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◆ INTRODUCTION

With principle-based reserving (PBR) having become operative as of Jan. 1, 2017—replacing the old formulaic approach for calculating reserves for life insurance products—this article provides an overview of the new valuation methodology and presents the results of the PBR pilot project, shedding some light on how PBR will work going forward.

◆ PBR OVERVIEW

The increasing complexity and sophistication of the designs of many life insurance products necessitated the replacement of the traditional formula-based approach with a more sophisticated methodology more closely reflecting today's products' varying risks. The revised *Standard Valuation Law* (#820) adopted by NAIC in 2009 authorized a new *Valuation Manual* (VM) to provide reserve requirements for life insurance and annuity products, detailing the methodology for determining the appropriate principle-based reserves. The VM helps facilitate the uniform implementation of PBR across the states and insurance departments. It was adopted in 2012, paving the way for the states to begin enacting the NAIC revisions to Model #820 in their respective legislative sessions. For PBR to be implemented, at least 42 states (a supermajority) representing 75% of total U.S. premium had to enact the revisions made to Model #820.

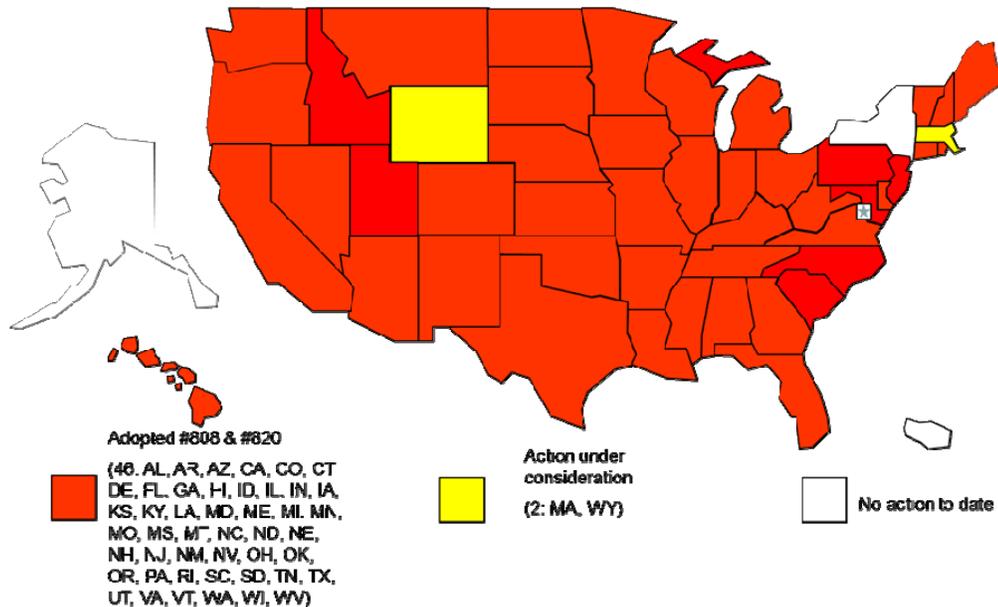
The VM operative date of Jan. 1, 2017, was established when 46 states representing 85.7% of premium enacted the revisions to Model #820 by July 1, 2016 (Figure 1). At the 2016 Summer National Meeting, it was reported 24 of those states have issued bulletins or other announcements regarding the VM operative date and the implementation of PBR.

The concern with the old formulaic methodology is it would often lead to excessive conservatism in reserve calculations for some products and inadequate reserves for others. The PBR valuation methodology is designed to "right-size" reserves; i.e., reduce reserves too high for some products and increase reserves too low for other products. With PBR, insurers are disincentivized from developing "workarounds" aimed specifically to reducing reserves for their products. Furthermore, an NAIC impact study has shown even if there are large changes in reserves for individual products with PBR, the overall effect on life insurance reserves is expected to be small.

The VM defines which insurance contracts are subject to a PBR valuation. Unless otherwise specified, the PBR methodology will apply to life insurance contracts issued on and after Jan. 1, 2017 (VM operative date). However, PBR will be phased-in over three years to allow for an easier transition. An insurer may opt to defer the implementation of PBR methodology to life insurance contracts issued during the first

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FIGURE 1: PBR ADOPTION MAP AS OF JAN. 31, 2017



This map represents state action or pending state action regarding NAIC amendments to the model(s). This map does not reflect a determination as to whether the pending or enacted legislation contains all elements of NAIC amendments to the model(s) or whether a state meets any applicable accreditation standards. Source: NAIC.

three years following the VM operative date. Because elements of the actuarial method in AG 48<sup>1</sup> are based on VM-20,<sup>2</sup> an insurer may partially implement the VM during the three-year deferral period, even though for new business the insurer otherwise defers implementation.

Current life insurance products offer multiple benefits and/or options to consumers within a single contract such as death benefits, accelerated death benefits, secondary guarantees such as no lapse guarantees, policy loans, retirement income benefits such as guaranteed lifetime income benefits and long-term care benefits. In contrast with the formula-based approach, PBR can effectively value all the options and/or benefits in a single contract. The PBR methodology incorporates the value of both asset and liability cash flows, as the value of some of these benefits depends on the current and future market value of the underlying assets.

As opposed to the old formula-based system that locks in certain assumptions, thereby producing reserves that do not change along with the economic environment, PBR is a dynamic system designed to adjust reserves as economic conditions change. The reserve liability is determined with PBR as a function of the discounted value of the differences between the asset and liability cash flows for each period over the range of economic scenarios. The objective is to calculate the likelihood assets may be insufficient to cover the obligations of the insurer, and by what amount. Under economic scenarios where assets are insufficient, the PBR methodology determines all the amounts of the insufficiencies and discounts them back to the valuation date.

The PBR valuation methodology defines three reserve calculations: 1) a net premium reserve (NPR); 2) a deterministic reserve (DR); and 3) a stochastic reserve (SR). The level of risk embedded in a life insurance policy determines whether the insurer will be required to calculate all three reserve components (NPR, DR, SR), or only two reserve components (NPR, DR), or just one reserve component (NPR).

A new supplement was developed for reporting VM-20 reserves and added to the 2017 annual financial statements for life insurers. This supplement breaks out the principle-based reserve into its various components of NPR, DR and SR. Of the required calculations for an insurer, the highest reserve will be the required reserve. The breakout of the reserve components in this manner facilitates regulatory analysis. Analysts, examiners and actuaries are able to determine the proportion of the required reserves resulting from each type of reserve calculation. If the distribution of the reserve components significantly differs from the expected distribution, regulators may choose to analyze the reserves more closely.

The breakout also allows for analysis of year to year changes in reserves by type of reserve calculation to be accomplished more easily.

#### ◆ PBR COMPANY PILOT PROJECT

The Principle-Based Reserving Implementation (EX) Task Force tasked the PBR Review (EX) Working Group to conduct a PBR pilot project in 2016. The goal of the project was to test and evaluate the PBR regulatory processes to determine if any changes need to be made. In addition, to evaluate the requirements defined in the VM or reporting requirements. To accomplish this goal, the Working Group asked a small group of life insurers from nine different jurisdictions to volunteer to perform PBR calculations on their term and/or universal life with secondary guarantees (ULSG) products.

The participating insurers calculated their reserves in accordance with VM-20 and used the newly developed VM-20 reserve supplement to report the results. Also, the insurers completed the report as required by VM-31, PBR Actuarial Report Requirements for Business Subject to a Principle-Based Reserve Valuation, which is a nonpublic confidential document detailing how a life insurer complies with all of the requirements of PBR valuation.

State insurance regulators reviewed the reserve results as reported by the insurers to assess the clarity and completeness of the VM, the adequacy of the VM-20 supplement and the compliance with all requirements of a PBR valuation as defined in Model #820. In the interest of considering the perspectives of all parties ahead of full implementation of PBR, the participating life insurers were asked to provide feedback on any and all aspects of the PBR pilot project in a short survey.

#### ◆ REPORTED PBR PILOT PROJECT RESULTS

Results of the PBR pilot project were submitted by participating life insurers to their respective states of domicile by the due date of Aug. 15, 2016. Subsequently, NAIC staff—under a confidentiality agreement between the states and the NAIC—compiled, reviewed and analyzed the results and

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<sup>1</sup>Actuarial Guideline XLVIII—Actuarial Opinion and Memorandum Requirements for the Reinsurance of Policies Required to be Valued under Sections 6 and 7 of the NAIC Valuation of Life Insurance Policies Model Regulation (AG 48) was adopted Dec. 16, 2014, with an effective date of Jan. 1, 2015, and refers to the actuarial method, which is also a principle-based methodology that companies may use in evaluating the level of primary assets held by captive insurers in support of reserves.

<sup>2</sup>VM-20, Requirements for Principle-Based Reserves for Life Products, establishes the minimum reserve requirements for individual life insurance policies subject to a principle-based valuation and within the scope of the VM. As defined by Model #820, the VM-20 requirements constitute the Commissioners Reserve Valuation Method for individual life insurance policies not excluded elsewhere in the VM.

## PRINCIPLE-BASED RESERVING PILOT PROJECT AND IMPLEMENTATION PROCESS (CONTINUED)

all relevant information they received from the insurers. Working closely with state insurance regulators, a final report was completed Jan. 19, 2017, and submitted to the Principle-Based Reserving (PBR) Implementation (EX) Task Force.

The 11 life insurers involved in the PBR pilot project calculated and reported reserves of about \$3.6 billion for 1.3 million policies, with a total face amount of approximately \$828.1 billion (Figure 2).

Upon reviewing the data submitted by life insurers, state insurance regulators sent a list of follow-up questions for each insurer. Once the insurer responded to these questions, confidential, regulator-to-regulator calls were held with each insurer to discuss the findings in more detail.

Based on the data submissions and the follow-up discussions, the major findings and observations about the PBR pilot project include the following:

- With some exceptions, life insurers followed the instructions of the PBR pilot project (i.e., mandatory calculations and the modeling of five years of business) provided by state insurance regulators.
- All insurers were able to complete the VM-20 reserve supplement, as well as the VM-31 actuarial report.
- The level of detail provided in the VM-31 actuarial report ranged widely among the participating insurers. While some insurers provided significantly more detail than others, no single insurer provided a fully completed report. Some additional detail was generated during the follow-up discussions with each insurer.
- The VM-31 actuarial reports from all insurers were similar, as they responded to the requirements in the order in which they appear in VM-31. State insurance regulators noted this was a positive outcome, as it provided a level of standardization to the reports. Further discussions focused on whether VM-31 would need to be modified to eliminate some duplication of require-

ments and standardize the report to follow the order of the requirements.

- Ten of the insurers tested level term life insurance products and seven tested ULSG products. Of the latter, two insurers did not calculate the required stochastic reserve due to reported time or system constraints.
- Three insurers noted they would value products issued in 2017 under PBR, while one other insurer indicated it may value its products under PBR depending on what tax reserve would be allowed. The remaining seven insurers said they did not plan to value any of their products issued in 2017 under PBR.
- Two out of the 10 companies testing term products reported a negative DR. A negative DR is possible under the VM-20 methodology if the product's gross premiums are at such a level that, when combined with the investment income earned on the invested assets, the resulting cash inflows are more than sufficient to pay all the claims and expenses under the product. However, aggressive or unrealistic insurer experience assumptions may also generate a negative DR. This presents a challenge state insurance regulators may face when they examine companies under PBR, as there are many moving parts in the reserving process needing to be evaluated and validated against past and developing experience.
- The seven companies testing ULSG products reported positive DR. The five companies that calculated SR reported positive SR and all but one had an SR exceeding the DR.
- Three companies reported no reinsurance ceded reserve and eight companies reported reinsurance ceded reserves. Seven of the eight companies reported a pre-reinsurance ceded reserve greater than the post-reinsurance ceded reserve. One of the eight companies reported a pre-reinsurance ceded reserve less the post-reinsurance ceded reserve. State insurance regulators

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**FIGURE 2: PBR PILOT PROJECT PRE-REINSURANCE CEDED LIFE INSURANCE BUSINESS TESTED**

Product Tested	Number of Policies	Face Amount	Reported Reserve	Average Policy Size	Average Reserve per Policy	Average Reserve per \$1,000
Term	1,202,860	794,754,740,729	1,255,885,003	660,721	1,044	1.58
UL & ULSG	74,322	34,362,378,886	2,373,612,499	462,345	31,937	69.08
<b>Total</b>	<b>1,277,182</b>	<b>828,117,119,615</b>	<b>3,629,497,502</b>	<b>649,177</b>	<b>2,842</b>	<b>4.38</b>

Source: NAIC.

considered, because it is possible the post-reinsurance ceded reserve could be greater than the pre-reinsurance ceded reserve, there was a need to review the reinsurance accounting rules to determine if any changes in statutory accounting rules are needed.

- During the pilot project, there were some questions about the interpretation of provisions within various sections of VM-20 and VM-31. State insurance regulators, having determined some language needs to be clarified, have formed a VM-20 Review Working Group consisting of regulators, industry representatives and actuarial professionals to address these interpretation questions. Any proposed revisions to the VM to address these issues will be submitted by this new Working Group to the Life Actuarial (A) Task Force for consideration.
- All participating companies responding to the survey found the PBR pilot project to be a useful and valuable exercise. Companies indicated the project provided information on the extent of work and time involved in implementing PBR. Also, the survey informed on the necessary work in developing assumptions and margins, on technical corrections needed to the modeling software, on understanding and explaining modeling results, and on the impact to the DR and SR due to the use of different discount rates used in the reserve calculations.
- State insurance regulators also found the PBR pilot project to be extremely valuable. It provided an opportunity to see how experience assumptions and margins differed among companies and how actual insurer PBR results compared. The PBR pilot project also provided a view of the level of detail companies documented in the VM-31 actuarial report and the opportunity to see the types of questions and interpretations that arose in applying the VM-20 requirements, pointing out areas within the VM where additional clarification may be needed.

### ◆ CONCLUSION

While the move to PBR has not been without challenges, its numerous benefits should offset the costs of any challenges. The PBR methodology allows state insurance regulators to “right-size” reserves based on the risks embedded in the insurance contracts, thereby minimizing the need for arrangements such as reinsurance captives in order to reduce reserve redundancies. Likewise, the PBR methodology increases reserves on products embedded with significant market risks not captured by the formula-based reserve methodology. Another benefit of PBR to state insurance regulators is the elimination of the need to develop future actuarial guidelines interpreting how to modify the formula-based reserve methodology to address new risks created by the development of new insurance benefits added to life insurance contracts.

A key challenge for state insurance regulators will be the determination that the reserve, as calculated under PBR and reported in the VM-20 supplement, is in compliance with all the requirements of Model #820 as spelled out in the VM. As noted earlier, there are many moving parts in the PBR valuation process, including the product benefits, guarantees, gross premium structure and policy load structure, as well as insurer experience assumptions regarding mortality, morbidity, longevity, policy surrender rates, premium lapse rates, free withdrawal rates, policy loan rates and interest rate crediting strategy, asset earned rates and expenses. State insurance regulators will need the capability, and the NAIC is developing that capability, to collect and track actual individual insurer experience to assist state insurance regulators in evaluating and validating the insurer experience assumptions used in the reserving process.

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