of Insurance Commissioners (United States).

⁴ See Swiss Re (2016).

Pressure points on life insurers

5. **Low interest rates can adversely affect insurers in several ways.** The following shows a selection of the potential adverse effects of falling rates on insurers.⁵



6. **The main concern is the effect of protracted low interest rates on investment returns.** Problems arise when (re)investment returns fall below the guarantees underwritten in the past. As interest rates start to fall, there is no straightforward answer to the question when supervisors should start worrying. This depends on the specific circumstances in each jurisdiction, taking into account factors such as the nature of insurance products, insurers' solvency positions, their risk management capabilities and the investment environment. It is important that supervisors identify if they are in a situation where falling rates warrants supervisory attention and action. Additionally, supervisors should bear in mind two different timing perspectives; in-force business versus newly underwritten business.

Box 1

Why asset-liability mismatch poses a problem

Asset-liability management is a fundamental risk management tool used by insurers. A well-managed insurer seeks investments that are appropriate to the nature and term of its insurance liabilities and that maximise investment returns within its risk tolerance level and available financial resources. For example, guaranteed policy benefits are usually matched with investments in risk-free assets such as government bonds of the same term and cash flow pattern. That way, if interest rates rise or fall, the value of the asset and insurance liability will move in parallel, with no net impact on an insurer's capital position.

However, it may not always be possible or desirable to perfectly match assets and liabilities. Most commonly, this is because the duration of life insurance liabilities is longer than the assets available in the market. For commercial reasons, insurers may deliberately choose to mismatch in order to earn additional investment returns.

Regardless of whether insurers deliberately, or otherwise, mismatch the duration of their assets and liabilities, a mismatch makes them vulnerable to falling interest rates. Table 1 shows a simplified example to explain why this can be problematic.

In this example, a fall in interest rates increases the value of the liabilities by more than the value of the assets. As a result, the insurer moves from a surplus to a deficit capital position. In extreme cases, this could mean moving from a solvent to an insolvent position.

⁵ See Swiss Re (2012).

This example assumes a market-consistent approach for the valuation of insurance liabilities or technical provisions that is responsive to interest rate changes. Under a book valuation or “locked-in” assumption approach, the value of insurance liabilities would not move when interest rates change. However, this could mask or overstate the insurer’s solvency position, especially if the assets are valued on a market-consistent basis. About a quarter of the surveyed supervisors follow the “locked-in” assumption approach for the valuation of technical provisions.

From a macro perspective, insurers seeking longer-duration assets could trigger a perverse feedback loop. If insurers seek longer-term assets to reduce any asset-liability duration gap, this could drive the prices of such assets higher. Consequently, long-term interest rates could fall, prompting further purchases.⁶ Slightly more than half of the surveyed jurisdictions, most of which are currently in a low interest rate environment, have observed such “search for duration” behaviour by their life insurers.

Impact of asset-liability mismatch

Table 1

	Initial present value (PV)	Duration	PV after a 200 basis point fall in interest rates
Assets	200	2	$200 - 2 \times -2\% \times 200 = 208$
Liabilities	190	5	$190 - 5 \times -2\% \times 190 = 209$
Surplus/deficit	10		-1

Assets

7. **Some insurers have been “searching for yield”, shifting towards riskier assets.** Although 14 of the surveyed supervisors have observed “search for yield” behaviour, almost all remarked that the practice is limited and well contained. This is consistent with the views of the International Association of Insurance Supervisors (IAIS).⁷ The International Monetary Fund (IMF)⁸ has also found that insurers do not seem to have actively shifted towards riskier assets although some insurers have engaged in a “search for yield”. This is probably due to the expected higher returns on such assets not sufficiently compensating for the higher capital requirements on riskier assets. In addition, insurers’ risk appetite may constrain moves towards riskier assets.

8. **Importantly, supervisors should ascertain that insurers that are investing more in riskier and/or less liquid assets have adequate risk management capabilities and can mitigate those risks in line with their established risk appetite.** In the surveyed jurisdictions where insurers have adopted a riskier investment strategy, their revised investments of choice include the following:

- lower-quality corporate bonds;
- equities;
- real estate;
- foreign currency-denominated assets;
- private placements;
- commercial mortgage loans; and
- infrastructure investments.

⁶ See Shin, H S (2017).

⁷ See IAIS (2016).

⁸ See IMF (2017) and IMF (2016).

Liabilities

9. **Insurers have been offering insurance products with investment guarantees for many years.** Among the surveyed jurisdictions, products with investment guarantees were sold in Denmark as early as 1842. However, low interest rates were not generally perceived as problematic in the past because solvency requirements were simple and not risk-sensitive. In other words, low rates were not seen as an issue because there was no benchmark for establishing whether insurers might or might not be able to meet the guarantees.

10. **In many jurisdictions, low interest rates pose challenges to insurers offering insurance products with investment guarantees.** Out of the 26 jurisdictions in which products with investment guarantees are offered, only three have never been in a low interest rate environment.

11. **The types of investment guarantee vary from jurisdiction to jurisdiction, reflecting the wide variety of insurance products.** In general, the types of guarantee can be classified as follows:

- by product type – non-participating, participating/with-profits, unit-linked, universal life; or
- by nature of contingency – regular income, capital protection, death benefit, maturity benefit surrender benefit.

12. **Most of the surveyed supervisors share a common view that annuities are the product most exposed to risks from a prolonged low interest rate environment.** In general, annuity products can expose insurers to risks from low interest rates in the following ways:

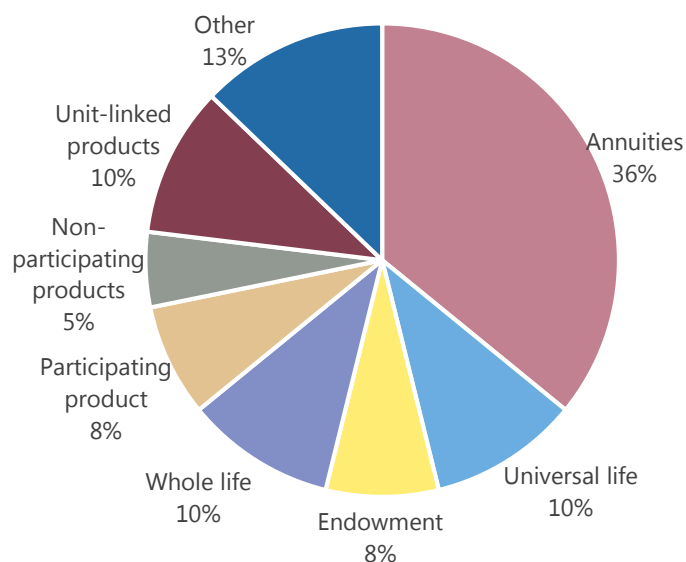
- **Guaranteed minimum annuity pay-outs:** insurers are exposed to the risk that the expected rates used, when pricing the product, to discount future payouts are higher than the actual returns they earn
- **Guaranteed accumulation rate** (during the deferred period, before the annuity pay-outs start): if insurers offer a guaranteed minimum return on the fund/premiums invested during the deferred period, they may suffer losses if their actual returns are lower

13. **Other savings or investment-type life insurance products are also considered risky in a protracted low interest environment.** Graph 1 shows the proportion of the surveyed supervisors that considered each product type risky in a low interest environment. Table 2 explains how such products can be risky to insurers. The product types or features are not exclusive, in that they can be combined. For example, it is possible to structure participating endowment, or unit-linked whole life policies.

Risky products in a prolonged low interest rate environment

In per cent

Graph 1



Source: BIS Survey.

Types of investment guarantees

Table 2

Product	Description of investment guarantee
Universal life	Universal life products typically offer guaranteed minimum crediting rates on the invested sum, which is the premiums invested less charges and policyholder withdrawals.
Endowment	Endowment products can offer implicit or explicit guaranteed returns, depending on the product type – see below for participating, non-participating and unit-linked product types.
Whole life	Similar to endowment, except there is no maturity guarantee.
Participating products	Participating products may offer explicit minimum guaranteed annual, maturity and/or termination returns. There could also be implicit guaranteed returns that policyholders may expect in the form of future bonuses based on factors such as how the policy was sold; and what other insurers are offering.
Non-participating products	Non-participating products are priced based on certain assumed discount rates, which are effectively implicit guaranteed rates. It is possible to offer explicit minimum guaranteed returns as well, but such products are rare as they are usually very expensive.
Unit-linked products	Unit-linked products may offer explicit minimum guaranteed annual, maturity and/or termination returns.

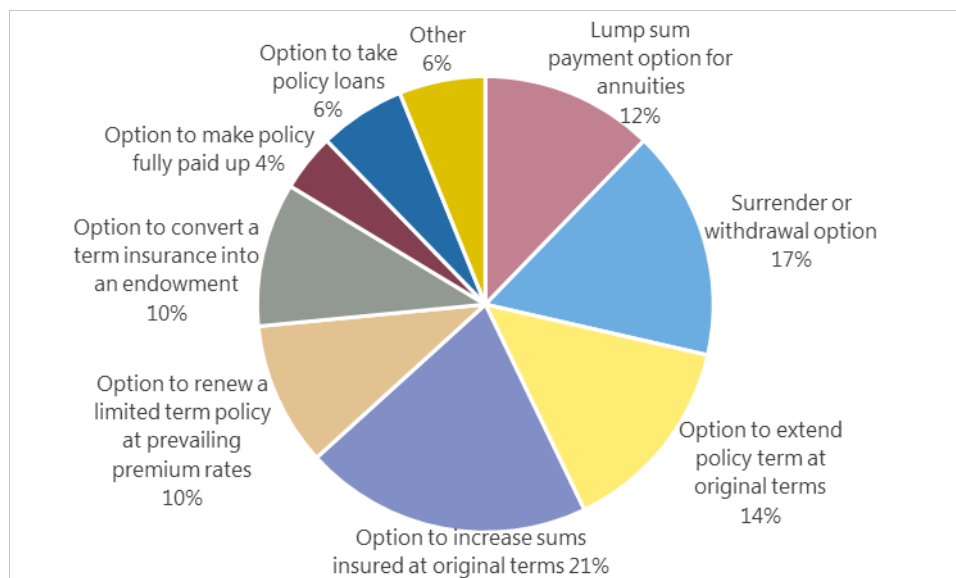
14. **Supervisors should not focus only on investment guarantees.** Other product features such as policyholder options could also give rise to problems in a low interest rate environment. Most of the surveyed supervisors view the option to increase sums insured at original terms as being potentially problematic. Such an option allows policyholders to increase their insurance coverage at the original premium rates, possibly when interest rates were higher. Buying the same policies in a low interest rate environment would cost more, and the shortfall between present and past premium rates is effectively a

loss borne by the insurers. Graph 2 shows the proportion of the surveyed supervisors that considered each product feature problematic. However, these product features are not prevalent in the surveyed jurisdictions.

Problematic product features (besides investment guarantees) in a low interest rate environment

In per cent

Graph 2



Source: BIS Survey.

15. **Options for policyholders to surrender or cancel their policies may work to the benefit of insurers under certain circumstances.** This can happen in two ways:

- if the investment returns earned by insurers were to be lower than the guaranteed returns to policyholders, the surrender of those insurance policies would, in a prolonged low interest rate environment, mean that insurers would not experience future losses on that business; or
- rate-sensitive assets (for example bonds) bought when interest rates were high(er) are likely to result in large unrealised gains when interest rates fall, which insurers could unlock when they sell the assets to meet the surrender value payments.

Despite these potential benefits, insurers need to be vigilant against the potential adverse impact of mass surrenders on their financial and liquidity position. Moreover, encouraging policyholders to surrender raises conduct-of-business issues.

Negative interest rates in Switzerland⁹

Until recently, negative interest rates were an unheard-of phenomenon. From a theoretical perspective, discounting future insurance liability cash flows using negative interest rates essentially means setting aside more funds at present than the amount an insurer expects to pay out in the future. This is counterintuitive because insurers typically earn positive investment returns over time, which results in insurers needing to hold lower technical provisions to meet future policyholder obligations.

Since January 2015, the Swiss National Bank has been charging negative interest rates on banks' deposits to manage the upward pressure on the Swiss franc. As a result, yields on the benchmark 10-year Swiss government bonds have fallen into negative territory. This has posed unique challenges to life insurers in Switzerland, particularly those offering group life occupational pension products, on two fronts:

- increased difficulty in meeting interest rate guarantees due to lower investment returns from reinvestment of maturing assets; and
- higher technical provisions due to lower discount rates.

In 2016, although the "technical interest rates" that life insurers used to value their technical provisions fell, the maximum rate remained in positive territory at 1.63%. This partially contributed to an increase in technical provisions by 1.9% (CHF 5.68 billion).

The predominant product line in the market, accounting for over 70% of gross premiums written, is group life occupational pension schemes. Such products are subject to statutorily prescribed rates that insurers must use to convert policyholders' accumulated retirement funds into regular pension payments. Partly in response to the low interest rate environment, insurers have significantly withdrawn from this market, with gross premiums written falling by 6.3% (CHF 1.55 billion) in 2016 compared to 2015.

To cope with the low interest rate environment, life insurers in Switzerland have adopted the following strategies:

- scale back or stop altogether the underwriting of new insurance policies with interest rate guarantees and instead, focus more on underwriting protection policies covering mainly death and disability;
- compensate for shortfalls in guaranteed pension payments under group life contracts by reducing interest payments on the accumulated funds of active policyholders; and using surpluses from protection type of business to cover the shortfalls; and
- on a smaller scale, shift investments from lower-yielding fixed interest securities to real estate, equities and other alternative investments such as private equity, hedge fund and infrastructure projects.

Only limited so-called "search for yield" behaviour has been observed, as the yields offered by other investments do not fully compensate for the lower earnings. In addition, the higher capital requirements on those higher-yielding assets make such investments less attractive.

Sizing up the problem

16. **A number of life insurers in certain jurisdictions have struggled to meet the investment guarantees they promised policyholders.** One way insurers can be certain that they can meet the investment guarantees to policyholders is to invest in government bonds with a duration similar to the underlying insurance contract. "Certainty" assumes that the risk of default on the government bonds is negligible. Under this investment approach, insurers can measure their ability to honour investment guarantees by assessing if the yields they can earn from the government bonds will exceed the investment guarantees. Graph 3 shows that life insurers in at least eight countries experienced investment strains over the last 10 years. Only a few of the surveyed jurisdictions provided information on the average policy

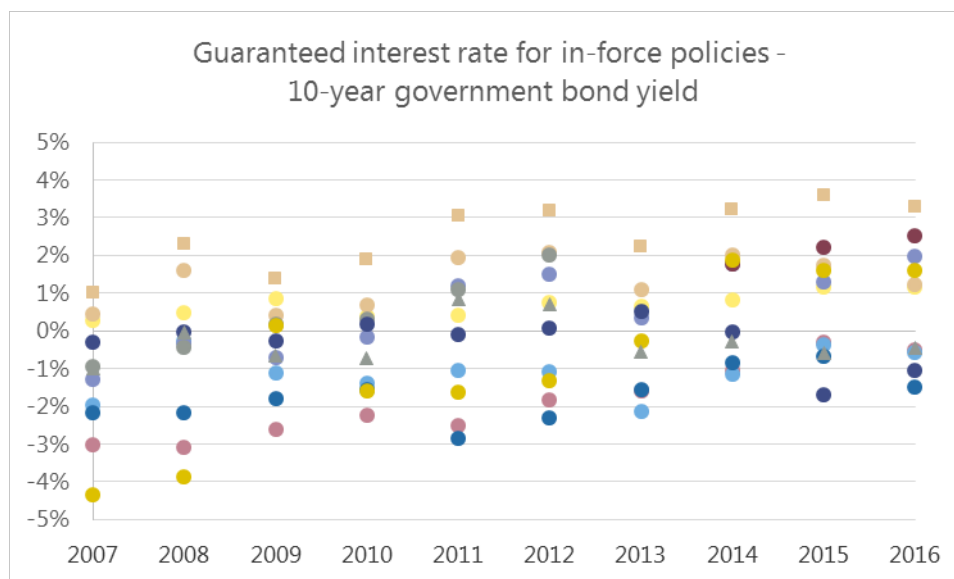
⁹ See FINMA (2016).

duration of life insurance contracts with investment guarantees, ranging between five and 10 years. For comparison purposes, Graph 3 assumes that the average policy term of such contracts is 10 years. Each dot represents a jurisdiction (12 in total). All dots above 0% indicate some investments strains, in that, on average, insurers earn less than the amount they had guaranteed policyholders.

Investment shortfall

In per cent

Graph 3



Source: BIS Survey.

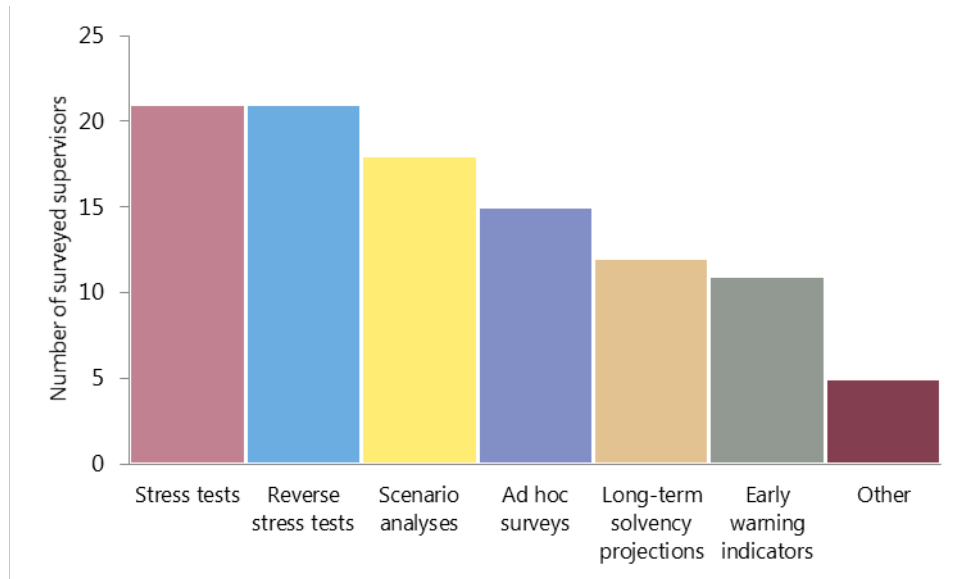
17. **Life insurers in several major jurisdictions have legacy business that has many more years to run before the policies mature or expire.** Although in-force business with investment guarantees has declined over the years in a few countries, in many others, such business has remained broadly unchanged or has increased. In 2016, more than half of the in-force business in five countries, as measured in terms of technical provisions of life insurers, consisted of products with investment guarantees. Moreover, life insurance products with investment guarantees remain popular in certain jurisdictions.

18. **Supervisors can use a variety of tools to assess the potential impact of future low interest rates, ranging from simple early warning indicators to more elaborate approaches such as future solvency projections.** Stress tests, including reverse stress tests, are clearly a favoured tool for supervisors. Since the IAIS strengthened its standards in 2011 by introducing own risk and solvency assessment (ORSA) standards in the Insurance Core Principles (ICPs), many jurisdictions have introduced ORSA requirements. Feedback from the surveyed jurisdictions indicate some convergence in industry practices – most insurers have been reporting their stress test results for exposures to low interest rates as part of their ORSA submissions to supervisors. In general, supervisors do not direct insurers to choose the type and extent of stresses. Insurers are free to use stresses that are meaningful for their business. In addition, supervisors may impose standardised stress tests across the entire industry, or peer groups within the industry, to assess the relative impact of industry-wide stresses on different insurers. One supervisor considered it particularly useful to review individual insurer stress tests and identify industry best practices so as to encourage other insurers to improve their stress test exercises. Graph 4 shows the supervisory tools that have been used in the surveyed jurisdictions to assess the impact of low interest rates. The “other” category includes targeted discussions with insurers and analysis of the insurers’ product offerings.

Supervisory tools to assess impact of low interest rates

In number

Graph 4



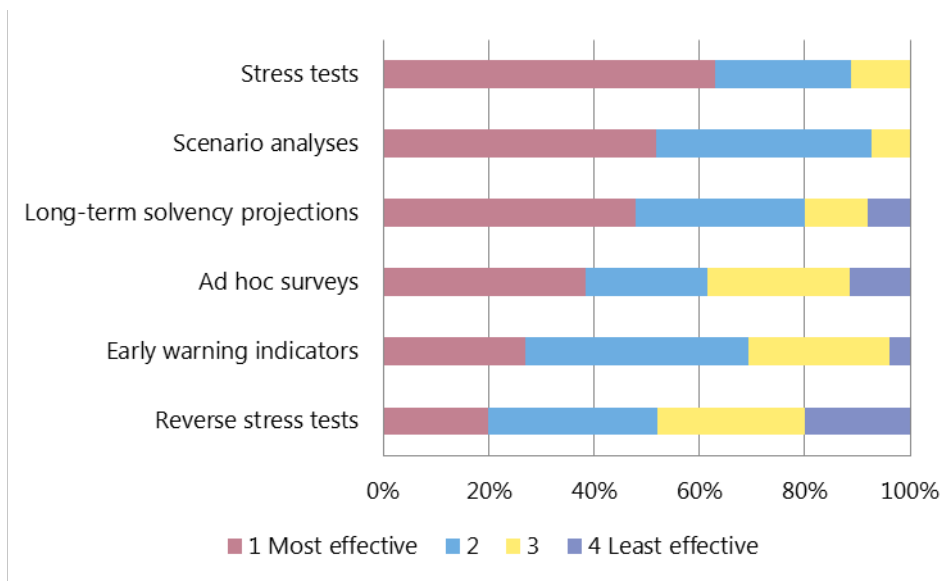
Source: BIS Survey.

19. **Even supervisors that do not face a low interest rate problem regard stress tests as being an effective risk assessment tool.** However, it is important to recognise that no single tool is ideal. Supervisors should consider using multiple tools to assess the impact of low interest rates on insurers, as each tool has pros and cons. Expert judgment is needed to analyse the signals from different tools, and to recognise the limitations of each. In particular, supervisors should exercise caution in interpreting results from tools that rely on insurers' subjective assumptions, which may be biased or overly optimistic. Graph 5 shows the relative ranking of a number of different tools by the surveyed supervisors and the Table 3 lists some pros and cons for each tool.

Relative effectiveness of supervisory tools to assess impact of low interest rates

In per cent

Graph 5



Source: BIS Survey.

Comparison of supervisory assessment tools

Table 3

	Pros	Cons
Stress tests ¹⁰	<ul style="list-style-type: none"> • Targeted and objective (less exposed to insurers' bias) • Provide concrete results • Can specify level of stress and extent of risk mitigation recognition • Can assess impact on both individual insurers and the industry as a whole • Allow a deep assessment of risk dynamics 	<ul style="list-style-type: none"> • May not capture the interaction between different variables (unlike scenario analyses) • Limited use if valuation basis is not sensitive to market movements (for example, the "locked-in" assumption approach)
Reverse stress tests	<ul style="list-style-type: none"> • Provide concrete results 	<ul style="list-style-type: none"> • Does not provide much information if an insurer remains solvent under all chosen stresses
Scenario analyses	<ul style="list-style-type: none"> • Provide concrete results • Provide more realistic results by capturing interactions among different variables • Can prescribe specific scenarios 	<ul style="list-style-type: none"> • Difficult to specify plausible yet sufficiently extreme scenarios • Difficult to specify correlations between different variables, especially under stressed conditions
Long-term solvency projections	<ul style="list-style-type: none"> • Provide a forward-looking view of an insurer's possible future financial condition under different scenarios • Can identify interest rate scenarios in which an insurer is most vulnerable 	<ul style="list-style-type: none"> • Results can be heavily reliant on insurers' own view of future economic forecasts • Difficult to separately identify the impact of certain variables because of the various assumptions underlying the projections • Based on subjective assumptions about future conditions • Insurers' assumptions may be overly optimistic
Ad hoc surveys	<ul style="list-style-type: none"> • Allow clear identification of potential problems arising from a low interest rate environment • Ability to address specific issues 	<ul style="list-style-type: none"> • Insurers' responses might be biased • May not provide forward-looking or predictive results
Early warning indicators	<ul style="list-style-type: none"> • Can be easy to set up for continuous monitoring • Can serve as a prompter for more intense supervisory attention 	<ul style="list-style-type: none"> • May be difficult to capture the unique risk profile of individual insurers • May not provide comparable results across insurers due to different product mix • Data may not be readily available on a timely basis • May not be sensitive to interest rate movements

¹⁰ A stress test typically involves a projection of an insurer's financial condition under a specific set of severely adverse conditions that may be the result of several risk factors over several time periods with severe consequences that can extend over months or years. A scenario analysis usually involves assessing the impact of possible future environments on an insurer, either at a point in time or over a period of time, taking into account changes to and interactions among many factors over time. See IAA (2013).

20. **Most jurisdictions that have not experienced low interest rates are not monitoring the potential impact of such a scenario on their insurers.** While supervisors need to prioritise their surveillance activities given scarce resources, exposure to interest rate movements warrants close monitoring as one of the most significant risks for life insurers. That said, such monitoring could justifiably be of a lower priority where there are few in-force or new policies sold with investment guarantees.

21. **The surveyed supervisors have mixed views on the usefulness of early warning indicators.** Although there is a wide range of early warning indicators that are monitored by some supervisors, care should be taken in interpreting the results. As with any supervisory tools, it is important to understand the mechanics of the tools and their limitations. Early warning indicators are only one set of inputs that supervisors can consider, along with other information, such as supervisory review outcomes from on-site inspection and off-site monitoring activities. Moreover, some indicators may not be comparable among insurers due to their specific risk profiles. The following are early warning indicators that are used by the surveyed supervisors:

- asset-liability duration mismatch;
- difference between actual investment returns (possibly net of expenses and/or taxes) and guaranteed interest rates;
- solvency ratios, including by different segments of interest-sensitive products (it is noteworthy that one of the surveyed supervisors requires insurers to submit their solvency ratios on a weekly or daily basis);
- changes in capital required for interest rate risk exposure;
- changes in certain balance sheet items, for example, technical provisions, equity, provision for bonuses, implicit reserves in assets;
- changes in asset composition, separately identifying the proportion of risky assets;
- changes in business mix, separately identifying the proportion of products with investment guarantees;
- mismatch between cash inflows and outflows;
- sensitivity of the solvency position or profits to changes in interest rates; and
- a composite index of various indicators, for example, technical provisions, solvency ratios, sum-at-risk and reinsurance coverage.

22. **Views are mixed on the usefulness of macroprudential tools for assessing risks arising from low interest rates.** The IMF¹¹ has called for supervisors and regulators to take a more macroprudential approach in addressing systemic risk arising from insurers' common exposures to market risk. On the other hand, the European Insurance and Occupational Pensions Authority (EIOPA)¹² has found little evidence to conclude that a macroprudential framework is needed to address challenges arising from the low interest rate environment. From the surveyed supervisors that have some sort of macroprudential framework, the typical tools used to assess system-wide vulnerabilities arising from a low interest rate environment are macro stress tests and sector-wide risk aggregation. Other tools used include forward-looking sensitivity analysis, macro scenario analyses and projection of the impact of investment spread tightening on insurers' earnings. Graph 6 shows the proportion of the surveyed supervisors that considered each macroprudential tool useful. Importantly, several supervisors emphasised that a range of macroprudential tools should be used to complement each other.

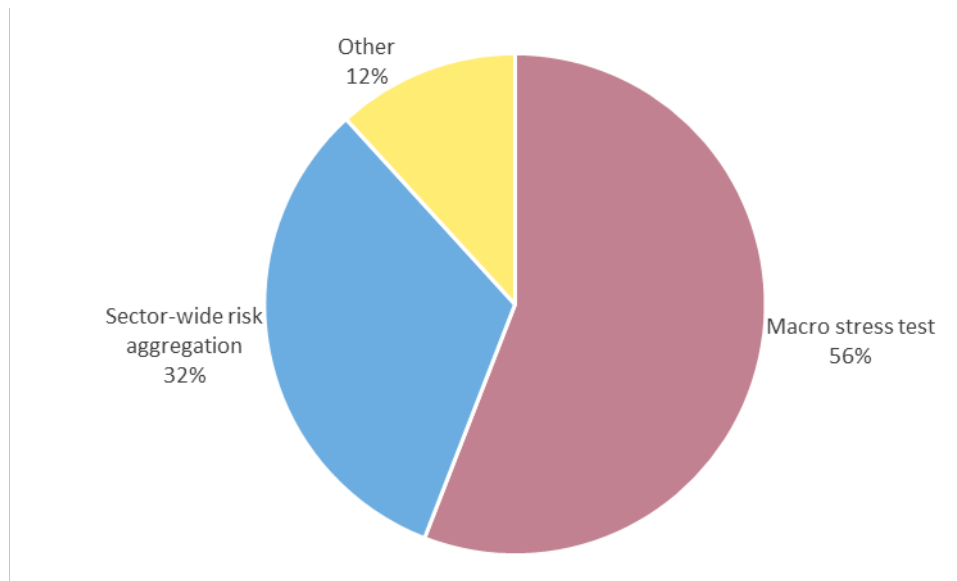
¹¹ See IMF (2016).

¹² See EIOPA (2016).

Macroprudential tools to assess low interest rate impact on insurers

In per cent

Graph 6



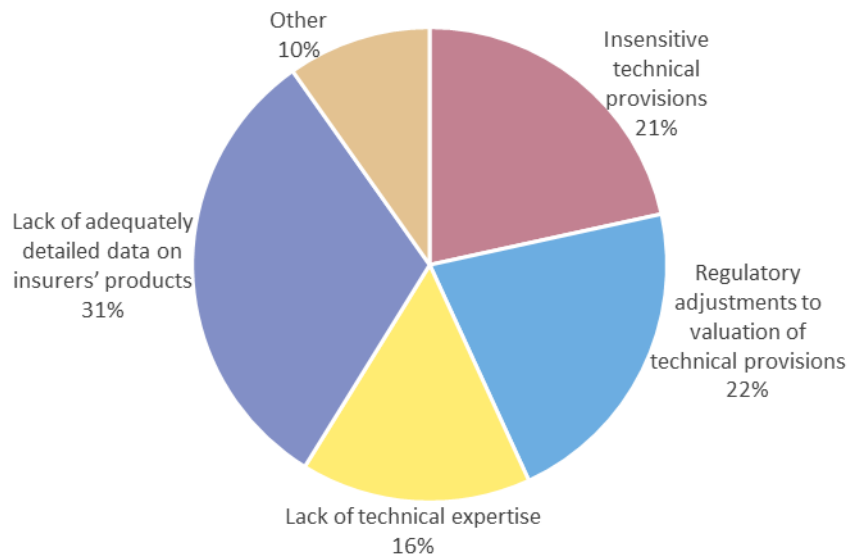
Source: BIS Survey.

23. **Lack of data is the main challenge for most of the surveyed supervisors in identifying and quantifying the impact of a low interest rate environment on insurers.** Without sufficiently detailed and reliable data on insurers' products (for example on cost of guarantees or sensitivities to interest rate movements), supervisors find it difficult to quantify the impact of low interest rates and to identify any trends in insurers' exposure to low interest rates. As a result, supervisors may not know if there is a problem in their jurisdictions. It may be too late when the problem is uncovered, at which point it will cost significantly more or become more difficult to address than at an earlier stage. Examples of data gaps cited include the lack of regular stress test reporting, information on cost of guarantees, and sensitivity analysis. Supervisors should consider taking the necessary actions to obtain the data they need to address the low interest rate issue. Graph 7 shows the proportion of the surveyed supervisors that concurred with the different challenges in identifying and quantifying the impact of low interest rates.

Supervisory challenges in identifying and quantifying impact of low interest rates

In per cent

Graph 7



Source: BIS Survey.

24. **Supervisors are preparing for possible interest rate increases.** Most of the surveyed supervisors think that a sudden rise in interest rates could potentially have adverse effects on insurers. However, insurers can benefit from interest rate increases under certain circumstances; for example, if the value of liabilities were to fall by more than the value of assets. Furthermore, according to the BIS,¹³ insurers' investment returns may increase only gradually if interest rates increase due to large holdings of fixed income instruments and because firms may be forced to replace maturing bonds with lower-yielding securities.

25. **Supervisory tools used to monitor low interest rates are also used to assess the potential impact of rising interest rates.** According to the surveyed supervisors, problems could arise mainly through two channels if interest rates rise:

- **depressed asset values:** The value of fixed income assets falls when interest rates rise. If the value of liabilities does not fall to the same extent (for example, due to the valuation approach prescribed by supervisors), or if the duration of assets is higher than liabilities, the insurers' capital resources will fall, weakening their solvency positions; and
- **mass policyholder surrenders:** Policyholders may be more inclined to cancel their policies in favour of other investments offering higher yields. This is particularly the case if the surrender penalties imposed by insurers are low or non-existent. Due to heightened competition, insurers may decide to increase profit distribution to policyholders. Both surrender payments and increased profit distribution will reduce the insurers' capital resources. In extreme cases, mass surrenders could give rise to not only solvency problems but also liquidity strains on insurers.

¹³ See BIS (2017).

Supervisory response

26. **In general, supervisory actions can be categorised as follows:**

- **business activity restrictions** (for example, a ban on underwriting new insurance policies);
- **reinforcement of financial position** (for example, requiring additional capital); and
- **last resort measures** (for example, placing an insurer into run-off).

The surveyed supervisors have a broad range of powers to deal with insurers in difficulties due to low interest rates. The most used tool at the surveyed supervisors is to subject insurers to more intense supervisory reporting. While this tool does not, in itself, mitigate the impact of low interest rates, it does provide supervisors with a greater ability to respond quickly, before the situation worsens and dims the prospect of successful remedial measures. Two supervisory authorities reported that they lack such powers.

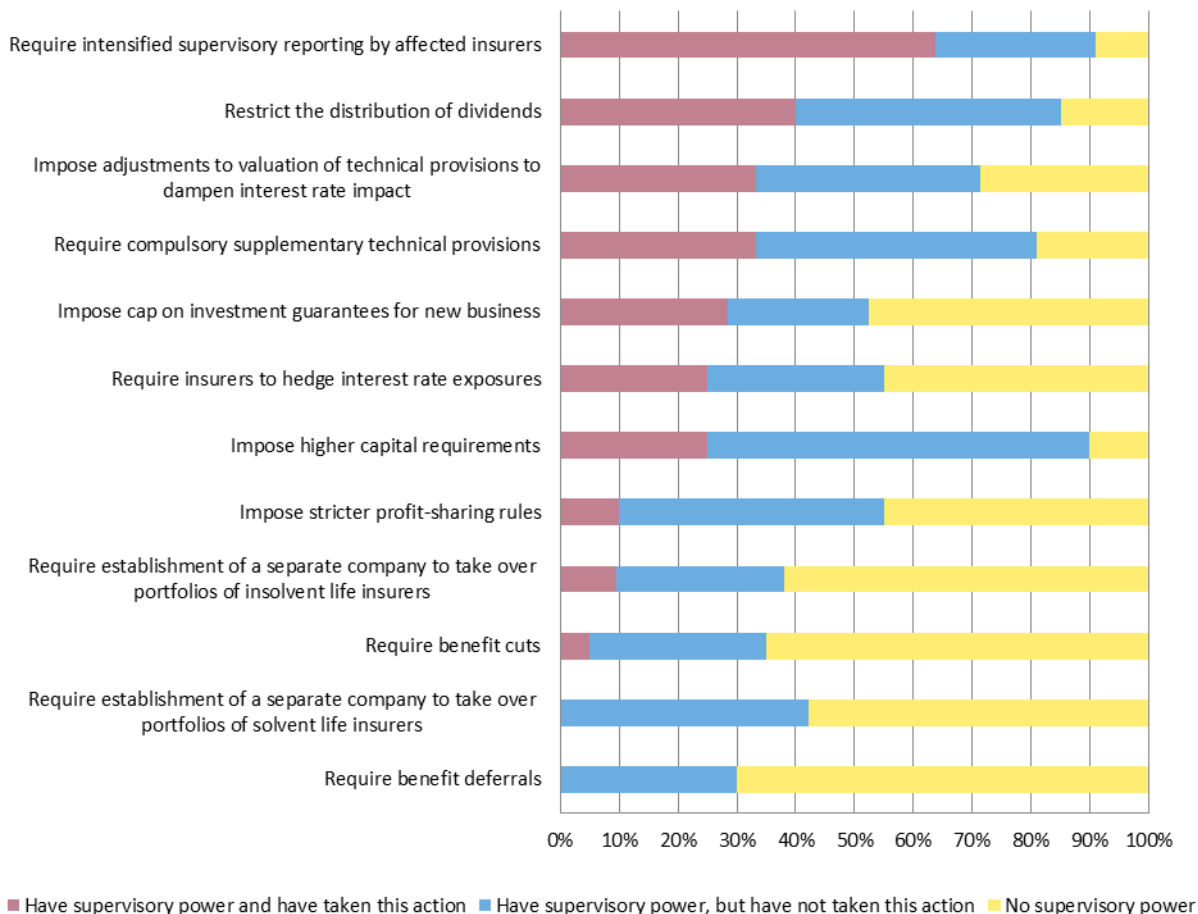
27. **Other commonly used tools aim at conserving capital and increasing insurers' loss-absorbing capacity.** The most popular capital conservation measure is to restrict dividend distribution to shareholders. Most of the surveyed supervisors have powers to require higher technical provisions and capital requirements.

28. **Most of the surveyed supervisors do not have powers to impose requirements that violate the contractual obligations of insurers to policyholders and to take resolution measures.** For example, more than half of the surveyed supervisors cannot require insurers to defer paying out investment guarantees or to reduce those guarantees. Most surveyed supervisors also lack the power to require the establishment of a bridge institution to take over the portfolios of solvent or insolvent insurers. Graph 8 shows the proportion of the surveyed supervisors with powers to take the specified actions and, if applicable, whether or not they have taken such action. Other measures not listed in Graph 8 include restricting the remuneration of senior management, requiring a recovery plan, and restricting the underwriting of new business.

Supervisory powers

In per cent

Graph 8



Source: BIS Survey.

29. **In the four jurisdictions where insurers had breached solvency requirements due to low interest rates, supervisors employed different measures to restore the solvency of those insurers.** The following summarises the actions taken by those supervisors and insurers.

Actions by insurers

- Capital injection from parent
- Capital-raising
- Higher reserves to address asset-liability mismatch
- Management change
- Enhanced risk management

Actions by supervisors

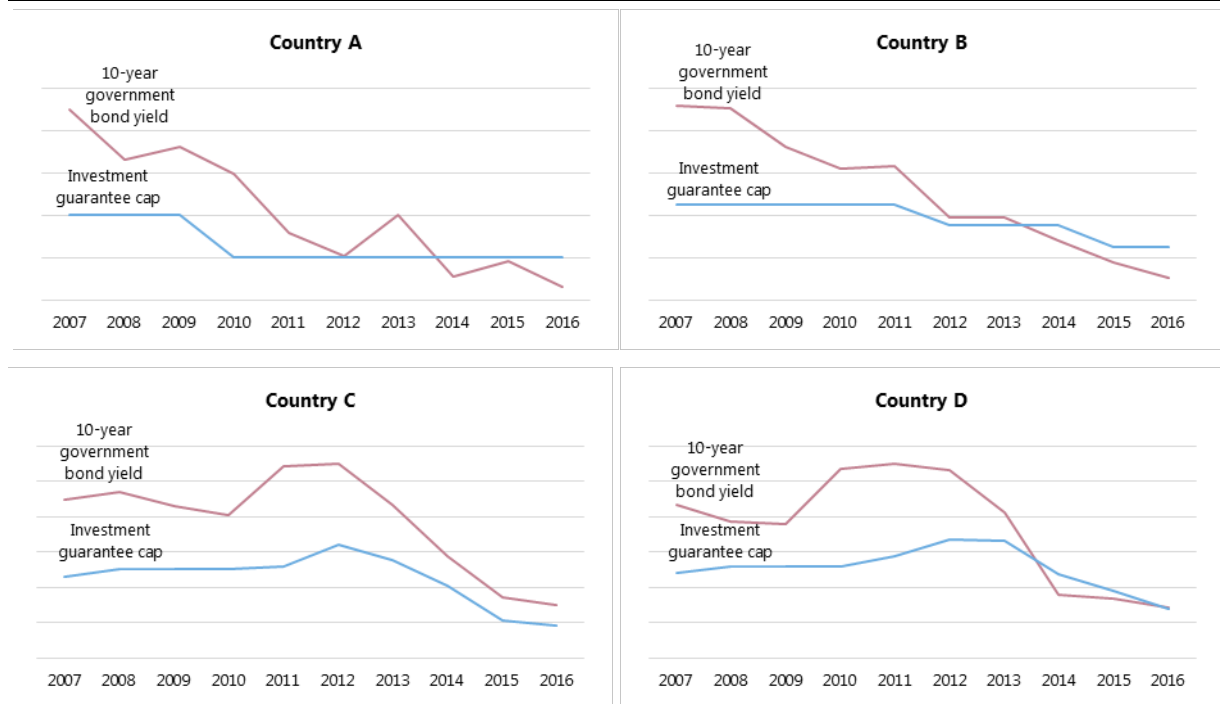
- Require more capital and/or higher technical provisions
- More intense supervision
- Require recapitalisation and recovery plans

30. **Not many countries have imposed caps on investment guarantees for new business.** Investment guarantee caps are restrictions that supervisors set on the amount of investment guarantees that insurers can offer policyholders. In countries where supervisors have taken such action, the cap broadly moves in line with government bond yields. Graph 9 shows movements of the caps and the 10-year government bond yield benchmark from 2007 to 2016.

Evolution of investment guarantee caps and 10-year government bond yields

In per cent

Graph 9



Source: BIS Survey.

31. **The surveyed supervisors use different criteria to assess the effectiveness of the different supervisory actions that can be taken to address the low interest rate problem.** The criteria used by supervisors to rank the supervisory actions include the following:

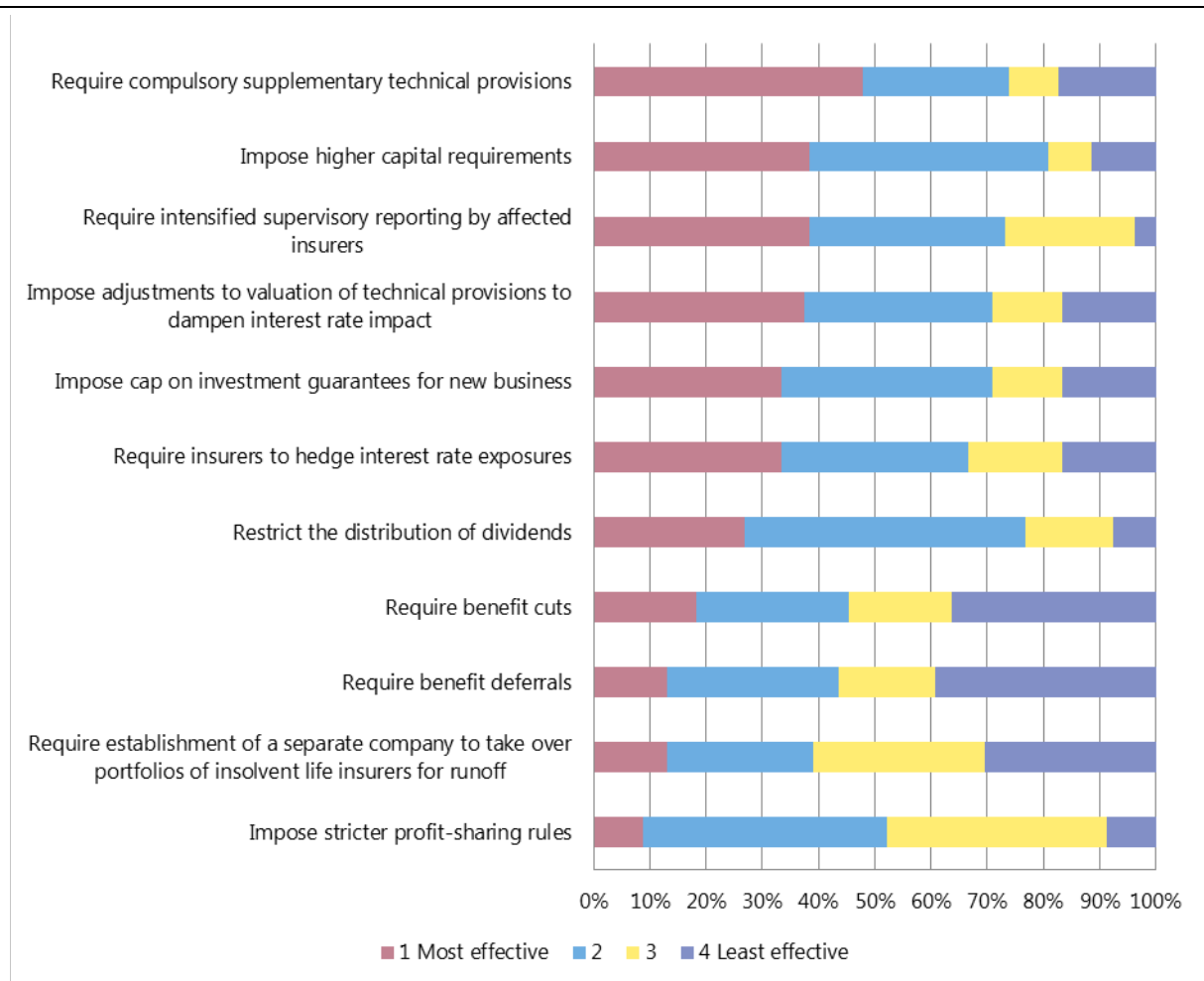
- feasibility to execute the measure;
- effectiveness of measure in restoring the financial health of insurers;
- immediacy of potential impact;
- significance of potential impact;
- impact on shareholders (measures should “bite”);
- impact on policyholders (a few supervisors mentioned that only in exceptional cases can they take actions that would disadvantage policyholders); and
- timing when the actions would be most effective, and whether the actions have a proactive or reactive effect.

32. **Most of the surveyed supervisors consider requiring insurers to hold more technical provisions as being the most effective measure to address the adverse impact of low interest rates.** Graph 10 shows the ranking of the various supervisory actions by the surveyed supervisors.

Relative effectiveness of supervisory measures

In per cent

Graph 10



Source: BIS Survey.

33. **Some supervisors lack the necessary powers to impose certain measures that they consider as being most effective in addressing the adverse impact of low interest rates.** For example, 17 supervisors considered a cap on guaranteed rates as being very effective or effective, but only five supervisors have actually imposed such a cap, mainly because the rest lack supervisory powers to do so. Consideration should be given to obtaining these powers in order to be able to deal with the low interest rate issue effectively.

34. **Supervisors should be mindful of potential unintended consequences when considering supervisory action options.** One supervisor emphasised that insurers should be held responsible for the risks that they take. Although supervisors may require insurers to take action to address certain problems once they are detected, insurers should not be able to use this as an excuse for not managing risks properly on an ongoing basis.

35. **Some of the surveyed supervisors can, and have allowed insurers to adjust the way they value technical provisions to dampen the adverse impact of low interest rates.** While such adjustments can positively impact an insurer's solvency position, some commentators consider them a form of regulatory forbearance, masking the true financial state of those insurers. Valid arguments support these measures, for example, to avoid procyclical effects or if it is expected that low interest rates will persist only in the short term. However, if the measures are in place over a longer term, some would argue that the solvency of those insurers are artificially bolstered and that they may be unlikely to meet their policyholder obligations if a shock were to occur. It is better to know the true extent of the problem so that remedial measures can be taken, rather than allowing business-as-usual under the potentially misleading assumption that the insurers are financially sound.

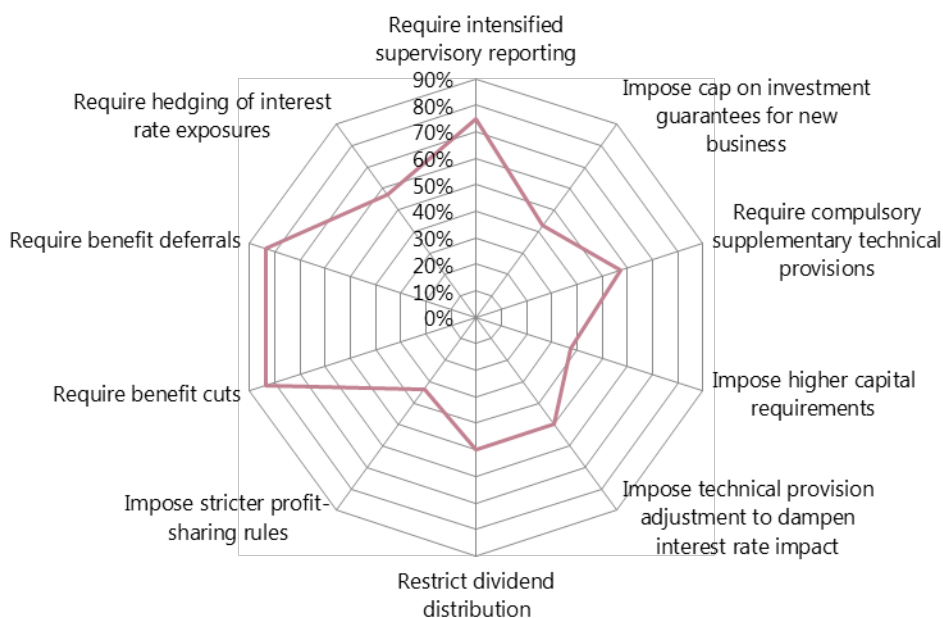
36. **Certain supervisory actions involve a trade-off between prudential aims and consumer protection.** There is no clear right or wrong approach in making this trade-off. Although certain supervisors have specific mandates focusing mainly on prudential objectives, all supervisors need to exercise sound judgment in striving for the fairest possible outcomes for policyholders. For example, encouraging policyholders to surrender policies with investment guarantees could reduce the liabilities of insurers, but may not be in the interests of the policyholders if they incur high surrender penalties or forego the in-the-money guarantee. Switching to another insurer will require many years to build up their cash values again. Similarly, allowing insurers excessive recognition of the profit participation feature to offset regulatory capital requirements may not be appropriate, particularly if future benefit cuts are not justified based on the reasonable expectations of policyholders.

37. **To be effective, intensified supervisory reporting and requiring capping of investment guarantees for new business should be conducted as early as possible.** Requiring benefit cuts (including for non-participating products) or deferrals is usually considered to be the last resort. In general, pre-emptive measures to enhance the resilience of insurers should be put in place as early as possible. Such measures include requiring higher capital, hedging of interest rate exposures and stricter profit-sharing rules. But requiring an already weak insurer to hold more capital or technical provisions could further impair its solvency position. As mentioned earlier, while requiring benefit cuts or deferrals can help in reducing the liabilities of insurers, these are usually considered to be last-resort measures since they are against the immediate interests of policyholders, which supervisors should protect. Graph 11 shows the ranking by the surveyed supervisors of the timing of a range of supervisory actions if they are to be effective. The further away the actions are from 0%, the later these actions can be taken relative to the other actions.

Ranking of timeliness of supervisory actions

In per cent

Graph 11



Source: BIS Survey.

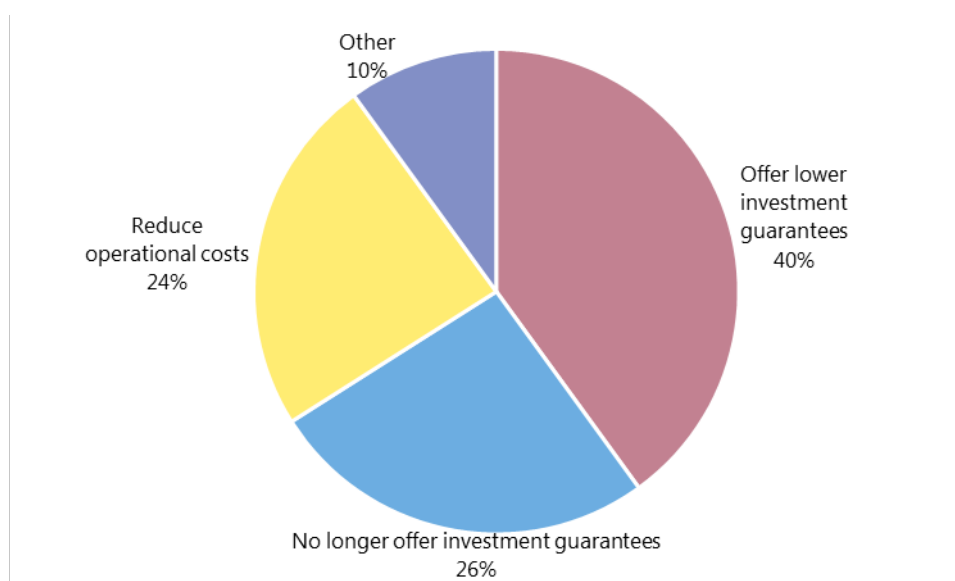
Insurers' response

38. **In the surveyed jurisdictions that are experiencing or have experienced a low interest rate environment, insurers no longer offer investment guarantees or have reduced such guarantees for new business.** Some insurers have moved to other product lines, such as unit-linked business, that pass on the entire investment risk to policyholders. Graph 12 shows the proportion of the surveyed jurisdictions in which insurers have taken the specified actions for new business. The "other" measures taken by the affected insurers include repricing products to reflect the higher cost of investment guarantees, revising interest rate models to allow for low and/or negative interest rates, increasing capital, and transferring risks to reinsurers.

Insurers' response to low interest rates for new business

In per cent

Graph 12



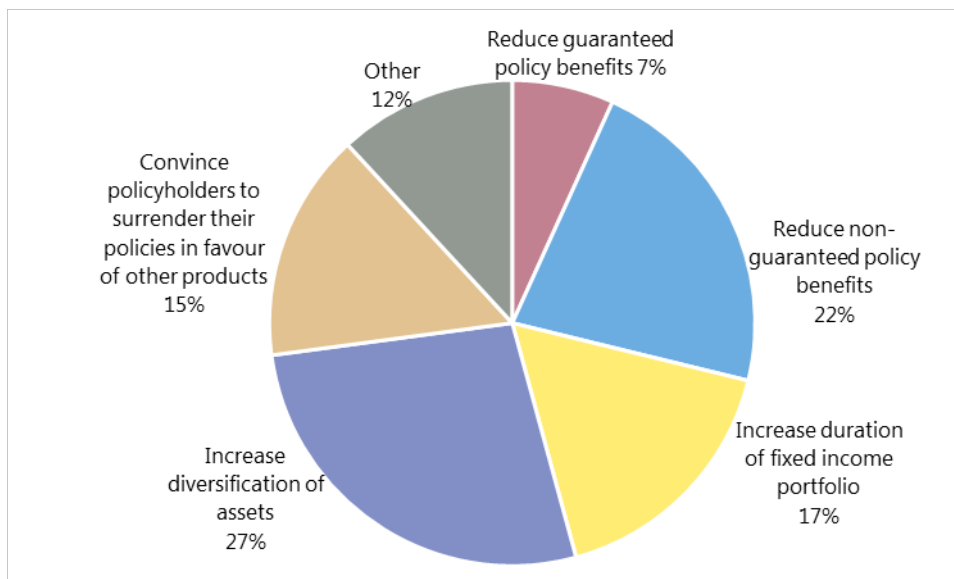
Source: BIS Survey.

39. **For in-force business, insurers have taken some measures that warrant close supervisory scrutiny such as incentivising policyholders to surrender their policies and investing more in higher-yielding (lower-quality) assets.** Other actions that insurers have taken include increasing asset diversification to reduce concentration risk, and reducing non-guaranteed benefits such as bonuses for participating products or crediting rates for universal life products. Graph 13 shows the proportion of the surveyed jurisdictions in which insurers have taken the specified actions for in-force business. The “other” measures include increasing technical provisions, increasing capital, hedging interest rate exposure and transferring risks to reinsurers.

Insurers' response to low interest rates for in-force business

In per cent

Graph 13



Source: BIS Survey.

40. **Of all these measures, the surveyed supervisors view reducing investment guarantees and improving asset-liability management as being the most effective.** Early action by insurers, prior to entering a low interest environment, that the surveyed supervisors consider most effective include:

- reducing or removing policy benefits including investment guarantees;
- increasing technical provisions and/or capital;
- hedging investment guarantees; and
- shifting to other product lines that are less sensitive to interest rates.

Other ongoing actions that the surveyed supervisors consider most effective (besides asset-liability management) include:

- monitoring profitability;
- regularly repricing products; and
- diversifying assets.

Conclusion

41. **In general, the surveyed supervisors consider that supervisors and insurers have responded appropriately to the low interest rate environment.** Supervisors have employed various tools, as detailed above, to identify and address the potential adverse impact on insurers. Insurers have adjusted their investment and business strategy to mitigate their risk exposures.

42. **However, the lack of data including information on the duration of life insurance contracts raises the question whether supervisors and insurers are aware of the full extent of the problem posed by low interest rates.** It is important that supervisors and insurers take the necessary steps to improve the availability of reliable data.

43. **Risks remain in certain jurisdictions due to the relatively large portfolio of in-force insurance business with investment guarantees.** In addressing these risks, a balance should be struck between protecting policyholders' interests and financial stability objectives.

44. **Supervisors in jurisdictions that are not or have not been exposed to a low interest rate environment may benefit from the experience of other jurisdictions.** In particular, they could consider taking the necessary action to mitigate the possible adverse impact on insurers if interest rates were to fall in the future.

References

BIS (2017): 87th Annual Report, June.

EIOPA (2016): A potential macroprudential approach to the low interest rate environment in the Solvency II context, March.

FINMA (2016): Swiss Financial Market Supervisory Authority Insurance Market Report 2016, September.

IAA (2013): Stress Testing and Scenario Analysis, July

IAIS (2016): IAIS Global Insurance Market Report (GIMAR) 2016, January.

IMF (2016): Global Financial Stability Report, April.

——— (2017): Global Financial Stability Report, April.

Shin, H S (2017): "How much should we read into shifts in long-dated yields?", speech at the US Monetary Policy Forum, New York, 3 March.

Swiss Re (2012): "Facing the interest rate challenge", *Sigma*, no 4/2012, August.

——— (2016): "World insurance in 2016: the China growth engine steams ahead", *Sigma*, no 3/2017, July.