

Life Insurance Cash Values –
A Case Study in Goal-Oriented Product
Development

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Disclosure

This paper was developed to provide a general overview of the issues related to its subject matter. The comments and recommendations contained in this paper are not intended to provide specific consulting advice or a statement of actuarial opinion. The unique situation of an individual company should always be considered in determining an appropriate response.

Background

As I worked with clients to update their life insurance portfolios for the 2017 CSO mortality table over the past couple of years, many were surprised by the impact of substituting the 2017 CSO for the 2001 CSO mortality table. For many issue ages, the cash values under the 2017 CSO mortality table are significantly lower than the same values calculated using the 2001 CSO mortality table. This led to a lot of frustration because companies generally did not want to roll out a new product with lower cash values than its predecessor.

Example

The following example is based on a female non-tobacco user at issue age 45 (ANB). Cash values are equal to statutory minimum values using a 4% interest rate and semi-continuous functions.

Whole Life Cash Values per \$1,000 of Face Amount

Policy Year	2001 CSO	2017 CSO	% Change
1	0.00	0.00	0.0%
2	0.00	0.00	0.0%
3	11.55	8.65	-25.1%
4	24.92	20.11	-19.3%
5	38.61	31.95	-17.2%
6	52.62	44.19	-16.0%
7	66.93	56.81	-15.1%
8	81.54	69.80	-14.4%
9	96.42	83.12	-13.8%
10	111.60	96.80	-13.3%
20	278.75	256.52	-8.0%
30	471.98	459.44	-2.7%
40	666.38	677.09	1.6%
50	817.64	837.85	2.5%
60	904.40	916.59	1.3%
70	951.14	954.79	0.4%
76	1,000.00	1,000.00	0.0%

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While the difference in cash values wears off at the end of the coverage period, there is still a material difference at the 10th, 20th, and even 30th anniversaries. When the insured turns 65, the guaranteed cash value is 8% lower using the 2017 CSO mortality table compared to the 2001 CSO mortality table.

Solution

When cash value accumulation is an important marketing objective, it is important to remember that companies are always free to offer cash values in excess of the statutory minimum requirements so long as the progression (smoothness) requirements are met. Many companies offer higher cash values using some combination of a lower interest rate than the statutory maximum nonforfeiture rate, a lower expense allowance than the maximum expense allowance permitted by the standard nonforfeiture law, continuous functions, or grading to a net level premium reserve.

These approaches proved to be insufficient to bridge the gap created by the change to the 2017 CSO mortality table, particularly when the corresponding 2001 CSO product used similar methods to enhance the cash values. In order to more closely emulate the cash values of 2001 CSO products, it was necessary to develop a sequence of nonforfeiture factors that result in the desired cash value pattern and meet the progression requirements. When a high degree of fidelity between the old and new products was required, an exact match could be achieved every five years with very little variance in between.

Expanded Example

This is an expansion of the prior example that shows the cash values calculated using a set of nonforfeiture factors that were derived to meet the following objectives:

- Cash values during the first five years are equal to the statutory minimum values based on the updated basis of values (2017 CSO and 4% interest).
- The cash value on the 10th anniversary and every multiple of five thereafter is equal to the greater of the 2001 CSO cash value and the statutory minimum value based on the updated basis of values.

This approach allowed the company to take advantage of the lower statutory minimum cash values in early policy years while offering longer term cash values that are generally greater than or equal to the original 2001 CSO product.

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Whole Life Cash Values per \$1,000 of Face Amount

Policy Year	2001 CSO (Target)	2017 CSO (Minimum)	% Change	2017 CSO (Modified)	% Change
1	0.00	0.00	0.0%	0.00	0.0%
2	0.00	0.00	0.0%	0.00	0.0%
3	11.55	8.65	-25.1%	8.65	-25.1%
4	24.92	20.11	-19.3%	20.11	-19.3%
5	38.61	31.95	-17.2%	31.95	-17.2%
6	52.62	44.19	-16.0%	46.91	-10.9%
7	66.93	56.81	-15.1%	62.37	-6.8%
8	81.54	69.80	-14.4%	78.30	-4.0%
9	96.42	83.12	-13.8%	94.71	-1.8%
10	111.60	96.80	-13.3%	111.60	0.0%
20	278.75	256.52	-8.0%	278.75	0.0%
30	471.98	459.44	-2.7%	471.98	0.0%
40	666.38	677.09	1.6%	677.09	1.6%
50	817.64	837.85	2.5%	837.85	2.5%
60	904.40	916.59	1.3%	916.59	1.3%
70	951.14	954.79	0.4%	954.79	0.4%
76	1,000.00	1,000.00	0.0%	1,000.00	0.0%

The following table shows a comparison of the cash value between the pivot points that were used to define the nonforfeiture factors. In general, the intermediate cash values are well within 0.5% of the target cash value.

Whole Life Cash Values per \$1,000 of Face Amount

Policy Year	2001 CSO (Target)	2017 CSO (Minimum)	% Change	2017 CSO (Modified)	% Change
10	111.60	96.80	-13.3%	111.60	0.0%
11	127.07	110.83	-12.8%	126.66	-0.3%
12	142.79	125.26	-12.3%	142.15	-0.4%
13	158.78	140.10	-11.8%	158.12	-0.4%
14	175.02	155.38	-11.2%	174.58	-0.3%
15	191.55	171.12	-10.7%	191.55	0.0%
16	208.39	187.32	-10.1%	208.06	-0.2%
17	225.53	203.97	-9.6%	225.05	-0.2%
18	242.96	221.06	-9.0%	242.50	-0.2%
19	260.70	238.57	-8.5%	260.40	-0.1%
20	278.75	256.52	-8.0%	278.75	0.0%

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Conclusion

This is an example of goal-oriented product development. By establishing a goal (e.g., offer cash values that are generally greater than or equal to the prior product), the actuary can endeavor to find a new method or technique that achieves this goal instead of just accepting the results of using a traditional method.

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Let us help you develop goal-oriented product development strategies by contacting us for a free initial consultation. You may contact us by phone, email, or through our website. We would be happy to schedule a time to review your situation and collect the information that we need to develop a specific proposal at no expense or obligation to you.

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