



# Unlocking FAS 97's Management Potential

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Today's interest-sensitive insurance and deferred annuity products commonly are designed to include defined margins for investment spread, expenses, and mortality, as well as front-end loads or surrender charges. These margins, in the aggregate, are intended to recover acquisition costs and produce period profits to achieve targeted returns on investment at issue or returns on equity after issue. FAS 97's margin-based financial perspective for such products clearly is preferable to a traditional return-on-premium approach when active management of policyholder charges and credits is required. However, the difficulty of interpreting reported results that include the effects of revising DPAC amortization schedules, also provided for by FAS 97, has proven to be a major impediment to the use of GAAP financial reports for many product managers and others concerned with the profitability of such product lines.

Fortunately, the effects of such amortization revisions, commonly termed "unlocking," can be evaluated and meaningfully interpreted if two items are known or can be estimated:

1. The deviation of current-year gross profits from expected, and
2. The change in amortization rate (the ratio of the present value of deferrable expenses to the present value of estimated gross profits).

The first of these two items is the usual focus of management attention. However, the second item may be even more important, as it often is symptomatic of changes in future expected margins on the business. The purpose of this article is to explore the causes and effects of FAS 97 DPAC amortization revisions and to encourage the preparation of analyses that will assist in the interpretation and communication of results for management users of GAAP product line financial reports involving such revisions.

## The Basics for FAS 97 Unlocking

FAS 97 requires that capitalized acquisition costs (as well as unearned revenue) be amortized in relation to estimated gross profits. When current or expected future experience varies from that assumed in the original or current amortization schedule calculations, amortization schedules are to be retrospectively adjusted. Many companies use a DPAC amortization model that substitutes actual past and current gross profits for the original or previously revised estimated gross profits for those periods, and that includes revised estimates of future gross profits based on actual persistency to date and any changes in management's future margin expectations. While deviations in current-year gross profits may produce a small change in the amortization rate, more significant changes in the amortization rate may be expected when future estimated gross profits are revised. Parallel changes in recognition of unearned revenue may be expected and should be considered in any unlocking analysis; however, the remainder of this article focuses on DPAC amortization changes.

## Management Understanding of Amortization Schedule Revisions is Critical

Management's focus should be on the achievement of both current and future margins necessary to support the pricing-basis targeted return on investment or annual returns on equity. Actuaries can assist management to be attentive to the underlying cause-and-effect relationships between current and future margin deviations and DPAC amortization revisions when such revisions are expected to have significant effects on current-year results.

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While many users of financial statements are aware that current-year deviations in gross profits, such as a mortality spike, may be partially offset by DPAC amortization adjustments, few understand the significant effects of changes made to estimates of future margins. If future estimated gross profits are reduced, as for example when current lapses are higher than expected, the effect is to accelerate DPAC amortization to date, depressing current-year net income. Changes in DPAC amortization schedules are most likely to result from decreases in policy or premium persistency or from reductions in expected future margins from investment, mortality, or expenses, as product managers seldom are beneficiaries of significant increases in future estimated gross profits. Changes in amortization rates that result from changes in future estimates, such as a permanent reduction in expected investment spread on account balances, may signal a fundamental change in product management strategy or in the ability of the product manager to deal effectively with external influences.

Also, in many companies, the model used to calculate amortization schedules still is undergoing refinement. Model “improvements” that result in the revision of the estimated gross profits for past or future periods may introduce unintended effects on the resulting amortization schedule. If not carefully monitored and controlled, such hidden changes may materially affect the reported net income of the current, and possibly also future, periods. Management should be made aware of the financial effects of such model changes when they occur.

Managers who rely on GAAP financial statements to monitor the profitability of the product lines subject to FAS 97 should be provided with sufficient supporting information to discern any deviations or changes in current-year or future margins and evaluate their potential effect on earnings through the amortization process. In turn, management should challenge proposed changes in future estimated gross profits, as such changes may indicate areas requiring management attention to restore profitability.

## Notation and Terminology

The mathematical notation used in this article was described in recent TSA papers by Joe Tan [1] and Mike Eckman [2] on source-of-earnings analyses and the effects of unlocking under FAS 97.

Many observers, including Tan, use the term “unlocking” somewhat loosely to describe any change or deviation in the amount of amortization from that which was expected. In his paper, Eckman suggests that “unlocking” be used to describe the effects of changing future assumptions, as opposed to “truing-up” past or current assumptions to reflect experience. I have found it helpful to reserve the term “unlocking” for the effects of changes in the amortization rate.

While the amortization rate is quite sensitive to changes in estimates of future gross profits, deviations from expected current-year gross profits may not be sufficient to materially change the amortization rate. Thus, an appropriate term for the effect of current-year deviations may be “dynamic amortization.”

Eckman uses the term “catch-up” to describe the effect of retrospective application of revisions in the amortization rate to past gross profits. While this term probably will remain in common use, some observers have suggested “cumulative effect” as a more formal alternative.

## Examining Deviations from Expected Results

Any analysis of results presumes that a mechanism is in place to estimate expected results for the current period as a basis for comparison. For products subject to FAS 97 accounting, the analysis requires estimation of the expected level of outstanding DPAC at period end as well as the period gross margins. In the following section, we examine six components of deviation from expected results for UL-type products, only one of which is the deviation in current period gross margins that is the usual focus of management attention. The components fall into three categories: deviations in current experience, deviation resulting from past revisions of the amortization schedules, and deviations resulting from changes in the amortization rate, which respond to changes in both current and future estimated gross profits.

### A. Deviations in Current Experience

#### (1) Deviation in the Current Period Gross Margins

$$G_t^A - G_t^P$$

Current-year gross profit margins often are the primary focus of profitability management and source-of-earnings analysis. While this article does not address source-of-earnings analyses in any detail, clearly such analyses are critical to informed management of the product line.

## (2) *Dynamic Amortization Adjustment*

$$-A\%^L \times (G_t^A - G_t^P)$$

This effect is the result of the difference between actual and estimated current-year gross profits at the previously estimated amortization rate. Current-year deviations from expected gross profits will be partially offset by the current-year revision in amortization, for example, the effect of higher (lower)-than-expected gross profits will be offset by higher (lower) amortization of expenses.

## (3) *Deviation in Renewal Deferrable Costs*

$$(DE_t^A - DE_t^P) \times \left(1 + \frac{r_t}{2}\right)$$

While renewal year "excess" acquisition costs may not be material for many UL-type contracts, deferrable costs in renewal years may be quite significant for flexible-premium deferred annuity contracts, as many interpreters of the FASB's guidance believe that all (not just excess) acquisition costs for renewal contributions may be deferrable on such contracts as the cost of acquiring new funds. A deviation in renewal deferrable costs from the level expected may indicate a parallel deviation in policy or premium persistency that could call for revaluation of future estimated gross profits and result in a revised DPAC amortization rate.

## B. *Deviations Resulting from Past Revisions of the Amortization Schedules*

### (4) *Past Amortization Revisions*

$$(1 - A\%^L) \times G_t^P - (1 - A\%^G) \times G_t^G$$

This expression represents the effect of past changes to estimated gross profits and the DPAC amortization schedules (that is, the difference between the most recently revised DPAC amortization schedule and the original GAAP schedule). While some product managers may wish to track such a deviation from original assumptions, many would consider past revisions to be water under the bridge, and measure current actual experience versus the expected based on the most recently revised assumptions. The key here is to identify clearly the baseline against which the reported results are to be measured.

## C. *Deviations Resulting from Changes in the Amortization Rate*

### (5) *Current-Year Unlocking Effect*

$$(A\%^L - A\%^C) \times G_t^G$$

This component represents the effect of the change in amortization rates as applied to the actual current-year gross profits. It has the same cause as the cumulative effect (catch-up adjustment). Changes in future estimated gross profits will tend to change the current-year net income in the same direction (for example, a reduction in future estimated gross profits will tend to increase current-year DPAC amortization by increasing the amortization rate, thus decreasing current year earnings).

### (6) *Cumulative Effect (Catch-Up Adjustment)*

$$(DPAC_{t-1}^C - DPAC_{t-1}^R) \times (1 + r_t)$$

This effect consists of the change in amortization rates as applied to the accumulated value of past gross profits. It results from a change in the rate of amortization, due to deviation of current-year gross profits from expected or changes in estimates of future gross profits. This effect will have the same direction of effect as the current-year unlocking. The relative magnitude of the effect is a function of the age of the business. The older the business, the greater the cumulative effect of changing the amortization factor.

**TABLE 1**  
**EXAMPLES OF CAUSE-AND-EFFECT ANALYSES**

Cause of Deviation	One-Time Lapse Increase	Increase in Current and Future Spreads	One-Time Mortality Decrease	Asset Default with Decreased Future Spreads
Deviation in current year gross profits	Increase surrender charges	Increase investment margin	Increase mortality margin	Decrease investment margin
Deviation in future estimated gross profits	Decrease account value base and margins	Increase account value base and margins	Insignificant effect	Decrease account value base and margins
<b>Current-year amortization effects</b>				
Change in A%	Increase	Decrease	Probably no change	Increase
Cumulative Unlocking Effect (Catch-up)	Decrease income	Increase income	No effect	Decrease income
Dynamic Adjustment	Decrease income	Decrease income	Decrease income	Increase income
Current-Year Unlocking Effect	Decrease income	Increase	No effect	Decrease income
<b>Combined effect on net income</b>				
Current Year	Offset margin increase	Probably incremental increase	Offset margin increase	Probably exacerbates decrease
Future Years	Decrease from prior expected	Increase over prior expected	Probably no effect	Decrease from prior expected

When the level and incidence of past gross profits and deferrable expenses are the same in the two DPAC amortization schedules, this component can be expressed in terms of the change in amortization rate and the accumulated value of past gross profits:

$$(A\%^C - A\%^L) \times \sum_{n=1}^{t-1} G_n^P \times (1 + r_t)$$

The effect of model "improvements" that affect the incidence of past gross profits may be evaluated by differencing these two expressions for the cumulative effect.

## Illustrative Examples

Table 1 illustrates for four sources of deviation how the causes and effects of deviations in experience that

cause DPAC amortization schedule revisions can be simply interpreted for management. Such explanations may be supplemented by financial analyses that provide the values of the components of the deviation. One helpful way to present such information is in terms of the expected level of current and future estimated gross profits rather than absolute dollar amounts.

### *Example: One-Time Lapse Increase*

Suppose current-year lapses are higher than expected, resulting in a 10 percent increase in current-year gross profits (due to the influence of surrender charges) and a 20 percent decrease in future estimated gross profits (due to a reduction in the account value base). The resulting amortization schedule uses a revised  $A\%^C$  of 60 percent rather than the expected  $A\%^L$  of 55 percent. There is no deviation in current-period deferrable expense, the credited rate used in the amortization

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schedule is 8 percent, and the accumulated value of past gross profits is five times the expected current-period gross profits.

With this information, we can evaluate the six components of deviation defined above:

- (1) Deviation in the current-period gross profits = 0.10
- (2) Dynamic amortization adjustment =  $-55\% \times 0.10 = (0.055)$
- (3) Deviation in renewal deferrable costs = 0.00
- (4) Past amortization revisions = N/A
- (5) Current-year unlocking effect =  $(55\% - 60\%) \times 1.10 = (0.055)$
- (6) Cumulative effect =  $(55\% - 60\%) \times 5 \times 1.08 = (0.270)$

Net deviation from expected net income = (0.280)

The reader is invited to set up and evaluate other illustrative situations, such as those described in Table 1.

## Capital Gains and Losses

An especially interesting subset of deviations from expected experience is realized capital gains and losses. In January 1991, the AICPA released *Practice Bulletin 8 (PB 8)*, Application of FASB Statement No. 97, "Accounting and Reporting by Insurance Enterprises for Certain Long-Duration Contracts and for Realized Gains and Losses from the Sale of Investments," to Insurance Enterprises, dated November 1990. Perhaps the most controversial practice addressed by *PB 8* is the treatment of capital gains and losses in the estimated gross profits used as the basis for amortization of DPAC and unearned revenues for UL-type contracts. *PB 8* states that "expected gains and losses from sales of investments related to universal life contracts should be included in the determination of EGP, because earned investment income should be based on the expected yield of the investments. If the timing and amount of realized gains and losses from the sales of investments change from the expected and materially affect the expected total yield and the estimated gross profits, DPAC amortization should be re-evaluated."

*PB 8*'s conclusion suggests that estimated gross profit models and DPAC amortization calculations should include estimated future capital gains and losses (perhaps as an incremental annual yield) in estimated

total investment returns, estimated gross profits should be adjusted for realized capital gains and losses in the period when the investments are sold, and future estimates of investment return should be adjusted following the purchase of new investments having different yields. However, many insurance companies considering application of *PB 8*'s recommendations currently exclude estimated capital gains and losses from their DPAC amortization model, primarily because of the unpredictability of the timing of such gains and losses and the unusual patterns of DPAC amortization that may result when realized gains and losses are included in the unlocking process. The following examples illustrate some of these possible unusual patterns.

- If a realized capital gain or loss is simply due to the exchange of a low-coupon instrument for a high-coupon instrument with the same yield on the initial investment, then there is no economic gain or loss and the company's credited rates may not change. However, because the *FAS 97* DPAC amortization model maintains the investment base equal to account values, a capital gain or loss with no economic effect may well change the present value of estimated gross profits and, in consequence, the amortization rate and amount of amortization to date.
- If there is a realized capital loss (or default) due to a change in quality, then the line of business may suffer a significant economic loss, requiring the allocation of additional assets to support the account values. One would expect the dynamic effect to partially offset the current-year loss. However, if the replacement asset has a greater yield than the assets prior to failure, then the present value of estimated gross profits may increase, with the effect that the current-year loss is exacerbated.

It is clear from these examples that the segregation of current-year from future estimated gross profit effects is essential to understanding and communicating the effects of an unlocking. Such examples also illustrate the desirability of developing procedures for the reallocation of assets following realized capital gains and losses that will appropriately reflect the economics of the business to the extent possible.

## Summary

The margin perspective offered by *FAS 97*'s guidance for UL-type contracts provides rich opportunities for improved management information. Nevertheless,

users of financial statements prepared according to this guidance face significant challenges in interpreting results, especially when DPAC amortization schedules have been revised. Actuaries involved in the preparation of GAAP financial statements can facilitate the use of reported results by evaluating the components of unlocking as described in this article and interpreting and communicating the results to those responsible for managing the profitability of such products. Such analysis, especially if coupled with an examination of the source-of-earnings components of the gross profit stream, can go a long way toward unlocking FAS 97's management potential.

## References

1. Tan, Joseph H., "Source-of-Earnings Analysis under FAS 97 Universal Life Accounting," *TSA XLI* (1989): 443-506.
2. Eckman, Michael V., "Additional Source-of-Earnings Analysis under FAS 97 Universal Life Accounting and Some Observations on the Effect of Unlocking Assumptions," *TSA XLII* (1990): 59-90.

## Appendix

### *The Effects of Revising Amortization Schedules*

Some readers may find it helpful to follow a derivation of the expressions for the components of experience deviations and amortization schedule revisions, especially because such an illustration may assist in modifying the expressions for specific circumstances such as timing effects. This sidebar provides the derivation of expressions 2, 4, 5, and 6 for those readers. Expressions 1 and 3 should be self-explanatory.

When unlocking occurs, a revised DPAC amortization schedule based on current-period assumptions,  $DPAC^C$ , is substituted for the original or previously revised DPAC schedule. In essence, the unlocking is an occasion to jump from the DPAC amortization schedule used in the prior reporting period,  $DPAC^R$ , with amortization factor  $A\%^L$ , at the beginning of the reporting period to the revised amortization schedule, based on a revised amortization factor  $A\%^C$ , at the end of the period. The  $A\%$ 's are the ratios of the present value of

deferrable expenses,  $DE$ , to the present value of estimated gross profits,  $G$ , taken at the credited rate  $r$ .

The change in DPAC that occurs in a given duration  $t$  is the ending  $DPAC_t$  less the beginning  $DPAC_{t-1}$ . The effect of the unlocking can be expressed as the difference between the ending revised  $DPAC^C$  and the ending expected  $DPAC^P$ , based on the assumptions used in the prior period amortization calculation. To unravel the components of the unlocking in a meaningful manner, it is helpful to express each of these ending  $DPAC_t$  values in terms of an accumulation of the beginning  $DPAC_{t-1}$ .

$$DPAC_t^C =$$

$$DPAC_{t-1}^C \times (1 + r_t) + DE_t^A \times \left(1 + \frac{r_t}{2}\right) - G_t^A \times A\%^C$$

$$DPAC_t^R =$$

$$DPAC_{t-1}^R \times (1 + r_t) + DE_t^P \times \left(1 + \frac{r_t}{2}\right) - G_t^P \times A\%^L$$

Each of these expressions has three elements. Differencing the equations by element from left to right, together with a little adept restatement of the difference of the last elements, unravels the four deviation components that include the effects of a change in amortization schedule:

$$DPAC_{t-1}^C - DPAC_{t-1}^P \times (1 + r_t)$$

In this expression, the prior period DPAC amortization schedule was used in reporting the beginning DPAC balance. Thus, our  $DPAC^P = DPAC^R$  in Eckman's terminology.

$$+ (DE_t^A - DE_t^P) \times \left(1 + \frac{r_t}{2}\right)$$

In this expression, renewal deferrable expenses are assumed to be incurred on average in mid-year. The extension to other cases is left to those who must deal with them.

$$-(G_t^A - G_t^P) \times A\%^L$$

$$-G_t^A \times (A\%^C - A\%^L)$$

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Some readers will note that the values of the cumulative effect and the deviation in renewal deferrable expenses derived above assume either that the credited rate did not change from the expected value for the current period or that the original credited rate is used to

discount estimated gross profits and accrue the DPAC balances. The derivation of expressions to include changes in credited rates is left to those who must accommodate alternative situations.

