Memorandum

To:   NAIC Investment Risk Based Capital (RBC) Working Group

From:   Walter Givler – Northwestern Mutual Life, Mark Anderson – Met Life and other members of the ACLI Derivative Risk Mitigation Team (Andrew Melnyk/Khari Cook coordinating)

Date:  March 29, 2013

Re:  Life Insurer RBC for Derivatives

Executive Summary

In an effort to apply the most relevant knowledge and experience to a review of RBC asset charges arising from life insurer derivative use, we held a series of working sessions of industry derivative specialists, NAIC capital market experts and regulators. All of the relevant components of the current RBC calculation were reviewed. Most of these components have been updated within the last five years. However, we identified four areas for further inquiry.

This gave rise to one recommendation; change the potential exposure formula for written credit default swaps (sold protection) to reflect recovery experience consistent with the RBC formula for bonds. In this way the RBC approach will be as consistent as the fundamental credit risk inherent in both circumstances.

Background

The individuals who participated in the meetings which influenced the background, analysis and recommendations in this document are industry derivative specialists, NAIC capital market personnel and regulators. All of them have familiarity with derivative use and the associated regulation. Many were contributors on earlier projects which form the basis of current NAIC derivative risk based capital and reporting requirements.

The scope of the work reflected in this memorandum is informed by the charge of the Investment Risk-Based Capital Working Group and applied to the derivative asset class:

“.......evaluate relevant historical data and applying defined statistical safety levels over appropriate time horizons in developing recommendations for revisions to the current asset risk structure and factors in each of the risk-based capital formulas and delivering those recommendations to the Investment RBC Working Group.”

When evaluating the RBC asset charges arising from derivative use it is important to consider the appropriate regulatory context, characteristics and uses of derivatives.
The NAIC model investment laws and regulations establish specific constraints on the use of derivatives. Governance of derivative use starts with approved and documented authorities from the insurer’s Board of Directors to management. These authorities are coordinated with and enhanced by limits established by the insurer’s domiciliary state.

Derivatives used to manage asset risk are interdependent with the affected assets. This means that the risks inherent in the derivative transaction itself and the effect of the transaction on overall asset risk must both be considered when determining the appropriate RBC. In most cases, the RBC impact is derived from factors applicable to the affected assets, or used elsewhere in the RBC calculation.

By way of example, under the current method, all derivative uses may attract RBC asset charges on:

- Derivative book /adjusted carrying value ("BACV") net of collateral, which is based in large part on the credit quality of the derivative counterparty using existing NAIC designations;
- Off-balance sheet exposure;
- Replication of permissible assets;
- Collateral received from counterparties related to derivative agreements.

In the case of derivatives used in replications and derivatives used in hedging, the derivatives are paired with insurer assets or liabilities to produce a desired economic effect. Paired assets attract their own RBC charge, which may require adjustment in order to enable RBC to accurately reflect the resulting risk. In other words, if a cash instrument or counterparty NAIC designation changes, the derivative-related RBC also changes in a manner sensitive to the changing risk.

Review of the life RBC calculation indicates four areas which impact or give rise to RBC asset charges for derivative usage.

Miscellaneous Assets (LR012) – This part of the RBC formula computes the RBC applied to the amount held on the balance sheet, known as book adjusted carrying value (BACV) net of collateral received, exposed to loss upon default of the counterparty or exchange. The NAIC designation of the counterparty determines the RBC factor.

Replication Synthetic Asset Transactions (RSAT (LR013)) – RSATs involve the pairing of a cash instrument and derivative to synthetically create permissible investments that are otherwise too expensive to directly acquire or are unavailable in the cash markets. These transactions are a combination of a derivative(s) and one or more cash instruments such as U.S. Treasury securities, agency securities, or other fixed maturity holdings. They are monitored by the NAIC Securities Valuation Office (SVO) and reported in detail on Schedule DB Part C. The RBC is derived from the SVO designation of the RSAT as a package, as if it were a newly acquired asset. The RBC previously attributable to the cash instrument is credited at 100% in the RBC calculation and is in-effect replaced by the RBC attributable to the RSAT package.
Hedging (LR014, LR015) - Hedging is the process of using derivative instruments to most efficiently limit risk associated with a particular asset in a manner consistent with the insurer’s long term objectives. In order for regulators to distinguish between insurers that have effectively reduced their risks from those insurers that have not, the risk based capital computation has been made sensitive to such differences. Increasing or decreasing exposure to different asset classes in relation to a benchmark asset allocation tailored to meet the long term obligations to policy owners is critical to successfully managing an insurance company. The relative advantage of using cash market transactions versus derivative market transactions depends upon market conditions. The RBC credit for the risk reductive effect of hedging bond and common stock asset risk is determined as a fraction of the RBC asset charge in order to provide for residual risks created by the hedging program. The maturity of the cash instrument versus that of the hedging instrument, counter party risk and general business risk are considered in the formula for determining the RBC credit.

Off Balance Sheet and Other Items (LR017) – A charge for off-balance sheet exposure is included in RBC for derivatives based on the credit risk of the counterparty or exchange. Schedule DB Part A and B include a calculation for potential exposure, which is a main component of the off-balance sheet calculation. Potential exposure is a statistically derived measure of the potential increase in derivative instrument credit risk exposure, for derivative instruments that generally do not have initial cost paid or consideration received, resulting from future fluctuations in the underlying interests upon which derivative instruments are based. For collars, swaps other than credit default swaps and forwards, potential exposure is expressed as a fraction of the notional amount with the RBC charge based on the NAIC designation of the counterparty. For written (sold protection) credit default swaps, used in replications, potential exposure is the full notional amount. For options and purchased (bought protection) credit default swaps, the potential exposure is zero. For futures, potential exposure is based on initial margin per contract and the number of futures contracts outstanding. The other main component of off-balance sheet exposure utilizes the calculation in Miscellaneous Assets (LR012).

Each of the above areas was reviewed along with other matters put before the group as reflected in the meeting notes (Appendix 1). It was noted that much of the derivative RBC computation and related reporting had been updated during the last five years, however we concluded that several areas deserved attention as follows:

1. **Replications** – Is the 100% RBC credit on the cash instrument that is paired with the derivative in the replication appropriate, taking into consideration NAIC monitoring and the risk mitigated by substitutability?

2. **Fair value (FV) versus BACV** – Is one basis preferable to the other as the foundation for computing derivative-related RBC?

3. **Off balance sheet exposure** – Is the current approach effective in terms of measuring potential exposure and applying an RBC charge commensurate with the risk?

4. **Subsidiary counterparties** – Is the risk effectively reflected in RBC?
Analysis

Replications – Is the 100% RBC credit on the cash instrument that is paired with the derivative in the replication appropriate, taking into consideration NAIC monitoring and the risk mitigated by substitutability?

The replication, or RSAT, is subject to review any time the credit quality of the cash instrument changes or, at a minimum, annually under the requirements of the NAIC.

The specifics of the RSAT review requirements reflected in the SVO Purposes and Procedures Manual were reviewed. It was generally agreed that if these procedures are administered as designed there would be a timely identification of any material credit deterioration of the cash instrument and the insurer would be compelled to substitute another cash instrument consistent with the existing NAIC designation of the RSAT, or the SVO would change the designation as appropriate thus adjusting RBC to reflect the new risk. In this way, RBC remains responsive to the risks involved. This would also obviate the need to seek additional conservatism by reducing the RBC credit attributed to the cash instrument to an amount less than 100%, and avoid duplicate RBC (some left on the cash instrument and a full charge on the RSAT).

A representative of the NAIC Capital Markets and Investment Analysis Office (a/k/a SVO) was invited to review the administration and conduct of the procedures around monitoring the credit quality of the RSAT cash instrument. A deck of material was provided and is in Appendix 3. The presentation was entitled Replication Transactions- The Cash Component. After the procedures were explained it was our conclusion that the credit quality of the cash instrument is monitored along with the RSAT package. The monitoring is done at least annually and evaluated against an appropriate standard of effectiveness.

We observed that as a package the RSAT is effectively monitored under existing NAIC procedures and if the components of the RSAT were reported separately they would each attract an appropriate asset charge under the current RBC structure. On that basis we concluded that the 100% RBC offset/credit for the cash component is appropriate and no change would be recommended.

FV versus BACV – Is one basis preferable to the other as the foundation for computing derivative-related RBC?

We used research done by the NAIC Capital Markets Bureau to address this question. A 2011 sample of the largest life insurers suggested that using FV as a basis for asset charges applied to Off Balance Sheet and Other Items (LR017) produced 22% higher RBC for the industry when compared to BACV. For Miscellaneous Assets (LR012) it produced 2% lower RBC for the industry. These results gave rise to a conceptual discussion around the advisability of using a measurement basis other than the BACV reflected in the regulatory financial statements. It was noted that at any point in time the use of FV could produce higher or lower industry RBC when compared to using BACV. It was also noted that using
FV could make RBC more pro-cyclical or volatile. For other assets, we understand that BACV will continue to be the basis on which RBC asset charges are applied. No one felt that a strong basis for change is indicated and none is recommended.

**Off balance sheet exposure – Is the current approach effective in terms of measuring potential exposure and applying an RBC charge commensurate with the risk?**

Representatives from MetLife provided observations on their review of various approaches for determining economic capital related to counterparty credit risk (off and on balance sheet) for various derivative instruments. This enabled us to compare and contrast certain Monte-Carlo and Add-on approaches, including the NAIC approach, to determine the potential case for change.

They highlighted two components of counterparty credit risk (CCR):

- **Current exposure** = replacement cost of the transaction if the counterparty defaults immediately
- **Potential exposure** = future replacement cost or the extent to which the value of a position could become positive

Two approaches for estimating potential exposure were compared:

- **Monte Carlo simulation** = simulation of underlying market risk factors over the life of a trade at selected time intervals to maturity
- **Add-on** = current market value plus an add-on factor found in a look-up table multiplied by the notional amount of the contract

Included in Appendix 5 is a list of pros and cons for each approach and a more detailed comparison of the respective methodologies. Key findings were also summarized indicating, in general, that the Monte Carlo based approaches were more sensitive to concentration risk and produced a wider range of capital requirements while the Add-on approaches tended to be less difficult to implement and produced a narrower range of capital requirements. The Monte-Carlo based approaches are considered more sophisticated and data intensive. Use of Add-on approaches is less complex and less resource intensive. Both yield generally understandable results.

It was noted that the Basel III regime for banks allows for the use of more sophisticated capital measurement techniques for those entities inclined to seek regulatory approval. For other banks not so inclined, less sophisticated techniques are applied.

We recognize that an approach suitable for insurance regulatory purposes must be effective and feasible for all sizes and sophistication of insurers. All recognized that the Monte Carlo approaches require a substantial investment and sophistication and it is not feasible at this time to expect smaller insurers to accommodate such a requirement. This narrowed the field of feasible approaches to the two Add-ons: “current exposure method” (CEM) and the NAIC method used today. There were no strong
opinions that the CEM represented enough of an improvement over the status quo to recommend a full change of approach.

However, reflecting on the RBC approach for bonds, it was noted that expected losses used to establish capital charges should reflect recovery experience (loss given default). We agreed that using 100% of the notional amount for written (sold protection) credit default swaps when calculating the potential exposure overestimates the risk. Our recommendation is that this formula be changed to reflect recovery experience consist with the RBC approach for bonds, when the updated information is finalized.

*Subsidiary counterparties – Is the risk effectively reflected in RBC?*

In order to evaluate the completeness of existing requirements, we inquired of the NAIC as to the diligence and procedures performed with respect to the SVO’s “List of Counterparties Rate by the SVO for Schedule DB – Part E – Section 1”.

It was noted that the SVO’s process involves a standard review of ratings described in Part Six Section 3 of the Purpose and Procedures Manual, stated as follows: “The SVO will convert the counterparty’s or the guarantor’s financial strength ratings as assigned by an NAIC CRP (e.g., S&P Financial Programs Ratings, Moody’s Counterparty’s Ratings or Fitch Counterparty Risk Ratings) into an equivalent NAIC Designation. In the absence of an NAIC CRP counterparty financial strength rating, the SVO may convert the counterparty’s senior unsecured rating as assigned by an NAIC CRP, into the equivalent NAIC Designation. In the absence of an NAIC CRP counterparty financial strength or senior unsecured rating, the SVO will conduct a review of the counterparty’s financial statements to assign an NAIC Designation.”

In order for RBC to be sensitive to changes in counter-party credit quality, Companies must ensure that the specific counterparty entity to be listed on Schedule DB—Part E—Section 1 has been assigned a current rating. The following documents are to be submitted for SVO review to allow for a current rating:

- A Counterparty Rating ATF Initial Filing Form
- Form CRR-1, as discussed in Part Two, Section 9(b) of the Purpose and Procedures Manual of the NAIC Securities Valuation Office
- Evidence of an NAIC CRP counterparty rating, an NAIC CRP senior unsecured rating or a copy of the most recent Audited Financial Statement for the counterparty, or the counterparty’s guarantor, so that the SVO can assess credit quality and assign an NAIC Designation.

We concluded that these requirements, if complied with, assure that RBC will be sensitive to changing counterparty credit risk whether the counter party is a stand-alone entity or member of a group. No changes are recommended.
Recommendation

Our one recommendation is that the potential exposure formula included in the Schedule DB Part A instructions for written (sold protection) credit default swaps be changed to reflect recovery experience consistent with the RBC approach for bonds.

Appendices

For access to the appendices, please visit the Related Documents and Resources section of the Investment Risk-Based Capital Working Group (f/k/a C-1 Factor Review Subgroup) webpage.

1 – Meeting notes

NAIC C-1 for derivatives call notes.

2 – Materials used for background on Miscellaneous Assets, RSATs, Hedging, Off Balance Sheet and Other Items

LR012 Counterparty BACV RBC excl MetLife.pptx
LR013 RSAT RBC excl MetLife.pptx
LR017 RBC Counterparty off-bal Instructions LAH.pdf
NAIC RBC 2011

3 – Materials used for RSAT analysis

RSAT Summary.docx
Replication (Synthetic Asset) Tra

4 – Materials used for FV compared to BACV analysis

LR017 RBC BV-FV analysis.pdf
LR012 RBC BV-FV analysis.pdf

5 – Materials used for off balance sheet/potential exposure analysis

PotentialExposure_E exclMetLife.pptx

6 – Materials used for counterparties and subsidiaries analysis

See: Part Six Section 3 of the SVO Purpose and Procedures Manual - 2012