Chairperson's Corner

By Xueli Zhang

Dear Reinsurance Section Members,

I am very excited to be your chairperson for the 2020–2021 year. I have been a long-term member of the section and I joined the Reinsurance Section Council in 2018. Over the past two years, I have taken on various roles within the section council including treasurer, vice chair, webpage coordinator, and marketing coordinator. I appreciate the opportunity to lead the section and serve you in 2021.

What an unprecedented time that we live in right now! We have experienced something we have never seen in our careers, a global spread of a pandemic combined with a deep economic recession. At first, it looked more like a stress scenario that I had used in my actuarial analysis than reality. The good news is that I noticed my colleagues, clients and friends have all adapted quickly to the new reality. We move on to achieve our goals in the face of the challenges and have fun at the same time. For example, I started to enjoy virtual wine-tastings after I got used to the extensive working from home, business meetings with children and pets in the background and no Zumba class for more than six months. Zumba was important to me because I used to Zumba every day for four years before COVID-19 began.

My fellow Reinsurance Section Council members have also successfully adjusted to the changes and continued to serve our members over the past year. I'd like to highlight some of the achievements by the section in 2020.

- **Research:** Our section has a long-standing tradition of investing most of the section revenue on our research projects. Even though many research projects were on hold earlier this year due to the uncertainty from COVID-19, we contributed financially (and through volunteers) to a number of research projects, including wrapping up the "Reinsurance Treaty Recapture" project, releasing a series of papers related to the Living to 100 Symposium, and drafting the final report on the "Mortality by Socioeconomic Position Category in the U.S." project. We will restart the "Mortality Improvement Trends" project shortly.
- **Continuing education:** We helped to meet our members' continued education needs by coordinating content and speakers for sessions at SOA meetings. We sponsored two well received webcasts this year, "Reinsurance 101" and "Extreme Leadership." In addition, we released five podcasts in 2020, four of which were cosponsored with another section.
- **REAL symposium:** Our completely redesigned annual Reinsurance Seminar has a new name of "REAL Symposium" starting this year. REAL stands for Reinsurance Education and Learning. Due to COVID-19, we had to convert the material into a four-part webcast series covering important reinsurance topics, including health, regulatory update, strategic use of reinsurance, and mortality updates. We decided to spread the webcasts into October and November to make it easy to participate in all of them. We hope to bring the REAL Symposium to you in-person in 2021. This one-day event is special because it is fully devoted to reinsurance content and will provide networking opportunities with reinsurance professionals, such as actuaries, accountants, lawyers, and treaty administrators.

- **Newsletters and online resources:** There were a total of seven reinsurance newsletters in 2020, which is up from three issues per year from 2014 to 2019. Our digital newsletter articles are now sent directly to all members and can be read easily on all devices. We regularly update our section webpage to share recent updates. Through the section Resources page, section members can access section-produced webcast recordings (one year or older) at no additional cost and listen to all past podcasts.

After being a reinsurance pricing actuary for 13 years, reinsurance is one of my favorite topics. It is not only my work but also my passion. I believe customized reinsurance solutions could be the most efficient way to address issues in many situations. When reinsurance improves capital efficiency of insurance companies, the benefits are passed on to customers in the form of lower premium and/or better products. Currently, reinsurance is a niche area and I think the understanding is limited to a small portion of the insurance professionals. I believe our section could help by spreading reinsurance knowledge. We have customized the level of reinsurance understanding according to the specific situations of different groups. Therefore, I'd like to focus on the following areas over the next year.

- **Reinsurance education:** We will continue to provide high quality content to our members. In addition to our existing formats as I mentioned above, I'd like to explore new ways to help our members connect to the relevant reinsurance information that fits their specific needs and interests. I'd like to adjust our communication and content for the new environment and new generation of insurance professionals.
- **LEARN** (Life Education and Reinsurance Navigation): This is another way the Reinsurance Section contributes to the industry and society. Insurance is a highly regulated industry at state level and reinsurance could be a complex topic. We have coordinated and sponsored onsite presentations to state regulators on the topics that they are interested in. We will resume this long-standing service when normal business travel restarts.
- **Research and collaboration:** While reinsurance could be a niche topic, understanding reinsurance and working on a reinsurance solution normally involve a wide range of other topics such as financial reporting, investment, taxation, modeling, product development and so on. Our section has been blessed with a good budget. We will continue to collaborate with other sections to sponsor research projects that benefit our section members.
- **New SOA structure:** The SOA is developing a strategy to change the current section model to a new community approach. I will keep our members informed of the progress so that we will be well prepared for a smooth transition in the future.

I look forward to working with the rest of the Reinsurance Section Council, including the three newly elected council members, to continue bringing value to our section members. A complete list of the Reinsurance Section leadership team can be found at our website. I'd like to thank our departing council members, Kyle Bauer, Jean-Marc Fix and Laura Muse, for their service over the past three years. I learned a lot from their dedication and professionalism. I also want to thank our SOA staff, Jessica Schuh and Jim Miles, for their assistance and valuable suggestions.

Finally, I'd like to thank you, our 1,784 section members, for your support. Most of you are either involved with reinsurance or have an interest in this area. The main purpose of our section is to serve you to advance the reinsurance profession. I believe two-way communication helps to meet this purpose. Therefore, please feel free to reach out to me or anyone on the leadership team if you have questions or comments. In addition, I highly encourage you to participate in section activities, including volunteering. Many of you have already done so as a "Friend of the Council," so there is a big "thank you!" for your contributions. When the pandemic ends, I hope I will be able to meet some of you in person at the SOA Annual Meeting & Exhibit in 2021. If our work helps you to deepen your understanding of reinsurance, to communicate reinsurance ideas with other parties and/or to solve problems with a reinsurance solution, we will be very happy to hear about it. That will be the best reward for the Reinsurance Section Council. ■

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SOCIETY OF ACTUARIES
REINSURANCE SECTION

Reinsurance News
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Non-guaranteed Reinsurance Under Principle-based Reserves

By Katie van Ryn and Dylan Strother

With the mandatory implementation of principle-based reserving (PBR) for individual life insurance issued in 2020 and later, the requirements set forth in Section 20 of the Valuation Manual (VM-20) are the new reserving standard for directly issued, ceded and assumed reserves.

Due to the modeled reserve components under PBR, the reserve credit for reinsurance may be significantly different than the traditional formulaic approach used by both insurers and reinsurers. This will require a discerning look at both current reinsurance arrangements as well as the assumptions and approach used to model reinsurance cash flows in light of PBR requirements.

Concern from regulators regarding reserve credits across early adopters of PBR led to a large project and industry field test for the modeling of non-guaranteed reinsurance cash flows conducted by the American Academy of Actuaries and supported by the NAIC and Oliver Wyman.

The primary objective of the project was to investigate three proposed revisions to the guidance supporting modeling of non-guaranteed reinsurance under VM-20. In this article, we provide a brief background on the issue and explore how temporary solutions are impacting insurers as well as the journey to a long-term solution.

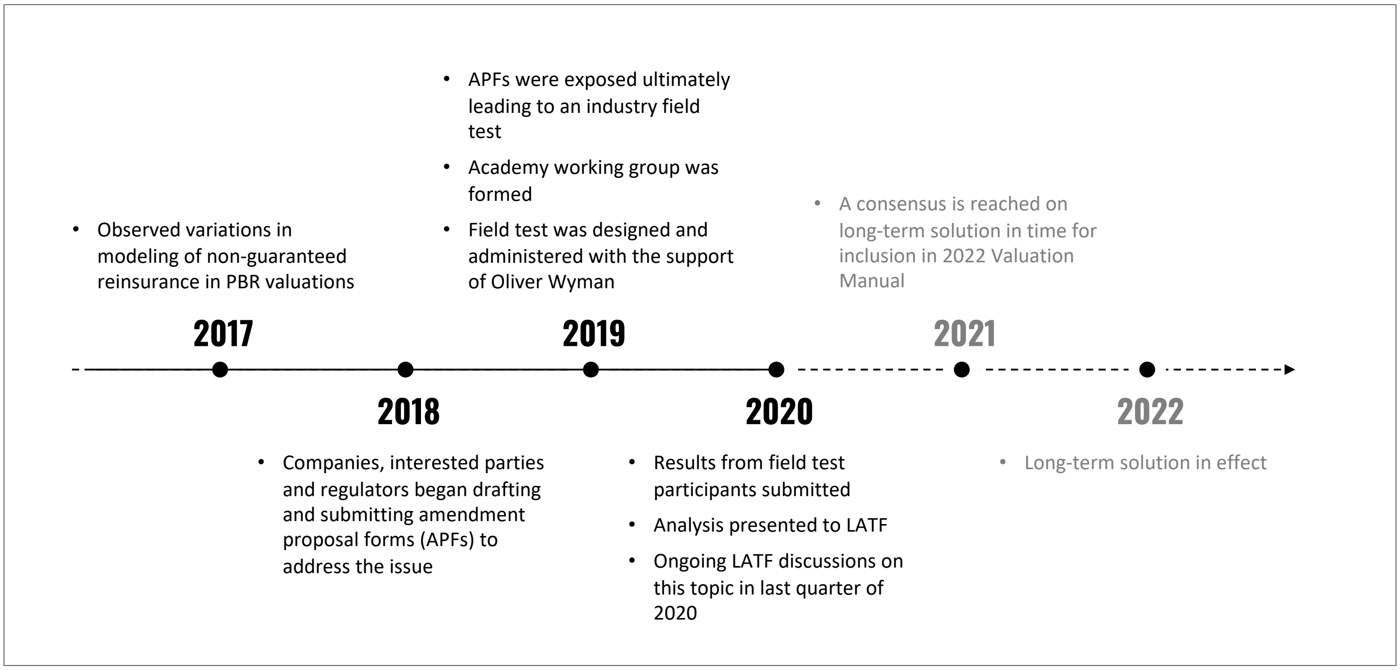
BACKGROUND

Initially, VM-20 provided only high-level guidance for how writers are to model non-guaranteed reinsurance cash flows to incorporate into reserves. As a result, various practices emerged and a range of reserve credits were observed by regulators who adopted the regulation early. In addition, regulators raised questions over the consistency of reserve credits held by direct writers and reserves held by reinsurers.

Variation in observed reserve credits between direct writers is primarily driven by the level of mortality margin specific to each company and the relationship between company-specific prescribed mortality and negotiated reinsurance premiums. Inconsistencies between reserve credits and reserves held by reinsurers are primarily driven by differences in valuation assumptions (including the modeling approach for non-guaranteed reinsurance premiums) and mechanics of aggregating and computing final reserves.

Due to this range of practice, a temporary formulaic reserve credit (the "interim solution") was put in place for 2020 valuations. A complete timeline of the journey for a long-term solution, including the events leading up to the industry field test and future expectations of the next steps, is displayed in Figure 1.

Figure 1
Timeline of Regulatory Discussions on Non-guaranteed YRT Under PBR



IMPACT OF THE INTERIM SOLUTION

The interim solution was put in place for the 2020 valuation manual and is mandatory for contracts issued after 1/1/2020, with an optional grandfather period for contacts issued between 1/1/2017 and 1/1/2020. Oliver Wyman's 2020 PBR Emerging Practices Survey, covering 95 percent of the individual life sales market and including both direct writers and reinsurers, indicated that non-guaranteed reinsurance is material for approximately 84 percent of the industry subject to PBR and 60 percent of those impacted chose to apply the solution retrospectively to all business subject to PBR.

The survey results also indicated that the interim solution has halted adjustments to reinsurance arrangements as a result of PBR, as writers considering changes to their reinsurance strategy as a result of PBR was reduced from 38 percent to 18 percent.

Still, some are considering changes to reinsurance arrangements. We have noted increased interest in coinsurance arrangements that fully transfer risk as well as guaranteed YRT, both of which minimize the modeling challenges introduced by non-guaranteed arrangements.

THE JOURNEY TO A LONG-TERM SOLUTION

The three APFs that were evaluated during the industry field test are summarized in Figure 2. Field test participants were also asked to model specific variations of the APFs which included different mortality improvement assumptions as well as prescribed loss triggers to indicate rate changes.

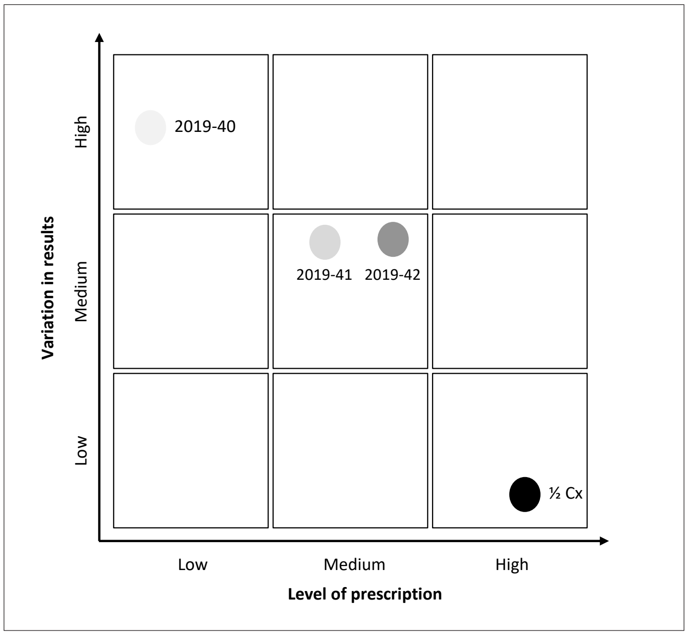
Figure 2
Field Test APF Descriptions

APF	Description
2019-40	Model non-guaranteed reinsurance premiums using anticipated experience with margins based on clarified modeling principles/guidance and actuarial judgment.
2019-41	Premiums determined using current non-guaranteed reinsurance premium scale with projected adjustments based on what the company actually expects will occur. Claims determined using the company's anticipated experience mortality assumptions including mortality improvement.
2019-42	Use current non-guaranteed reinsurance premium rates, plus a prescribed margin for non-guaranteed rates based on the difference between "baseline credibility" prudent estimate mortality and company experience mortality.

Oliver Wyman analyzed the results of the field test with support from NAIC staff. The analysis included using field test results to understand drivers and key components of YRT issue (e.g., relationship between anticipated mortality & current scale). In addition, field test results were utilized to confirm the results of a representative PBR model, which was subsequently supported analysis of the proposed solutions on a consistent basis.

Each of the three APFs were compared under several different criteria, with the goal of highlighting where and to what degree the various solutions differ. Figure 3 highlights the level of prescription and variability of results within the three APFs. In determining the long-term solution, regulators must balance the desire for a principle-based approach with the level of variation observed between companies.

Figure 3
Level of Prescription Versus Level of Variation in APFs



Other criteria, such as modeling complexity, potential for asymmetry between assuming and ceding interpretations and defined level of risk sharing will influence the long-term solution. Detailed results and analysis produced as part of the field test can be found on the NAIC website.[1]

Discussions around the long-term solution will continue in 2020 with the goal being to adopt a long-term solution ahead of the 2022 Valuation Manual.

LOOKING AHEAD

Regardless of the final solution, companies can expect to revisit their modeling set up for reinsurance under PBR in order to comply with the long-term solution. In addition, there still may be some judgement involved depending on the final solution.

Reinsurance and its relationship to statutory reserves is more complex under PBR. Given this complexity and uncertainty on non-guaranteed reinsurance, we have observed a trend towards agreements with stronger guarantees that transfer all risks. We are eager to track and understand how this trend evolves as discussions on the long-term solution continue. ■

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ENDNOTE

1 *https://content.naic.org/sites/default/files/inline-files/YRT%20%20PBR%20%20Field%20Test%20and%20Interpretation%20Survey%20%20Results%20%20Analysis%20%28Updated%20August%207%202020%29.pdf*

Lower for Even Longer

What Does the Low-yield Economy Mean for Insurers?

By Thomas Holzheu

Quick and decisive interventions by monetary and fiscal authorities helped cushion the impact of the COVID-19 crisis. Governments took bold measures to provide liquidity to households and private firms through direct transfers or by providing loan guarantees to banks. As a result, public debt levels have skyrocketed from the already elevated levels going into this crisis. Central banks have been quick to react to market turbulence and tighter financial conditions by cutting policy rates, re-enacting their 2008 playbook of quantitative easing and special lending facilities as well as entering into new territories with the U.S. Federal Reserve (Fed) buying corporate credit.

With a protracted recovery, we believe Fed funds rates will remain close to zero for the next three years at least. Bond yields have fallen farther from already low levels, with the U.S. 10-year Treasury yield hitting a record low of 0.4 percent in early March before regaining some ground. We expect that central banks worldwide will keep borrowing costs low to keep higher debt burdens more sustainable. This is particularly relevant for Europe where several of the peripheral economies were already struggling with elevated debt levels during the Euro crisis. We forecast the U.S. 10-year yield to stand at around 1 percent through 2022, and that the German 10-year yield will remain negative.

The Fed and the European Central Bank have been performing strategic reviews of their monetary policy frameworks. In late August, the Fed concluded that process in late August and adopted a flexible average inflation targeting framework. That means it will allow inflation to overshoot the 2 percent level to make up for periods of undershooting inflation and the ensure that the labor market also improves for low- and moderate-income communities. The Fed will not just allow, but welcome, inflation that exceeds 2 percent when it has been below target for some time. These developments imply interest rates will remain lower for longer even as inflation accelerates. That would be an uncomfortable combination for insurers.

PROPERTY & CASUALTY INSURERS WERE UNABLE TO OFFSET LOW INTEREST RATES PRE COVID-19

Property & Casualty (P&C) insurers are generally less sensitive to interest rate changes than Life and Health (L&H) insurers, given a low share of multi-year contracts in their policy portfolios and the absence of product guarantees. Nevertheless, P&C insurers are dependent on investment returns, as profitability is driven by both underwriting and investment performance. Investment income on invested cash flows, which for long-tail lines can remain on the balance sheet for a couple of years, is an integral part of the business model. Accordingly, pricing for P&C products considers the time value of money. Premium rates need to rise if investment yields are lower. For claims with long settlement periods, the investment of underwriting cashflows between occurrence and settlement are more exposed to interest rate risk. On average, premiums for long-tail lines like general liability, medical malpractice and workers' compensation are invested for about three to four years

Figure 1
Total Investment Yield Non-life Insurance, 1999–2019

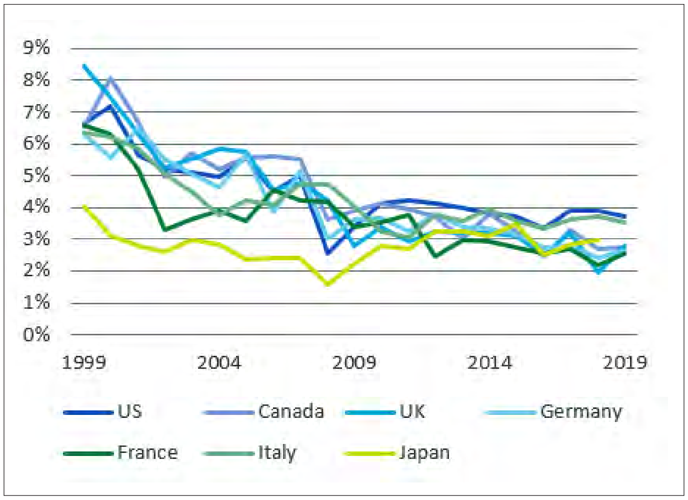
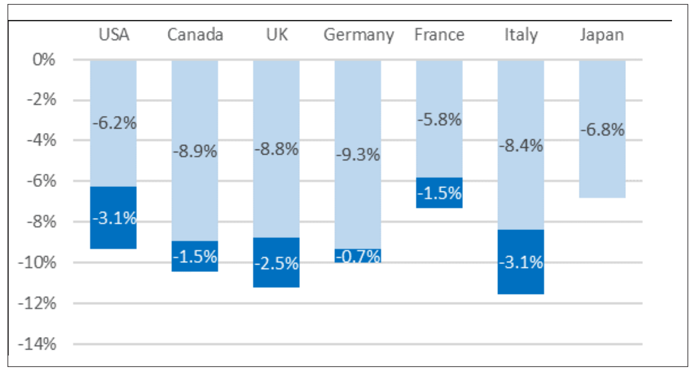


Figure 2
Estimates of the 2019 Non-life Profitability Gap and Sensitivity to Lower Interest Rates Through 2021



P&C insurers' yields on their asset portfolios have fallen post GFC, putting pressure on profitability in the past decade. However, soft market conditions have left insurers with little pricing power to offset lower investment returns, even before COVID-19. As Figure 1 shows, pre-GFC total yields in most G7 markets were in the 4 percent to 6 percent range. By 2019, earned yields had fallen to 2 percent from 4 percent.

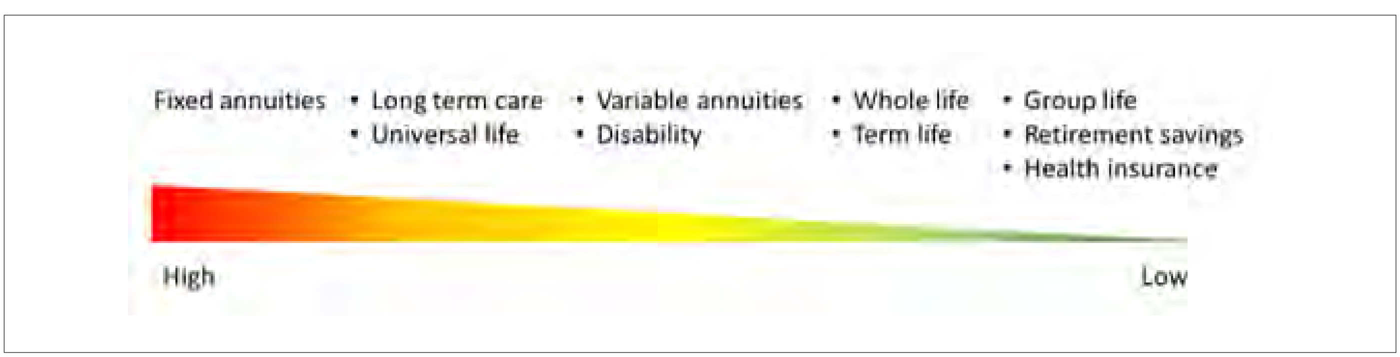
Before COVID-19, most major markets were already in a prolonged phase of below-average profitability. In the last decade, the average ROE of the G7 markets was relatively low, around 7 percent, reflecting a period of soft underwriting cycle, weak investment performance, and a high level of capital funds. For last year, we estimated that non-life insurers in the G7 markets would have needed to improve their underwriting margin by six to nine percentage points (ppt), depending on the market, to achieve long-run ROE expectations. With the projected farther drop in interest rates, we estimate that the sector's profitability gap will widen by another one to three ppt through 2021. Even with recent price rises in commercial lines, more re-underwriting is needed to address profitability shortfalls.

LIFE INSURANCE IS MORE INTEREST-RATE SENSITIVE THAN NON-LIFE

Life insurers have more exposures to interest rate changes on the asset and liability side of their business. The average maturity of U.S. life insures' bond portfolios was 10.7 years in 2019 compared to 5.8 years for Property & Casualty. Many non-life policies are short-tail in nature and can be re-underwritten annually. The life sector, however, is dominated by savings products and long-dated multi-year contracts. Interest rates have a large impact on savings products, for which investment income is a major source of earnings for life insurers and where embedded guarantees determine insurance liabilities. Interest rate sensitivity is the highest for products where guarantees are rigid, and the duration of the business is high.

As Figure 3 shows, by product the most significant impact is on: (1) fixed annuities, where the insurer guarantees the policyholder a certain crediting rate over a given period. In a low interest rate environment, it is harder to earn a spread over the

Figure 3
Sensitivity of Life Products to Interest Rates by Product Type, Ranked From Highest Impact to Lowest Impact



rate promised to the consumer from invested assets; (2) long-term care, where the contribution to profitability from investment income is expected to be sizable; (3) Universal Life products, where profitability depends on the insurer earning a spread above the crediting rates promised to the consumer, which also face spread compression and where secondary guarantees have become "in the money" from the policyholder perspective; and (4) variable annuities, which are more sensitive to equity markets. Still, the fees charged for the guarantees offered can be insufficient to maintain profitability in a low interest rate environment, as low and volatile interest rates lead to increased hedging costs. Hedging the interest rate sensitivity for many products has become more expensive and difficult to manage. Re-pricing and de-risking activities have dampened sales in several product categories.

Policyholder behavior in response to interest rate changes can foil insurers' asset-liability matching and hedging strategies, which both are heavily reliant on reasonably accurate predictions of future cash flows. Policyholder behavior can be a significant issue for savings products because of the options and guarantees embedded in the products. For example, policyholders usually have the right to reduce or increase premium payments for regular premium contracts in later years, and to withdraw money from both regular and single premium accounts. Another option sometimes granted to policyholders is the right to extend a contract at maturity under the original terms. Declining interest rates can also reduce the motivation for policyholders to lapse their savings policies. As rates decline, embedded interest rate guarantees gain in value and attractive alternative investment opportunities for policyholders are in short supply. Cash flows from life savings products are therefore hard to predict, which gives rise to many challenges in managing interest rate risk.

The importance of investment income is compounded by the issue of duration mismatches for long-duration life products. There is a lack of sufficiently long-duration financial instruments for life insurers liabilities. Both insurers and pension funds have high demand for long-term investments, making the lack of long-term investment opportunities even more precarious. Life insurer liabilities often last 30 years or more, and assets with such a long duration are either unavailable or illiquid in many markets. This generates a reinvestment risk for the insurer. If the duration of an insurer's assets and liabilities is not properly matched, falling interest rates will erode profitability. This can also be problematic under a market consistent valuation of assets and liabilities (as required under Solvency II, for example) because a decline in interest rates increases the value of the liabilities more than the value of the assets. This could lead to a drop in the market value of equity capital, impairing insurer's solvency.

COPING WITH THE LOW-YIELD ENVIRONMENT

The most effective means for life insurers to manage interest rate sensitivity is to change product features. According to a global survey from the Bank of International Settlements, 40 percent of life insurers lowered the guaranteed benefits in their new savings products business, and 26 percent abolished guaranteed products to counter the negative impact of already low interest rates in 2017.[1] For in-force business, they sought to incentivize policy holders to surrender their policies in favor of other products (15 percent) and reduce benefits (29 percent). A survey of CFOs at European life insurers found similar results, with 29 percent having changed product features in new business, and 18 percent doing so for in-force business, while also sometimes increasing the price of products.[2] In some cases, the insurers have withdrawn from certain market segments altogether. Another that has occurred over the last decade is a shift from savings to protection business such as term-life, critical illness, disability or health.

With these actions, life insurers effectively moved some of their interest rate and other investment risks to policyholders, and profit sharing was reduced. Portfolios have been steered towards unit-linked or asset-management-type business, which reduces insurers exposure to financial market risks. The profitability challenges of the extended low interest environment on legacy business has pushed many life insurers to also pay increased attention to implementing an in-force management strategy for long-run sustainable profitability.

Changes in the market environment have also led insurers to realign their asset allocations. Search for yield has led to more investments in higher-risk assets, albeit with caution and within a strict solvency framework in most jurisdictions. Asset allocations increased moderately to higher-risk credit, private loans, private equity and other more illiquid asset classes. U.S. insurers gradually shifted their bond allocations toward the lowest investment grade category BBB, which implies a higher exposure to rating migration. Capital charges from regulators and rating agencies create strict trade-offs for adding more risk to the asset mix. The introduction of risk-based prudential regulations in certain markets has made some asset classes more costly in terms of capital requirements. Overall, asset allocation could not offset the underlying decline in market yields and insurers' portfolio yields have steadily declined over the last decade, despite higher levels of equity, credit and illiquidity risk.

CONCLUSIONS

The COVID-19 crisis has amplified the downward pressure on interest rates. Amid the mounting debt levels resulting from the massive fiscal and monetary stimulus and a subdued medium-term economic outlook, we expect monetary policy to stay very accommodative for the foreseeable future. Considering also the rise of implicit or explicit yield curve control, as well as the redesign of monetary policy frameworks, we believe interest rates will remain very low for even longer.

Interest rates are a key parameter for insurance operations, not least because investment income is an important earnings stream. Sustained low interest rates are negative as fixed income investments make up most insurers' portfolio investments. Low rates in the last decade have prompted insurers to invest more in higher-risk, higher-yielding assets, with caution. Portfolio yields have declined over the last decade and we expect a further decline with the recent farther drop in market rates.

With declining investment yields, insurers need to focus on underwriting results, especially as prospective fixed income gains in existing portfolio holdings will be less likely. Though non-life insurance prices are hardening in the major markets, our analysis shows more re-underwriting is required to narrow the existing profitability gap. We believe the trend of declining investment yields will continue given the recent drop in re-investment rates. The predicted decline in interest rates will widen the profitability gap into 2021 by about one to three ppt in the G7 non-life markets. More rate increases in excess of claims trends will be needed to achieve a sustainable improvement in profitability.

Life insurers are more exposed to interest rate risks given the dominance of savings and prevalence of long-dated multi-year contracts in their product mix. Many have reduced and shortened the duration of guarantees and shifted from savings to protection products. The extended low interest environment since the GFC has also pushed many to look more closely at management of in-force business as a route to longer-run sustainable profitability. ■

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ENDNOTES

1 Insurance Supervisory Strategies for a low interest environment, Bank for International Settlement, October 2017.

2 Based on responses from 18 European insurers, including multinationals. European Insurance: Insurers Ready to Deploy Excess Capital in 2017 - CFO Survey, Moody's, 12 June 2017.