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A pandemic's impact on stress testing frameworks

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Introduction

As we reflect on 2020 that seems to have gone by in a flash, we have seen the remarkable ability of the human race to adapt and innovate, with the insurance market being no different. Remote working was set up with near perfect transition, that saw insurers adapting to change and the use of technology on a level never seen before in the insurance sector. However, the negative impact of the COVID-19 pandemic left its mark – from the tragic loss of life to the significant economic and societal impacts and, of course, the specific effects on the insurance sector.

With the promulgation of the Solvency Assessment and Management (SAM) regulatory framework on 1 July 2018, insurers have increasingly asked the question of what a "1-in-200 year" event would actually look like. This paper aims to explore how frequently we can expect an event like COVID-19 to occur when compared to the calibration of selected modules within the SAM Standardised Formula. It further goes on to recognise potential areas where COVID-19 has highlighted shortfalls in the Solvency Capital Requirement (SCR) for consideration in insurers' economic capital modelling and broader Own Risk and Solvency Assessment (ORSA).

The journey thus far

If we look back to March 2020 we can remember that equity markets were in freefall, worldwide lockdowns were imposed, social distancing was the new norm and both fist bumps and elbow shakes were gaining traction. At the time many felt like Henny Penny and were thinking that the sky was falling. But was it really a 1-in-200 year event when compared to the underlying calibrations of the Standardised Formula?

In answering this question, we look at the key risks that are captured by the Standardised Formula SCR, namely market risk, life underwriting risk, non-life underwriting risk and operational risk, and assess how the emergence of those risks under COVID-19 impacted on insurers' solvency.

Market Risk

In the market risk module we saw that equity risk, interest rate risk and currency risk were the risks within the Standardised Formula that were most significantly affected by COVID-19.

- **Equity Risk**

  According to the calibrations of the Standardised Formula, which consider **annual movements** of an insurer's overall equity exposure, the MSCI World Index saw a 1-in-9 year event for the 12 months ending March 2020 (13% fall from March 2019 to March 2020) while the JSE All Share Index experienced a 1-in-10 year event over the same period (21% fall). However, we could also consider the **intra-year** drop in the JSE All Share Index from its pre-crash high in December 2019 to its lowest point in March 2020, which was a significant fall of 34%. But even this movement translates to only a 1-in-100 year event according to the Standardised Formula calibrations.

  With equities comprising only 14% of non-life insurers' investment portfolios on average[1], the impact of the falling equity market was not as significant as might have been expected. In contrast, life insurers were more exposed with equities representing on average 43% of their overall investment portfolio[2]. Despite this, however, most of these equity investments relate to investments made on behalf of policyholders through with-profits policies and linked business. With this risk passed on to the policyholders, most SCR ratios of life insurers were largely unaffected. Insurers who offer downside protection on their equity-backed policies saw a significant increase in their investment guarantee reserves, with the fall in the markets also resulting in an increase in the volatility of equity markets, with some of this offset by the hedging strategies that were employed.

Reference:
1. Prudential Authority – Non-life industry experience 2018
2. Prudential Authority – An overview of the experience of life insurers in South Africa for 2018

Observation

It is imperative that insurers are well prepared for these extreme market movements, with a clearly defined approach for investment decisions under such conditions, allowing careful and objective consideration when markets are in free fall, reducing the risk of knee jerk-reactions. This should include a focus on the hedging of investment guarantees, and stress testing the effectiveness of those hedges under extreme market movement scenarios.

- **Currency Risk**

  Similar to equity risk, the Standardised Formula calibrations (considering **annual movements**) suggest that the GBP/ZAR movement for the twelve months to April 2020 equates to a 1-in-10 year event (19% depreciation). For the USD/ZAR, we saw a 1-in-17 year event over this same period (12% depreciation). However, as with equity risk, we could also consider the **intra-year** movement from the most recent strongest position of the ZAR against the USD, in December 2019, to the weakest position in April 2020, over which a 27% depreciation was experienced. Even this only translates to a roughly 1-in-30 year event when compared against the Standardised Formula calibrations.

  The average life and non-life insurer have limited foreign exposures and hence the impact of the ZAR deterioration had an insignificant effect on most insurers' SCR ratios over the last year.

Observation

Insurers need to understand the level of diversification assumed in the calibrations of the Standardised Formula to identify areas where economic capital requirements might need to deviate from the Standardised Formula. While the Standardised Formula does not allow for diversification between different currencies, the past year has made it clear that the volatility of the Rand is not the same for all foreign currencies, e.g. the USD/ZAR exchange rate tends to be more volatile than other exchange rates.

- **Interest Rate Risk**

  Interest rate risk was the most severely affected market risk module, with nominal yields reducing by up to 40% at short durations (equivalent to a 1-in-100 year event) and increasing by up to 80% at longer durations (which is much more severe than a 1-in-200 year event). Subsequent to this volatility, the PA had updated the constituent bonds used to derive the risk-free curve. This update had very little impact at short durations, but significantly reduced the impacts at longer durations. Had the new bond constituents been used throughout 2020 the impacts at long durations would be somewhere between a 1-in-20 and a 1-in-50 year event, depending on the duration. This less severe impact is also more in line with the observed movements in government bond yields.

Observation

Insurers with long-dated liabilities need to assess their exposure to non-parallel movements in the yield curve, e.g. tilts and changes in shape, as these are not considered within the Standardised Formula. This is especially important where asset-liability matching is not based on matching cash flows, but rather based on matching duration or overall movements in liabilities. This shortfall in the Standardised Formula was noted during SAM's development and insurers' risk management functions could benefit from revisiting the relevant position papers and discussion documents to understand the shortcomings of the Standardised Formula, not only for interest rate risk, but also for other risk modules.

Observation

Many insurers have defaulted to using the PA's risk free curve for other calculation bases, e.g. IFRS and Embedded Value reporting, but, after the volatility experienced during 2020, insurers were urgently considering alternative curves. With a variety of risk-free curves available, it's important for insurers to have a sufficiently deep understanding of any yield curve that is used, for example an understanding of the curve construction methodology (interpolation and extrapolation), selection of bond constituents and whether historically the curve has displayed desirable behaviour, especially during times of market stress.

Observation

Insurers can improve economic capital models by recalibrating many of the market risk modules, using more recent and larger data sets than those underlying the Standardised Formula. A typical example is interest rate risk, where there is significant experience available beyond the data set that was used to calibrate the Standardised Formula. Re-calibrating using more recent data could also better reflect changes in market behaviour, like the impact of technology and automated trading on equity markets.

Life Underwriting Risk

While pandemics have always been a classical stress test for life insurers, COVID-19's far reaching complexity could not have been captured in the simplicity of a theoretical stress test.

- **Mortality Catastrophe Risk**

  COVID-19's mortality impact has taken much longer to materialise than the three months assumed in the Standardised Formula. With vaccines now available there is renewed hope that we can start estimating the pandemic's ultimate impact. In this regard our analysis is based on the estimated impact of a third wave, without any fourth wave impact and after netting off other lockdown related impacts like limited deaths due to influenza and lower accidental deaths. The excess deaths within the South African population is then estimated to reach anywhere between 180 000 and 250 000 by the end of 2021[3]. According to the Standardised Formula calibrations this could be expected to happen once every 250 to 370 years[4].

Further to this there are also longer-term mortality impacts from both lockdown and the associated economic recession, which have been estimated to be multiples of the direct excess deaths, with this impact being spread over the next 10 years[5]. These longer-term impacts are expected to be concentrated in lower income families where poverty induced deaths are likely to occur. However, higher income families are also expected to be subject to increased risk from at least a few factors, including delayed cancer diagnoses, emotional impacts from lockdown and potential long-term COVID-19 symptoms. To the extent that these deaths occur in the most impoverished of communities the impact on the insurance industry would be limited, but the loss of human life remains equally tragic. When including the impact of these longer-term deaths the severity of the COVID-19 pandemic becomes undoubtably more severe than the 1-in-200 year event envisioned by the Standardised Formula.

- **Morbidity Risk**

  Life insurers were also subject to other claim variances, including increases in temporary disability claims due to severe COVID-19 conditions, where waiting periods could be very short, as well as additional hospital cash claims due to COVID-19 submissions, although this is expected to be more than offset by a reduction in submissions arising from elective procedures. There could also be lockdown related impacts on morbidity claims, e.g. from temporary changes in lifestyle activities and alcohol availability.

- **Retrenchment Risk**

  The lockdown induced recession is the worst economic contraction our country has faced, at least since 1960 when economic growth data became available. This recession caused between 2.2 and 3.0 million job losses[6 and 7], well in excess of the 1 million jobs lost during the 2008 Global Financial Crisis[8]. Retrenchment risk might be negligible at an industry level[9], but there are a number of insurers with significant exposure thereto, leading to such insurers recognising large retrenchment losses. This is the second round of such losses in less than 15 years, illustrating that retrenchment experience is highly volatile, but also that it behaves more like a short-lived catastrophe and less like the long-term upward stress included in the Standardised Formula. This is especially relevant for business with shorter contract boundaries, where the impact of such a short-lived catastrophe might not be captured sufficiently by the Standardised Formula.

Observation

Insurers with any material retrenchment risk need to take great care in ensuring their economic capital and ORSA stresses make an appropriate allowance for the true nature of retrenchment risk. In light of its volatility and potentially large and relatively frequent losses, risk appetite policies also need to be reassessed to ensure there are appropriate risk limits in place for retrenchment risk.

Reference:

3. Extrapolated from SAMRC Excess Deaths data
4. Swiss Re – Pandemic influenza: A 21st century model for mortality shocks
5. Business Tech – 'Real and dire possibilities' facing South Africa after lockdown: Dawie Roodt
6. Statistics South Africa – Quarterly Labour Force Survey, Quarter 2: 2020
7. NIDS-CRAM – Overview and Findings, NIDS-CRAM Synthesis Report Wave 1
8. Business Tech – South Africa lost 1 million jobs because of the 2008 recession – here's why this one could be even worse
9. Prudential Authority – An overview of the experience of life insurers in South Africa for 2018

- **Lapse Risk and New Business Volumes**

  The life insurance industry's lapse experience is always fascinating to observe and 2020 was no different. Despite severe and unprecedented economic hardship there were no massive increases in industry level lapses[10], definitely nothing that suggests we had a mass lapse event on our hands. In fact, some insurers experienced an improvement in lapse rates. This emphasises that any experience item, like lapses, that depends on policyholder behaviour is notoriously difficult to predict under extreme conditions, as it might behave counterintuitively.

  New business volumes showed large reductions[10], as disposable income came under pressure and advisor networks were restrained from travelling, placing at least some upward pressure on per policy expenses.

Observation

ORSA scenarios representing extreme conditions need to consider the possibility of policyholders behaving in unexpected and counterintuitive ways, as this is not only plausible but could also notably change the outcomes of such scenarios.

Non-Life Underwriting Risk

With roughly 80% of non-life premiums being attributed to the motor, property and liability lines of business[11], we have seen that, on the surface, there appears to be a limited impact of the pandemic on non-life underwriting risk for the average non-life insurer, as the risk modules do not specifically cater for the direct impacts of the COVID-19 pandemic.

As such, the below are short-term observations that were observed across the non-life insurance market for the average insurer:

- Significant business interruption claims paid and reserved for
- Reduced loss ratios of the motor line of business owing to the lockdown
- Cash backs paid to policyholders to share in this improved motor experience
- Reduced cover from comprehensive to third party, fire and theft
- Increased claims on accident and health, travel and property contents lines of business
- Increased expenses following work-from-home protocols adopted

Observation

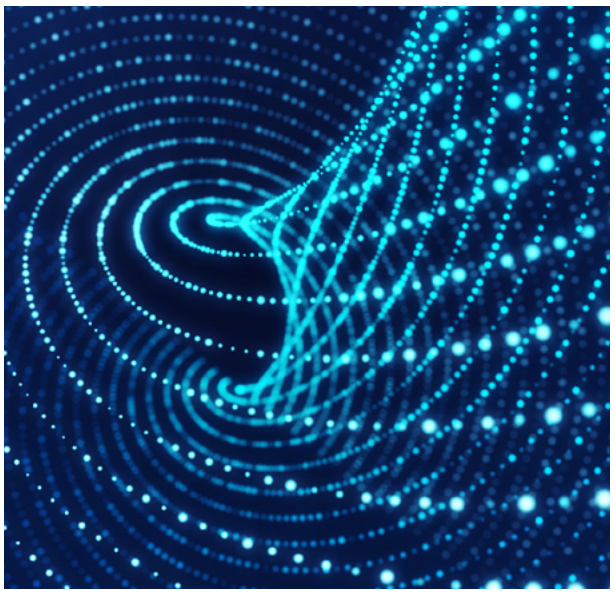
With the observation that there was very limited impact on non-life insurers' Standardised Formula SCRs, non-life insurers that use the Standardised Formula as a proxy for economic capital as part of their ORSA process need to critically assess the appropriateness of the non-life underwriting risk modules in light of the current environment, both from a claims and expenses perspective.

Operational Risk

As the Standardised Formula allowance for operational risk is largely a premium and reserve exposure-based calculation, we have seen that, on average, the operational risk allowance for insurers decreased relative to expectations, in line with lower than expected business volumes.

Observation

One would expect that with new work-from-home protocols, increased stress environments and stretched resource capacity following the pandemic, operational risk would increase. However, the Standardised Formula doesn't accurately capture this effect. Insurers that use the Standardised Formula as a proxy for economic capital as part of their ORSA process need to critically assess the appropriateness of the operational risk modules in light of the current environment.



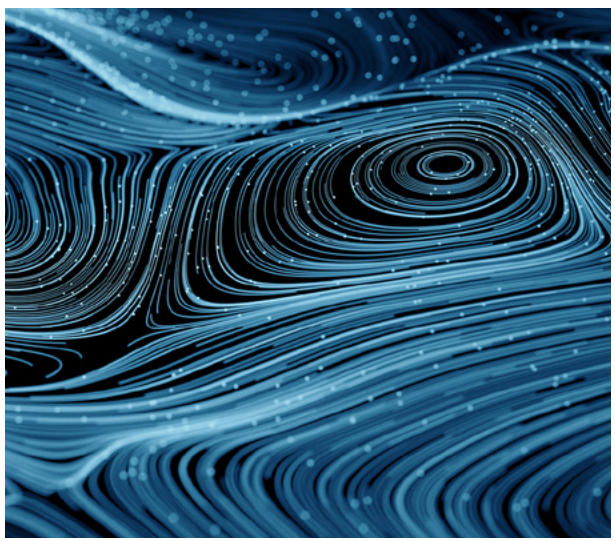
Reference:
10. Prudential Authority – Summary of QRT data
11. Prudential Authority – Non-life industry experience 2018

Looking Forward

With the pandemic not yet over, we have listed below some items insurers should consider when assessing their top and emerging risks within the ORSA process. These items should also be considered as part of the post-stress profit assessment for their Loss Absorbing Capacity of Deferred Taxes calculation.

- Increased lapses and lower new business volumes owing to suppressed economic growth and retrenchments
- Increased risk of defaults and widening of credit spreads as the economy remains fragile
- Impact on the property market and property investments of a permanent shift towards remote working and e-commerce
- Fiscal and monetary policy impacts on the economic environment and wider financial markets
- Longer-term mortality impacts which are still highly uncertain
- Impact on trade credit and credit life business over the next few years following the economic impact of the pandemic
- Potential delays in transformation and other large-scale programmes, including IFRS 17 implementation
- Potential long-term implications on staff skillsets following prolonged remote working, school and university disruption and the related implications for operational risk and scarce skills
- Changes in cyber and security risk related to prolonged remote working and e-commerce.

Last year may have felt like more than a 1-in-200 event across the risks the industry faced. But it is safe to say that, bar the remaining uncertainty surrounding business interruptions claims, the industry's capital position was more than adequate to absorb the severe impact, showing the resilience of the balance sheets under the new capital regime. What our analysis has confirmed, however, is that not all of the risks and interrelationships of the risks can be catered for in a one-size-fits all standardised formula. It is important that insurers feed the insights and data gained during the pandemic into other elements of their risk management framework, in particular their ORSAs. In this way they will be better informed about the effectiveness of various elements of their risk management strategies as they adapt and thrive in the increasingly uncertain world. As Albert Einstein so eloquently put it: "In the middle of difficulty lies opportunity".



Authors

Lafras Eksteen
Senior Manager, Actuarial and Insurance Solutions, Deloitte Africa
leksteen@deloitte.co.za
+27 (011) 209 8109

Ricardo Govender
Senior Manager, Actuarial and Insurance Solutions, Deloitte Africa
rgovender@deloitte.co.za
+27 (011) 304 5953

Deloitte.