

Early warning or false alarm?

September 2013



Following approval of internal models, the Prudential Regulation Authority (PRA) plans to monitor the continued adequacy of the Solvency Capital Requirement (SCR) via a series of simplified metrics to be known as Early Warning Indicators (EWI). In this short paper we explore the potential performance of the EWI proposed for life insurance business excluding with-profits.

INTRODUCTION

On 23 May 2013 the Prudential Regulation Authority (PRA) issued a letter to insurance firms setting out proposals for the continued monitoring of the levels of Solvency Capital Requirement (SCR) following approval of internal models. The intent is to provide the PRA with a rule of thumb, to be known as an Early Warning Indicator (EWI), which indicates when a firm's SCR calibration has potentially slipped below the required calibration standard of 99.5% value at risk (VaR) over a one-year period. Separate EWIs are proposed for:

- Life insurance business (excluding with-profits)
- With-profits funds
- General insurance business

The EWIs will now see trials, with relevant insurers required, from September 2013, to be aware of the position of their SCRs relative to the EWI threshold levels and prepared to discuss any significant changes with the PRA.

Internal models are unavoidably extremely complex and it does not come as a surprise that regulators are seeking simpler expressions of the relevant metrics to help focus supervisory activity where it is most needed. However, just as the internal models themselves reflect simplified abstracts of a more complex real system, the use of simple rules of thumb extends this abstraction much further, with clear potential consequences for the reliability of the results.

In this short paper we explore the potential performance of the EWI proposed for life insurance business excluding with-profits and ask:

- Does the level of the EWI appear appropriate in relation to the SCR and how are changes in financial conditions likely to impact the relative levels of the SCR and EWI threshold and thus possible threshold breaches?
- What are the broader implications of the proposed EWI approach?

INVESTIGATION: PERFORMANCE OF THE EWI PROPOSED FOR LIFE INSURANCE BUSINESS (EXCLUDING WITH-PROFITS)

The structure of the EWI proposed for life insurance business excluding with-profits is very simple:

$$\text{EWI threshold} = 300\% \times \text{pre-corridor minimum capital requirement (pMCR)}$$

The pMCR is to be calculated per the definition used for the recent long-term guarantees assessment (LTGA)* sponsored by the European Insurance and Occupational Pensions Authority (EIOPA), defined by:

- Factors ranging from 2.1% to 0.7% applied to best estimate liabilities (the factor applied varying with the type of business)
- A factor of 0.07% applied to capital at risk (sums assured—best estimate liabilities)

The basis for our investigation is a Model Life Company (MLC). The MLC is a relatively uncomplicated operation with a single life fund. Its focus has historically been on non-profit business, in particular, fixed annuities in payment, inflation-linked annuities in payment (RPI, LPI types), deferred annuities, and unit-linked pensions

* Definition is per the document *Technical Specification on the Long Term Guarantee Assessment (Part I)*, dated 28 January 2013.

business with minimal guarantees. For investigative purposes, it is assumed that MLC is using an 'internal model' for its Solvency II reporting. On 30 December 2011 the value of liabilities was £8.6 billion with own funds of £1.0 billion. The SCR was £0.6 billion, calculated using thousands of multivariate risk scenarios to generate a distribution of capital results from which the SCR (99.5% VaR) can be derived.

Our investigations are based on weekly observations of financial market conditions across the period January 2008 to December 2012 with MLC's own funds and SCR being recalculated at each weekly point to reflect the impact of the changed conditions.

The first step for us was to check that the calibration of MLC's SCR was reasonable in relation to the 99.5% VaR target; if this were not the case then comparisons to the EWI threshold level would be misleading. This check was performed by undertaking a back-test of the weekly change in the own funds of the MLC against a target VaR capital requirement adjusted to reflect a weekly rather than an annual risk exposure period. The results are shown in Figure 1.

Based on 261 weeks we would expect 1.3 breaches of the weekly capital requirement. The observed result over the investigation period was two breaches, providing some support for the reasonableness of the calibration.

Our next step was to consider the weekly track of the SCR for our MLC and compare this to an equivalent weekly calculation of the EWI Threshold.

Figure 2 shows that, with the exception of the first quarter of 2009, the SCR for our MLC would have exceeded the EWI threshold. Given that we are already generally comfortable with the level of MLC's SCR, this implies the proposed EWI threshold (300% of the pMCR) could be taken as a broadly reasonable level for our MLC. This result may, however, differ for other undertakings and there may ultimately be a need for some tailoring of the threshold level—perhaps one size should not aim to fit all, with thresholds tailored to some extent to reflect the characteristics of individual firms.

Putting aside the overall level of the threshold, which is a relatively simple matter of calibration, the area of most interest is the relationship between the SCR and EWI threshold. Over the period of recent history considered, the SCR varies from just over 400% of the pMCR to as low as 285% of it. In particular, we note the very significant divergence in the two measures between the third quarter of 2008 and the end of 2009. This period covers the worst of the banking crisis, with interest rates falling and credit spreads widening greatly. The pMCR for our MLC is driven by the level of the best estimate liabilities, which continued to increase under the falling interest rate regime though mitigated to some extent by an increased matching adjustment.

Figure 1: Back-test of Required Capital (matching adjustment included)

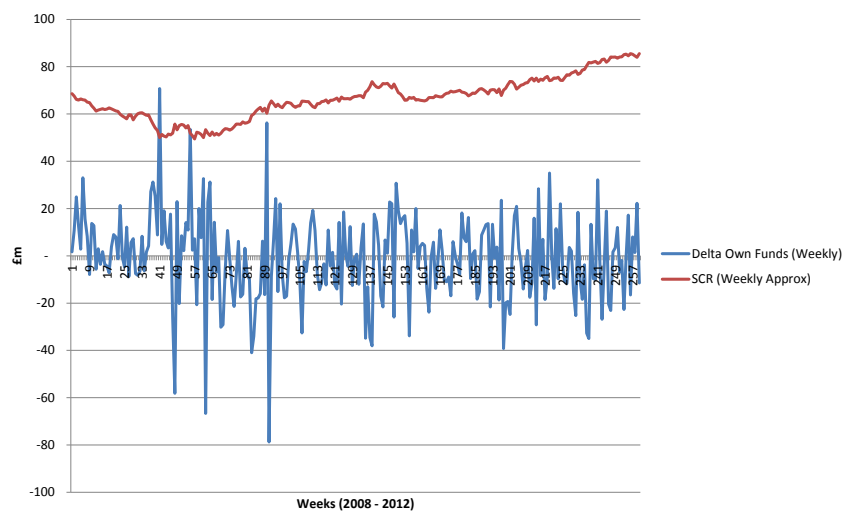
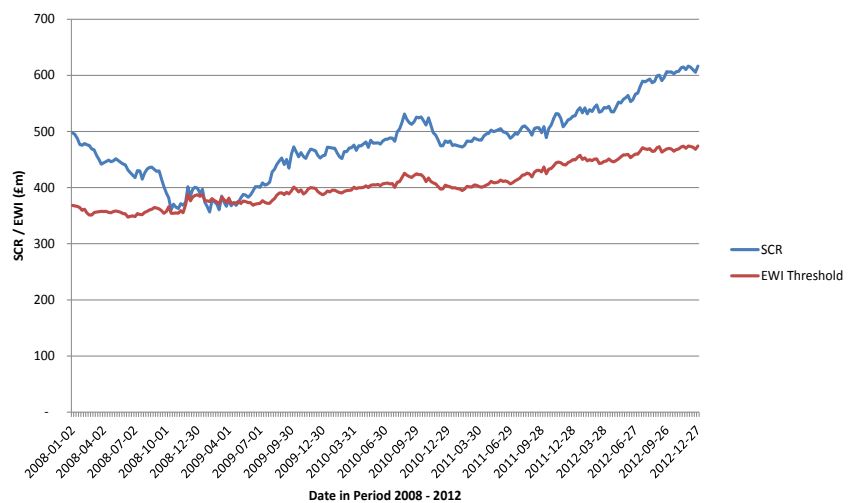


Figure 2: Historical Results: SCR vs. EWI Threshold (matching adjustment included)



However, at the same time, the MLC's SCR was falling because of:

- Reduced capital from credit spread risk: With the significant increase in spreads on credit-risky assets, their duration is shortened and with it the sensitivity to stresses in credit spreads applied to calculate the SCR. A further factor here is the reduction in spread risk capital that is due to the partial mitigation allowed under the matching adjustment.
- Reduced capital from interest rate risk: The fixed-income assets of MLC are slightly longer in duration than its liabilities. The widening of credit spreads during the banking crisis reduces the duration mismatch and the exposure to interest rate risk.

The points above illustrate a key limitation of the proposed EWI in that, being driven only by the liabilities side of the balance sheet, the measure does not respond to changes in required capital, which arise through asset-side influences and changes to a firm's asset-liability matching (ALM) position.

As the availability of the matching adjustment under Solvency II remains uncertain, we repeated the above analysis excluding this feature and compared the results.

The EWI ratio is simply the ratio of the SCR to the pMCR. If it exceeds 300% then the EWI threshold is met. From Figure 3 we can see that excluding the matching adjustment does not materially change the behaviour of the EWI ratio. However, it does significantly change the level of the ratio, which reinforces the likely need for a more tailored calibration as portfolios will undoubtedly vary in terms of the extent to which the matching adjustment influences the liabilities and required capital.

Furthermore, based on the EWI ratio, our MLC appears healthier when the matching adjustment is excluded. This is misleading as, during the height of the banking crisis, the MLC is actually unable to cover its SCR in the absence of the matching adjustment. Hence, while the EWI may have a role to play it is clearly only one of many indicators that the PRA and insurers themselves will need to monitor.

POTENTIAL IMPLICATIONS

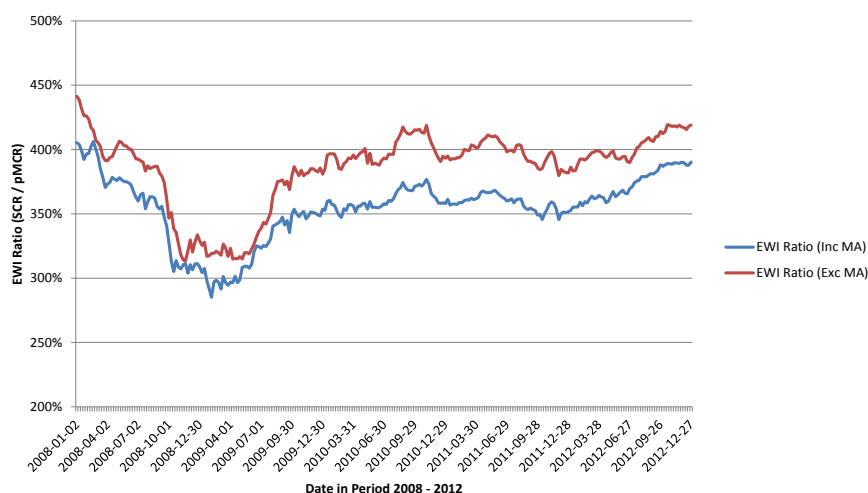
The implications of the introduction of the EWI regime depend very much on how it will be used by the PRA and this is not yet fully clear.

One scenario might be that the EWI is simply used as an additional trigger to prompt regulatory enquires and to help ensure that firms are able to explain the movements in their SCR against the simplified EWI threshold. Under this scenario, the EWI would not necessarily constrain the realisation of capital benefits from an internal model or valid actions, such as improvement to ALM, in pursuit of better risk management. Nevertheless, the volatility of the SCR-EWI threshold relationship may still place an increased burden on both firms and the PRA if it triggers frequent questioning and the need for supporting analysis. The danger here is that much of this effort is driven by noise introduced by the simplified EWI and is of limited practical benefit to either side.

A less benign outcome would be for the EWI threshold to become a de facto floor for the SCR.

Such an outcome could limit the benefit to be gained from an internal model and act as a disincentive to firms in undertaking some projects to improve their risk management and lower their SCR. Furthermore, in times of stress when own funds are reduced, we found that the change in the EWI threshold showed a marked tendency to place our MLC under greater pressure.

Figure 3: Historical Results: EWI Ratio (SCR / pMCR) With and Without Matching Adjustment



For example, in January 2009 there was a week when own funds fell by £53 million. However, the SCR fell by £23 million in partial mitigation but the EWI threshold fell by only £10 million. More generally, considering the worst 20 weekly falls in own funds, there was only one occasion where the move in the EWI threshold was more beneficial to the MLC. This latter point is of some concern if found to be generally applicable to many insurers as it indicates potential for increased pro-cyclicality and pressure on firms to take actions which might subsequently be found to have been unnecessary.

SUMMARY

Whilst understanding the desire for simplified measures to assist regulatory engagement with insurers, our analysis suggests that the current proposals may need further refinement in order to better balance simplicity with reliability.

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