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COMPANY SECTION**

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Chairperson's Corner

By Ryan Stowe

The more things change, the more they stay the same. On the heels of principle-based reserves (PBR) and the Department of Labor (DOL) fiduciary rule, our industry is poised for significant changes to the way we conduct business on multiple fronts. Increased uncertainty around the globe has shown us that the U.S. economy is more interconnected with the rest of the world than ever before. With more than \$13 trillion (yes, that is 13 followed by 12 zeros) in global sovereign debt yielding negative interest rates,¹ the United States has become a safe haven for foreign investors looking to at least get their money back on a nominal basis. High demand, coupled with low inflation and weak economic data, has led to the rallying of U.S. Treasuries. At the time of this article, the 10-year had closed as low as 1.37 percent and the 20-year as low as 1.69 percent.²

Your Smaller Insurance Company (SmallCo) Section Council continues to work the issues facing smaller insurance companies by bringing you timely information. PBR is going to bring significant changes to all companies selling life insurance products, big or small. Not taking action (e.g., just taking the smaller company exemption if applicable) is taking action, and it could result in unintended consequences. Through a two-part webinar series, we have provided practical implementation considerations for companies to think about. Each webinar, titled PBR: Current Issues for Small Companies, Part I and Part II, can be viewed from the SOA website (<http://www.soa.org/professional-development/archive/webcast-recordings.aspx>):

We have also allocated more than \$50,000 of section funds toward research projects that will address:

- Benchmarking the product development process
- Making sense of PBR results
- Simplified methodologies in VM-20
- Modern set of deterministic scenarios
- Impact of VM-20 on product development

Look for insights from these research projects in the coming months. As more information becomes available on the DOL fiduciary rule, potential implications and industry reactions, we will pass along information in a timely manner.

Please mark your calendars for the following events, which will feature a broad range of SmallCo topics:

- SOA Annual Meeting & Exhibit (Oct. 23–26 in Las Vegas)
- Webinars (all co-sponsored with the Financial Reporting Section)
- Five-part series on PBR implementation and governance (for *registration*; for *recordings*):
 - VM-20 Assumption Guidance
 - VM-31 Documentation Requirements and the PBR Actuarial Report
 - VM-20 Prudent Estimate Mortality
 - VM-G Governance
 - VM-20 Asset Modeling
- Year-end financial reporting issues (December)

It has been my pleasure to serve the section over the years, and this year is no different. As we head into the fall, a fresh batch of leaders will emerge to join the council, and current council members will step into new leadership roles. If you are interested in taking this step yourself, please consider this an open invitation to reach out to me or to any other council member to become a friend of the council. Many hands make for light work, and light work creates opportunities to develop both personally and professionally, meet new people and reconnect with old acquaintances. ■



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ENDNOTES

¹ Christopher Whittall and Sam Goldfarb, "Black Hole of Negative Rates is Dragging Down Yields Everywhere," *Wall Street Journal*, July 14, 2016. <http://www.wsj.com/articles/black-hole-of-negative-rates-is-dragging-down-yields-everywhere-1468174982>.

² <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield>

Letter From the Editor

By Scott D. Haglund

Welcome to the September 2016 issue of *Small Talk*, the Smaller Insurance Company Section newsletter. As you work through your tasks this week, take time to consider how the articles this month impact you.

The Chairperson's Corner highlights dates of some significant upcoming events, as well as funded research that will be underway in the near future.

Mark Birdsall and Marianne Purushotham show you examples of monitoring tools that can assist with principle-based reserving (PBR) analysis.

Karen Rudolph provides a regulatory update on the PBR milestone achievements, net premium reserve definition, post-level term profits, minimum reserve changes and some amendments made (VM-G, VM-20).

On the non-PBR regulatory front (yes, that exists), Leon Langlitz provides an update on other regulatory changes. The topics addressed are 2017 CSO, cybersecurity and group capital.

And Steve Chamberlin gives a preview of the Smaller Insurance Company Section-sponsored sessions at the SOA Annual Meeting & Exhibit—a great opportunity to network with other companies and get a head start on your 2017 tasks.

A parting thought to this letter: As I look over the current environment in which we operate, I'm oddly enough reminded of the yellow brick road from *The Wizard of Oz*. During that movie, Dorothy follows that road to reach her goal of finding the wizard and ultimately getting home. However, in her travels, she encounters many obstacles along the way—witches, flying monkeys and poppies, to name just a few.

As you consider your "road," what is that personal, professional or organizational goal? On that road, what witches or monkeys will you encounter? How do you need to prepare for those challenges, and what support will you need? I encourage you to keep learning more about our profession and the challenges we face. In order to stay on your road, you will need focus and help from others. Involvement in industry meetings, Society of Actuaries (SOA) sections and continuing education is critical to reach your goals. Best of luck as you travel on your path. ■



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For more information visit SOA.org/AnnualMeeting.

Company Profitability and Risk Dashboards—A Tool in the Understanding and Management of Risk, Part 1

By Mark Birdsall and Marianne Purushotham

With principle-based reserves (PBR) becoming effective on Jan. 1, 2017, the decisions regarding what to do about implementing PBR at the company level have become more immediate and important. Companies have a range of options, from the “small company exemption” to a “wait-and-see” approach (the “phase-in”) to the possible use of simplified methods for PBR to electing full PBR with its “less risk, less work” provisions, including stochastic and deterministic exclusion tests.

Regardless of the approach a company may take, it is important to remember that *PBR was intended to embed risk analysis more fully into both reserve and capital calculations.*

Risk analysis is performed to drive decision-making regarding the design and pricing/repricing of products, assessing investment and risk mitigation strategies, developing compensation strategies for agents and employees, and field force management. To communicate effectively with decision-makers, results of detailed analysis must be distilled in a way that communicates results to both actuaries and non-actuaries. Methods like using dollar amounts, indexes and visual representations to summarize the detail work well. Also, with the new data visualization tools available in the marketplace today, companies are finding the management dashboard to be extremely useful.

A dashboard is a tool that provides key business performance data to management on a frequent and regular basis.

This tool is also helpful to companies to support PBR implementation efforts and enable effective communication about profitability and risk with the company board of directors, rating agencies and regulators. Even a small company with limited resources can implement this type of tool, provided pricing and cash-flow projection models and experience studies are available to produce the information on a regular basis.

Developing a dashboard is a unique process to each company—giving consideration to its particular products, target markets, distribution channels and the associated risk profiles.

In this article, we discuss a case study that develops a management dashboard for a hypothetical life insurance company that includes the following key business indicators:

- Actual-to-expected (A/E) ratios for experience assumptions associated with key product risks
- Agent/agency/channel quality of business scores
- Customer value scores and clustering techniques for in-force and new policyholders
- Production levels and product mix versus plan
- Current value of new business written
- Current level of surplus strain
- Additional indicators or statistics specific to a particular product or risk (e.g., agent debit balances for final expense carriers)

DEVELOPING ACTUAL-TO-EXPECTED RATIOS FOR EXPERIENCE ASSUMPTIONS RELATED TO KEY PRODUCT RISKS

Identifying Key Product Risks in In-Force Blocks

As a first step, companies will need to identify the primary risks inherent in their current product portfolios.

With today’s more complex products, risk profiles can vary considerably from product to product, based on product design. Despite significant differences in risk, options provided to policyholders are often modeled without any degree of calibration to actual experience. Some optional benefits may be significantly lapse-supported because there is no requirement for an incremental cash surrender value related to the benefit.

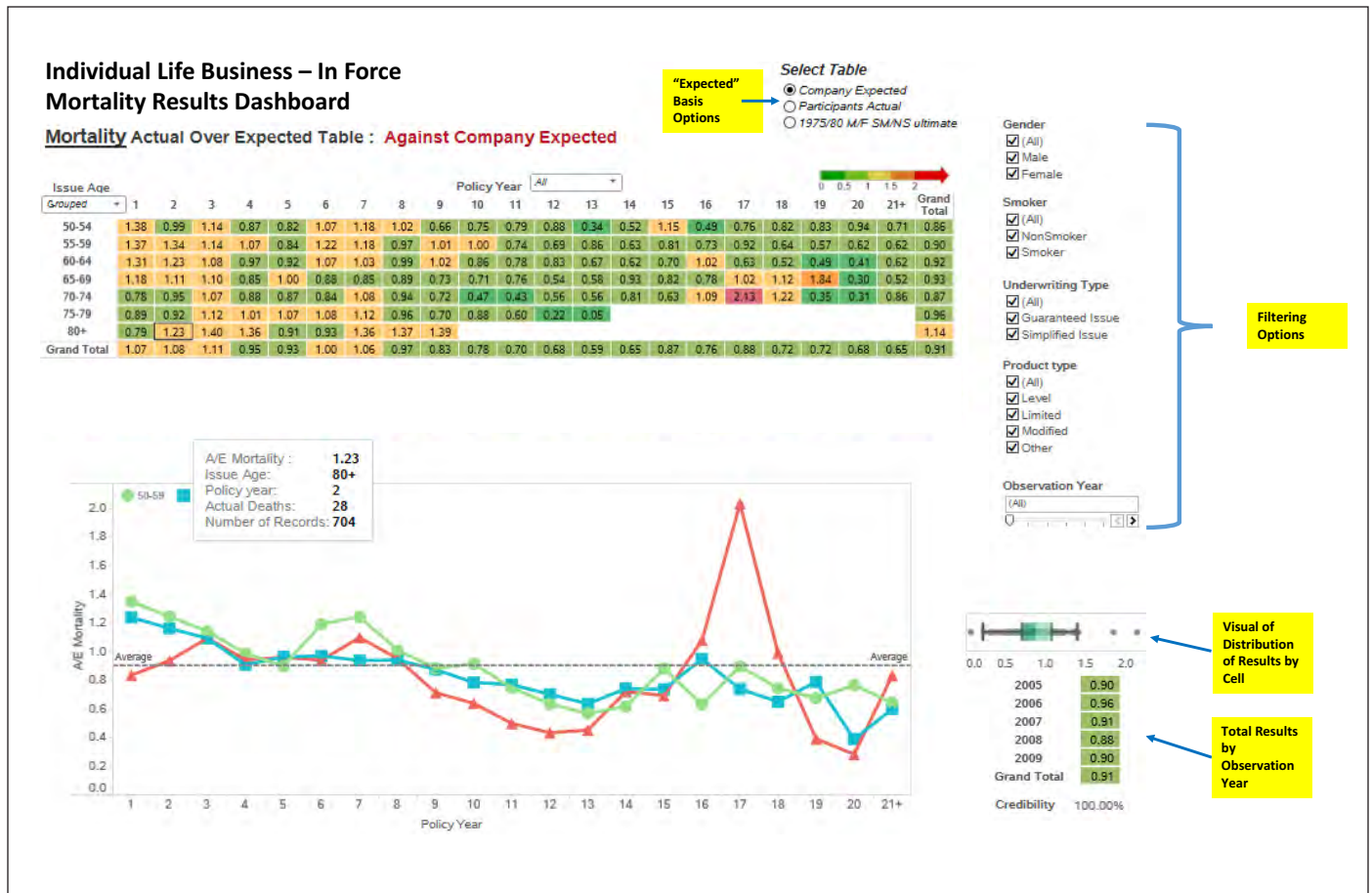
Targeted sensitivity testing utilizing existing pricing models and asset adequacy analysis models can help identify the key risks. In this analysis step, the company may want to select and document a set of objective criteria for identifying key product risks through sensitivity-testing results.

Aligning Experience Studies With Key Product Risks

After the key risks for a product or product group are identified, it is important that the company align its experience studies with key assumptions related to these risks in order to determine the A/E ratios to be included in the dashboard monitoring.

Figures 1a and 1b demonstrate examples of a life insurance focused product risk monitoring dashboard. These dashboard views track mortality and lapse results for the in-force block. The user can look at subsets of the data via the filters available on the right-hand side of the dashboard. These were identified as part of the key product risk identification process.

Figure 1a
Dashboard for In-Force Mortality Monitoring



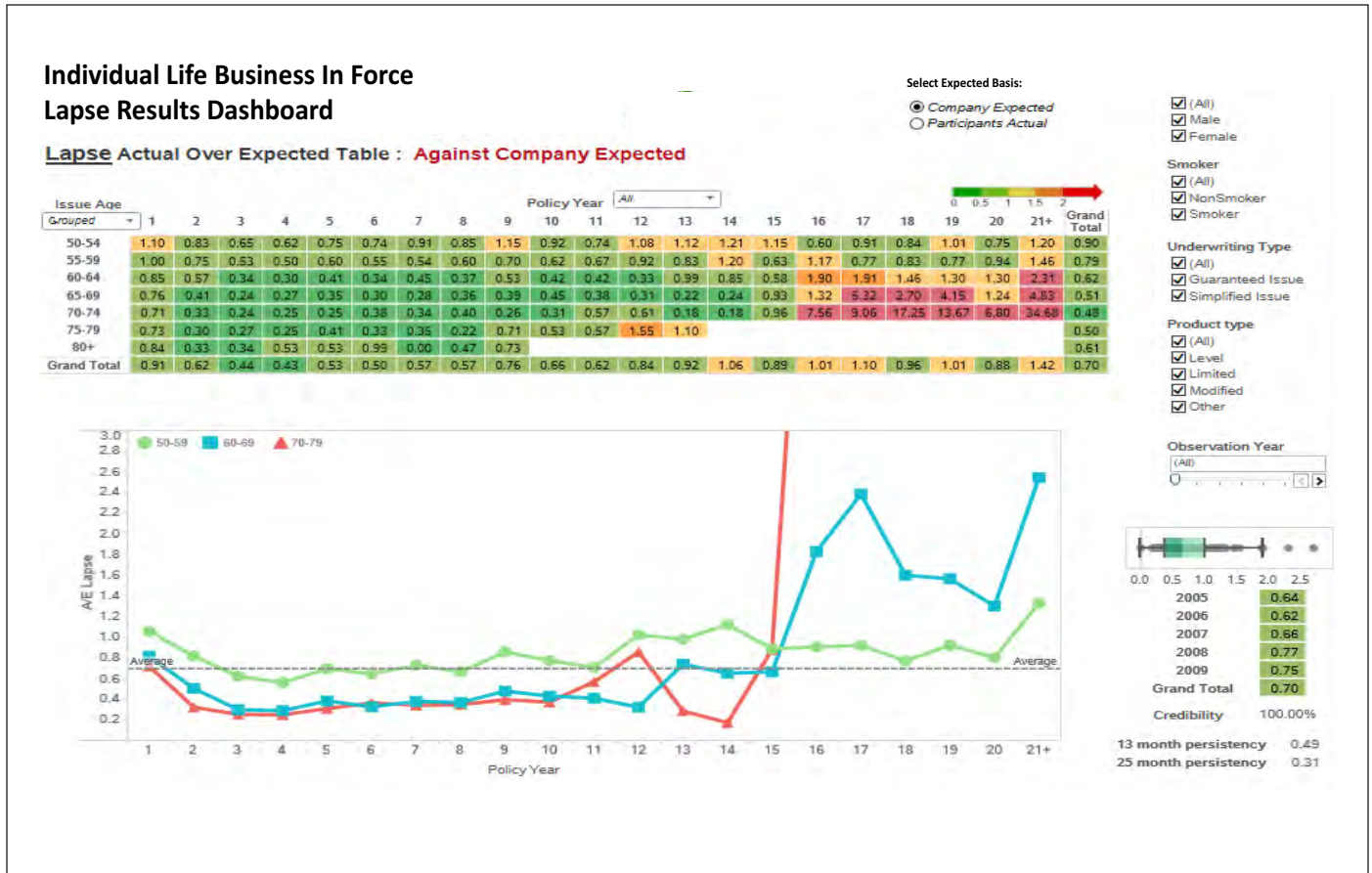
The two dashboard views are consistently designed. For Figure 1a, results are presented as ratios of A/E results with three options for the “expected” basis—a company expected mortality table, the total of all participants in a particular industry study, and for the mortality dashboard only, an industry expected table. (Note that this sample dashboard was designed as part of a tool provided to companies participating in a consortium study of industry experience, which allows for aggregation of all companies results.)

Note that information is presented in several different formats—graphs, tables and figures. The large graph in the lower area shows higher-level, more visual and more summarized results, while the table above it provides more detailed information underlying the particular view. The table also employs a “heat mapping” approach, allowing the user to see overall areas where results are favorable or unfavorable. In this example, the colors range from green (favorable) to red (unfavorable). The design of the tool should consider all the information needs of potential users. Needs range from a high-level view of the re-

sults and trends to drilling down for more exploration of the underlying data.

Although smaller companies may have less credible data regarding their own business, establishing this targeted monitoring process allows companies to begin to understand high-level differences in their own experience compared to industry-average experience as more credible data emerges over time. A problem with relying solely on industry studies for assumption setting is that these studies do not fully represent the distribution of individual company experience around the average. In fact, even larger companies have occasionally misinterpreted and misapplied industry study results. To some extent, every company is unique in factors like its markets, products, distribution channels, underwriting practices and conservation practices. Using the emerging information on individual company A/E ratios in sensitivity testing can provide an insightful view of the cost of setting assumptions that may vary from company experience, regardless of the statistical credibility of that experience.

Figure 1b
Dashboard for In-Force Lapse/Surrender Monitoring



Other Sources of Risk to Profitability of Business

Figure 1c provides A/E ratios for maintenance expenses and net investment earnings. These values complete a set of A/E ratios that began with mortality and lapses in Figures 1a and 1b. These ratios serve as additional measures for management to understand where the company is doing well with respect to sources of profit.

To develop an A/E ratio for maintenance expenses, a company would perform a high-level expense analysis for the current period (e.g., year-to-date), including identifying actual acquisition expenses, maintenance expenses and investment expenses, and deciding how to handle non-recurring (one-time) expenses. This expense analysis can be performed using either a fully allocated approach or a marginal expense approach, but it is important that all expenses are accounted for.

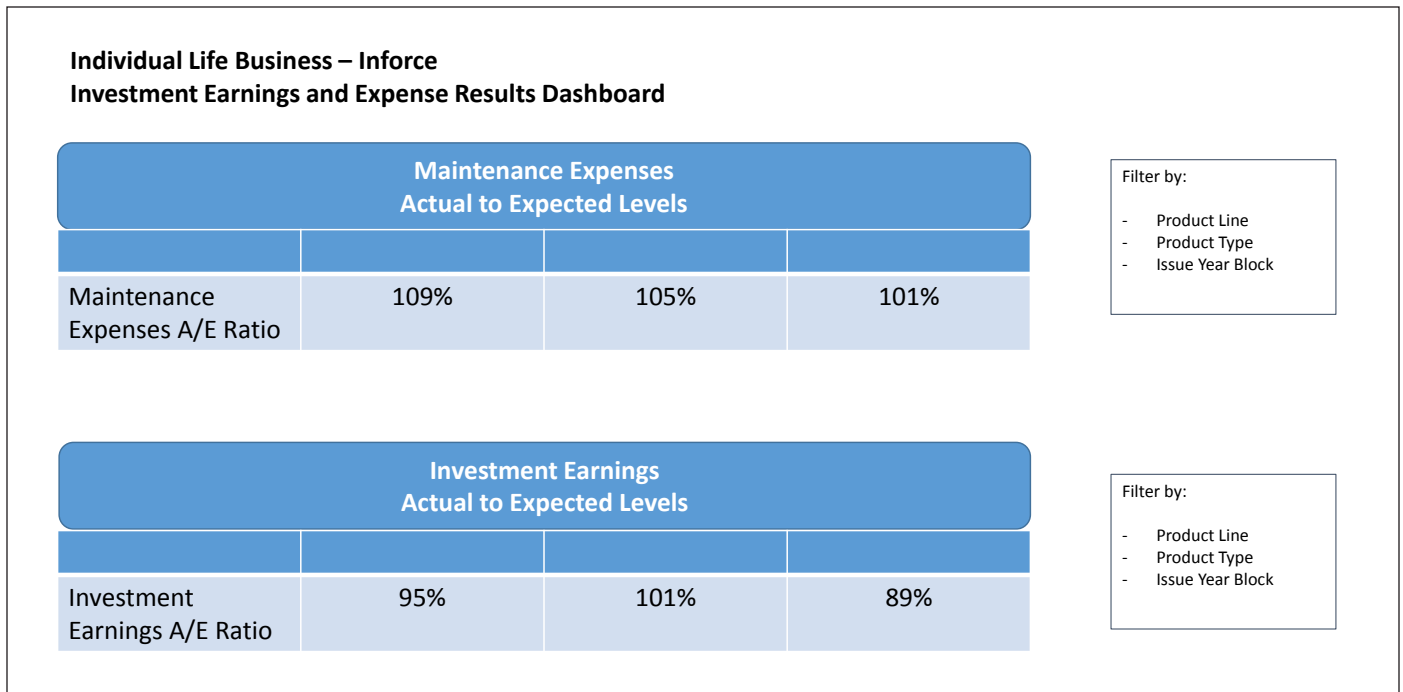
Expected maintenance expenses can be developed by multiplying the maintenance unit expense assumptions (e.g., dollars per policy for the portion of the year-to-date) by the actual units (e.g., number of policies) plus expected fixed expenses not as-

signed to a base. The A/E ratio is the total actual maintenance expense, derived from the expense analysis year-to-date, divided by the expected maintenance expenses, appropriately pro-rated.

For investment earnings, the issue of allocating investment earnings between target capital and free surplus may be significant. Some companies use a multiple of statutory risk-based capital as an estimate of target capital. However target capital is calculated, free surplus would be the difference between statutory total adjusted capital and target capital. The important point is that including the earnings on free surplus can mask the true profitability of the blocks of business being reported to management by making them appear worth more than they actually are. In a real sense, free surplus could be treated as a separate line of business from the insurance business. So, in calculating actual investment earnings, the earnings attributable to free surplus should be excluded.

Expected investment earnings year-to-date may be calculated in a manner consistent with the development of the company business plan.

Figure 1c
Investment Earnings and Expense Results



The A/E ratio is the total actual investment earnings year-to-date divided by the expected investment earnings year-to-date. An A/E ratio for earnings on free surplus may also be calculated by dividing the actual allocated investment earnings on free surplus by the corresponding value in the company business plan.

DEVELOPING AGENT/AGENCY/CHANNEL BUSINESS QUALITY MEASURES

For many companies, a key risk to be managed is related to the quality of new business written. For these companies, much effort and surplus may be required to produce the business initially. This includes the costs associated with evaluation of mortality and/or morbidity in connection with each application received due to the risk of anti-selection and to establish appropriate prices for the risks accepted by the company. For companies that advance first-year commissions, recovery of agent debit balances can also be a significant issue.

At Mark's former company, the question of the quality of new business was addressed by performing traditional mortality and lapse experience studies at different levels, including by product and key product risk as well as by writing agent. These results stimulated the repricing of certain products and a more informed view of agent performance. New business quality became one of the criteria for company awards. While there is an issue related to the credibility of data at such a granular level,

they found that (with exceptions), the quality of business written by an agent was fairly consistent.

Taking that process a step further, the company used its most-current pricing models to run each agent's business for the current period (e.g., quarterly, year-to-date), adjusting the mortality and lapse assumptions by the A/E ratios for that agent. This produced a measure of the present value of profits by agent for the current period. It turned out that 15 to 20 percent of the agents were responsible for about 75 percent of the present value of profits, while a smaller group of agents wrote business that produced a present value loss. The company was then able to focus on nurturing relationships with this top tier of agents and consider its best options with respect to the remaining agents, particularly those whose production reduced company value.

Figure 2 demonstrates the inclusion of a "drill-down" capability in a dashboard designed to track a score of agent/agency/distribution channel quality for a particular company. The agent quality score would be developed by identifying key predictors of agent performance using company historical data, as well as other data obtained or developed by the company regarding each existing agent. For example, companies can obtain demographic data from data vendors and develop internal models of expected losses in debit balances by agent. Using the identified key predictors, scoring models could be developed to monitor existing agents (and evaluate potential new agents).

Figure 2
Distribution Quality Score Dashboard



This dashboard format allows the user to explore agent quality measures at different levels of aggregation, from the agent level up to the distribution channel level. Agent quality scores and A/E ratios for mortality and lapse can be sorted by column to focus on agents or agent groups with higher or lower values for these three measures. In this example, a low agent quality score corresponds to favorable (low) A/E mortality and lapse ratios.

CUSTOMER VALUE SCORES AND CLUSTER ANALYSIS

Consistent with the agent quality score, the process of developing a customer value score includes identifying the key predictors for key product risks, such as mortality and lapse, using company historical data. This includes policyholder data contained in company records, policy information and agent information, as well as data obtained by the company from sources such as MIB,

Continued on page 12

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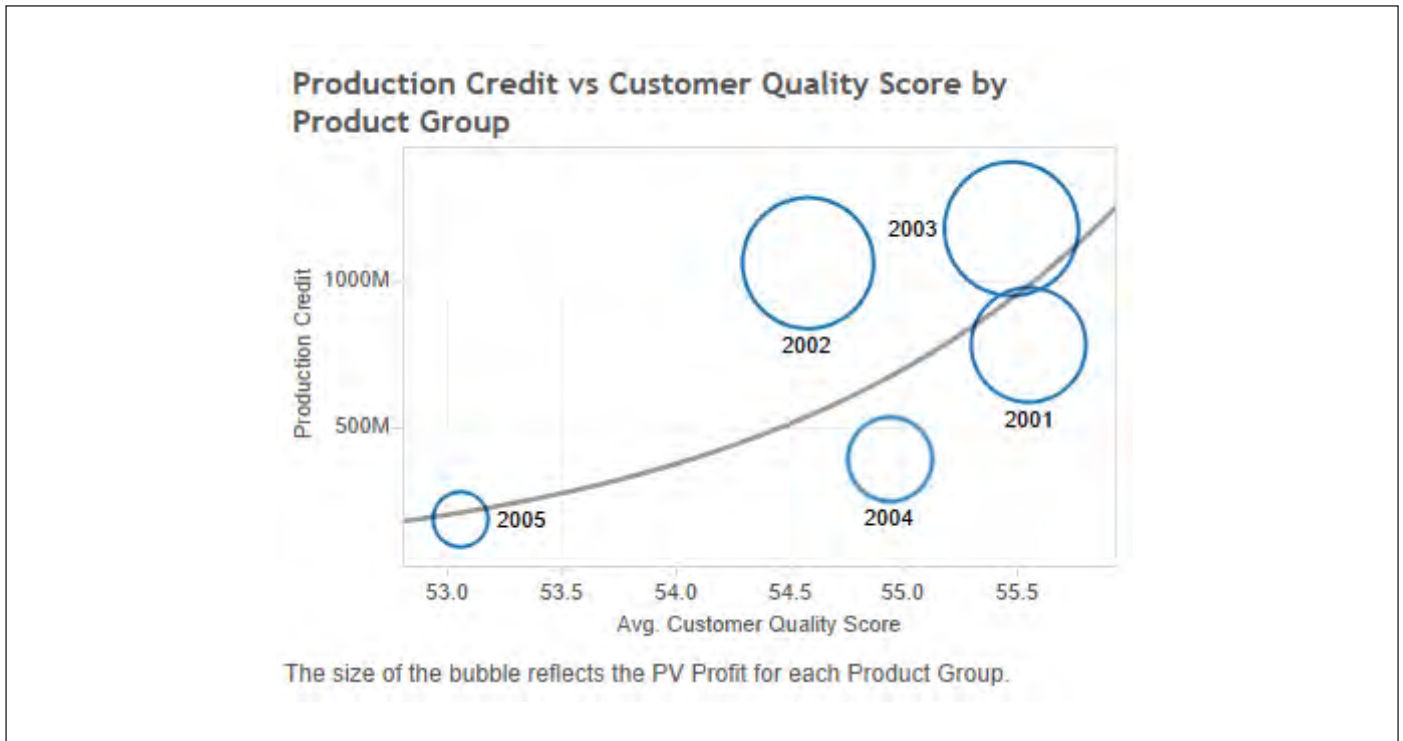
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Figure 3
Customer Value Score Dashboard



motor vehicle records and data vendors. This process can also be aided by statistical techniques, including predictive modeling and factor analysis.

In working through this process for life insurance customers, it is important to recognize the interaction between mortality and lapse. When customers lapse a life insurance policy, they are likely to be relatively healthy, or they would keep paying the premiums. This anti-selection in lapse behavior means that higher lapses are correlated with higher mortality for life insurance and vice versa.

Using the identified key predictors, a scoring model would be developed that could be used to score existing policyholders and provide management information on the distribution of scores across the business. By collecting appropriate information at the time of application, the scoring model could also be used to evaluate new applications for insurance.

Using cluster analysis, the data related to lapse propensity can also be used to identify customer clusters. Customer clusters are for both evaluating potential customers in lead lists as well as becoming a potential key predictor for agent quality scoring. Whether customer clusters are more or less likely to lapse can be identified and tracked using a dashboard monitor.

The scatter diagram in Figure 3 is an example of a dashboard that examines the relationships between customer value score and production level, premium credits and first-year commissions for the five product groups in the sample data. This view is filtered on production credit. Note the upward-sloping trend exponential curve and larger circles indicating that higher production levels are correlated with higher-quality customers in the sample data.

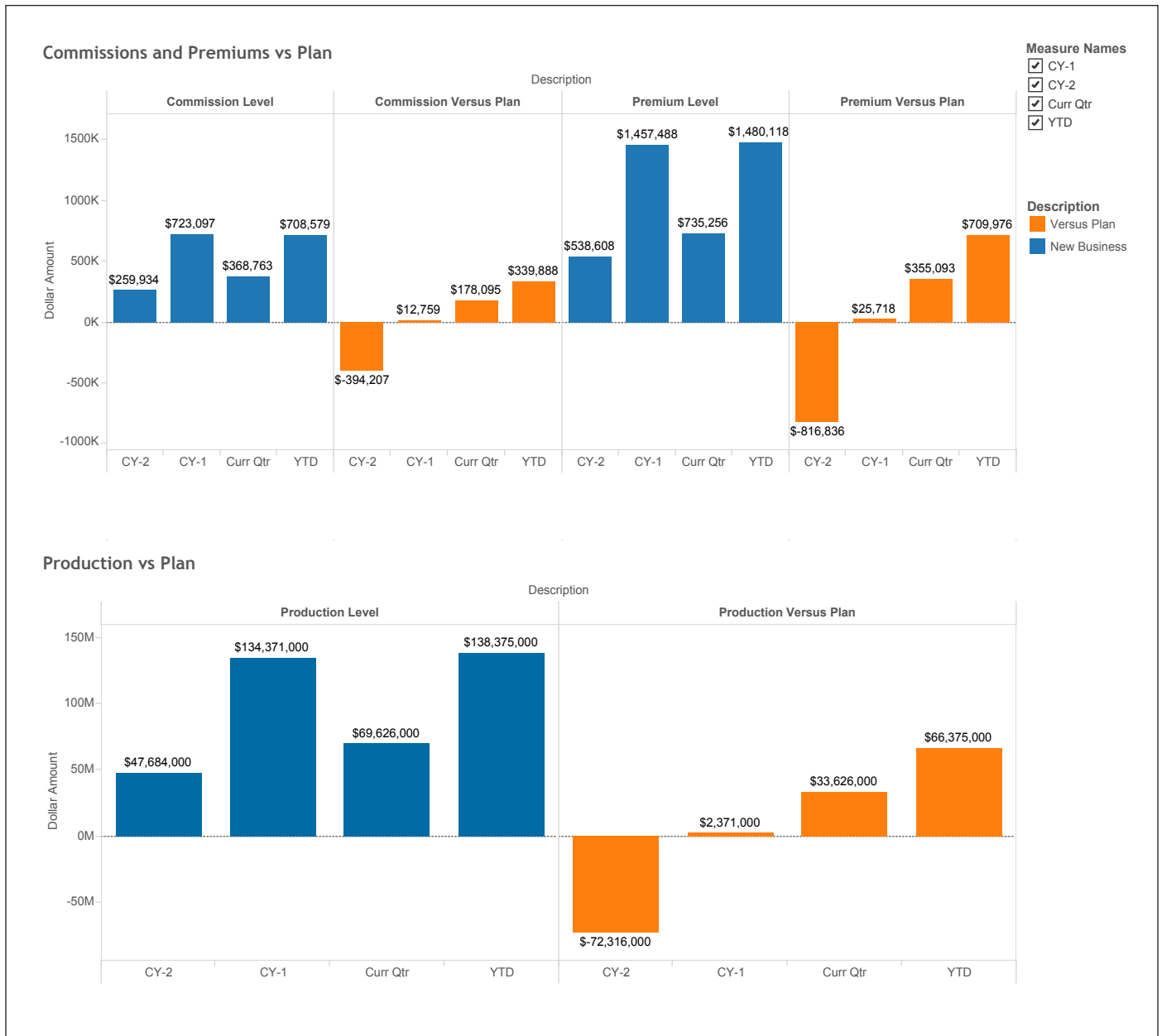
PRODUCTION LEVELS AND PRODUCT MIX VERSUS PLAN

Figure 4 provides comparisons of production levels to the company business plan, including an estimate of the impact of actual product mix to anticipated product mix. Quantifying variations in product mix can inform decisions regarding product pricing and compensation strategies.

CURRENT VALUE OF NEW BUSINESS WRITTEN AND SURPLUS STRAIN

Consider next the sample dashboard displayed in Figure 5, which portrays the value of profits and surplus strain for the current period. Note that the filter capability enables the user to explore the graphical information according to several listed criteria, including region, agency and/or agent identification number, product group and customer cluster. The graph in

Figure 4
Sales Tracking Dashboard



Value of New Business and Product Mix Index

Description	CY-2	CY-1	Current Quarter	Year-to-Date
VNBW per \$1,000 Production*100	\$1,919	\$1,847	\$1,924	\$1,942
Plan VNBW per \$1,000 Production*100	\$1,667	\$1,667	\$1,667	\$1,667
Product Mix Value = (1 - 2)/100 * Production/\$1,000	\$120,122	\$242,580	\$178,847	\$381,005

Figure 5
Value of New Business and Surplus Strain



the lower left-hand corner displays an analytical variable times strain, which is the negative ratio of the present value of profits divided by the surplus strain, and which can be interpreted as a measure of the return on the investment of surplus. The graph in the lower right-hand corner compares the surplus strain and present value of profits with the company business plan for year-to-date and the two prior years. These graphs tell a story about the value being added to the company through new business; the surplus investment required to produce that new business; where the value is coming from by producer group, product group and customer type; the efficiency of the use of the surplus investment; and how well the new business level fits with company plans.

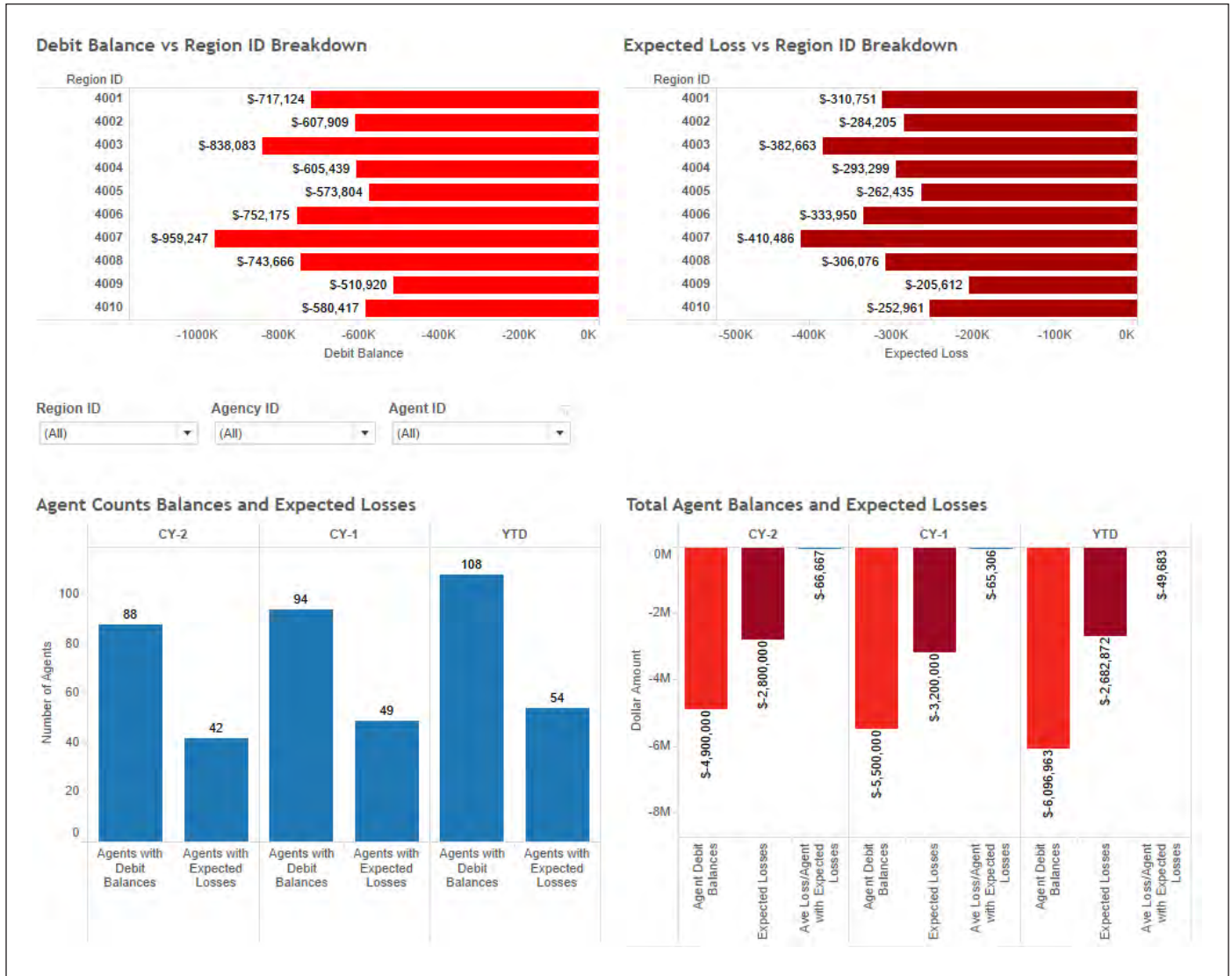
EXAMPLE OF ADDITIONAL INDICATORS FOR INCLUSION IN A DASHBOARD: AGENT DEBIT BALANCES

Each company will have unique statistics and information that will be important to track on a regular basis for managing the business and its associated risks. These data can also be incorporated into the dashboard tools developed.

For example, Figure 6 provides information regarding debit balances and expected losses by region, agency and agent. The calculation of expected losses from debit balances would likely be impacted by agent quality scores or vice versa.

In summary, dashboards can be designed to help companies manage the quality of new business and to understand, mea-

Figure 6
Agent Debit Balances and Expected Losses



sure and manage risks in the context of pricing, reserving and managing capital. Use of the dashboard will help drive objective decision-making through providing a regular management focus on the key drivers of company value. Both actuarial and non-actuarial management will have a greater understanding of the company risk profile and trends in experience that, together with other management reporting, will enable them to make sound decisions to effectively manage company risks and communicate with their boards of directors, rating agencies and regulators. In Part 2 of this article, we will add data to the sample company profitability and risk dashboard with respect to quantifying and ranking risk margins and measuring target capital and company value. ■



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Regulatory Update

By Karen Rudolph

The views expressed in this article are solely those of the author and do not necessarily reflect the views of Milliman or the Society of Actuaries, nor are they intended as methods of regulatory or tax compliance.

NAIC ACHIEVES PBR MILESTONE

On June 10, 2016, the National Association of Insurance Commissioners (NAIC) issued a news release on its website announcing the adoption of a recommendation to activate principle-based reserving (PBR) starting on Jan. 1, 2017. At the time of this news release, the revised Standard Valuation Law permitting recognition of a PBR approach had been passed by 45 states, representing nearly 80 percent of the U.S. life insurance market. The quote from John M. Huff, NAIC president and Missouri insurance director appears here:

This is an historic accomplishment for the state-based system of insurance regulation that marks the beginning of a new policy valuation system that can adapt to new and innovative life insurance products benefiting consumers and life insurers. For many years, life insurers and insurance regulators contended with an outdated formulaic-based system that was challenged to keep pace with consumer demands for new life insurance products, while providing life insurers with reasonable valuation guidance for ensuring financial soundness.

With this milestone achieved, and as the 2016 calendar year progresses, the NAIC's Life Actuarial Task Force (LATF) is scrambling to smooth out any snags or rough edges they view as critical to a company's implementation of VM-20's minimum reserve requirements. This article will cover late-developing amendment proposal forms (APFs) submitted to the LATF for its consideration. At the time of drafting of this article, several of these APFs were either adopted or under consideration by the LATF group. The reader should be advised to follow up with relevant developments regarding final action.

NET PREMIUM RESERVE DEFINITION

Several clarifications and adjustments have been made to the net premium reserve (NPR) language in VM-20. The following discussion assumes the reader is familiar with the NPR formula for term and universal life with secondary guarantee (ULSG) products.



During the LATF call on June 22, the group discussed the APF submitted by ACLI regarding the definition of secondary guarantee. The language in VM-20 did not include a formal definition of "secondary guarantee" in terms of a ULSG product. The language that has been added is consistent with the definition found in Model Regulation 830. Specifically, a secondary guarantee is a conditional guarantee that a policy will remain in force for either:

- More than five years (the secondary guarantee period); or
- Five years or less (the secondary guarantee period) if the specified premium for the secondary guarantee period is less than the net level reserve premium for the secondary guarantee period based on the CSO valuation tables defined in VM-20 Section 3.C and the valuation interest rates defined in this section, or if the initial surrender charge is less than 100 percent of the first year annualized specified premium for the secondary guarantee period

even if its fund value is exhausted.

This language is equivalent to the carve-out in Model Regulation 830 Section 3A(2), except that Model Regulation 830 defines what is *not* a secondary guarantee and VM-20 defines what *is* a secondary guarantee.

The VM-20 Section 3 definition of NPR for ULSG includes the comparison of two reserve components. One of these components is determined by ignoring the fact that the policy has a secondary guarantee (see Section 3B(5) in VM-20). The method used for this component is much like the reserve determined under the Universal Life Insurance Model Regulation. The clarification necessary in the 3B(5) reserve component

was to define “future benefits” as being based on the greater of e_{x+t} , which is the actual policy fund value on the valuation date and f_{x+t} , which is a proxy fund value at the valuation date developed by assuming payment of the level gross premiums necessary to keep the policy in force for the entire coverage period, based on the policy’s (primary) guarantees of mortality, interest and expenses.

The second of the two reserve components is defined in Section 3B(6). In this component the secondary guarantee is recognized. As such, the reserve calculation can make use of lapse rates through a specified formula for lapse. The APF clarifies that the R_{x+t} variable of the following lapse formula cannot be greater than 1 or less than 0.

$$L_{x+t} = R_{x+t} \cdot 0.01 + (1 - R_{x+t}) \cdot 0.005 \cdot r_{x+t}$$

Where

$$R_{x+t} = \frac{[FFSG_{x+t} - ASG_{x+t}]}{[FFSG_{x+t} - LSG_{x+t}]}, \text{ but } \geq 1 \text{ and } \leq 0$$

For term policies subject to Actuarial Guideline 45 (return of premium term, or “ROP term”), the lapse rates to be used in the NPR have been clarified as “6% for the first half of the initial level premium period, and 0% for the remainder of the initial level premium period.” Prior to this clarification, the reader would have found 0 percent at all durations to be the requirement for lapse rates for this product type.

Also for term policies, the language and the table specifying lapse rates to use in the NPR calculation have been clarified. The rates remain unchanged from earlier versions, but the language regarding when to apply these rates has been made clear.

POST-LEVEL TERM CASH FLOWS

An amendment proposed by the Minnesota Department of Commerce was adopted by LATF on May 19. This APF prohibits the recognition in the deterministic reserve of any *positive net cash flows* following the level premium period for a term product (losses may be recognized). This stipulation appears in Section 9 on assumptions, under paragraph D.6 for policyholder behavior. The new language is:

For the calculation of the deterministic reserve, for a term life policy issued 1/1/2017 and later that guarantees level or near level premiums for more than five years until a specified duration followed by a material premium increase, or for a policy for which level or near level premiums are expected for more than five years, followed by a material premium increase, for the period following that premium increase the cash inflows or outflows shall be adjusted such that the present value of cash inflows does not exceed the present value of cash outflows.

Notice that the new requirement is specific to a term plan with more than five years of level premiums and specific to the deterministic reserve calculation. Prior to adding this additional paragraph, for the type of term products defined, the company would have based the inclusion or exclusion of any post-level term cash flows on whether the company’s experience was relevant and credible. If the company has no relevant or credible experience, then a 100 percent shock lapse at the end of the level term period would be the reasonable assumption for this situation. The reason regulators felt this provision was necessary has to do with the availability of the 2017 CSO and the fact that the term NPR was developed in a 2001 CSO valuation environment. As such, calibration of the NPR was based on 2001 CSO, and the NPR parameters (in particular the 135 percent allowance on post-level term profits) were a counterweight to the conservatism in the 2001 CSO mortality rates. However, with 2017 issues, companies will have the ability to value NPR using 2017 CSO. It was felt that not enough relevant testing was available to determine if 135 percent continues to be the appropriate parameter for term NPR. Until the NPR formula can be recalibrated to the new 2017 valuation table, the regulators felt this provision was necessary.

MINIMUM RESERVE CHANGES

An amendment titled “Keep Term and ULSG Separate” affected Sections 2, 3, 4, 5 and 7 of VM-20. The change put in place by this amendment was an effort to appropriately assign the PBR excess to the policies that contributed the excess. In other words, the new language clearly defines how the deterministic reserve and stochastic reserve (SR) are apportioned among product groups. The revised Section 2 language makes three product groups clear. The product groups are: all term policies, all ULSG policies and all life insurance policies subject to 3.A.2. As originally submitted, the amendment included two options for apportioning the SR.

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On July 7, 2016, LATF adopted Option 2 of this amendment, which is described further later. LATF also voiced a commitment to further study Option 1. Both options will be explained and demonstrated in order to profile the differences. Option 2 will be the only option appearing in VM-20 Section 5.G in the version of the Valuation Manual appropriate for Jan. 1, 2017.

Let's first start with the calculation of the modeled SR and see how, under each of Options 1 and 2, the SR would be apportioned among the product groups included in the SR model segment. For this illustration, product 1 is traditional whole life (WL) and product 2 is a lifetime ULSG product. The company manages its risks across these products similarly because they are both permanent products, and, therefore, products 1 and 2 are combined in the same model segment. The company does not qualify for the companywide exemption; chooses not to perform the stochastic exclusion test for either product; and will implement PBR for both products for 2017 year-end.

For purposes of this illustration, the following definitions are made and linked to the amounts in Table 1.

$SR^{Aggregate}$ = SR when both product groups are considered in one model segment (11,000 in Table 1)

$SR^{Opt1^{Product1}}$ = SR when product group 1 is considered separately, using the 30 percent worst scenarios resulting from the calculation of $SR^{Aggregate}$ (2,000 in Table 1)

$SR^{Opt1^{Product2}}$ = SR when product group 2 is considered separately, using the 30 percent worst scenarios resulting from the calculation of $SR^{Aggregate}$ (11,500 in Table 1)

$SR^{Opt2^{Product1}}$ = SR when product group 1 is considered separately, using a set of 30 percent worst scenarios unique to product group 1 (2,250 in Table 1)

$SR^{Opt2^{Product2}}$ = SR when product group 2 is considered separately, using a set of 30 percent worst scenarios unique to product group 2 (11,700 in Table 1)

For purposes of discussion, assume $SR^{Aggregate}$ is determined for the aggregate model segment (i.e., both product groups combined). The revised language of Section 5 describes the calculation of $SR^{Aggregate}$ and indicates that “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

Table 1
Aggregation and Allocation Examples

		Product 1 (WL)	Product 2 (ULSG)	Model Segment
a	NPR Net of Reins	5,000	4,000	9,000
b	Model Segment SR			11,000
c(1)	SROpt1	2,000	11,500	13,500
c(2)	SROpt2	2,250	11,700	
d	“Offsets” Benefits (c(1)-b)			2,500
e				
f		Product 1 (WL)	Product 2 (ULSG)	Total
g	Allocate SR: Option 1	1,630	9,370	11,000
h	PBR Excess: Option 1	0	5,370	
i	Minimum Reserve Option 1	5,000	9,370	14,370
j				
k	Allocate SR: Option 2	2,250	11,700	
l	PBR Excess: Option 2	0	7,700	
m	Minimum Reserve Option 2	5,000	11,700	16,700

combined into the same aggregation subgroup. If policies from more than one product group are included in an aggregation subgroup, the reserve for each product group shall also be determined, as described in Section 5.G.” Once $SR^{Aggregate}$ is calculated and known, the revised language of 5.G comes into play. This is a step that needs to be performed in order to facilitate the determination of the minimum reserve of Section 2. The company has calculated $SR^{Aggregate}$. Both options that LATF had considered are detailed here. As noted, Option 2 was ultimately adopted and will appear in the version of VM-20 applicable for Jan. 1, 2017.

- **Option 1.** Under Option 1, the allocated portions sum to the total $SR^{Aggregate}$. A key characteristic of Option 1 is that $SROpt1^{Product1}$ and $SROpt1^{Product2}$ are separately determined but using the same 30 percent worst scenarios that comprise the CTE70 for the entire group of policies. If the sum of the SR for each product group does not equal the total for the entire group of policies, the total is allocated to each product group proportionately, as demonstrated by the formula.

$$SR1\% = \frac{SROpt1^{Product1}}{(SROpt1^{Product1} + SROpt1^{Product2})}$$

$$SR2\% = \frac{SROpt1^{Product2}}{(SROpt1^{Product1} + SROpt1^{Product2})}$$

The portion of $SR^{Aggregate}$ allocated to product 1 is ($SR^{Aggregate} \cdot SR1\%$); the portion of the SR allocated to product 2 is ($SR^{Aggregate} \cdot SR2\%$). In the Table 1 example, $SR1\% = 14.8\%$ and $SR2\% = 85.2\%$.

- **Option 2.** Under Option 2, $SROpt2^{Product1}$ and $SROpt2^{Product2}$ are each determined independently using the set of 30 percent worst scenarios specific to the risks of each separate product group. In this option, the sum of $SROpt2^{Product1}$ and $SROpt2^{Product2}$ is most surely something different from $SR^{Aggregate}$, since it is highly likely that the scenarios contributing to the CTE70 will differ.

Once the allocation of the SR to the two contributing product groups is known, then the Section 2 minimum reserve for each product group can be determined. In order to apply the language of Section 2, the company needs the product-level NPR for product 1 (WL) and separately for product 2 (ULSG). This product-level NPR is the sum of the seriatim NPR amounts for the policies in the product group, is adjusted for due and deferred premium amounts, and is net of reinsurance ceded. Under both allocation options, the minimum reserve for each product subgroup is the product-level NPR plus the excess PBR reserve allocated to that subgroup. For simplicity, the illustration assumes that the deterministic reserve falls below the SR,

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and so the deterministic reserve amount is ignored in the illustration. Specifics for allocating the deterministic reserve among subgroups are discussed later.

Table 1 provides an example of the two SR allocation options. All figures in Table 1 are only for illustrating the allocation options and do not represent actual calculations of PBR reserves. In this example, the cash-flow offset benefit for the model segment (i.e., both product groups combined) is 2,500 (13,500 – 11,000). We can know this offset amount only by first finding the 30 percent worst scenarios for the aggregate segment and then running product-specific SRs using that same set of scenarios. There are two key elements of the allocation structure:

1. The PBR Excess is only defined by product subgroup. The provision for this construct is found in the revised Section 2 language whereby each of the three product groups (term, ULSG, all other policies subject to Section 3.A.2) have minimum reserves defined separate to the others. For example, in Table 1 the PBR excess is 2,000 when viewed as a model segment (11,000 – 9,000). However, when viewed as product groups under Option 1, the PBR excess is 0 for WL and 5,370 for ULSG. When viewed as product groups under Option 2, the PBR excess is 0 for WL and 7,700 for ULSG.
2. Under Option 2, there are no cash-flow offset benefits across product groups due to the nature of calculating each product-level SR independently. This is because each product-level SR is determined using a separate calculation and potentially unique 30 percent worst scenarios. Under Option 1, the cash-flow offset available at the aggregate level (the 2,500 in row (d) of Table 1) is recognized, but limited when allocated to the product-level subgroups by the Option 1 proportions, or $SR1\%$ and $SR2\%$. In Table 1, after calculating the SR for each product group using the same 30 percent worst scenarios, product 1 has no PBR excess ($NPR > SR$) and product 2 has a PBR excess of 7,500 (11,500 – 4,000). In the Option 1 allocation approach, the product level excess is essentially

scaled back by 85.2 percent of the 2,500 offset ($5,370 = 7,500 - 85.2\%(2,500)$). The 85.2 percent is the Option 1 allocation percentage ($85.2\% = 11,500 / 13,500$).

The previous discussion focused on the revised requirements addressing allocation of the SR. For the allocation of the deterministic reserve, the revised language simply includes this new paragraph in VM-20 Section 4.D:

If the group of policies for which a deterministic reserve is calculated includes policies from more than one product group, where product group is defined as in Section 2 to be term insurance policies, ULSG policies, and all other types of policies, a deterministic reserve shall be determined for each product group by following the process of A – C above by treating each product group as a subgroup. The Net Asset Earned rate used for discounting each product group can be the NAER for the group of policies. If the sum of the deterministic reserve for each product group does not equal the total deterministic reserve, the total shall be allocated to each product group proportionally.

Based on the language provided, the company can choose to use the NAER from the model segment in determining the product-level deterministic reserves. The other choice would be to calculate NAERs unique to each product-level deterministic reserve for use in discounting cash flows. Whichever method is chosen, it will only influence how the aggregate deterministic reserve is allocated back to the product group for purposes of Section 2 minimum reserve determination.

OTHER APFS

The following amendments are important to know and understand as well, and are largely in the spirit of clarification, removing redundancies and improving geography of the document.

- **VM-G.** The key change in VM-G for actuaries is an effort to convey the concept that the company will assign to one or more qualified actuaries the responsibilities outlined in Section 4 of VM-G. The qualified actuary’s responsibilities are made distinct from those of the appointed actuary, which are covered in VM-30.
- **Companywide exemption.** The provisions for this exemption are moved from VM-20 Section 6 (Exclusion Tests) to Valuation Manual Section II Reserve Requirements.
- **VM-20.** The terms “reinsurance discrete cash flows” and “reinsurance aggregate cash flows” are no longer necessary and are removed. At one time, the deterministic reserve was a seriatim construct, and it was necessary to allocate reinsurance aggregate cash flows to individual policies. Following the introduction of the seriatim NPR amount, the deterministic reserve became an aggregate reserve, and therefore the reinsurance aggregate cash flows can be considered part of the deterministic reserve. ■



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SOA Explorer Tool

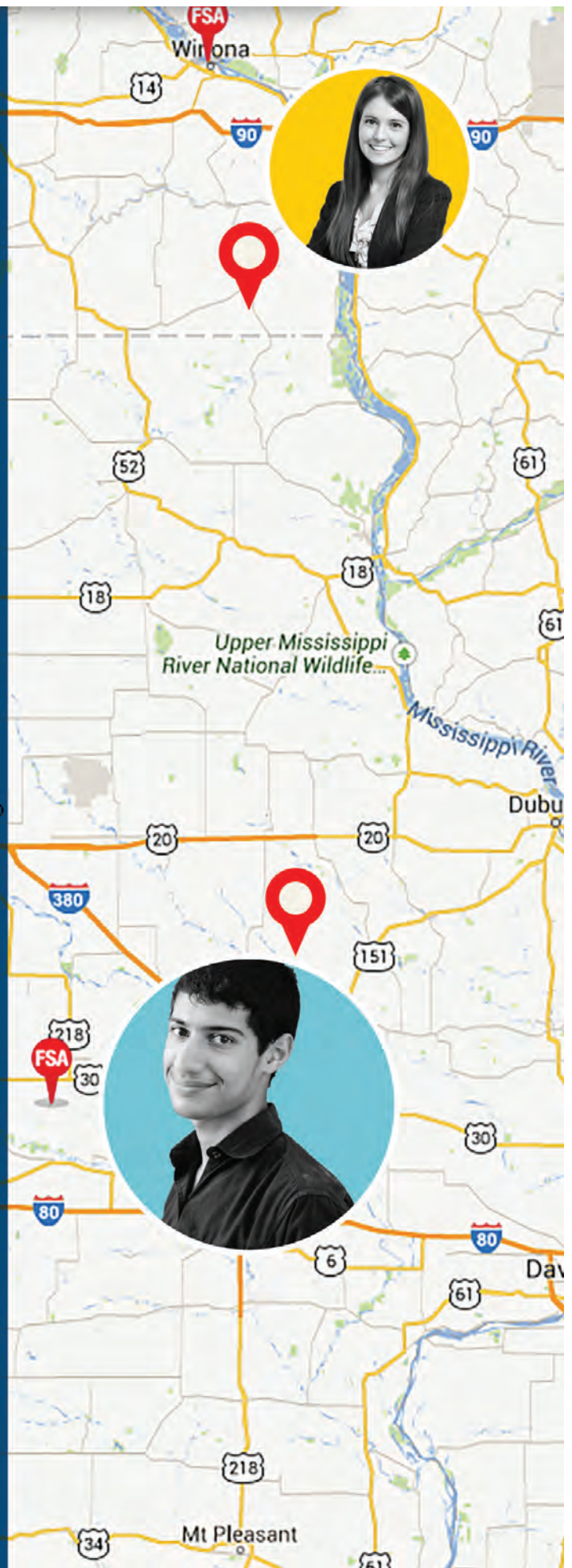
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Non-PBR Regulatory Changes

By Leon Langlitz

With all the emphasis on principle-based reserving (PBR), sometimes it is easy to lose track of other important regulatory changes that need to be monitored.

The Regulatory Change Team (Non-PBR) of the Smaller Insurance Company Section has as its task to stay abreast of new regulatory developments, other than PBR, that may become important to smaller insurance companies. To that end, the team has identified activity related to three topics that it would like to highlight: the 2017 CSO Mortality Table, cybersecurity and group capital calculations.

2017 CSO

While the 2017 CSO Mortality Table was adopted as part of the National Association of Insurance Commissioners' (NAIC's) adoption of the Valuation Manual on June 10, 2016, it is *not* strictly a PBR issue. This table will be required to be used for *all* life issues beginning on Jan. 1, 2020. *Any* company may begin using the table on Jan. 1, 2017, on a plan-by-plan basis in jurisdictions that have adopted the valuation manual. Companies can use this table for new life insurance products even if they are exempt from PBR or choose to implement PBR at a later date. To repeat, use of the 2017 CSO is independent of a company's use of PBR.

The SOA report and the actual tables can be found at <https://www.soa.org/Research/Experience-Study/Ind-Life/Valuation/2017-cso-tables.aspx>. New Valuation Basic Tables, Relative Risk Tables and Commissioner Standard Ordinary Mortality Tables have been developed.

The 2017 CSO Mortality Table is similar to prior CSO tables in that it is based on fully underwritten mortality. Guaranteed issue and simplified issue versions of the 2017 CSO are also being developed. It is uncertain when they will become effective and how one will determine which of the three versions of the 2017 CSO table to use. The variety of approaches to (especially) simplified underwriting makes it difficult for the NAIC to write clear rules governing which table to use in a particular situation.

CYBERSECURITY

The NAIC has established a Cybersecurity Task Force under the auspices of the Executive Committee. The task force is to consider issues concerning cybersecurity as they pertain to the role of state insurance regulators. To that end, the task force has drafted an initial *Insurance Data Security Model Law*. While the NAIC is currently seeking comments—and undoubtedly the draft will change—it will be beneficial for the small company actuary to be aware of this work. Since we access and use personal information, and in some cases personal health information, in our work, we need to be cognizant of our responsibility to reduce the risks in using and storing that data. In addition, the draft contains a section where the insurance company must ensure that its vendors meet certain requirements for safeguarding data. The draft may be accessed at http://www.naic.org/documents/committees_ex_cybersecurity_tf_160524_draft_ins_data_sec_model_law.pdf.

GROUP CAPITAL

Another NAIC project that may affect a small company actuary whose company has affiliates, whether insurance or noninsurance, is the development of a group capital measure. The Group Capital Calculation Working Group, working under the auspices of the E Committee of the NAIC, is to develop a group capital calculation using a risk-based capital (RBC) aggregation methodology. While this appears to be primarily focused at multinational insurer groups, all insurer groups might be affected by this development. There are a number of open issues that still need to be decided, not the least of which are whether it will apply to all legal entities within a group, whether smaller groups will be subject to the same requirements as larger groups, and how entities that don't have RBC will be included. The NAIC Group Capital Calculation Recommendation, which provides the background and reasons why the NAIC believes this to be important, can be found at http://www.naic.org/documents/committees_e_grp_capital_wg_related_cap_calc_reccomendation.pdf.

Whenever there is potential for a small company to be affected by a development, it remains incumbent for the actuary to be aware of the development, so that when senior management raises questions, the actuary will be in a position to make a meaningful contribution. ■



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Smaller Insurance Company Annual Meeting Sessions

By Steve Chamberlin

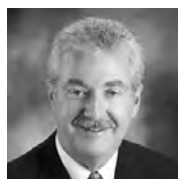
The Smaller Insurance Company Section is sponsoring four sessions at the 2016 Society of Actuaries Annual Meeting & Exhibit in Las Vegas. We'll start on Monday, Oct. 24, at 10:30 a.m. with a session on how smaller companies can outperform larger companies. Terry Long will moderate this session and Doug Baker and Jenna Fariss will present information on how smaller companies can seize opportunities and gain market advantages. Some smaller companies are already using technology, partnerships and outsourcing to level the playing field, and together with their agility to adapt, their focus and ability to innovate can give them an advantage over their larger competitors. The presentation will include survey results and case studies showing opportunities for smaller insurance companies where larger companies are slow to change.

On Tuesday, Oct. 25, at 2 p.m., Trevor Huseman, Terry Long and Stefanie Porta will provide an update on principle-based reserves (PBR) for smaller insurance companies. PBR presents challenges for smaller insurance companies to have enough resources for tasks such as modeling and experience studies. The smaller insurance company actuary will have to understand the professionalism standards that apply to PBR, and the implications of the small company exemption and the three-year transition rules. The panel will discuss implementation issues for smaller insurance companies with audience interaction during the session.

We'll have our section breakfast on Wednesday, Oct. 26, at 7:15 a.m. Incoming section chair Bryan Amburn will provide an update on current section activities. It is also a good opportunity to network with your peers.



Our last session is at 10:15 a.m. on Wednesday and is a buzz group session with the opportunity to interact with other smaller insurance company actuaries. Attendees will divide into groups to discuss topics such as: How is the interest rate environment impacting how you do your job? What are the latest product development issues? What is happening with risk-based capital (RBC) and PBR? How are companies reacting to the Department of Labor fiduciary rule? How are events in Washington being perceived by smaller companies? Attendees will determine other topics to discuss. Facilitators for this session will be Don Walker, Leon Langlitz, Stefanie Porta, Jerry Enoch and Bryan Amburn. ■



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