Life and Health Actuarial Task Force
Amendment Proposal Form*

1.   Identify yourself, your affiliation and a very brief description (title) of the issue.

    American Academy of Actuaries" Life Reserves Work Group, David Neve, Chair; Gary Falde, Vice-Chair
    Modify requirements for prescribed reinvestment asset spreads; make related changes for consistency

2.   Identify the document, including the date if the document is "released for comment," and the location in the document where the amendment is proposed:

    VM-20 Requirements for Principle-Based Reserves for Life Products, version ED11 dated 3/25/10, primary changes are in Sections 7.E, 7.F, 9.F.6, 9.F.8, 9.F.9, and Appendix 2.D through 2.F; additional minor changes marked in the Table of Contents, 7.B., 7.D, other portions of 9.F, and Appendix 2 for consistency with these primary changes.

3.   Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on "track changes" in Word®) version of the verbiage. (You may do this through an attachment.)

    See below.

4.   State the reason for the proposed amendment? (You may do this through an attachment.)

    This amendment does a number of things aimed to create a more consistent, realistic, and transparent fixed income investment environment residing in the cash flow model for purposes of buying and selling of assets and quantifying asset default risk. It would replace the existing language that specifies that all reinvestment spreads net of default costs and investment expenses are to be 4% of the appropriate Treasury rate plus 25 basis points (totaling about 25-40 basis points in current markets). Prescribed spreads for certain basic assets are provided, and a type of minimum floor is established which puts a boundary on the impact of the model investment strategy on the reserve. The asset default cost provisions adopted at the March 2010 meeting remain essentially unchanged except to tie them into the modified spread environment.

    Key features of the amended language include:

- Gross spreads based on actual current and historical market data are prescribed for modeling purchases of corporate bonds (i.e. public, non-callable). Prescribed default costs that were already established in VM-20 for starting assets are then deducted explicitly for purchased assets the same way as for starting assets. Investment expenses are also deducted. The prescribed gross spreads are provided by credit quality (or "PBR credit rating") and maturity (or "weighted average life (WAL)."

- The prescribed gross spreads start at current average market spreads in effect at the valuation date (published by the NAIC from a market source) and grade by the start of projection year four to long-term benchmark spreads (derived and published by the NAIC based on actual historical data from the same market source).

- Long-term benchmark spreads are to be based on a variation of the mean spread over the most recent observation period spanning from 7 to 15 years (depending on how far back the NAIC's chosen source goes). The mean is appropriate to target here because spreads are used both for buying and selling assets, and to bias them in one direction or the other would either add or subtract conservatism depending on whether assets are predominantly being purchased or sold in the model. Whether purchases or sales predominate depends on such elements as the type of product, policyholder behavior, maturity of the block, and the investment strategy.

- A variation of the mean is recommended in order to limit the volatility of the resulting spread requirement from one calendar year to the next as new data is incorporated. Specifically, an "85% conditional mean" is recommended in which the trading days having the 7.5% highest and 7.5% lowest spreads during the observation period are excluded. The tables provided in Appendix 2 are based on a conditional mean for the 9.25 year period from 7/1/2000 to 9/30/2009.

- Gross spreads for investments other than for public, non-callable corporate bonds and for swap curve spreads are not prescribed but are to be consistent with and in reasonable relationship to the prescribed spreads for public, non-callable corporate bonds. Gross spread assumptions are needed to compute market values when modeling the sale of starting assets as well as purchase and sale of reinvestment assets, and the NAIC can't feasibly prescribe spreads for all the various asset types. Spreads used in calculating the market value of assets sold, including for corporate bonds, are to be consistent with but not necessarily the same as the spreads used for purchases, recognizing that specific starting assets may have different characteristics than the modeled reinvestment assets.

- The methodology incorporates a type of minimum floor. The company's model investment strategy together with the prescribed and non-prescribed spreads must not produce a lower minimum reserve than would result using an alternative investment strategy made up solely of a stated blend of "A2/A" and "Baa2/BBB" public, non-callable corporate bonds along with their associated prescribed spreads. The proposed blend of 50% A and 50% BBB is intended to represent an approximate equivalent of the industry average asset allocation. This is based in part on data incorporated in a NAIC Rating Agency Work Group report.

- The model investment strategy, which is a representation of the company's actual investment policy for a model segment, is permitted to be complex and to incorporate assets for which spreads are not prescribed or it is permitted to be simple and be expressed as a function only of assets for which spreads are prescribed (or zero for Treasuries) for ease of demonstrating compliance with the alternative investment strategy comparison. The model strategy and/or non-prescribed spreads must be adjusted however if the combination would result in a lower reserve than would be produced by the alternative investment strategy.

- Swap curve spreads are also prescribed for use throughout the cash flow model (not just purchases) to help standardize the treatment of LIBOR-based floating rate assets, swaps, and hedging strategies. The swap spread tables are not included in this submission as they need a little more work prior to publication.

Some quantitative analysis of the amendment will be incorporated in a separate presentation document planned for the June 24 LHATF call. The amendment does include proposed new current and long-term gross spread tables (Tables F, G, H, and I in Appendix 2 of VM-20). They have been updated for market conditions through 9/30/2009.

* This form is not intended for minor corrections, such as formatting, grammar, cross–references or spelling. Those types of changes do not require action by the entire group and may be submitted via letter or email to the NAIC staff support person for the NAIC group where the document originated.

NAIC Staff Comments:

Dates: Received	Reviewed by Staff	Distributed	Considered
6/21/10	JLE		
Notes:			

Table of Contents

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Section 7.   Cash Flow Models

B.   General Description of Cash Flow Projections

        1.   For the deterministic reserve and for each scenario for the stochastic reserve, the company shall project cash flows ignoring federal income taxes and reflecting the dynamics of the expected cash flows for the

entire model segment. The company shall reflect the effect of all material product features, both guaranteed and non-guaranteed. The company shall project cash flows including the following:

a.   Revenues received by the company including gross premiums received from the policyholder.

b.   Amounts charged to account values on general accounts business and use those amounts to determine any effects on future policy benefits, and not as revenue.

Guidance Note: Amounts charged to account values on general accounts business examples include cost of insurance and expense charges.

c.   All material benefits paid to policyholders, including but not limited to, death claims, surrender benefits, and withdrawal benefits, reflecting the impact of all material guarantees.

d.   Net cash flows between the general account and separate account for variable products.

Guidance Note: Cash flows going out from the general account to the separate account increase the reserve and cash flows coming in to the general account from the separate account decrease the reserve. Examples include allocation of net premiums to the separate account, policyholder-initiated transfers between fixed and variable investment options, transfers of separate account values to pay death or withdrawal benefits, and amounts charged to separate account values for cost of insurance, expense, etc.

e.   Insurance company expenses (including overhead expenses), commissions, fund expenses, contractual fees and charges, and taxes (excluding federal income taxes and expenses paid to provide fraternal benefits in lieu of federal income taxes).

f.   Revenue sharing income received by the company (net of applicable expenses) and other applicable revenue and fees associated with the policies and adjusting the revenue to reflect the uncertainty of revenue sharing income that is not guaranteed.

g.   Net cash flows associated with any reinsurance as described in Section 8.

h.   Cash flows from derivative liability and derivative asset programs, as described in Section7.L.

i.   Cash receipts or disbursements associated with investment income, realized capital gains and losses, principal repayments, ~~appropriate~~ asset default costs, investment expenses, asset prepayments, and asset sales. Cash flows related to policy loans are handled in the reserve calculation in a manner similar to cash flows to and from separate accounts.

Guidance Note: Since the projection of cash flows reflect premium mode directly, deferred premiums are zero under this approach.

2.   In determining the stochastic reserve the company

a.   May perform the cash flow projections for each policy in force on the date of valuation or by grouping policies into representative cells of model plans using all characteristics and criteria having a material impact on the size of the reserve. If the company groups policies in representative cells the company shall develop the groups such that the resulting stochastic reserve is greater than or equal to the stochastic reserve that would result with no grouping. The company shall use a per policy calculation to show compliance with this requirement, unless the company can demonstrate compliance with the requirement using another appropriate method.

b.   Shall determine the number and composition of subgroups for aggregation purposes in a manner that is consistent with how the company manages risks across the different product types, and that reflects the likelihood of any change in risk offsets that could arise from shifts between product types. If a company is managing the risks of two or more different product types as part of an integrated risk management process, then the products may be combined into the same subgroup.

Guidance Note: Aggregation refers to the number and composition of subgroups of polices that are used to combine cash flows. Aggregating policies into a common subgroup allows the cash flows arising from the policies for a given stochastic scenario to be netted against each other (i.e., allows risk offsets between policies to be recognized).

C.   Non-Guaranteed Element Cash Flows

1.   Except as noted in paragraph 5 below, the company shall include non-guaranteed elements (NGE) in the models to project future cash flows beyond the time the company has authorized their payment or crediting. Future NGE amounts should be adjusted in each scenario to reflect changes in experience in the NGE amounts.

2.   The projected NGE shall reflect factors that include but are not limited to the following (not all of these factors will necessarily be present in all situations):

   a.   The nature of contractual guarantees;

   b.   The company's past NGE practices and established NGE policies;

   c.   The timing of any change in NGE relative to the date of recognition of a change in experience;

   d.   The benefits and risks to the company of continuing to authorize NGE.

3.   Projected NGE should be established in a way that does not eliminate the margin in the minimum reserve.

4.   Projected levels of NGE in the cash flow model must be consistent with the experience assumptions used in each scenario. Policyholder behavior assumptions in the model must be consistent with the NGE assumed in the model.

5.   For any portion of an NGE that is not based on some aspect of the policy's or contract's experience, that portion should not be included unless it has been authorized for payment by the Board of Directors.

Drafting Note: Paragraph 5 needs to be reworded to clarify that it is referring to income that is not included in the model.

6.   Report any liability for dividends declared by not yet paid that has been established according to statutory accounting principles as of the valuation date separately from the minimum reserve. Accordingly, where such a separate liability is reported on the statutory balance sheet as of the valuation date, exclude any dividends that are included in the separate liability from the reserve cash flow projection.

D.   Starting ~~and Projected~~ Assets

1.   For each model segment, the company shall select starting assets such that the aggregate annual statement value of the assets at the projection start date equals the estimated value of the minimum reserve allocated to the policies in the appropriate model segment subject to the following:

   a.   Starting asset values shall include the relevant balance of any due, accrued or unearned investment income.

   b.   For an asset portfolio that supports both policies that are subject and not subject to these requirements, the company shall determine an equitable method to apportion the total amount of starting assets between the subject and non-subject policies.

   c.   If for all model segments combined, the aggregate annual statement value of starting assets is less than 98% or greater than 102% of the final aggregate minimum reserve, the company shall provide documentation in the PBR Actuarial Report that provides reasonable assurance that the aggregate minimum reserve is not materially understated as a result of the estimate of the amount of starting assets.

2.   The company shall select starting assets for each model segment that consists of the following:

a. All separate account assets supporting the policies.

b. All policy loans supporting the policies that are explicitly modeled under Section 7.E.

c. All derivative instruments held at the projection start date that are part of a derivative program and can be appropriately allocated to the model segment.

d. The negative of any pretax interest maintenance reserve liability that can be allocated to each model segment at the projection start date subject to the following:

   i. The amount of PIMR allocable to each model segment is the approximate statutory interest maintenance reserve liability that would have developed for the model segment assuming applicable capital gains taxes are excluded. The allocable PIMR may be either positive or negative, resulting in either a decrease or increase to starting assets.

   ii. In performing the allocation to each model segment, the company shall use a reasonable approach to allocate any portion of the total company balance that is disallowable under statutory accounting procedures (i.e., when the total company balance is an asset rather than a liability).

   iii. The company may use a simplified approach to allocate the PIMR, if the impact of the PIMR on the minimum reserve is minimal.

e. An amount of other general account assets such that the aggregate value of starting assets meets the requirements in Section 7.D.1. These assets shall generally be selected on a consistent basis from one reserve valuation to the next. Any material change in the selection methodology shall be documented in the PBR Actuarial Report.

3. The aggregate value of general account starting assets is the sum of the amounts in Paragraphs 2.b through 2.e above.

   Guidance Note: The aggregate value of general account assets in Paragraph 3 above may be negative. This may occur for example for model segments in which a substantial portion of policyholder funds are allocated to separate accounts. The assets in Paragraph 2.e above may include negative assets or short-term borrowing, resulting in a projected interest expense.

4. The company shall calculate the projected values of starting assets in a manner consistent with their values at the start of the projection.

5. When calculating the projected statement value of assets at any date, the company shall include the negative of any outstanding PIMR. For purposes of these requirements, the projected PIMR for any model segment and for all model segments combined may be negative.

E. Reinvestment Assets and Disinvestment

   1. At the valuation date and each projection interval as appropriate, model the purchase of general account reinvestment assets with available cash and net asset and liability cash flows in a manner that is representative of and consistent with the company's investment policy for each model segment, subject to the following requirements:

      a. The model investment strategy may incorporate a representation of the actual investment policy that ranges from relatively complex to relatively simple. A complex model representation may include, for example, illiquid or callable assets whereas a simple model representation may involve mapping of more complex assets to combinations of, for example, public non-callable corporate bonds, U.S. Treasuries, and cash. In any case, the PBR actuarial report shall include documentation supporting the appropriateness of the representation relative to actual investment policy.

b. The final maturities and cash flow structures of assets purchased in the model, such as the patterns of gross investment income and principal repayments, and fixed or floating rate interest basis, shall be determined by the company as part of the model representation.

c. The combination of price and structure for fixed income investments and derivative instruments associated with fixed income investments shall appropriately reflect the then-current U.S. Treasury curve along the relevant scenario and the requirements for gross asset spread assumptions stated below.

d. For purchases of public non-callable corporate bonds, use the gross asset spreads over Treasuries prescribed in Section 9.F. (For purposes of this subsection, "public" incorporates both registered and 144a securities.) The prescribed spreads reflect current market conditions as of the model start date and grade to long-term conditions based on historical data at the start of projection year four.

e. For transactions of derivative instruments associated with fixed income investments, reflect the prescribed assumptions in Section 9.F for interest rate swap spreads.

f. For purchases of other fixed income investments, if included in the model investment strategy, set assumed gross asset spreads over Treasuries in a manner that is consistent with, and results in reasonable relationships to, the prescribed spreads for public non-callable corporate bonds and interest rate swaps.

g. Notwithstanding the above requirements, the model investment strategy and/or any non-prescribed asset spreads shall be adjusted as necessary so that the minimum reserve is not less than would be obtained by substituting an alternative investment strategy in which all fixed income reinvestment assets are public non-callable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of 50% PBR credit rating 6 ("A2/A") and 50% PBR credit rating 9 ("Baa2/BBB"). The following pertains to this requirement:

   i. Policy loans, equities, and derivative instruments associated with the execution of a clearly defined hedging strategy (in compliance with Sections 7.L and 7.M) are not impacted by this requirement.

   ii. The PBR actuarial report shall include documentation demonstrating compliance with this requirement.

Guidance note: In many cases, particularly if the model investment strategy does not involve callable assets, it is expected that the demonstration of compliance will not require running the reserve calculation twice. For example, an analysis of the weighted average net reinvestment spread on new purchases by projection year (gross spread minus prescribed default costs minus investment expenses) of the model investment strategy compared to the weighted average net reinvestment spreads by projection year of the alternative strategy may suffice. The assumed mix of asset types, asset credit quality, or the levels of non-prescribed spreads for other fixed income investments may need to be adjusted to achieve compliance.

2. Model at each projection interval any disinvestment in a manner that is consistent with the company's investment policy and that reflects the company's cost of borrowing where applicable. Gross asset spreads used in computing market values of assets sold in the model shall be consistent with but not necessarily the same as the gross asset spreads in Sections 7.E.1.d and 7.E.1.f above, recognizing that starting assets may have different characteristics than modeled reinvestment assets.

3. Determine the values of reinvestment assets at the valuation date and each projection interval in a manner consistent with the values of starting assets that have similar investment characteristics.

EF. Cash Flows from InvestedStarting Assets

The company shall determine cash flows from investedstarting assets, including starting and reinvestment assets, as follows:

1. ~~Select assets at the beginning of the projection from the company's actual assets backing the policies associated with each model segment using the method to determine the amount of starting assets described in Section 7.D.~~

1~~2~~. Determine cash flows for each projection interval for general account fixed income assets including derivative asset programs associated with these assets as follows:

    a. Model gross investment income and principal repayments in accordance with the contractual provisions of each asset and in a manner consistent with each scenario. Grouping of assets is allowed if the company can demonstrate that grouping does not result in materially lower reserves than would have been obtained using a seriatim approach.

    b. Reflect ~~appropriate~~ asset default costs as prescribed in Section 9.F and anticipated investment expenses through ~~a~~ deduction_s_ to the gross investment income ~~using prudent estimate assumptions~~.

    c. Model the proceeds arising from modeled asset sales and determine the portion representing any realized capital gains and losses.

    Guidance Note: Examples of general account fixed income assets include public bonds, convertible bonds, preferred stocks, private placements, asset backed securities, commercial mortgage loans, residential mortgage loans, mortgage backed securities, and collateralized mortgage obligations.

~~**Drafting Note:** Additional requirements may be needed to determine projected market values on sales of starting assets using the prescribed net spread on reinvestment assets described in Section 7.F. For instance, it would be inappropriate to use net-after-default spreads in the discounting of pre-default cash flows to determining market values.~~

    d. Reflect any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns, or other economic values directly in the projection of asset cash flows.

2~~3~~. Determine cash flows for each projection interval for general account equity assets (i.e., non-fixed income investments having substantial volatility of returns such as common stocks and real estate investments) including derivative programs associated with these assets as follows:

    a. Determine the grouping for equity asset categories (e.g. large cap stocks, international stocks, owned real estate, etc.) and the allocation of specific assets to each category as described in Section 7.J.

    b. Project the gross investment return including realized and unrealized capital gains for each investment category in a manner that is consistent with the projected total return on the S&P 500 for the Scenario, reflecting any differences in the total return and risk between the S&P 500 and each equity investment category.

    Guidance Note: This does not imply a strict functional relationship between the returns on the various investment categories and the return on the S&P 500, but it would generally be inappropriate to assume that an investment category consistently 'outperforms' (i.e. has lower risk, but achieves a higher expected return relative to the efficient frontier) the S&P 500.

    c. For the deterministic reserve use an S&P 500 total return assumption that equals the 10-year U.S. Treasury interest rate curve in Scenario 12 from the prescribed scenarios in Section 5.B plus 4% of U.S. Treasury interest rate curve plus .25%.

    d. For the stochastic reserve use an S&P total return assumption that reflects the equity return of the stochastic economic scenarios in Section 7.G.

e. Model the timing of an asset sale in a manner that is consistent with the investment policy of the company for that type of asset. Reflect expenses through a deduction to the gross investment return using prudent estimate assumptions.

3̲4. Determine cash flows for each projection interval for policy loan assets by modeling ~~existing~~ loan balances either explicitly, or by substituting assets that are a proxy for policy loans (e.g., bonds, cash, etc.) subject to the following:

a. If the company substitutes assets that are a proxy for policy loans, the company must demonstrate that such substitution

i. Produces reserves that are no less than those produced by modeling existing loan balances explicitly; and

ii. Complies with the policyholder behavior requirements stated in Section 9.D.

b. If the company models policy loans explicitly, the company shall:

i. Treat policy loan activity as an aspect of policyholder behavior and subject to the requirements of Section 9.D.

ii. For both the deterministic reserve and the stochastic reserve, assign loan balances either to exactly match each policy's utilization or to reflect average utilization over a model segment or sub-segments.

iii. Model policy loan interest in a manner consistent with policy provisions and with the scenario. In calculating the deterministic reserve, include interest paid in cash as a loan cash flow in that projection interval, but do not include interest added to the loan balance as a loan cash flow (the increased balance will require increased repayment cash flows in future projection intervals).

iv. Model principal repayments, including those which occur automatically upon death or surrender.

v. Model any investment expenses allocated to policy loans and include them either with loan cash flows or insurance expense cash flows.

4̲5. Determine cash flows for each projection interval for all other general account assets by modeling asset cash flows on other assets that are not described in Subsections E.2 through E.4 above using methods consistent with the methods described in Subsections E.2 and E.3 above. This includes assets that are a hybrid of fixed income and equity investments.

5̲6. Determine cash flows for each projection interval for all fixed income separate account assets as follows:

a. For the deterministic reserve, use an economic scenario that reflects the U.S. Treasury interest rate curves in Scenario 12 from the prescribed scenarios in Section 6.B. plus 4% of U.S. Treasury interest rate curve plus .25%.

Guidance Note: The Scenario 12 interest rate yield curves are based on a one standard deviation shock to the economic conditions as of the projection start date, where the shock is spread uniformly over the first 20 years of the projection. It is anticipated that Scenario 12 will be updated quarterly and posted on the NAIC website, reflecting the current yield curve at the end of each quarter. The values in Scenario 12 are based on a generator that has not yet been adopted.

b. For the stochastic reserve, use the stochastic economic scenarios in Section 7.G.

Drafting Note: This section needs additional work.

6<u>7</u>.   Determine cash flows for each projection interval for all equity separate account assets using the method described in Subsection E.3 above, but the grouping of funds is described in 7.K below.

7<u>8</u>.   Determine cash flows for each projection interval for all other separate account assets not described in Subsection 6 and 7 above using methods consistent with the methods described in Subsections 6 and 7 above. This includes separate account assets that are a hybrid of fixed income and equity investments.

~~F.~~   ~~Cash Flows from Reinvestment Assets~~

~~The company shall determine cash flows from reinvestment assets as follows:~~

~~1.~~   ~~Model any purchase of general account reinvestment assets with available net asset and liability cash flows in a manner that is representative of and consistent with the company's investment policy for each model segment. Determine the value in a manner consistent with the value of starting assets that have similar investment characteristics. Model any disinvestment in a manner consistent with the company's investment policy and that reflects the cost of borrowing.~~

~~2.~~<u>~~4.~~</u>   ~~Determine cash flows for each projection interval for general account fixed income assets including derivative asset programs associated with these assets as following:~~

         ~~a.~~   ~~For fixed income investments including derivative asset programs associated with these assets, at purchase of each asset, determine an appropriate combination of market price and future contractual cash flow provisions for which the resulting purchase yield appropriately reflects the then current U.S. Treasury interest rate curve plus 4% of the appropriate U.S. Treasury interest rate curve plus .25%.~~

~~Drafting Note:~~ ~~The NAIC shall define the structure and levels of the prescribed net spreads over Treasuries. One recommendation being considered is that only the option adjusted net spreads be prescribed. In such case, the company could add an appropriate option premium to the purchase yield as long as it also fully models the associated cash flow risks such as calls or prepayments.~~

         ~~b.~~   ~~For fixed income assets including derivative asset programs associated with these assets, after purchase, model the cash flows using the contractual provisions determined in Paragraph 2.a above and following the same methodology as described in Subsection E.2 of this section, except that no deduction for default costs and investment expenses is necessary since they are implicit in the prescribed net spreads.~~

~~3.~~   ~~Determine cash flows for general account equity assets following the same methodology as described in Subsection E.3 of this section.~~

~~4.~~   ~~Determine the cash flows for new policy loans following the same methodology as described in Subsection E.4 of this section.~~

~~5.~~   ~~Determine the cash flows for all other general account assets following the same methodology as described in Subsection E.5 of this section.~~

~~6.~~   ~~Determine the cash flows for separate account fixed income, equity and other assets following the same methodology as described in Subsections E.6, E.7 and E.8 of this Section.~~

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Section 9.   Assumptions

F.   Asset Assumptions

     Guidance Note: This subsection includes requirements for prescribed asset default costs<u>, certain prescribed asset spreads,</u> and ~~for~~ handling of uncertainty of timing and amounts of cash flows due to embedded options in the assets.

     1.   Procedure for Setting Annual Default Cost Factors by Projection Year ~~F~~<u>f</u>or Starting Fixed Income Assets with an NAIC Designation

The company shall determine a set of total annual default cost factors, by projection year, for each starting fixed income asset that has an NAIC designation, expressed as percentages of the statement value in each projection year. In making such determination for each asset, the company shall use certain inputs from company records according to 9.F.2, assign a PBR credit rating according to the procedure in 9.F.3, and use prescribed tables or other sources as indicated in this subsection and contained or referenced in Appendix 2. The total annual default cost factor in each year shall be the sum of three prescribed components (a) + (b) + (c) as follows:

a. The "baseline annual default cost factor" in all projection years shall be taken from the most current available baseline default cost table published by the NAIC using the PBR credit rating and weighted average life (WAL) of the asset on the valuation date. The methodology for creating this table can be found in Appendix 2 of this section VM-20. Table A of Appendix 2 shall be the initial NAIC table for this purpose.

b. The "spread related factor" shall grade linearly in yearly steps from the prescribed amount in year one to zero in years four and after. The prescribed amount in year one may be positive or negative and shall be calculated as follows:

   i. Multiply 25% by the result of (ii) minus (iii).

   ii. The current market benchmark spread published by the NAIC consistent with the PBR credit rating and WAL of the asset on the valuation date.

   iii. The most current available long-term~~historical mean~~ benchmark spread published by the NAIC consistent with the PBR credit rating and WAL of the asset on the valuation date. ~~The methodology for creating the historical mean benchmark spread table can be found in Appendix 2 of this section VM-20. Until a different table is published by the NAIC, Table H of Appendix 2 shall be the NAIC table for this purpose.~~

   iv. The resulting amount shall not be less than the negative of the baseline annual default cost in year one and shall not be greater than two times the baseline annual default cost in year one.

Drafting Note: Table H (investment grade spreads) and Table I (below investment grade spreads) in Appendix 2 need to be combined into one table.

Drafting Note: ~~The spread related factor should only be included in the final VM-20 if the requirements for reinvestment spreads are also changed so that they are based initially on actual market spreads and grade off to historical average spreads. The current version of VM-20 is not structured that way, and the spread related factor would be inconsistent with the current version. The American Academy of Actuaries Life Reserves Work Group plans to present for LHATF's consideration a consistent approach to reinvestment spreads during the second quarter of 2010.~~

c. The "maximum net spread adjustment factor" shall be the same amount for each starting fixed income asset within a model segment and shall grade linearly in yearly steps from the prescribed amount in year one to zero in years four and after. The prescribed amount in year one shall be calculated as follows:

   i. For each asset included in the model segment and subject to this subsection 9.F.1 calculate a preliminary year one net spread equal to the option adjusted spread of the asset on the valuation date less the sum of the amounts from 9.F.1.a and 9.F.1.b for the asset and less the investment expense for the asset.

   ii. Calculate a weighted average preliminary year one net spread for the model segment using a weight applied to the amount in 9.F.1.c.i for each asset equal to that asset's statement value on the valuation date multiplied by the lesser of 3 years and the asset's WAL on the valuation date.

iii.   Calculate the amount in 9.F.1.c.i above for a hypothetical asset with the following assumed characteristics (the regulatory threshold asset):

     1.   A PBR credit rating of 9.

     2.   A WAL equal to the average WAL on the valuation date for the assets in the model segment and subject to this subsection 9.F.1.

     3.   An option adjusted spread equal to the current market benchmark spread published by the NAIC for the assumed PBR credit rating and WAL. The methodology for determining this published spread can be found in Appendix 2.

     4.   Investment expense of 0.10%.

Drafting Note: Table F of Appendix 2 provides illustrative current benchmark spreads as of a particular date, but the intent of the requirement is that the published spread be as of or close to the valuation date.

iv.   The prescribed amount in year one is the excess, if any, of the result in 9.F.1.c.ii over the result in 9.F.1.c.iii.

Guidance Note: A broader explanation for this factor. For each model segment, a comparison is to be made of two spread amounts, both being net of the default costs calculated thus far and net of investment expenses. In each case, the gross option adjusted spread is based on current market prices at the valuation date. The first result represents the weighted average net spread for all the assets in the model segment (and subject to this subparagraph), as if all the assets were purchased at their current market spreads. The second result represents the net spread for a portfolio of index Baa bonds (NAIC 2, PBR credit rating of 9) as if the index Baa portfolio were purchased at the current average market spread. If the first result is higher than the second, additional default costs must be added to each asset until the two results are equal for the first projection year. This additional amount of default cost on each asset then grades off linearly in the model until it reaches zero in year four and after. This process is repeated each actual valuation date. A company that invests in an asset mix earning an average gross spread greater than Baa bonds initially, or an asset mix whose average market spread could widen significantly relative to market spreads for Baa bonds are examples of situations likely to trigger additional assumed default costs either initially or in the future.

Drafting Note: The maximum net spread adjustment factor still needs further study as to potential reserve volatility it could produce.

2.   Company-Determined Inputs for Each Asset

The company shall determine certain items for each asset that are necessary to calculate the total annual default cost factors.

a.   "Investment expense" for each asset shall mean the company's anticipated experience assumption for assets of the same type, expressed as an annual percentage of statement value.

b.   "Option adjusted spread (OAS)" for each asset shall mean the average spread over zero coupon Treasury bonds that equates a bond's market price as of the valuation date with its modeled cash flows across an arbitrage free set of stochastic interest rate scenarios. For floating rate bonds, the OAS shall be calculated as the equivalent spread over Treasuries if the bonds were swapped to a fixed rate. Market conventions and other approximations are acceptable for the purposes of this subsection.

c.   "Weighted average life (WAL)" for each asset shall mean the weighted average number of years until 100% of the outstanding principal is expected to be repaid, rounded to the nearest whole number but not less than 1. For bonds or preferred stocks that are perpetual or mature after 30 years, the WAL shall be 30. Market conventions and other approximations are acceptable for the purposes of this subsection.

Guidance Note: OAS is a metric used for callable corporate bonds and other bonds with optionality such as residential mortgage backed securities. Any excess of the nominal spread of an asset over its OAS represents

additional return for taking on the risk of embedded options. This additional return is not considered when using OAS to make adjustments to annual default cost factors because the additional return is assumed to be related to the cost of embedded options which must be modeled directly by the company along each scenario in the cash flow model (see 9.F.8). OAS is dependent on market prices, which may be gathered by companies in a variety of ways for financial reporting purposes. For instance, prices and OAS may be developed internally for assets with less relative liquidity such as private placements. The general sources of market prices used to determine OAS as well as the method or source for the OAS calculation should be documented in the PBR actuarial report. In some cases OAS may not be available due to unavailability of market prices. When such is the case the asset may be excluded from the particular calculation.

3.   Determination of PBR Credit Rating

    a.   Table J of Appendix 2 converts the ratings of NAIC Approved Ratings Organizations (AROs) and NAIC designations to a numeric rating system from 1-20 that is to be used in the steps below. A rating of 21 applies for any ratings of lower quality than those shown in the table.

    b.   For an asset with an NAIC designation that is derived solely by reference to underlying ARO ratings without adjustment, the company shall determine the PBR credit rating as the average of the numeric ratings corresponding to each available ARO rating, rounded to the nearest whole number.

    c.   For an asset with an NAIC designation that is not derived solely by reference to underlying ARO ratings without adjustment, the company shall determine the PBR credit rating as the second least favorable numeric rating associated with that NAIC designation.

Guidance Note: The 1-21 PBR credit rating system attempts to provide a more granular assessment of credit risk than has been used for establishing NAIC designations for risk based capital and asset valuation reserve purposes. The reason is that unlike for RBC and AVR, the VM-20 reserve cash flow models start with the gross yield of each asset and make deductions for asset default costs. The portion of the yield represented by the purchase spread over Treasuries is often commensurate with the more granular rating assigned, such as A+ or A-. Thus, use of the PBR credit rating system may provide a better match of risk and return for an overall portfolio in the calculation of VM-20 reserves. However, for assets that have an NAIC designation that does not rely directly on ARO ratings, a more granular assessment consistent with the designation approach is not currently available.

Guidance Note: The Purposes and Procedures Manual of the NAIC Securities Valuation Office which establishes the rules for setting NAIC designations has been undergoing significant change during 2009-2010, particularly in the area of assessing the credit risk of structured securities. The Valuation of Securities Task Force of the NAIC (VOSTF) implemented an interim solution in 2009 to set designations for non-agency residential mortgage-backed securities based on modeling by a third party firm. VOSTF is developing a long-term solution for these and other structured securities such as commercial mortgage-backed securities that may involve a combination of modeling and other methods such as "notching up" or "notching down" the result derived by reference to ARO ratings. In all such cases where the ARO rating basis is either not used at all or is adjusted in some way, the intent is that paragraph (c) be used to determine the PBR credit rating. Another common example where (c) is to be used would be securities that are not SVO Filing Exempt, such as many private placement bonds. For example, a private placement that was not Filing Exempt and was rated by the SVO as NAIC 1 would be assigned a PBR credit rating of 6 (second least favorable), equivalent to A2.

4.   Special Situations

    a.   For an asset handled under 9.F.3.c, and for which the NAIC designation varies depending on the company's carrying value of the asset, the company must avoid overstatement of the net return of the asset when projecting future payments of principal and interest together with the prescribed annual default costs.

Guidance Note: For example, if a non-agency residential mortgage-backed security is rated NAIC 2 if held at a particular company's carrying value but NAIC 4 if held at par, and that company's cash flow model first projects the full recovery of scheduled principal and interest, it would be more appropriate to then deduct annual default costs consistent with NAIC 4 rather than NAIC 2. If the company's cash flow model has already incorporated a reduced return of principal and interest consistent with the company's carrying value, then it would be more appropriate to

deduct annual default costs consistent with NAIC 2. Modeling of assets with impairments is an emerging topic, and methods for handling in vendor and company projection models vary.

5.   Annual Default Cost Factors for Starting Fixed Income Assets without an NAIC Designation

For starting assets that do not have an NAIC Designation, the default assumption shall be established such that the net yield shall be capped at 104% of the applicable corresponding historical U.S. Treasury yield rate most closely coinciding with the dates of purchase and maturity structure of supporting assets plus 25 basis points.

6.   Annual Default Cost Factors for Reinvestment Fixed Income Assets

~~Purchase spreads over Treasuries on reinvestment assets are prescribed as an amount that is already net of default costs. Therefore,~~ ~~T~~the sets of annual default cost factors for reinvestment fixed income assets~~these assets~~ are determined following the same process as for starting fixed income assets except that subsection 9.F.c does not apply to reinvestment assets~~zero~~.

~~Drafting Note:~~ ~~The above requirement will need to be modified if the final requirements for reinvestment spreads are specified as being gross of default costs.~~

7.   Amount of Assumed Default Costs

The assumed default costs in the cash flow model for a projection interval shall be the sum over all fixed income assets of the result of the total annual default cost factor for each asset, adjusted appropriately for the length of the projection interval, multiplied by the appropriate credit exposure for each asset.

8.   Procedure for Setting Prescribed Gross Asset Spreads by Projection Year for Certain Asset Transactions and Operations in the Cash Flow Model

a.   Gross asset spreads over Treasuries for public non-callable corporate bonds purchased in projection year one shall be the current market benchmark spreads published by the NAIC consistent with the PBR credit rating and WAL of assets purchased.

b.   Gross asset spreads over Treasuries for public non-callable corporate bonds purchased in projection years four and after shall be the most current available long-term benchmark spreads published by the NAIC consistent with the PBR credit rating and WAL of assets purchased.

c.   The prescribed gross asset spreads for these asset types shall grade linearly between year one and year four in yearly steps.

d.   Interest rate swap spreads over Treasuries shall be prescribed by the NAIC for use throughout the cash flow model wherever appropriate for transactions and operations including but not limited to purchase, sale, settlement, and cash flows of derivative positions, and reset of floating rate investments. A current and long-term swap spread curve shall be prescribed for year one and years four and after, respectively, with yearly grading in between. The 3-month and 6-month points on the swap spread curves represent the corresponding LIBOR spreads over Treasuries.

9.   Basis of NAIC Long-Term Benchmark Spreads

Drafting Note: The detailed methodology and data source used to create the initial long-term benchmark spread table is described in Appendix 2 of this section VM-20. Until a different table is published by the NAIC, Table H of Appendix 2 shall be the NAIC table for this purpose. This subsection spells out the principles to be used by the NAIC to apply to any particular data source for developing future tables. It is expected that the current table would be reviewed annually.

The prescribed long-term benchmark spread table established by the NAIC shall to the extent practicable:

a.   Reflect recent historical market data based on actual daily trading activity.

b. Reflect an expanding observation period that uses the most recent reported data, with a minimum observation period of seven years expanding to a maximum observation period of 15~~fifteen~~ years.

c. Be based on an "85% conditional mean" of the periodic market data. This measure is defined as the mean obtained after excluding from the observation period the trading days involving the 7.5% highest and 7.5% lowest observed spreads for "A" rated 7-10 year maturities or other most similar asset category available from the source data. For other asset categories, the mean shall be obtained after excluding the same trading days that were excluded for the primary asset category.

d. Provide a table of bond spreads by PBR credit rating and WAL and swap spreads by maturity. If needed, interpolation and/or smoothing techniques should be applied to the source data to provide sufficient granularity and logical relationships by credit quality.

Guidance Note: Long-term prescribed spreads are targeted at the historical mean because any biased measure could either add or subtract conservatism depending on whether assets are predominantly being purchased or being sold in the cash flow model. The conditional mean concept is intended to limit the volatility of the long-term prescribed spreads from one valuation date to the next by excluding a limited number of observations in both tails within the averaging period. Empirical analysis during the 2000-2009 time period showed little change in volatility or the level of prescribed spreads from excluding more than the highest and lowest 7.5% observations.

10~~8~~. Modeling of Embedded Options in Assets

Reflect any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns, or other economic values contained in the various Scenarios directly in the projection of asset cash flows under the various scenarios within the stochastic reserve calculation model and under the deterministic scenario within the deterministic reserve calculation model.

Guidance Note: For example, model the impact on cash flows of embedded prepayment, extension, call and put options in a manner consistent with current asset adequacy analysis practice.

* * * * *

Appendix 2   Tables for Calculating Asset Default Costs and Asset Spreads, Including~~and~~ Basis of Tables

This appendix describes the basis for certain prescribed asset default cost and asset spread tables to be updated and published periodically by the NAIC via website. These tables are needed for insurers to comply with the requirements of Subsection 9.F for asset default costs and asset spreads in VM-20. In some cases, as specified in 9.F, tables published in this appendix will serve as the NAIC published table until a different table is published. The development of the various tables is described in subsections A-E of this appendix. The actual tables are shown in subsection F of this appendix. Certain tables were developed based on various source material referenced herein. Other tables are simply compilations or presentations of data from such sources.

It is important to note up front that the development of prescribed default costs is based entirely on analysis of corporate bonds. Default costs for other fixed income securities are assumed to follow those of corporate bonds with similar NAIC designations through a mapping tool called "PBR credit rating." Examples of other fixed income securities are structured securities, private placements, and preferred stocks. Discussions at the NAIC during 2009-2010, particularly at the Valuation of Securities Task Force (VOSTF), have focused on the observation that similarly-rated assets of different types may have similar likelihood of default or loss of principal but may have a significantly different distribution of the severity of that loss. Discussions have particularly focused on the different drivers of severity between structured securities and corporate bonds. As a result, VOSTF has been developing updated methods to assign NAIC designations for C-1 risk based capital purposes for structured securities in order to better take into account these differences. The VM-20 procedure to assign a PBR credit rating has been structured so that in the cases where VOSTF decides to go away from directly using the ratings of approved ratings organizations, the PBR credit rating will be based on the NAIC designation rather than underlying ratings. Where VOSTF continues to authorize use of underlying ratings, the PBR credit rating will also be based on those ratings. However, VM-20 uses the underlying ratings to assign the PBR credit rating in a somewhat different manner.

Subsection 9.F.3 describes the process the company must follow to assign a PBR credit rating for any fixed income asset with an NAIC designation.

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A.   Baseline Annual Default Cost Factors

The general process followed to determine the baseline annual default cost factors shown in Table A (see subsection F) was as follows:

1.   Determine from historical corporate bond data a matrix of cumulative default rates, for maturities of 1 to 10 years and for 20 ratings classes (Aaa, Aa1, Aa2, Aa3 … Caa2, Caa3, Ca).

2.   Determine also from historical corporate bond data a set of recovery rates that varies only by rating class.

3.   Determine a matrix of baseline annual default cost factors (in basis points), where for a given rating the Baseline Annual Default Cost Factor for a bond with maturity or weighted average life of $t = 10,000* (1-$ Recovery Rate) * (1-[1-Cumulative Default Rate $(t)]^{[1/t]}$).

4.   Items 1) and 2) above were determined from Moody's reports that were published in February 2008. In February 2009 and February 2010, Moody's published updated versions of these reports but there is no commitment from Moody's to continue updating these reports in the future. It was not explored whether another source for one or both elements might be preferable. If the NAIC decides to use Moody's as the source going forward, then the matrix of baseline annual default cost factors could be updated after Moody's publishes any updated research.

Details of steps 1 and 2 above are contained in subsections B and C below. Essentially though, step 1 involved gathering from Moody's historical data the cumulative default rates for key maturities over many cohort years, ranking those rates, and applying a CTE 70 metric. For example, for the period 1970-2007, representing 37 years, there were 37 one year cohorts, 33 five year cohorts, and 28 ten year cohorts. A CTE 70 for ten year maturities involved averaging the 8 cohorts with the highest ten year cumulative default rates. Step 2 involved gathering from Moody's historical data the annual recovery rates for various bond categories from 1982-2007, ranking those rates, and calculating sample mean and CTE 70 statistics. The final recovery rate table uses the mean for higher quality investment grade rating classes, uses the CTE 70 for lower quality below investment grade rating classes, and grades in between.

In subsection F below,

1.   Table A shows Baseline Default Costs using Moody's Data as of February 2008, and

2.   Table B shows Baseline Default Cost Margin as of February 2008 (Table A rates minus the historical mean rates).

B.   Cumulative Default Rates Used in Baseline Annual Default Cost Factors

The current process to determine cumulative default rates is as follows:

1.   Obtain the most recent Moody's report on Default Rates (e.g., Moody's 2008-02-11 Special Comment - Corporate Default & Recovery Rates 1920-2007).

2.   Extract 1 year, 5 year and 10 year average cumulative default rate data by whole letter rating (e.g., Aaa, Aa, …CCC) from the report (e.g., Exhibit 27 - Average Cumulative Issuer-Weighted Global Default Rates, 1970-2007*).

3.   Extract 1 year, 5 year and 10 year cumulative default rate cohort data by whole letter rating from the report (e.g., Exhibit 36 - Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2007). Calculate the mean of these 1y, 5y and 10y cumulative default rates, which should be close to the result in (2) for each whole letter rating.

4.   Sort the data in 3) to calculate preliminary CTE 70 1y, 5y and 10y cumulative default rates at each whole letter rating.

5.   Adjust the result in 4) to reflect any differences between 2) and 3). For example, 5) = 4) + [2) - 3)].

6. Use linear interpolation to determine cumulative default rates for maturities 2 to 4 and 6 to 9.

7. Transform the data into a matrix that varies by rating notch (e.g., Aaa, Aa1, Aa2, Aa3, A1,…, Caa2, Caa3, Ca) using an algorithm to ensure that in the new matrix the rows are monotonic by maturity, the columns are monotonic by rating, and to the extent possible the new matrix has a shape comparable to another Moody's cumulative default rate table that varies by notch(e.g., Moody's Idealized Cumulative Default Rates).

8. For maturities greater than 10 years define baseline annual default cost factors as equal to those for 10 year maturities.

In subsection F below,

1. Table C shows Empirical CTE 70 Default Rates from Moody's Data as of Feb 2008.

2. Table D shows Prescribed Cumulative Default Rates derived from Moody's Data as of Feb 2008.

C. Recovery Rate Used in Baseline Annual Default Cost Factors

The current process to determine the recovery rate is as follows:

1. Obtain the most recent Moody's report on Recovery Rates (e.g., Moody's 2008-02-11 Special Comment - Corporate Default & Recovery Rates 1920-2007).

2. Extract historical annual data on recovery rates (e.g., the All Bonds column from Exhibit 22 - Annual Average Defaulted Bond and Loan Recovery Rates, 1982-2007).

3. Determine the mean and CTE 70 of the annual sample observations for each of the different lien position categories as well as for the All Bonds category.

In subsection F below,

1. Table E1 shows a sorted version of "Exhibit 22 - Annual Average Defaulted Bond and Loan Recovery Rates, 1982-2007," and develops the CTE 70 Recovery Rates and the implied Margin.

Table E1 develops Mean and CTE 70 Recovery Rates for All Bonds as well as for Senior Bank Loans and five bond lien position categories that make-up the All Bonds statistics. Implementation will be facilitated if VM-20 uses one recovery rate based on All Bonds rather than using all six lien position categories. Using the more detailed data would require either companies or the SVO to assign each asset to one of the categories.

Table E1 also illustrates that bonds that are more senior in the issuer's capital structure tend to have higher recovery rates than bonds that are subordinated.

2. Table E2 shows the final Recovery Rates that vary by PBR credit rating. This table was determined by assuming CTE 70 applies for Ba3/BB- and below, Mean applies for Baa1/BBB+ and above, and interpolated recovery rates apply for ratings that are between Ba3/BB- and Baa1/BBB+. This approach recognizes that investment grade bonds are more likely to be senior in the issuer's capital structure, and below investment grade bonds are more likely to be subordinated. Differentiating by actual seniority position of each bond was not considered practical. In addition, since recovery rates and default rates are not 100% correlated, and the cumulative default rates were set at CTE 70, use of the mean recovery rate at least for the higher quality bonds helps to avoid overly conservative prescribed default costs for those bonds.

D. Illustrative Current Market Benchmark Spreads

CA current market benchmark spreads published by the NAIC are intended to represent average market spreads at the valuation date for public non-callable corporate bonds and interest rate swaps. They are used to establish the initial spread environment in the cash flow model for purposes of modeling reinvestment assets and disinvestment and for modeling

prescribed default costs. Section 9.F calls for both spreads and default costs to grade from initial to long-term conditions by the start of projection year four. is used only one place in the asset default cost methodology, and that is to establish the gross OAS for the regulatory threshold asset used in the maximum net spread adjustment factor. Ultimately, the NAIC will need to publish current market benchmark these spreads on a website on a quarterly basis. The current process to determine current market benchmark spreads is as follows:

1.   Extract valuation date Investment Grade bond index spread data by ratings category and maturity bucket (e.g., download JULI (JPMorgan US Liquid Index) Interpolated Spread over Treasury data for All Industries).

2.   Extract valuation date Below Investment Grade bond index spread data by ratings category (e.g., download JPMorgan Domestic High Yield Index Spread to Worst data by Rating Tier), and assume that the Below Investment Grade spread curve is flat across maturities.

3.   Transform the data into a matrix that varies by rating notch (e.g., Aaa, Aa1, Aa2, Aa3, A1,…, Caa2, Caa3, Ca) and maturity (1, 2, …, 30) using an algorithm to ensure that in the new matrix: (a) the rows are monotonic by rating, (b) the investment grade columns are monotonic by maturity, and (c) the columns on the borderline between investment grade and below investment grade (Baa3/BBB- and Ba1/BB+) isare interpolated between Baa2/BBB and Ba12/BB+.

In subsection F below,

1.   Table F shows Current Market Benchmark Spreads as of 09/30/200911/30/2007 for Investment Grade bonds.

2.   Table G shows Current Market Benchmark Spreads as of 09/30/200911/30/2007 for Below Investment Grade bonds.

E.   Long-TermMean Benchmark Spreads

Long-term benchmark spreads published by the NAIC are the assumed long-term average spreads for non-callable public bonds and interest rate swaps. They are used to establish the long-term spread environment in the cash flow model for purposes of modeling reinvestment assets and disinvestment. They Mean benchmark spreads are also used as the normative spreads when calculating the spread related factor in the asset default cost methodology. They could potentially be used as long term reinvestment spreads should the NAIC decide to do so. Ultimately, the NAIC will need to publish these spreads on a website. The current process to determine mean benchmark spreads is as follows:

1.   Extract daily Investment Grade bond index spread data for the prescribed observation period by ratings category and maturity bucket (e.g., download JULI (JPMorgan US Liquid Index) Interpolated Spread over Treasury data for All Industries).

2.   Extract daily date Below Investment Grade bond index spread data for the prescribed observation period by ratings category (e.g., download JPMorgan Domestic High Yield Index Spread to Worst data by Rating Tier), and assume that the Below Investment Grade spread curve is flat across maturities.

3.   For the whole letter "A" rated 7-10 year maturity bucket, or nearest similar category, calculate the "85% conditional mean average" by first excluding the 7.5% highest and 7.5% lowest daily observations over the prescribed observation period and then computing the mean of the remaining daily observations.

43.   Calculate for each other ratings category and maturity bucket the mean over the prescribed observation period after excluding the observations from the same trading days excluded in step 3(e.g., 7 years was used). In developing Tables H and I, a 9.25 year averaging period was used, specifically 7/1/2000 through 09/30/2009.

54.   Transform the data into a matrix that varies by rating notch (e.g., Aaa, Aa1, Aa2, Aa3, A1,…, Caa2, Caa3, Ca) and maturity (1, 2, …, 30) using an algorithm to ensure that in the new matrix: (a) the rows are monotonic by rating, (b) the investment grade columns are monotonic by maturity, and (c) the columns on the borderline between investment grade and below investment grade (Baa3/BBB- and Ba1/BB+) isare interpolated between Baa2/BBB and Ba12/BB+.

Drafting Note: A description of the development of the prescribed interest rate swap spreads needs to be added. The process is similar but the data source is different.

Drafting Note: Two key considerations for the NAIC going forward will be the source of the spread data and the historical ~~observation~~averaging period. It has not yet been explored whether a source other than JULI (JP Morgan) would be preferable. Ideally the current and long-term benchmark spreads should come from the same source. A seven year ~~observation~~averaging period was originally chosen because consistent and reliable data was only available back to 2000, and examples were being created based on a 2007 valuation date. It is recommended that the ~~observation~~averaging period be allowed to lengthen~~ed~~ as more years of data are available, and that ultimately a rolling average of a maximum numbers of years be established such as 10 years or 15 years.

In subsection F below,

1. Table H shows Long-Term ~~7 year Mean~~ Benchmark Spreads as of 09/30/2009~~11/30/2007~~ for Investment Grade bonds.

2. Table I shows Long-Term ~~7 year Mean~~ Benchmark Spreads as of 09/30/2009~~11/30/2007~~ for Below Investment Grade bonds.

F. Tables

Table A.   Prescribed Baseline Annual Default Costs (in bps) using Moody's Data as of Feb 2008

PBR credit rating	Moody's\WAL	1	2	3	4	5	6	7	8	9	10
1	Aaa	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
2	Aa1	0.0	0.1	0.3	0.5	0.5	0.6	0.7	0.8	0.8	0.9
3	Aa2	0.1	0.4	0.8	1.0	1.2	1.3	1.4	1.5	1.7	1.8
4	Aa3	0.2	0.9	1.7	2.2	2.4	2.7	2.9	3.1	3.3	3.7
5	A1	0.4	1.7	3.4	4.1	4.5	4.9	5.2	5.5	5.9	6.4
6	A2	0.8	3.3	6.5	7.5	8.1	8.6	9.2	9.5	10.1	11.1
7	A3	2.8	7.0	10.6	11.8	12.6	13.5	14.4	14.9	15.6	16.7
8	Baa1	6.4	13.0	16.5	18.1	19.1	20.4	21.7	22.7	23.5	24.3
9	Baa2	16.3	26.3	32.5	36.9	39.8	40.3	42.4	44.0	44.7	45.2
10	Baa3	42.0	61.4	70.0	76.8	81.0	80.0	80.6	81.4	81.9	81.8
11	Ba1	90.5	123.4	134.7	143.1	148.8	143.9	140.4	138.4	137.2	135.7
12	Ba2	173.5	226.2	243.5	257.9	267.6	253.8	241.0	232.5	228.0	224.1
13	Ba3	262.0	295.0	311.3	328.6	349.6	334.4	321.0	313.1	308.2	305.9
14	B1	436.4	453.8	468.5	480.1	495.0	464.0	441.5	425.5	415.2	409.4
15	B2	621.8	573.8	565.2	560.8	567.4	525.7	492.9	467.1	449.6	436.4
16	B3	1,009.1	832.5	789.8	779.3	788.6	726.3	689.6	663.7	641.2	626.1
17	Caa1	1,440.9	1,095.2	1,004.3	983.8	999.3	922.7	879.6	855.0	840.7	839.5
18	Caa2	2,026.5	1,427.1	1,253.0	1,191.4	1,191.9	1,089.4	1,023.7	982.5	960.8	952.3
19	Caa3	3,974.3	2,806.9	2,385.2	2,269.9	2,316.1	2,090.5	1,942.9	1,850.2	1,809.0	1,815.6
20	Ca	7,090.1	7,090.1	7,090.1	7,090.1	7,090.1	7,090.1	7,090.1	7,090.1	7,090.1	7,090.1

Table B. Default Cost Margin (in bps) included in Table A

PBR credit rating	Moody's\WAL	1	2	3	4	5	6	7	8	9	10
1	Aaa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Aa1	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4
3	Aa2	0.1	0.3	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9
4	Aa3	0.1	0.6	1.1	1.3	1.4	1.4	1.5	1.6	1.7	1.8
5	A1	0.3	1.2	2.2	2.4	2.5	2.6	2.7	2.8	2.9	3.1
6	A2	0.5	2.3	4.2	4.5	4.5	4.6	4.8	4.9	5.0	5.4
7	A3	1.9	4.9	6.9	7.0	7.0	7.3	7.5	7.6	7.8	8.1
8	Baa1	4.3	9.2	10.7	10.8	10.6	11.0	11.4	11.7	11.8	11.8
9	Baa2	12.4	19.8	23.8	26.2	27.6	26.7	27.4	28.0	28.0	17.6
10	Baa3	24.5	34.2	35.4	36.2	37.4	34.2	32.9	32.1	31.3	34.2
11	Ba1	54.4	71.1	70.9	71.0	72.7	65.6	61.4	58.9	56.8	61.0
12	Ba2	108.7	136.0	137.3	139.8	144.6	129.0	118.7	112.2	108.1	103.7
13	Ba3	154.9	148.9	146.3	153.0	166.2	147.3	134.3	127.9	124.8	124.9
14	B1	258.0	230.2	222.5	227.1	240.0	209.2	189.6	178.9	173.5	173.0
15	B2	348.8	260.2	230.1	222.7	231.4	193.1	165.4	148.4	138.3	133.1
16	B3	587.1	409.8	368.9	371.0	392.0	344.0	320.9	307.4	297.3	294.4
17	Caa1	818.3	513.1	439.6	441.5	475.9	423.6	403.1	393.9	389.7	395.2
18	Caa2	1,095.1	595.6	453.7	416.2	435.6	361.6	317.1	282.1	250.6	224.8
19	Caa3	2,164.5	1,290.9	1,017.4	999.6	1,131.9	987.6	918.2	870.1	841.8	843.8
20	Ca	790.1	790.1	790.1	790.1	790.1	790.1	790.1	790.1	790.1	790.1

Table C. Empirical CTE 70 Default Rates (%) from Moody's Data as of Feb 2008

Rating \ WAL	1	2	3	4	5	6	7	8	9	10
Aaa	0.0000	0.0942	0.1884	0.2825	0.3767	0.6800	0.9833	1.2866	1.5899	1.8932
Aa	0.0492	0.2182	0.3873	0.5563	0.7253	0.8800	1.0347	1.1895	1.3442	1.4989
A	0.0583	0.3600	0.6617	0.9634	1.2651	1.6266	1.9881	2.3496	2.7111	3.0726
Baa	0.5481	1.2977	2.0474	2.7971	3.5467	4.1928	4.8389	5.4850	6.1311	6.7771
Ba	2.6013	6.6703	10.7393	14.8082	18.8772	21.0961	23.3149	25.5337	27.7526	29.9714
B	9.9611	16.9257	23.8903	30.8549	37.8196	41.2080	44.5965	47.9850	51.3735	54.7619
Caa	34.5818	41.8637	49.1457	56.4277	63.7096	66.1152	68.5208	70.9263	73.3319	75.7375

Table D.   **Cumulative Default Rates at CTE 70 derived from Moody's Data as of Feb 2008**

Rating \ Term	1	2	3	4	5	6	7	8	9	10
Aaa	0.0001%	0.0003%	0.0011%	0.0027%	0.0043%	0.0061%	0.0080%	0.0103%	0.0129%	0.0157%
Aa1	0.0007%	0.0048%	0.0151%	0.0313%	0.0458%	0.0639%	0.0834%	0.1046%	0.1288%	0.1571%
Aa2	0.0017%	0.0128%	0.0393%	0.0701%	0.1004%	0.1354%	0.1715%	0.2107%	0.2576%	0.3142%
Aa3	0.0037%	0.0303%	0.0892%	0.1506%	0.2097%	0.2784%	0.3506%	0.4245%	0.5137%	0.6284%
A1	0.0071%	0.0590%	0.1770%	0.2818%	0.3855%	0.5020%	0.6271%	0.7492%	0.9001%	1.0997%
A2	0.0132%	0.1116%	0.3358%	0.5143%	0.6897%	0.8869%	1.0967%	1.2939%	1.5426%	1.8851%
A3	0.0473%	0.2391%	0.5445%	0.8051%	1.0781%	1.3844%	1.7146%	2.0290%	2.3877%	2.8277%
Baa1	0.1096%	0.4463%	0.8470%	1.2374%	1.6245%	2.0842%	2.5796%	3.0748%	3.5658%	4.0844%
Baa2	0.2684%	0.8635%	1.5933%	2.4024%	3.2287%	3.9116%	4.7777%	5.6428%	6.4307%	7.1958%
Baa3	0.6631%	1.9290%	3.2827%	4.7647%	6.2327%	7.3466%	8.5839%	9.8402%	11.0552%	12.1929%
Ba1	1.3735%	3.7110%	6.0086%	8.4083%	10.7897%	12.4098%	13.9960%	15.6215%	17.2477%	18.7890%
Ba2	2.5368%	6.5040%	10.3058%	14.2473%	18.0898%	20.2970%	22.2031%	24.1689%	26.2970%	28.3259%
Ba3	3.6955%	8.1474%	12.6022%	17.2882%	22.3370%	25.1659%	27.6984%	30.3257%	32.9668%	35.6626%
B1	6.1549%	12.3912%	18.5430%	24.4577%	30.3603%	33.3742%	36.2428%	39.0509%	41.9040%	44.8307%
B2	8.7700%	15.5309%	22.0600%	28.0790%	34.1026%	37.0125%	39.6120%	42.0311%	44.5486%	47.0164%
B3	14.2329%	22.1052%	29.8341%	37.2322%	44.5424%	47.7158%	51.1441%	54.4483%	57.3933%	60.3261%
Caa1	20.3231%	28.5079%	36.7603%	44.9831%	53.2154%	56.6807%	60.4333%	64.2277%	67.8897%	71.6386%
Caa2	28.5824%	36.2037%	44.2010%	52.0905%	60.1578%	63.2458%	66.4304%	69.6787%	73.0350%	76.3641%
Caa3	56.0548%	63.5055%	70.7783%	78.6366%	86.1597%	87.7061%	89.3719%	91.1008%	92.9422%	94.8089%
Ca	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%

Table E1. Development of Prescribed Recovery Rates from Moody's Data as of Feb 2008

Moody's 2008-02-11 Special Comment - Corporate Default & Recovery Rates 1920-2007

Sorted Version of Exhibit 22 - Annual Average Defaulted Bond and Loan Recovery Rates, 1982-2007*

Summary Statistics	Sr. Secured Bank Loans	Sr. Secured Bonds	Sr. Unsecured Bonds	Sr. Subordinated Bonds	Subordinated Bonds	Jr. Subordinated Bonds	All Bonds
	51.40	33.81	21.45	19.82	12.31	7.79	22.21
	53.40	37.98	23.81	20.75	15.94	10.70	25.18
	58.80	39.23	29.69	23.21	18.19	13.50	25.50
	61.13	40.00	35.79	25.64	19.09	15.50	30.18
	66.16	43.00	36.66	26.06	22.60	16.85	32.31
	67.59	46.54	37.01	28.01	24.42	30.58	34.33
	67.74	47.58	37.13	29.61	24.51	36.50	35.53
	68.32	48.14	38.04	30.88	26.36	47.00	35.57
	73.43	48.37	41.63	33.41	29.99	48.50	38.98
	74.67	48.39	41.87	34.30	31.86	62.00	39.65
	75.25	55.40	43.81	34.57	33.77	NA	40.69
	75.44	59.22	45.24	37.27	35.64	NA	41.54
	75.82	62.02	47.60	41.41	35.96	NA	43.08
	76.02	62.05	49.19	41.82	38.04	NA	43.28
	78.75	63.46	49.41	43.50	38.23	NA	43.64
	82.07	69.25	51.02	43.75	39.42	NA	43.66
	87.74	71.00	52.60	44.73	40.54	NA	45.49
	88.23	71.93	52.72	44.81	41.54	NA	45.57
	NA	72.50	53.73	44.99	42.58	NA	45.89
	NA	73.25	54.25	46.54	44.15	NA	48.38
	NA	74.63	54.88	48.09	44.26	NA	49.39
	NA	75.50	55.02	49.40	46.89	NA	50.48
	NA	80.54	56.10	50.16	51.25	NA	53.53
	NA	83.63	60.16	51.91	56.11	NA	55.02
	NA	NA	62.73	54.47	94.00	NA	55.97
	NA	NA	62.75	67.88	NA	NA	59.12

* Issuer-weighted, based on 30-day post-default market prices. Discounted debt excluded.

** Loan recoveries in 2007 are based on 5 loans from 2 issuers, one of the 5 loans is 2nd lien debt

	Sr. Secured Bank Loans	Sr. Secured Bonds	Sr. Unsecured Bonds	Sr. Subordinated Bonds	Subordinated Bonds	Jr. Subordinated Bonds	All Bonds
# observations	18	24	26	26	25	10	26
1-70 CTE	30%	30%	30%	30%	30%	30%	30%
#obs. for 70 CTE	5.4	7.2	7.8	7.8	7.5	3.0	7.8
low 70CTEestimate	59.7%	40.1%	30.7%	23.9%	18.8%	10.7%	28.3%
high70CTEestimate	60.9%	41.2%	31.6%	24.7%	19.6%	11.9%	29.3%
70 CTE	60.2%	40.3%	31.5%	24.6%	19.2%	10.7%	29.1%
Mean	71.2%	58.6%	45.9%	39.1%	36.3%	28.9%	41.7%
Margin	11.0%	18.3%	14.5%	14.5%	17.1%	18.2%	12.6%

Table E2.   Prescribed Recovery Rates from Moody's Data as of Feb 2008

PBR Credit Rating	Moody's Rating	Recovery Rate
1	Aaa	41.7%
2	Aa1	41.7%
3	Aa2	41.7%
4	Aa3	41.7%
5	A1	41.7%
6	A2	41.7%
7	A3	41.7%
8	Baa1	41.7%
9	Baa2	39.2%
10	Baa3	36.7%
11	Ba1	34.1%
12	Ba2	31.6%
13	Ba3	29.1%
14	B1	29.1%
15	B2	29.1%
16	B3	29.1%
17	Caa1	29.1%
18	Caa2	29.1%
19	Caa3	29.1%
20	Ca	29.1%

Table F. **Illustrative Current Benchmark Spreads as of 11/30/2007 for Investment Grade Bonds**

WAL (Weighted Average Life)	Investment Grade PBR credit rating and Moody's / S&P Ratings									
	1	2	3	4	5	6	7	8	9	10
	Aaa/AAA	Aa1/AA+	Aa2/AA	Aa3/AA-	A1/A+	A2/A	A3/A-	Baa1/BBB+	Baa2/BBB	Baa3/BBB-
1	115.2	132.6	150.0	154.0	158.1	162.1	170.9	179.8	188.6	250.5
2	116.6	135.2	153.7	157.7	161.8	165.8	175.9	186.0	196.1	255.5
3	118.0	137.7	157.4	161.4	165.5	169.5	180.9	192.2	203.6	260.5
4	119.4	140.3	161.1	165.1	169.1	173.1	185.8	198.4	211.1	265.5
5	120.8	142.8	164.8	168.8	172.7	176.7	190.7	204.7	218.7	270.6
6	122.2	145.4	168.5	172.4	176.4	180.3	195.6	210.9	226.2	275.6
7	123.6	147.9	172.2	176.1	180.0	183.9	200.5	217.1	233.7	280.6
8	124.1	148.9	173.6	177.5	181.4	185.3	202.4	219.5	236.6	282.5
9	124.6	149.9	175.1	179.0	182.8	186.7	204.3	222.0	239.6	284.5
10	125.1	150.8	176.5	180.4	184.2	188.1	206.2	224.4	242.5	286.5
11	125.3	151.1	176.9	180.8	184.6	188.5	206.8	225.1	243.4	287.1
12	125.4	151.4	177.4	181.2	185.1	188.9	207.3	225.8	244.2	287.6
13	125.6	151.7	177.8	181.6	185.5	189.3	207.9	226.5	245.1	288.2
14	125.7	152.0	178.2	182.0	185.9	189.7	208.5	227.2	246.0	288.8
15	125.9	152.3	178.6	182.5	186.3	190.2	209.1	227.9	246.8	289.3
16	126.1	152.6	179.1	182.9	186.8	190.6	209.6	228.7	247.7	289.9
17	126.2	152.9	179.5	183.3	187.2	191.0	210.2	229.4	248.6	290.5
18	126.4	153.2	179.9	183.7	187.6	191.4	210.7	230.1	249.4	291.1
19	126.5	153.4	180.3	184.1	188.0	191.8	211.3	230.8	250.3	291.7
20	126.7	153.8	180.8	184.6	188.4	192.2	211.9	231.5	251.2	292.3
21	126.9	154.1	181.2	185.0	188.8	192.6	212.4	232.2	252.0	292.8
22	127.0	154.3	181.6	185.4	189.2	193.0	213.0	232.9	252.9	293.4
23	127.2	154.6	182.0	185.8	189.6	193.4	213.5	233.6	253.7	293.9
24	127.3	154.9	182.5	186.3	190.0	193.8	214.1	234.3	254.6	294.5
25	127.5	155.2	182.9	186.7	190.5	194.3	214.7	235.1	255.5	295.1
26	127.7	155.5	183.3	187.1	190.9	194.7	215.2	235.8	256.3	295.7
27	127.8	155.8	183.7	187.5	191.3	195.1	215.8	236.5	257.2	296.3
28	128.0	156.1	184.2	188.0	191.7	195.5	216.4	237.2	258.1	296.9
29	128.1	156.4	184.6	188.4	192.1	195.9	216.9	237.9	258.9	297.4
30	128.3	156.7	185.0	188.8	192.5	196.3	217.5	238.6	259.8	298.0

Table F.   <u>**Illustrative Current Market Benchmark Spreads as of 09/30/2009 for Investment Grade Bonds**</u>

WAL (Weighted Average Life)	Investment Grade PBR credit rating and Moody's / S&P Ratings									
	1	2	3	4	5	6	7	8	9	10
	Aaa/AAA	Aa1/AA+	Aa2/AA	Aa3/AA-	A1/A+	A2/A	A3/A-	Baa1/BBB+	Baa2/BBB	Baa3/BBB-
1	108.9	114.6	120.3	128.6	136.9	145.2	176.6	208.1	239.5	338.7
2	116.4	122.1	127.8	136.1	144.4	152.7	182.8	212.9	243.0	340.4
3	123.9	129.6	135.3	143.6	151.9	160.2	189.0	217.7	246.5	342.2
4	131.3	137.0	142.7	151.0	159.3	167.6	195.0	222.5	249.9	343.9
5	138.8	144.5	150.2	158.5	166.8	175.1	201.2	227.2	253.3	345.6
6	146.2	151.9	157.6	165.9	174.2	182.5	207.2	232.0	256.7	347.3
7	153.7	159.4	165.1	173.4	181.7	190.0	213.4	236.8	260.2	349.0
8	156.6	162.3	168.0	176.3	184.6	192.9	215.8	238.6	261.5	349.7
9	159.5	165.2	170.9	179.2	187.5	195.8	218.2	240.5	262.9	350.4
10	162.4	168.1	173.8	182.1	190.4	198.7	220.5	242.4	264.2	351.0
11	163.3	169.0	174.7	183.0	191.3	199.6	221.3	242.9	264.6	351.2
12	164.1	169.8	175.5	183.8	192.1	200.4	221.9	243.5	265.0	351.4
13	165.0	170.7	176.4	184.7	193.0	201.3	222.7	244.0	265.4	351.6
14	165.8	171.5	177.2	185.5	193.8	202.1	223.3	244.6	265.8	351.8
15	166.7	172.4	178.1	186.4	194.7	203.0	224.1	245.1	266.2	352.0
16	167.5	173.2	178.9	187.2	195.5	203.8	224.7	245.6	266.5	352.2
17	168.4	174.1	179.8	188.1	196.4	204.7	225.4	246.2	266.9	352.4
18	169.2	174.9	180.6	188.9	197.2	205.5	226.1	246.7	267.3	352.6
19	170.1	175.8	181.5	189.8	198.1	206.4	226.8	247.3	267.7	352.8
20	170.9	176.6	182.3	190.6	198.9	207.2	227.5	247.8	268.1	353.0
21	171.8	177.5	183.2	191.5	199.8	208.1	228.2	248.4	268.5	353.2
22	172.6	178.3	184.0	192.3	200.6	208.9	228.9	248.9	268.9	353.4
23	173.5	179.2	184.9	193.2	201.5	209.8	229.6	249.5	269.3	353.6
24	174.3	180.0	185.7	194.0	202.3	210.6	230.3	250.0	269.7	353.8
25	175.2	180.9	186.6	194.9	203.2	211.5	231.0	250.6	270.1	354.0
26	176.0	181.7	187.4	195.7	204.0	212.3	231.7	251.0	270.4	354.1
27	176.9	182.6	188.3	196.6	204.9	213.2	232.4	251.6	270.8	354.3
28	177.7	183.4	189.1	197.4	205.7	214.0	233.1	252.1	271.2	354.5
29	178.6	184.3	190.0	198.3	206.6	214.9	233.8	252.7	271.6	354.7
30	179.4	185.1	190.8	199.1	207.4	215.7	234.5	253.2	272.0	354.9

Table G.   Illustrative Current Benchmark Spreads as of 11/30/2007 for Below Investment Grade Bonds

WAL (Weighted Average Life)	Below Investment Grade PBR credit rating and Moody's / S&P Ratings									
	11 Ba1/BB+	12 Ba2/BB	13 Ba3/BB-	14 B1/B+	15 B2/B	16 B3/B-	17 Caa1/CCC+	18 Caa2/CCC	19 Caa3/CCC-	20 Ca/CC
1	312.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
2	315.0	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
3	317.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
4	320.0	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
5	322.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
6	325.0	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
7	327.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
8	328.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
9	329.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
10	330.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
11	330.8	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
12	331.0	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
13	331.3	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
14	331.6	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
15	331.9	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
16	332.2	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
17	332.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
18	332.8	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
19	333.1	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
20	333.4	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
21	333.6	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
22	333.9	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
23	334.2	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
24	334.5	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
25	334.8	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
26	335.1	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
27	335.4	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
28	335.7	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
29	335.9	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9
30	336.2	374.4	443.5	512.6	581.7	683.2	784.8	886.3	987.8	1,100.9

Table G.   Illustrative Current Market Benchmark Spreads as of 09/30/2009 for Below Investment Grade Bonds

WAL (Weighted Average Life)	Below Investment Grade PBR credit rating and Moody's / S&P Ratings									
	11	12	13	14	15	16	17	18	19	20
	Ba1/BB+	Ba2/BB	Ba3/BB-	B1/B+	B2/B	B3/B-	Caa1/CCC+	Caa2/CCC	Caa3/CCC-	Ca/CC
1	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
2	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
3	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
4	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
5	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
6	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
7	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
8	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
9	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
10	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
11	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
12	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
13	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
14	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
15	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
16	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
17	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
18	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
19	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
20	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
21	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
22	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
23	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
24	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
25	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
26	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
27	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
28	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
29	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9
30	437.8	529.8	596.8	663.9	730.9	876.8	1,022.8	1,168.7	1,314.7	1,478.9

Table H.   Illustrative 7Year Mean Benchmark Spreads as of 11/30/2007 for Investment Grade Bonds

WAL (Weighted Average Life)	Investment Grade PBR credit rating and Moody's / S&P Ratings									
	1	2	3	4	5	6	7	8	9	10
	Aaa/AAA	Aa1/AA+	Aa2/AA	Aa3/AA-	A1/A+	A2/A	A3/A-	Baa1/BBB+	Baa2/BBB	Baa3/BBB-
1	40.2	42.1	44.0	51.9	59.7	67.6	92.2	116.9	141.5	201.6
2	46.9	49.5	52.0	59.8	67.5	75.3	99.4	123.6	147.7	205.7
3	53.6	56.8	60.0	67.7	75.3	83.0	106.6	130.3	153.9	209.9
4	60.3	64.1	67.9	75.5	83.0	90.6	113.8	136.9	160.1	214.0
5	67.1	71.5	75.9	83.4	90.8	98.3	121.0	143.6	166.3	218.1
6	73.8	78.8	83.8	91.2	98.6	106.0	128.1	150.3	172.4	222.2
7	80.6	86.2	91.8	99.1	106.4	113.7	135.3	157.0	178.6	226.3
8	83.2	89.1	94.9	102.2	109.4	116.7	138.1	159.6	181.0	227.9
9	85.8	91.9	98.0	105.2	112.4	119.6	140.9	162.1	183.4	229.5
10	88.4	94.8	101.1	108.3	115.4	122.6	143.7	164.7	185.8	231.1
11	89.2	95.6	102.0	109.2	116.3	123.5	144.5	165.5	186.5	231.6
12	89.9	96.4	102.9	110.1	117.2	124.4	145.3	166.3	187.2	232.1
13	90.7	97.3	103.8	110.9	118.1	125.2	146.1	167.0	187.9	232.5
14	91.5	98.1	104.7	111.8	119.0	126.1	146.9	167.8	188.6	233.0
15	92.3	99.0	105.6	112.7	119.9	127.0	147.8	168.5	189.3	233.5
16	93.0	99.8	106.5	113.6	120.8	127.9	148.6	169.3	190.0	233.9
17	93.8	100.6	107.4	114.5	121.6	128.7	149.4	170.0	190.7	234.4
18	94.6	101.5	108.3	115.4	122.5	129.6	150.2	170.8	191.4	234.9
19	95.3	102.3	109.2	116.3	123.4	130.5	151.0	171.6	192.1	235.3
20	96.1	103.1	110.1	117.2	124.3	131.4	151.9	172.4	192.9	235.9
21	96.9	104.0	111.0	118.1	125.1	132.2	152.7	173.1	193.6	236.3
22	97.6	104.8	111.9	119.0	126.0	133.1	153.5	173.9	194.3	236.8
23	98.4	105.6	112.8	119.9	126.9	134.0	154.3	174.7	195.0	237.3
24	99.2	106.5	113.7	120.8	127.8	134.9	155.2	175.4	195.7	237.7
25	100.0	107.3	114.6	121.6	128.7	135.7	155.9	176.2	196.4	238.2
26	100.7	108.1	115.5	122.5	129.6	136.6	156.8	176.9	197.1	238.7
27	101.5	109.0	116.4	123.4	130.5	137.5	157.6	177.7	197.8	239.1
28	102.3	109.8	117.3	124.3	131.4	138.4	158.4	178.5	198.5	239.6
29	103.0	110.6	118.2	125.2	132.2	139.2	159.2	179.2	199.2	240.1
30	103.8	111.5	119.1	126.1	133.1	140.1	160.0	180.0	199.9	240.5

Table H.　　Long-Term Benchmark Spreads as of 09/30/2009 for Investment Grade Bonds

WAL (Weighted Average Life)	Investment Grade PBR credit rating and Moody's / S&P Ratings									
	1	2	3	4	5	6	7	8	9	10
	Aaa/AAA	Aa1/AA+	Aa2/AA	Aa3/AA-	A1/A+	A2/A	A3/A-	Baa1/BBB+	Baa2/BBB	Baa3/BBB-
1	60.3	68.3	76.3	83.4	90.5	97.6	125.0	152.5	179.9	252.0
2	66.0	74.0	82.0	89.3	96.6	103.9	130.3	156.6	183.0	253.5
3	71.7	79.7	87.7	95.2	102.7	110.2	135.5	160.8	186.1	255.1
4	77.4	85.4	93.4	101.1	108.7	116.4	140.7	164.9	189.2	256.6
5	83.1	91.1	99.1	107.0	114.8	122.7	145.9	169.1	192.3	258.2
6	88.8	96.8	104.8	112.8	120.9	128.9	151.0	173.2	195.3	259.7
7	94.5	102.5	110.5	118.7	127.0	135.2	156.3	177.3	198.4	261.2
8	96.7	104.7	112.7	121.0	129.4	137.7	158.3	179.0	199.6	261.8
9	99.0	107.0	115.0	123.4	131.7	140.1	160.3	180.6	200.8	262.4
10	101.2	109.2	117.2	125.7	134.1	142.6	162.4	182.2	202.0	263.0
11	101.9	109.9	117.9	126.4	134.8	143.3	163.0	182.7	202.4	263.2
12	102.5	110.5	118.5	127.0	135.5	144.0	163.6	183.1	202.7	263.4
13	103.2	111.2	119.2	127.7	136.2	144.7	164.2	183.6	203.1	263.6
14	103.8	111.8	119.8	128.4	136.9	145.5	164.8	184.1	203.4	263.7
15	104.5	112.5	120.5	129.1	137.6	146.2	165.4	184.6	203.8	263.9
16	105.1	113.1	121.1	129.7	138.3	146.9	166.0	185.0	204.1	264.1
17	105.8	113.8	121.8	130.4	139.0	147.6	166.6	185.5	204.5	264.3
18	106.4	114.4	122.4	131.0	139.7	148.3	167.1	186.0	204.8	264.4
19	107.1	115.1	123.1	131.7	140.4	149.0	167.7	186.5	205.2	264.6
20	107.7	115.7	123.7	132.4	141.1	149.8	168.4	187.0	205.6	264.8
21	108.4	116.4	124.4	133.1	141.8	150.5	169.0	187.4	205.9	265.0
22	109.0	117.0	125.0	133.7	142.5	151.2	169.6	187.9	206.3	265.2
23	109.7	117.7	125.7	134.4	143.2	151.9	170.1	188.4	206.6	265.3
24	110.3	118.3	126.3	135.1	143.8	152.6	170.7	188.9	207.0	265.5
25	111.0	119.0	127.0	135.8	144.5	153.3	171.3	189.3	207.3	265.7
26	111.6	119.6	127.6	136.4	145.2	154.0	171.9	189.8	207.7	265.9
27	112.3	120.3	128.3	137.1	146.0	154.8	172.5	190.3	208.0	266.0
28	112.9	120.9	128.9	137.8	146.6	155.5	173.1	190.8	208.4	266.2
29	113.6	121.6	129.6	138.5	147.3	156.2	173.7	191.2	208.7	266.4
30	114.2	122.2	130.2	139.1	148.0	156.9	174.3	191.7	209.1	266.6

Table I.   Illustrative 7 Year Mean Benchmark Spreads as of 11/30/2007 for Below Investment Grade Bonds

WAL (Weighted Average Life)	Below Investment Grade PBR credit rating and Moody's / S&P Ratings									
	11	12	13	14	15	16	17	18	19	20
	Ba1/BB+	Ba2/BB	Ba3/BB-	B1/B+	B2/B	B3/B-	Caa1/CCC+	Caa2/CCC	Caa3/CCC-	Ca/CC
1	261.7	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
2	263.8	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
3	265.8	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
4	267.9	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
5	270.0	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
6	272.0	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
7	274.1	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
8	274.9	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
9	275.7	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
10	276.5	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
11	276.7	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
12	276.9	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
13	277.2	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
14	277.4	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
15	277.6	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
16	277.9	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
17	278.1	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
18	278.3	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
19	278.6	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
20	278.8	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
21	279.1	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
22	279.3	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
23	279.5	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
24	279.8	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
25	280.0	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
26	280.2	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
27	280.5	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
28	280.7	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
29	280.9	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9
30	281.2	321.8	397.0	472.3	547.5	758.8	970.2	1,181.5	1,392.8	1,641.9

Table I. Long-Term Benchmark Spreads as of 09/30/2009 for Below Investment Grade Bonds

WAL	Below Investment Grade PBR credit rating and Moody's / S&P Ratings									
(Weighted	11	12	13	14	15	16	17	18	19	20
Average Life)	Ba1/BB+	Ba2/BB	Ba3/BB-	B1/B+	B2/B	B3/B-	Caa1/CCC+	Caa2/CCC	Caa3/CCC-	Ca/CC
1	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
2	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
3	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
4	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
5	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
6	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
7	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
8	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
9	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
10	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
11	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
12	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
13	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
14	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
15	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
16	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
17	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
18	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
19	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
20	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
21	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
22	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
23	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
24	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
25	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
26	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
27	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
28	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
29	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5
30	324.0	389.7	476.6	563.6	650.5	870.7	1,090.9	1,311.1	1,531.3	1,788.5

Table J.   Conversion from NAIC ARO Ratings and NAIC Designations to PBR Numeric Rating

Moody's Rating	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3
S&P Rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-
Fitch Rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-
DBRS Rating	AAA	AA high	AA	AA low	A high	A	A low	BBB high	BBB	BBB low
RealPoint Rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-
AM Best Rating	aaa	aa+	aa	aa-	a+	a	a-	bbb+	bbb	bbb-
NAIC Designation	1	1	1	1	1	1	1	2	2	2
Numeric Rating	1	2	3	4	5	6	7	8	9	10

Moody's Rating	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca
S&P Rating	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC
Fitch Rating	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC
DBRS Rating	BB high	BB	BB low	B high	B	B low	CCC high	CCC	CCC low	CC
RealPoint Rating	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	D
AM Best Rating	bb+	bb	bb-	b+	b	b-	ccc+	ccc	ccc-	cc
NAIC Designation	3	3	3	4	4	4	5	5	5	6
Numeric Rating	11	12	13	14	15	16	17	18	19	20

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