

Solvency II – countercyclical capital requirements and regulatory flexibility

This blog has been authored by group of Life actuaries with a focus on Financial and Capital Management working as part of the [IFoA Covid-19 Action Taskforce](#).*

In previous blogs from the Life Office Macro Financial and Capital Management working group of the IFoA COVID-19 Action Taskforce, we have considered the following areas:

- capital and management actions taken by life insurers, both prior to and during the crisis, as well as those planned for the future¹;
- the countercyclical measures in Solvency II and how well they worked in practice²;
- how insurers' solvency ratios, under Solvency II, actually performed³; and
- actions actually taken by international regulators in response to the crisis⁴.

In this blog we focus on lessons that might be learned for the future of Solvency II, which is particularly relevant given the current reviews in both the EU⁵ and, post Brexit, the UK⁶.

In particular, and consistent with our previous blog on countercyclical measures, we focus here on areas where Solvency II could exacerbate financial crises, or force insurers⁷ to undertake uneconomic actions which, typically, would be to the long-term detriment of stakeholders. The impact of the Covid-19 pandemic, including the wider economic impact, is an example of just such a crisis.

We consider examples of how Solvency II could be amended, or might be relaxed under stressed conditions, to prevent unintended consequences.

Countercyclical buffers

Our blog on the countercyclical measures in Solvency II concluded that *“One common theme, as highlighted by the European Risk Stability Board⁸, is that few of these measures really act in a truly countercyclical way, in that they don't build up buffers during benign markets which insurers can release in times of stress.”*

Under Solvency II, there is very limited opportunity for insurers to build up capital buffers in benign markets, other than through targeting a solvency ratio significantly higher than 100% (which inevitably leads to pressure from capital providers for capital distributions, or for the excess capital

¹<http://blog.actuaries.org.uk/blog/using-hindsight-gain-foresight>

²<https://www.actuaries.org.uk/system/files/field/document/Countercyclical-effects-v5-intro-%28002%29.pdf>

³http://www.actuaries.org.uk/system/files/field/document/How%20Solvency%20ratios%20performed_v4_wit_hGraphALT.pdf

⁴<https://www.actuaries.org.uk/system/files/field/document/Regulatory-Action-taken-to-mitigate-the-impact-of-the-COVID-19-pandemic-using-international-insight-to-gain-foresight.pdf>

⁵In December 2020, EIOPA issued their Opinion on the 2020 review of Solvency II (https://www.eiopa.europa.eu/content/opinion-2020-review-of-solvency-ii_en)

⁶A Treasury led review in the UK was announced in October 2020 and responses are invited by February 2021 (<https://www.gov.uk/government/publications/solvency-ii-review-call-for-evidence>)

⁷For the purpose of this note we focus mainly on life insurers. In this context, the term insurer shall mean both life insurer and reinsurer.

⁸https://www.esrb.europa.eu/pub/pdf/other/esrb.letter201016_on_response_to_Solvency_II_review_consultation~8898c97469.en.pdf

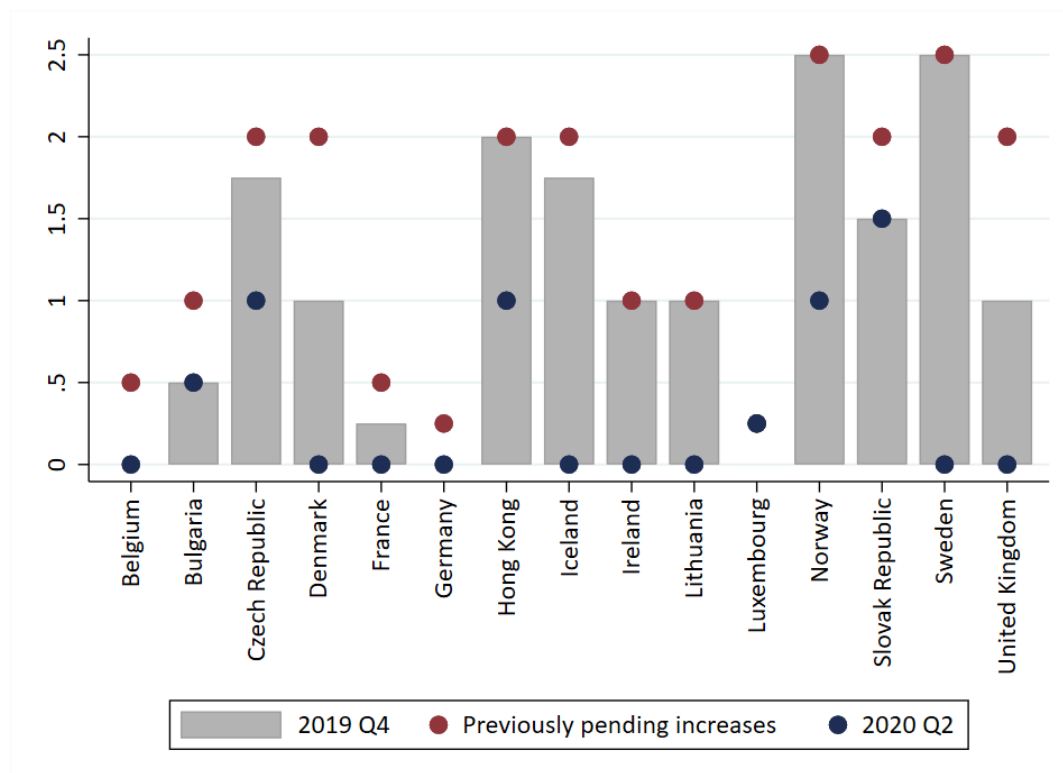
to be deployed). Technical provisions are a best estimate and capital requirements (see the section below on model calibration) can actually act in the opposite direction.

Within banking regulation, there is an explicit concept of countercyclical capital buffers (CCyBs).

A Bank Underground blog, written by staff at the Bank of England, showed how the CCyBs operated in practice⁹ during the Covid-19 shock, concluding:

“Policy makers in a range of countries were able to quickly release these capital requirements, enabling banks to use the cumulated buffers. This released capital may in turn potentially help banks to support lending. And it will likely benefit lending in the country releasing requirements on buffers as well as banks’ lending to other countries, leading to potential positive international spillover.”

Chart 1: Effective CCyB rates before and after the Covid-19 Shock (%) (source: Bank Underground)



This concept doesn’t translate so easily into insurance. The European Risk Stability Board considered this challenge in February 2020¹⁰ and concluded:

“Introducing an equivalent to the CCyB in the insurance framework would be difficult given its purpose and the way it is applied on balance sheets. (Re)insurers can invest in a procyclical manner, however their balance sheets do not have the elasticity of credit institutions’ balance sheets. In other words, even in the upward phase of the financial cycle, (re)insurers are not able to originate more loans than the written premiums they receive. Furthermore, the CCyB applies to banks’ entire

⁹“With a little help from my friends: counter-cyclical capital buffers during the Covid-19 crisis”:

<https://bankunderground.co.uk/2020/08/25/with-a-little-help-from-my-friends-counter-cyclical-capital-buffers-during-the-covid-19-crisis/>

¹⁰https://www.esrb.europa.eu/pub/pdf/reports/esrb.200226_enhancingmacroprudentialdimensionsolvency2~1264e30795.en.pdf

balance sheets, whereas for (re)insurers countercyclical tools should target the exposure to specific asset classes.”

However we believe a similar approach to the concept of CCyBs could still be applied to insurers. These could operate, for example, by requiring the solvency ratio of insurers to be higher/(lower) when markets are generally benign(/stressed) as assessed by a financial stability board.

Internal model calibration

In the UK in particular, most large insurers use internal models. While internal models, in theory, allow more flexibility than the standard formula, in practice they can actually add to procyclical behaviour.

It is not clear to us that regulators would currently accept explicit countercyclical measures, as built into the standard formula, in insurers’ own internal model calibrations.

Specifically, the symmetrical adjustment for equity risk in the standard formula is designed to reduce procyclicality by reducing (/increasing) the equity stress in the standard formula when equity market levels are low (/high) compared to their 3-year historic average. However, insurers may struggle to evidence that such an adjustment is justified in their own calibrations. An alternative would be for regulators to allow the symmetrical adjustment to be applied as an explicit external adjustment to the results of insurers’ base internal model calibrations.

Such explicit countercyclical adjustments could be extended to other risks, such as credit spreads, credit transitions, interest rates and property prices both in the standard formula, and then as an external adjustment to internal model calibrations.

More generally, this highlights a point about how capital model calibrations are set during an economic cycle, as we will now discuss.

Through-the-cycle model calibration, versus point-in-time and countercyclical calibrations

When calibrating models, one natural question that arises is: how should the model calibration for a risk be altered when a stress to that risk has already been experienced?

Ideally, one might wish overall capital requirements for insurers to be set through-the-cycle, which would suggest that the Solvency Capital Requirement (SCR) should be either stable under stress, or indeed reduce under stress so that the SCR absorbs some or all of the losses already experienced.

This question was considered in 2011 by the profession’s Stable Measures of Risk Working Party¹¹, chaired by Stuart Jarvis, who developed an edge-of-the-world framework to discuss point-in-time versus through-the-cycle calibrations.

We reproduce their framework below.



The “centre of the world” (green square) represents the actual position for the risk concerned, both initially and post an actual loss event, and the “edge of the world” (red circle) the stressed position considered in the capital requirements.

¹¹ See presentations given at the IFoA Finance and Investment Conference <https://www.actuaries.org.uk/system/files/documents/pdf/workshop-b3-stuart-jarvis.pdf> and Life Conference <https://www.actuaries.org.uk/system/files/documents/pdf/g1fulcherjarvis.pdf>

The total capital required by the insurer is a combination of losses suffered to date and the additional stress assumed, so essentially the distance from the starting point pre stress to the red dot post stress.





“Edge of the world” framework from Stable Measures of Risk Working Party

“Edge of the world” framework

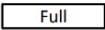
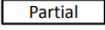
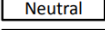
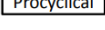
- At time 0 we are at centre of the world 
- We have a view of the edge 

At time 1, a moderate loss occurs


4 cases:

1. Edge unmoved 
2. Edge moves less than centre 
3. Centre and edge both moved equally 
4. Edge has moved more than centre 

Loss absorption


- Full 
- Partial 
- Neutral 
- Procyclical 

Extent to which losses are absorbed determines cyclical impact








Information content of adverse event

1. is **unconditional** in price space: targets a fixed '1 in 200' price level
2. is **mean reversion**: adverse event lowers likely severity of next event
3. is **unconditional** in return space: latest event has no impact on next
4. is **procyclical**: latest event leads to strengthened view of next one



Loss absorption

1. 
2. 
3. 
4. 



Examples

1. Fixed absolute stress

- Downside interest rate event may already be extremely small positive rates
- Peak spreads from credit crisis might form a post-crisis 1-in-200 event

2. Mean reversion

- After 20% equity fall, 40% stress might reduce to 30% (44% total)

3. Fixed relative stress

- Expense risk stress may be unlikely to react to new expense assumptions

4. Increased stress

- Credit crisis dramatically changed views on credit risk
- Equity falls typically associated with higher volatility

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The ideal capital measure, to allow a long-term approach, would be of type 1 or 2, so that the SCR reduces after an actual stress event. This might, as suggested in the working party presentation, be justified by assuming that some past event, e.g. the 2008 financial crisis, represents a fixed low point (or peak for credit spreads) in the markets.

A through-the-cycle calibration, which is in our experience the typical approach adopted in internal models, would be of type 3. So for example even after credit spreads have risen, as in March/April 2020, the absolute further stress considered in the SCR would typically be unchanged.

And if insurers were actually required to re-calibrate models to reflect current market conditions, such as market implied volatility, then stresses themselves might actually increase, exacerbating the effect of the losses experienced, which would be the procyclical calibration of type 4.

Taking equity markets as an example:

- The symmetrical adjustment in the Standard Formula is close to type 1 in the framework (at least until the cap or floor is reached).
- However, calibrating equity stresses to market implied volatility on equity derivatives at a point-in-time would typically lead to an answer of type 4, since implied volatility, and hence the market implied risk of further severe falls, typically rises in times of market stress.

Overall, we believe the 'edge of the world' model provides a helpful framework for considering how regulation should respond to stresses and how it could explicitly permit more countercyclical approaches to calibration.

Longevity stresses

As a specific issue arising from Covid-19, insurers have typically not, at this stage, revised their best estimate longevity assumptions for future higher mortality likely to result from the effects of the pandemic. But insurers are still required to hold prudent assumptions against a future shock to longevity risk in the opposite direction. This is, in a sense, the reverse issue to the ones discussed above, where despite a positive (in a financial sense) shock to longevity risk, total capital requirements have not reduced.

Implementation of internal model changes

Times of stress or change in market conditions may require recalibration of internal models and rapid implementation of different strategies, e.g. hedging programs, which then need to be reflected in internal model changes.

However, the process for implementing major model changes is currently very lengthy, including, in the UK, 6 months for the Prudential Regulatory Authority (“PRA”) to consider applications. There is a risk in the interim that models, and hence capital requirements, do not reflect changes to insurers’ risk profiles and give a misleading view of prudential requirements.

An alternative approach, particularly during times of stress, would be to allow insurers to make changes immediately but to provide the full documentation and receive approval later. This would be subject to internal second line and Board approval and require regulatory notification, and could also allow for a quicker PRA “no red flags” review.

Loss absorbing capacity of deferred taxes (“LACDT”)

For both standard formula and internal model insurers, the LACDT acts to reduce capital requirements, and, in benign conditions, to dampen changes.

However, it can act in a procyclical fashion under stress, since, when an insurer’s solvency is under stress, their ongoing profitability and hence ability to recover deferred tax losses, may be under question. Tax recoverability is assessed on the basis of a further 1-in-200 stress to the base position which becomes a highly subjective matter.

Regulators could explicitly suspend re-verification of LACDT recoverability under stressed conditions.

Matching Adjustment (MA)

We plan to write a separate blog on how the matching adjustment operated in practice, but consider some high-level points here.

It can be argued that the MA performed reasonably well in response to widening credit spreads, but that it has not yet been tested in a period of heavy and sustained credit downgrades.

The MA is naturally countercyclical in the sense that, as credit spreads widen, reducing asset valuations, the liability discount rate widens accordingly, reducing liability valuations. All things being equal, insurer’s assets and best-estimate liabilities are typically well-matched to both interest rate and credit spread moves under the MA.

However, this countercyclical effect does not apply when assets are downgraded by rating agencies, meaning insurers are exposed to this risk and can become forced sellers, even if their own perception of risk has not changed.

There is a particularly strong ‘cliff’ effect when assets are downgraded below investment-grade, since the MA is then capped at the level on investment-grade assets.

If insurers become forced sellers in downgrade, not only could this impact their published solvency but it could also act to increase the cost of funding for distressed companies in the wider economy, exacerbating the credit cycle. The cliff effect causes particular issues and could be removed by lifting the cap that applies on the MA of sub-investment-grade assets, or by allowing insurers wider discretion to choose comparable investment-grade assets for applying the cap.

For equity-release mortgages, an important asset class for many insurers and indeed an important product for consumers, the PRA's Effective Value Test ("EVT") is explicitly pro-cyclical. In addition to increasing exposure to property prices, which are typically uncertain during periods of stress, it creates an arguably artificial exposure to interest rates. The 0% floor on deferment rates under the EVT, however theoretically sound, causes particular practical issues. A more pragmatic approach to calibration could reduce these effects.

Other areas where the MA's operation in stress could be improved include:

- The requirement, imposed by the PRA's interpretation rather than from the letter of the Solvency II regulation, for separate collateral for derivatives in the MA and non-MA portfolios.

This requirement is both artificial (since the MA is not a separate legal entity, so legally derivative obligations cannot be separated) but can also act to exacerbate liquidity strains in stress, as was experienced by some insurers during H1 2020.

- The requirement under the Directive to rectify a breach of eligibility within two months, at penalty of otherwise losing the MA. Meeting this requirement can be difficult in times of market dislocation and any breaches may, in practice, prove temporary.

Insurers could be instead required to produce a plan to restore MA compliance within the two-month timescale, but be given longer to actually implement it when markets are stressed.

Risk Margin

As with the EVT for equity release mortgages the Risk Margin creates a material interest rate sensitivity. However, this exposure is through a regulatory reserve – the economic exposure to rates is captured in the best estimate liability. This exposure is particularly pronounced for insurers exposed to longevity risk.

Insurers might naturally be expected to hedge to their economic view, but then can become forced hedgers when interest rates fall, which can exacerbate market cycles.

In addition, the current calibration of the Risk Margin reduces the affordability of annuities, for both customers and defined benefit pension schemes, reducing their ability to de-risk, and also artificially incentivises offshore reinsurance of longevity risk.

EIOPA's Opinion on the Solvency II review included a proposed revision to the Risk Margin, which acts to mitigate these effects, but only to a limited extent. We would hope that the Treasury review in the UK considers more fundamental changes, including reconsideration of the cost-of-capital method.

Conclusion

Our first blog concluded by stating our belief that the crisis gave insurers an opportunity to look back and assess whether their capital planning and models, investment strategies and risk management frameworks operated during the crisis as intended. Equally, we imagine the crisis has given regulators an opportunity to look back and assess whether their regulatory measures and frameworks operated during the crisis as intended.

Specifically, during the EIOPA-led EU review and Treasury-led UK review of Solvency II, we would suggest policy makers should focus on how Solvency II performed during the Covid-19 crisis, arguably the first real test of the regime, as well as considering how future crises may be different.

As discussed in our earlier blog, some of the countercyclical measures may require modification in the light of this experience. And more generally, explicit countercyclical buffers could be introduced.

The Matching Adjustment, Effective Value Test and Risk Margin all contain cliff edges and other uneconomic elements that could be removed or amended to reduce the risk of procyclicality.

Internal model calibration could also be made more explicitly through-the-cycle or even countercyclical, including allowing explicit countercyclical adjustments outside of the insurer's own calibrations.

An over-riding theme that emerges from all these points is the need for regulatory flexibility during times of stress, particularly in terms of model recalibration, approval processes and action plans.

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