

**TRANSACTIONS OF SOCIETY OF ACTUARIES  
1975 VOL. 27**

**ACCOUNTING FOR THE PURCHASE OF A  
LIFE INSURANCE COMPANY**

GARY CORBETT

ABSTRACT

The publication by the AICPA of *Audits of Stock Life Insurance Companies* answered many questions regarding accounting for stock life insurance companies in accordance with GAAP. Inevitably, however, all questions that might arise were not definitively answered. No specific answers were provided regarding accounting for business combinations involving a life insurance company—the reader of the audit guide simply was referred to existing *Accounting Principles Board Opinions* applicable to all industries.

The American Academy of Actuaries Committee on Financial Reporting Principles has provided some assistance, but essentially there are many aspects of the subject of how the acquisition of a life insurance company is to be accounted for on the purchaser's books that remain to be settled.

Various methods of accounting for a block of in-force business acquired at the time of purchase have been proposed and used. This paper describes nine such methods, analyzing each by the use of a very simple model office. The paper concludes that only one of these nine methods is consistent with the *APB Opinions* and with the Academy committee's Recommendations.

The problems of accounting for the assets other than the in-force business of the purchased company, are touched upon, but the paper's main concern is with the application of accounting and actuarial principles to the problem of accounting for the purchased in-force.

---

I. INTRODUCTION

**H**ow business combinations involving a life insurance company are to be accounted for may have a very significant effect on the financial statements of each of the combining companies. This effect may be so great as to be a deciding factor in an acquisition and certainly would affect the price the purchaser is willing to pay. Yet the subject of purchase accounting for life insurance companies has received

relatively little attention, either in the formal publications of the American Institute of Certified Public Accountants (AICPA) or of the American Academy of Actuaries (AAA), or in the published works of professional accountants and actuaries.

This paper examines the publications of the AICPA and the AAA for materials pertinent to the problem of accounting for business combinations involving a life insurance company; reviews the types of assets acquired upon purchase; discusses briefly accounting for intangible assets acquired; examines in detail accounting for a purchased block of in-force business by examining proposed accounting methods, both as to conformity with the AICPA and AAA guidelines and as regards the financial results produced by the methods; and, in the course of this examination, suggests one method as being the only one that conforms with the AICPA and AAA guidelines. An extremely simple life insurance company model office is employed to examine and to display the results of the different methods.

The problem of deferred income taxes is not covered in this paper. It is the author's belief that deferred income tax considerations should be ignored in arriving at the most appropriate method of accounting for life insurance company acquisitions. Once a method has been selected, it may have to be modified if simply tax-effecting the net profits would not result in a suitable provision for deferred taxes.

## II. AICPA AND AAA PRONOUNCEMENTS AFFECTING PURCHASE ACCOUNTING FOR LIFE INSURANCE COMPANIES

*Audits of Stock Life Insurance Companies* (hereinafter referred to as "the audit guide"), prepared by the Committee on Insurance Accounting and Auditing of the AICPA, applies to the financial statements of stock life insurance companies that are prepared in accordance with generally accepted accounting principles (GAAP), as determined by the AICPA. Since this paper is concerned only with such financial statements, the audit guide is the first place one must look for guidance on the subject of purchase accounting for life insurance companies. A careful reading of the audit guide turns up only one reference to this subject—in the section "Investments in Subsidiaries" on pages 90–91. The significant paragraph reads:

For life insurance companies preparing financial statements in conformity with generally accepted accounting principles, investments in subsidiaries should be accounted for as purchases or poolings of interest in accordance with the provisions of Accounting Principles Board Opinion No. 16 and any cost in excess of net assets arising in purchase transactions should be accounted for in accordance with the provisions of APB Opinion No. 17.

Our perusal of the audit guide has thus told us nothing except to refer to *Accounting Principles Board Opinions Nos. 16 and 17. APB Opinion No. 16: Business Combinations* distinguishes between the purchase method and the pooling of interests method of accounting for business combinations. Extensive discussion of the pooling of interests method is not warranted in this paper, primarily because *Opinion No. 16* severely restricts the use of this method.

Further, under the pooling method, the parties to the pooling essentially combine their statement amounts in preparing financial statements for the combined enterprise, and generally no special accounting problems arise. A possible exception arises when the accounting methods of the combining companies are so inconsistent that they must be brought into conformity in order to represent fairly the financial results of the combined enterprise.

Under the purchase method, on the other hand, one of the parties is deemed to be the "acquirer" and the second party the "acquired." The assets and liabilities of the acquired company must be restated to current fair values, with any excess of price paid over restated net assets acquired generally being regarded as "goodwill." Further, when a group of assets are acquired, the cost of such assets must be allocated to the individual assets comprising the group. This allocation is on the basis of each asset's "fair value."

*APB Opinion No. 17: Intangible Assets* requires that a company record as assets the costs of intangible assets acquired and that these recorded costs be amortized by systematic charges to income over the periods estimated to be benefited (no such period is to exceed forty years). The *Opinion* further states that a straight-line method of amortization should be applied unless another systematic method is demonstrated to be more appropriate.

The above are extremely brief summaries of the two *Opinions* (the rules with respect to the purchase method alone cover thirty-one paragraphs of *Opinion No. 16*). Before making a final decision as to how to account for a purchase, the practitioner would be well advised to read these *Opinions* in their entirety.

Central to the reasoning of *Opinion No. 16* is the concept of "fair value" for acquired assets and liabilities. "Fair values" are values as of the date of acquisition, generally being market value for an acquired asset and "the present value of the amounts to be paid" for a liability.

The Academy Committee on Financial Reporting Principles (ACFRP) has addressed itself to the problem of fair value only for an acquired liability. Recommendation 1 of this committee is titled "Actuarial Methods and Assumptions for Use in Financial Statements of Stock Life

Insurance Companies Prepared in Accordance with Generally Accepted Accounting Principles." However, the scope of this Recommendation is not as broad as the title suggests. The lead paragraph of the Recommendation restricts its scope to "actuarial methods and assumptions for all elements affecting costs . . . with respect to reserves for non-participating policies."

Recommendation 1 generally requires that reserve assumptions be "selected as of the acquisition date." Paragraph 11 of the Recommendation defines "acquisition date" as follows: "the issue date, except that for statements of an acquiring company the term shall mean the date of purchase where a life insurance company has been acquired by purchase or where policies originally issued by another insurer have been acquired by purchase." (If the pooling of interests method is used, the original issue-date assumptions generally will continue to be used.)

This completes the recital of AICPA and AAA pronouncements pertinent to the question of purchase accounting. However, in addition to these specifics, other generally accepted accounting and actuarial principles, as interpreted by the audit guide and by the ACFRP, must be followed where applicable.

### III. TYPES OF ASSETS ACQUIRED IN THE PURCHASE OF A LIFE INSURANCE COMPANY

Three types of assets usually are acquired in the purchase of a life insurance company: an adjusted statutory surplus (hereinafter called "fair-value statutory surplus"); the block of in-force policies; and intangibles such as the agency plant, charter, and management. *APB Opinion No. 16* requires that the purchase price be allocated over all three types on the basis of each asset's fair value. Determining fair-value statutory surplus generally is straightforward. Necessary adjustments include revaluing invested assets to market, adding back nonadmitted assets, verifying that claim liabilities and accounts payable are fairly stated, and restoring to surplus such nonliabilities as the mandatory securities valuation reserve.

The allocation of the remaining purchase price between the block of in-force policies and the intangibles may or may not be relatively straightforward. If the purchaser, in arriving at the purchase price, assigned a value to the in-force business, this value, provided only that the assumptions entering into the calculation were chosen in good faith, generally can be accepted as the amount of the purchase price to be allocated to this asset. The remainder of the price is then assigned to the intangibles.

The value of a block of in-force business to a purchaser generally is

obtained by estimating future profits (statutory or GAAP) using "best estimate" assumptions with respect to investment income, mortality, withdrawals, and expenses, and discounting these future profits at an "investor's rate of return."

If the valuation is performed after the purchase, one has to be careful that the assumptions are realistic, since they have not been exposed to the marketplace. In particular, assumptions must not be chosen to produce a desired value. The determination of best-estimate assumptions, although not without complications, is relatively noncontroversial among men of good faith. However, the choice of an investor's rate of return is much more subjective. The choice depends on the type of profits (net level, Commissioners Reserve Valuation Method, GAAP, or other) being discounted, the reliability of the best-estimate assumptions (how much does the purchaser know about the true nature of the purchased block?), the purchaser's expectations for before-tax yields on investments in other types of business, and the current yield on essentially riskless investments.

For the most part this paper proceeds on the assumption that the purchaser has valued, either before or after the purchase, the in-force block of policies. Toward the end of the paper an approach is outlined that can be used when a portion of the purchase price has not been specifically allocated to the in-force block.

Reported profits of the acquiring company depend not only on the fair value assigned to each type of asset but also on how the costs assigned to such assets are amortized in future periods. In the case of fair-value statutory surplus, amortization is not a problem, since the constituent assets and liabilities are of a tangible nature. Any value allocated to the third class of assets—agency plant, management, and charter—will be set up initially as "goodwill," although some more descriptive label might be used on the financial statements themselves. This paper concerns itself only briefly, and in rather general terms, with the amortization of this asset value.

The major portion of the paper is concerned with the intermediate class of assets—the block of in-force business. The accounting for this class of asset is more complex than for the other two classes. Even when we know the net asset value (statutory reserves transferred to the purchaser less the purchase price paid by the purchaser to the seller) for the purchased in-force, we must also determine the liability to be set up on the purchaser's books for the policy reserves. Future reported profits will be affected not only by the initial policy reserve established but also by the reserve assumptions chosen and the method of amortizing any goodwill type of asset set up to cover the difference between the net assets

received from the seller and the policy reserve liability established. These problems will be extensively explored in the paper.

#### IV. ACCOUNTING FOR THE COST OF INTANGIBLES

In this section is discussed the problem of accounting for the portion of the total purchase price that has been allocated to intangibles, such as the agency plant and the management of the acquired company. *APB Opinion No. 17* requires that the costs allocated to such intangible assets be amortized by charges to income over the periods estimated to be benefited (no such period is to exceed forty years). The *Opinion* also states that a straight-line method of amortization should be applied unless another systematic method is demonstrated to be more appropriate.

Are the intangible assets, of the type referred to above, sufficiently different in the case of a life insurance company that their treatment should be different from that in other industries? Probably not. Regardless of the type of business acquired, the purchaser is willing to pay for intangible assets only because he expects them to result in future income. Thus it is appropriate to charge the costs of acquired assets to the periods in which income is expected to result.

With the publication of the audit guide and the accompanying ACFRP Recommendations, we have a much better idea of how profits from future business will emerge on general-purpose financial statements. Recommendation 1 requires that some provision for adverse deviations be included in GAAP reserve premiums unless the gross premiums are equal to, or less than, best-estimate premiums. No percentage-of-premium profit is permitted to emerge unless and until full provision has been made for adverse deviations. Consequently, the typical pattern of profits on new business is relatively low in the early years but grows quite rapidly as the loadings for adverse deviations are released. Therefore, the amortization of goodwill by a straight-line method will understate earnings in the first few years after purchase and overstate earnings in later years. Conservative projections of future profits, probably assuming no growth in new-business writings, should be employed to construct schedules that match the annual amortization to the profits expected to flow from the use of the intangible assets. The author believes that such amortization methods are permitted by *APB Opinion No. 17* as being systematic methods that can be demonstrated to be more appropriate than the straight-line method.

To support the type of deferred amortization referred to in the preceding paragraph, it probably will be necessary that the price paid for the intangible assets bear some reasonable relationship to the present

value of the profits on the projected new business. Any amount in excess of this present value probably should be amortized by a straight-line method, over forty years or less.

V. ACCOUNTING FOR THE COST OF IN-FORCE BUSINESS—  
MODEL OFFICE DEFINED AND ANALYZED

In order to better illustrate both theory and results, an extremely simple model office has been constructed. The purchased company has only one policy in force, a \$1,000 ten-year pure endowment issued eight years ago at an annual gross premium ( $\pi$ ) of \$90. To further simplify the model, mortality, withdrawals, and expenses are ignored, that is, are assumed to equal zero. Interest is the sole “real world” variable studied. However, as suggested later, conclusions derived from the study of the single-variable case can be extended to situations encompassing all the normal variables.

To study all the alternative accounting methods, a number of interest rates must be assumed:

Reserve rates:	
Statutory . . . . .	3%
GAAP (purchased company) . . . . .	4%
Actual earned rates:	
Over last eight years . . . . .	5%
Over next two years . . . . .	7%
Estimated earned rates for next two years:	
On purchaser's funds if no purchase . . . . .	7%
With no provision for adverse deviations (best estimate) . . . . .	7%
With full provision for adverse deviations (fully delta-ized) . . . . .	6%

The statutory calculations for the model are shown below:

Statutory reserves (net level):

$$P^s = 1,000/\ddot{s}_{\overline{10}|0.03} = 84.69 ;$$

$$R_8^s = 1,000v_{0.03}^2 - P^s\ddot{a}_{\overline{2}|0.03} = 775.68$$

$$R_9^s = 1,000v_{0.03} - P^s = 886.18 ;$$

$$R_{10}^s = 1,000 .$$

Estimated statutory profits:

$$SP_9 = 1.07(R_8^s + \pi) - R_9^s = 40.10 ;$$

$$SP_{10} = 1.07(R_9^s + \pi) - R_{10}^s = 44.51 .$$

Three different purchase prices are studied. The prices can be considered representative of good, average, and poor buys. The three prices were determined by the purchaser, assuming differing rates of interest earnings ( $5\frac{1}{2}$ ,  $6\frac{1}{2}$ , and  $7\frac{1}{2}$  per cent) over the next two years. The generalized formula for the purchase price ( $PP$ ) equates projected income (statutory reserve of the purchased company plus two years' gross premiums) to projected outgo (purchase price plus \$1,000 pure endowment payout):

$$R_8^s + \pi \ddot{a}_{\overline{2}|i} = PP^i + 1,000v^2,$$

or

$$PP^i = R_8^s + \pi \ddot{a}_{\overline{2}|i} - 1,000v^2.$$

Then

$$PP^{0.055} = 52.54; \quad PP^{0.065} = 68.53; \quad PP^{0.075} = 84.07.$$

It is interesting, but not essential to the concepts of the paper, to note that the GAAP earnings on the model policy would represent 32, 13, and 2 per cent rates of return on the three different purchase prices (for the model the rate of return depends very little on the particular accounting method used). It is unlikely that purchasers would pay different prices which resulted in such a wide range of returns. However, in the real world, seemingly excessive purchase prices for in-force business can result from bad judgment on the part of the purchaser or from the allocation of too high a portion of the total purchase price to in-force business as opposed to intangibles.

When a block of in-force business is purchased, the purchaser agrees to assume all the obligations of the insurer. In return he is entitled to the future premium income from the policies. The purchase transaction for this particular asset can be viewed as the purchaser receiving assets equal to the statutory policy reserves from the seller and the purchaser paying to the seller the agreed-upon purchase price for the asset. The difference between the assets transferred to the purchaser and the purchase price are called the "net assets" received by the purchaser.

It should be noted that all the assets referred to in the preceding paragraph must be at fair value as of the date of the acquisition. This requires that all securities be revalued to market. This revaluation will normally have been accomplished as part of the determination of fair-value statutory surplus.

It is obvious that, the lower the purchase price, the greater the net assets transferred and the greater the purchaser's profits on the purchased in-force. Eventual profit will depend only upon the net assets transferred and the actual experience under the policies, both of which are indepen-

dent of the accounting method used by the purchasing company. However, the incidence of the reported profits is dependent on the accounting method, including the actuarial assumptions, used for the purchased in-force. Before proceeding to an analysis of the different methods proposed for accounting for the purchase of the eight-year-old ten-year pure endowment, we will increase our understanding both of the model itself and of the accounting problems if we derive the formulas for the profits to be reported by the purchaser in the two years remaining prior to maturity of the policy. The formulas will then be analyzed to determine the variables affecting reported profits.

The reported profits for the ninth and tenth years of the policy are designated  $PIP_9$  and  $PIP_{10}$  ("profit if purchase"). Upon purchase, it is assumed that assets with a current fair value equal to the seller's eighth-year statutory reserve ( $R_8^*$ ) are transferred to the purchaser. The purchaser pays the purchase price out of his earned surplus.

In our example the invested assets shown on the balance sheet of the purchaser are not reduced by the amount of the purchase price. If the assets were so reduced, the purchaser would appear statutorily insolvent. Therefore, the effect of this reduction, on both invested assets and investment income, is taken into account by showing, for each of the three purchase prices, the purchaser's financial statements if the purchase price had been retained in earned surplus. The resulting profits are labeled "profit if no purchase" ( $PNP$ ):

$$PNP_9 = (0.07)(PP) ; \quad PNP_{10} = 0.07(1.07)(PP) .$$

The effect of the purchase upon the purchaser's profit ( $EPP$ ) then is the difference between the "profit if purchase" ( $PIP$ ) and the "profit if no purchase" ( $PNP$ ).

Using the approach described in the previous paragraph means that the investment income ( $I$ ) component of the "profit if purchase" is independent of the purchase price. Investment income is earned on the assets matching the eighth-year statutory reserve and on the gross premiums ( $\pi$ ) as received:

$$I_9 = 0.07(R_8^* + \pi) = 60.60 ;$$

$$I_{10} = 0.07[(R_8^* + \pi) + (I_9 + \pi)] = 71.14 .$$

In addition to the actual experience elements of investment income, gross premiums, and the \$1,000 pure endowment benefit, "profits if purchase" will be affected by the GAAP reserves and any "goodwill" type of asset.

“Goodwill,” or what will be more descriptively labeled “cost of purchased in-force” ( $C$ ), is the balancing asset that must be set up if the initial GAAP reserve ( $R_8^G$ ) is greater than the net assets transferred ( $R_8^s - PP$ ). Negative “goodwill” will be the result when the net assets transferred upon purchase are greater than the initial GAAP reserve. Such negative “goodwill” can be avoided if the GAAP reserves are increased by strengthening the reserve assumptions to the point where they fully provide for adverse deviations, and by reducing the reserve net premium, until the initial GAAP reserve is at least equal to the net assets transferred.

The generalized formulas for “profit if purchase” are

$$\begin{aligned} \text{and } PIP_9 &= \pi + I_9 - (R_9^G - R_8^G) - (C_8 - C_9) \\ PIP_{10} &= \pi + I_{10} - (R_{10}^G - R_9^G) - (C_9 - C_{10}) . \end{aligned}$$

The analysis of the above formulas proceeds differently depending upon whether there is any cost of purchased in-force.

*Initial GAAP Reserve Equals Net Assets Transferred*

Since  $C_8 = C_9 = C_{10} = 0$  in this situation, the “profit if purchase” formulas reduce to

$$\begin{aligned} \text{and } PIP_9 &= \pi + I_9 - (R_9^G - R_8^G) \\ PIP_{10} &= \pi + I_{10} - (R_{10}^G - R_9^G) . \end{aligned}$$

In analyzing the above formulas to determine the variables that affect “profit if purchase,” the first step is to reduce the components of  $PIP_9$  and  $PIP_{10}$  to as few variables as possible. If  $P^G$  is the net premium used in the calculation of  $R^G$ ,

$$R_9^G = (R_8^G + P^G)(1 + i) ; \tag{1}$$

$$\text{Therefore, } R_{10}^G = (R_9^G + P^G)(1 + i) = 1,000 .$$

$$P^G = 1,000v - R_9^G . \tag{2}$$

From formulas (1) and (2) above,

$$\begin{aligned} R_9^G &= (R_8^G + 1,000v - R_9^G)(1 + i) \\ &= \frac{1,000 + R_8^G(1 + i)}{s_{\overline{2}|i}} . \end{aligned}$$

Remembering that  $R_8^G = R_8^* - PP$  for the situation being analyzed, we can rewrite the “profit if purchase” formulas as follows:

$$\begin{aligned} PIP_9 &= \pi + I_9 - \left[ \frac{1,000 + R_8^G(1+i)}{1+(1+i)} - R_8^G \right] \\ &= \pi + I_9 + \left[ \frac{(R_8^* - PP) - 1,000}{s_{\overline{2}|i}} \right] \end{aligned}$$

and

$$\begin{aligned} PIP_{10} &= \pi + I_{10} - \left[ 1,000 - \frac{1,000 + R_8^G(1+i)}{1+(1+i)} \right] \\ &= \pi + I_{10} + (1+i) \left[ \frac{(R_8^* - PP) - 1,000}{s_{\overline{2}|i}} \right]. \end{aligned}$$

$PIP_9$  and  $PIP_{10}$  are thus dependent only on experience ( $\pi, I_9, I_{10}$ ), the net assets transferred, and the GAAP reserve interest assumption ( $i$ ).  $PIP_9$  and  $PIP_{10}$  are not dependent on any of the GAAP reserves. In practice, the “profits if purchased” would depend only on experience, the net assets transferred, and all the GAAP reserve assumptions (interest, mortality, withdrawals, and expenses).

*Initial GAAP Reserve Greater than Net Assets Transferred*

This situation gives rise to the asset labeled “cost of purchased in-force.” The initial cost of purchased in-force ( $C_8$ ) equals the difference between the initial GAAP reserve and the net assets transferred. The asset is then written off over the life of the in-force (two years) at the rate of interest  $i^c$ .

$$\begin{aligned} C_8 &= R_8^G - (R_8^* - PP) ; \\ C_9 &= C_8(1+i^c) - \frac{C_8}{a_{\overline{2}|i^c}} = C_8 \left[ \frac{1+i^c}{1+(1+i^c)} \right] \\ &= [R_8^G - (R_8^* - PP)] \left[ \frac{1+i^c}{1+(1+i^c)} \right] ; \\ C_{10} &= C_9(1+i^c) - \frac{C_8}{a_{\overline{2}|i^c}} = 0 . \end{aligned}$$

The generalized formulas

and

$$\begin{aligned} PIP_9 &= \pi + I_9 - (R_9^G - R_8^G) - (C_8 - C_9) \\ PIP_{10} &= \pi + I_{10} - (R_{10}^G - R_9^G) - (C_9 - C_{10}) \end{aligned}$$

thus can be restated as

$$PIP_9 = \pi + I_9 - \left[ \frac{1,000 + R_8^G(1+i)}{1+(1+i)} - R_8^G \right] \\ - \left\{ [R_8^G - (R_8^s - PP)] - [R_8^G - (R_8^s - PP)] \left[ \frac{1+i^c}{1+(1+i^c)} \right] \right\}$$

and

$$PIP_{10} = \pi + I_{10} - \left[ 1,000 - \frac{1,000 + R_8^G(1+i)}{1+(1+i)} \right] \\ - \left\{ [R_8^G - (R_8^s - PP)] \left[ \frac{1+i^c}{1+(1+i^c)} \right] - 0 \right\}.$$

$PIP_9$  and  $PIP_{10}$  are thus dependent on experience ( $\pi$ ,  $I_9$ ,  $I_{10}$ ), the initial GAAP reserve, the net assets transferred, the GAAP reserve interest assumption, and the interest rate ( $i^c$ ) employed in the amortization of the cost of the purchased in-force. Significant simplification results if we assume that the cost of the purchased in-force is to be amortized at the GAAP reserve rate.

$$PIP_9 = \pi + I_9 - \left[ \frac{1,000 + R_8^G(1+i)}{1+(1+i)} - R_8^G \right] \\ - \left\{ [R_8^G - (R_8^s - PP)] - [R_8^G - (R_8^s - PP)] \left[ \frac{1+i}{1+(1+i)} \right] \right\} \\ = \pi + I_9 + \left[ \frac{(R_8^s - PP) - 1,000}{s_{\overline{2}|i}} \right]$$

and

$$PIP_{10} = \pi + I_{10} - \left[ 1,000 - \frac{1,000 + R_8^G(1+i)}{1+(1+i)} \right] \\ - \left\{ [R_8^G - (R_8^s - PP)] \left[ \frac{1+i}{1+(1+i)} \right] - 0 \right\} \\ = \pi + I_{10} + \frac{(1+i)[(R_8^s - PP) - 1,000]}{s_{\overline{2}|i}}.$$

$PIP_9$  and  $PIP_{10}$  will be seen as being identical with those obtained when there was no cost of purchased in-force set up. The only assumption necessary for this identity is that the cost of purchased in-force be amortized at the GAAP reserve rate. In practice, the identity would be maintained only if the cost of the purchased in-force were amortized using annuity factors based on the GAAP reserve interest, mortality, and withdrawal assumptions.

We have now demonstrated that the reported profits arising from a block of purchased in-force will depend only on the purchase price (which affects the net assets to be transferred), actual experience emerging on the block, and the GAAP reserve assumptions, provided only that any asset set up for the business is amortized using the same assumptions as for the reserves. Therefore, different accounting methods will produce different reported profits only if they cause different sets of reserve assumptions to be used.

VI. ACCOUNTING FOR THE COST OF IN-FORCE BUSINESS—  
ANALYSIS OF PROPOSED METHODS

Over the last two years many proposed methods of accounting for the cost of a purchased in-force block of business have been advanced. However, they all break down into nine apparently distinct methods:

1. Reserve interest rate equals best-estimate interest rate.
2. Reserve interest rate equals fully delta-ized interest rate.
3. Reserve interest rate equals break-even interest rate.
4. Academy Recommendation 1 analogy.
5. Initial reserve equals statutory reserve.
6. Initial reserve equals seller's GAAP reserve.
7. Initial reserve equals seller's experience reserve.
8. Initial reserve equals "current assumption" reserve.
9. Reserve premium equals gross premium less current new-business loadings.

Fortunately, we need not analyze all nine methods in detail, since many of them employ the same GAAP reserve assumptions, and it was shown in the preceding section that methods employing the same reserve assumptions will produce the same reported profits. However, differences in the amounts shown for basic reserves, deficiency reserves, and un-amortized costs may have accounting, if not actuarial, significance.

The first two methods are specific concerning the reserve interest rate to be used. Method 1 employs the best-estimate rate, 7 per cent in our example, and method 2 the fully delta-ized rate, 6 per cent. These assumptions are analogous to the assumptions underlying the Type 2 and Type 1 valuation premiums described in paragraph 4 of the Academy's Recommendation 1:

4. For non-participating ordinary and industrial life insurance the range of such actuarial assumptions should be constrained by the relationship, for an entire line of business or a major block of business, of actual gross premiums to three theoretical valuation premiums:

*Type 1:* A Type 1 valuation premium is a premium based on assumptions selected as of the acquisition date which include provisions, selected without regard to the level of the gross premiums, for the risks of adverse deviations from most likely assumptions.

*Type 2:* A Type 2 valuation premium is a premium based on most likely assumptions (i.e., without provision for the risks of adverse deviations) selected as of the acquisition date.

*Type 3:* A Type 3 valuation premium is a premium based on assumptions selected as of the acquisition date which substantially reproduce the actual gross premium.

For all methods which are specific as to the reserve interest rate to be used, the initial GAAP reserve is set equal to the net assets transferred, and a net premium ( $P^G$ ) exactly sufficient to mature the policy is determined. If the resulting net premium is greater than the gross premium, a deficiency reserve ( ${}^D R^G$ ) must be set up equal to the present value of the annual deficiencies. Alternatively, the net premium could be limited to the amount of the gross premium, resulting in an increase in the basic GAAP reserve. In either event the total GAAP reserve is increased to an amount greater than the net assets transferred, with the result that a cost of purchased in-force must be established for the difference.

*Method 1: Reserve Interest Rate Equals Best-Estimate Interest Rate*

The net premiums are calculated as follows:

1. Purchase price = \$52.54:

$$R_8^G + P^G \ddot{a}_{\overline{2}|0.07} = 1,000v_{0.07}^2 ;$$

$$P^G = \frac{1,000v_{0.07}^2 - (R_8^G - PP)}{\ddot{a}_{\overline{2}|0.07}} = 77.69 .$$

2. Purchase price = \$68.53:

$$R_8^G + P^G \ddot{a}_{\overline{2}|0.07} = 1,000v_{0.07}^2 ; \quad P^G = 85.96 .$$

3. Purchase price = \$84.07:

$$R_8^G + P^G \ddot{a}_{\overline{2}|0.07} = 1,000v_{0.07}^2 ; \quad P^G = 93.99$$

$${}^D R_8^G = (P^G - \pi) \ddot{a}_{\overline{2}|0.07} = 7.72 = C_8 .$$

*Method 2: Reserve Interest Rate Equals Fully Delta-ized Interest Rate*

The net premiums are calculated as follows:

1. Purchase price = \$52.54:

$$R_8^G + P^G \ddot{a}_{\overline{2}|0.06} = 1,000v_{0.06}^2 ; \quad P^G = 85.86 .$$

2. Purchase price = \$68.53:

$$R_8^G + P^G \ddot{a}_{\overline{2}|0.06} = 1,000v_{0.06}^2 ; \quad P^G = 94.09 ;$$

$${}^D R_8^G = (P^G - \pi) \ddot{a}_{\overline{2}|0.06} = 7.95 = C_8 .$$

3. Purchase price = \$84.07:

$$R_8^G + P^G \ddot{a}_{\overline{2}|0.06} = 1,000v_{0.06}^2 ; \quad P^G = 102.08 ;$$

$${}^D R_8^G = (P^G - \pi) \ddot{a}_{\overline{2}|0.06} = 23.48 = C_8 .$$

*Method 3: Reserve Interest Rate Equals Break-even Interest Rate*

Whereas in methods 1 and 2 we used reserve interest rates determined independent of the purchase transaction itself (either best-estimate or fully delta-ized), method 3 employs a rate dependent on the actual purchase price paid. The rate is that which will equate projected income with projected outgo over the life of the policy. This assumption is analogous to the assumptions underlying Type 3 valuation premiums, as described in paragraph 4 of the Academy's Recommendation 1.

A reserve interest rate is calculated from the following formula:

$$R_8^G + \pi \ddot{a}_{\overline{2}|i} = 1,000v_i^2 ,$$

where

$$R_8^G = R_8^i - PP .$$

Since, in our simplified example, the three purchase prices were determined from estimates of  $5\frac{1}{2}$ ,  $6\frac{1}{2}$ , and  $7\frac{1}{2}$  per cent earnings in the future, the above formula produces these rates for  $i$ . Because method 3 sets the valuation premium equal to the gross and does not constrain the solved-for reserve interest rate within any limits, no deficiency reserves or cost of purchased in-force will ever arise.

*Method 4: Academy Recommendation 1 Analogy*

Methods 1-3 employ reserve interest assumptions analogous to the three types of valuation premiums described in paragraph 4 of Academy Recommendation 1. The principles expounded in this Recommendation should be applied to acquisitions except where they are inconsistent with any authoritative pronouncements specific to the problem of purchase accounting. Therefore, Recommendation 1 must be read in its entirety for any guidance it might provide. Paragraphs 6-8 of the Recommendation are of importance:

6. If the actual gross premiums equal or exceed the Type 1 valuation premiums, the reserve should be the excess of the present value of future costs over the present value of future Type 1 valuation premiums, valued on Type 1 assumptions.
7. If the actual gross premiums are less than the Type 1 valuation premiums but equal to or greater than the Type 2 valuation premiums, the reserve should be the excess of the present value of future costs over the present value of future Type 3 valuation premiums, valued on Type 3 assumptions.

8. If the actual gross premiums are less than the Type 2 valuation premiums, the reserve should be the excess of the present value of future costs over the present value of future actual gross premiums, valued on Type 2 assumptions.

Read together with paragraph 4, these three paragraphs prohibit the use of assumptions more favorable than best-estimate or less favorable than fully delta-ized and require the use of assumptions of the break-even type when the gross premium falls in the range bounded by the best-estimate and fully delta-ized net premiums. Applying this philosophy to the three methods already reviewed, we would use method 1 when the break-even rate is greater than the best-estimate rate, method 2 when the break-even rate is less than the fully delta-ized rate, and method 3 when the break-even rate is between the best-estimate and fully delta-ized rates.

Method 4 is a combination of methods 1-3, with rules governing when each type of interest assumption is to be used. One could regard method 4 as a modification of method 3 which limits the break-even rate to the range bounded by the fully delta-ized and best-estimate rates. Conceptually, this is the easiest way to look at the calculation of the reserve interest rates and net premiums. In each case we determine a reserve interest rate ( $i'$ ) corresponding to a purchase price, using the formula

$$R_8^G + \pi \ddot{a}_{\overline{2}|i'} = 1,000v_{i'}^2,$$

where

$$R_8^G = R_8^* - PP.$$

If 6 per cent  $\leq i' \leq 7$  per cent,  $i'$  is used as the reserve interest rate ( $i$ ), and  $P^G = \pi$ . For the \$68.43 purchase,  $i' = 6.5$  per cent =  $i$  and  $P^G = \pi = 90$ .

If  $i' < 6$  per cent,  $i = 6$  per cent and  $P^G$  is solved for. With a \$52.54 purchase price,  $i'$  is 5.5 per cent and thus  $i = 6$  per cent. Referring back to method 2, we see that  $P^G = \$85.86$ .

If  $i' > 7$  per cent,  $i = 7$  per cent and  $P^G$  is solved for. With an \$84.07 purchase price,  $i'$  is 7.5 per cent and thus  $i = 7$  per cent. Referring back to method 1, we see that  $P^G = \$93.99$ , which causes a deficiency reserve and a cost of purchased in-force to be established.

The first three methods define the reserve rate in such a way that, for a given purchase price, different rates are determined by each of the three methods. We already have shown that reported profits resulting from a given purchase price vary only if the reserve interest rate varies. Therefore, other methods will produce different profits only if they cause the use of a different reserve rate.

Is it possible to define interest rates different from those defined by method 4 and still be consistent with Recommendation 1? First, if the

defined rate was not between the fully delta-ized rate of 6 per cent and the best-estimate rate of 7 per cent, it would not be permitted. Within the range of 6-7 per cent, can a rate other than a break-even rate be justified?

The use of a lower than break-even rate would result in a deficient net premium, and, according to Recommendation 1, deficiency reserves are not required unless premiums are deficient on best-estimate assumptions. On the other hand, the use of a higher than break-even rate would result in the net premium being less than the gross, permitting some portion of the gross premium to flow directly into profit each year. However, Recommendation 1 requires that the net premium be increased up to the gross, by delta-izing the assumptions, until the assumptions reach the fully delta-ized level ( $i = 6$  per cent in our example). Therefore, the interest assumptions resulting from method 4 are the only assumptions consistent with Recommendation 1. Since reserve assumptions are the sole determinant of reported profit for a given purchase price, no other methods that produce different reported earnings can be consistent with Recommendation 1.

Five other apparently distinct methods have been proposed, however, and will be described. All of these methods do result in changes to components of the financial statements, even though reported profits are identical with those resulting from the application of method 4. Some of the methods may not be consistent with *APB Opinion No. 16* or Recommendation 1, but they are presented here for completeness and because they have been suggested as possibilities by one or more accountants or actuaries.

For all five of these methods, the initial reserve is independent of the purchase price. This independence generally causes the setting up of an initial reserve greater than the sum of (1) the net assets transferred to the purchaser and (2) any deficiency reserves resulting from the net premiums, calculated in accordance with Recommendation 1, exceeding the gross premium. This additional initial reserve must be compensated for by an equal increase to the cost of purchased in-force. But, if a reserve is sufficient, assuming fully delta-ized 6 per cent earnings, to mature the contract, how does one justify, from either an accounting or an actuarial point of view, increasing the reserve and the corresponding asset? There would be a valid reason for the initial reserve to be greater than the net assets transferred only if an initial reserve equal to the net assets transferred were not sufficient to mature the contract under Recommendation 1 assumptions.

The authors of these five methods often are not specific as to what reserve assumptions (restricted to interest in our example) should be

used. In general, they apparently were assuming that assumptions would be comparable to those that the purchasing company was using on its currently issued new business. This would mean adopting interest assumptions as outlined in method 4. Thus, under these additional methods, reported profits would be identical with those reported under method 4. For this reason, we shall study each of them only for the low purchase price of \$52.54, where the reserve interest rate is the fully delta-ized rate of 6 per cent. If we were to study the \$68.53 purchase price, the rate would be  $6\frac{1}{2}$  per cent, and for \$84.08, 7 per cent.

*Method 5: Initial Reserve Equals Statutory Reserve*

When the initial reserve is set equal to the statutory reserve, the cost of the purchased in-force must equal the purchase price. The net premium is determined from the formula

$$R_8^G + P^G \ddot{a}_{2|0.06} = 1,000v_{0.06}^2,$$

where  $R_8^G = R_8^s$ , giving

$$P^G = 58.82.$$

*Method 6: Initial Reserve Equals Seller's GAAP Reserve*

Under this method, the purchaser simply assumes the GAAP reserves being held for the acquired block of business by the seller. Any excess of this reserve over the net assets is set up as cost of purchased in-force. The initial reserve would be

$$R_8^{\text{Seller}} = 1,000v_{0.04}^2 - P^{\text{Seller}} \ddot{a}_{2|0.04},$$

where  $P^{\text{Seller}} = 1,000v_{0.04}^{10} / \ddot{a}_{10|0.04} = 80.09$ , so that

$$R_8^{\text{Seller}} = 767.46.$$

The net premium is found thus:

$$R_8^G + P^G \ddot{a}_{2|0.06} = 1,000v_{0.06}^2,$$

where  $R_8^G = R_8^{\text{Seller}}$ , we obtain

$$P^G = 63.05.$$

*Method 7: Initial Reserve Equals Seller's Experience Reserve*

Under this method, the seller's GAAP reserves are recalculated, substituting the actual experience of the seller for his original GAAP assumptions. Any excess of this reserve over the net assets is set up as cost of purchased in-force. The initial reserve would be

$$R_8^{\text{Exper}} = 1,000v_{0.05}^2 - P^{\text{Exper}} \ddot{a}_{2|0.05},$$

where  $P^{\text{Exper}} = 1,000v_{0.06}^2 / \ddot{a}_{10|0.06} = 75.72$ , giving

$$R_8^{\text{Exper}} = 759.20 .$$

The net premium is found thus:

$$R_8^G + P^G \ddot{a}_{2|0.06} = 1,000v_{0.06}^2 ,$$

where  $R_8^G = R_8^{\text{Exper}}$ , so that

$$P^G = 67.30 .$$

Proponents of this method argue that it will minimize discontinuities between the “old” and “new” assumptions for the block. But, if assets are revalued, such discontinuities cannot be avoided. Assets that were yielding 5 per cent prior to revaluation could be yielding 7 per cent after a revaluation to market—and a revaluation to market is necessary to determine the first component of the total purchase price: fair-value statutory surplus. The only alternative to a revaluation of all assets to market is to attempt to allocate assets between reserves and surplus and to leave those assets allocated to reserves at book (amortized cost for bonds). If this were done, the discontinuities referred to above would be lessened, but it must be questioned whether such a procedure would be in line with *APB Opinion No. 16*, which requires using the “fair value of the property acquired” (for marketable securities, current net realizable values).

*Method 8: Initial Reserve Equals “Current Assumption” Reserve*

Under this method, the seller’s GAAP reserves are recalculated, using from issue an interest rate appropriate to policies being issued on the acquisition date. Any excess of this reserve over the net assets is set up as cost of purchased in-force. The initial reserve would be

$$R_8^{\text{Current}} = 1,000v_{0.06}^{10} - P^{\text{Current}} \ddot{a}_{2|0.06} ,$$

where  $P^{\text{Current}} = 1,000v_{0.06}^{10} / \ddot{a}_{10|0.06} = 71.57$ , and

$$R_8^{\text{Current}} = 750.91 .$$

The net premium is found thus:

$$R_8^G + P^G \ddot{a}_{2|0.06} = 1,000v_{0.06}^2 ,$$

where  $R_8^G = R_8^{\text{Current}}$ , giving

$$P^G = 71.57 \quad (= P^{\text{Current}}) .$$

*Method 9: Reserve Premium Equals Gross Premium less  
Current New-Business Loadings*

This method determines the reserve premium by reducing the gross premium by the percentage-of-premium profit loading in the currently issued new business of the purchasing company. The reserve interest assumption would be "consistent" with the purchasing company's interest assumption. ("Consistent" means that the interest assumption would contain the same type of provision for adverse deviations, not that the best estimate necessarily would be the same). A purchasing company would have percentage-of-premium profit loadings on its new business only if it had Type 1 (Recommendation 1) net premiums with fully delta-sized assumptions.

Where the price paid for the purchased block of business is sufficiently low that the fully delta-sized net premium, necessary to mature the block, is less than the gross premium, this method has some appeal. However, if the acquiring company's percentage-of-premium loading on currently issued new business is less than the percentage-of-premium difference between the gross and the fully delta-sized net premium on the purchased in-force, we get ourselves into the rather anomalous situation in which the initial policy reserve is less than the net assets received, thus creating negative cost of purchased in-force, or "goodwill." This is the only method of the nine analyzed that can create this situation. It has been suggested by some of the proponents of this method that in this situation the net premium should be reduced sufficiently to eliminate the negative "goodwill." If this is done, we end up using the fully delta-sized net premium of method 2, and therefore this method would yield balance sheets and income statements identical with those of method 2. In this situation the results would also be identical with those obtained by the application of method 4 and thus compatible with Recommendation 1.

This identity is illustrated by the following calculations, which assume a 2 per cent loading of gross over fully delta-sized premium assumptions in the purchasing company's currently issued new business:

$$P^G = 0.98\pi = 88.20 ;$$

$$R_8^G = 1,000v_{0.06}^2 - P^G\ddot{a}_{\overline{10}|0.06} = 718.59 .$$

Net assets are equal to  $R_8^* - PP = 723.14$ , so that

$$C_8 = 718.59 - 723.14 = -4.55 .$$

But if we solve for the  $P^G$  that will make  $C_8$  equal to zero,  $R_8^G$  must equal the net assets, or  $R_8^G = 723.14$ . Since  $R_8^G = 1,000v_{0.06}^2 - P^G\ddot{a}_{\overline{10}|0.06}$ , we have

$$P^G = 85.86 \quad (= P^G \text{ for method 2}) .$$

It has been suggested that this method can be used regardless of the purchase price. In our example, the net premium would be set at 98 per cent of gross (\$88.20) and fully delta-ized assumptions ( $i = 6$  per cent) are used regardless of the purchase price. This methodology will result in the initial reserve always being the \$718.59 calculated above. In the case of the medium and high purchase prices, this reserve is greater than the net assets transferred at the time of purchase, thus inflating the policy reserve and causing the asset, cost of purchased in-force, to be set up. This writing-up of both sides of the balance sheet is an accounting fault that this method shares with the previous four, but there is, in addition, an actuarial shortcoming. The net premium on the purchased block should not be Type 1 (fully delta-ized with percentage-of-premium profit) just because the gross premiums on the purchaser's currently issued new business are sufficient to support Type 1 assumptions. If the net assets transferred at the time of purchase are sufficient to cover only Type 3 assumptions (chosen so that net premium equals gross premium), then Type 3 (break-even) assumptions rather than Type 1 (fully delta-ized) assumptions should be used in the reserve calculations for the purchased block. At the other extreme, where the net assets transferred are sufficient to cover Type 1 assumptions, one should not be permitted to increase the net premium, thus using assumptions more conservative than Type 1. Therefore, this method is actuarially invalid in all situations, with the exception of the one where the net premiums on currently issued new business are identical, as a percentage of gross, with Type 1 premiums on the purchased block. However, in this situation the results and the theory are identical with those of method 2, and therefore method 9 can be ignored so far as providing any additional insight to the theoretical problem of accounting for the purchase of an in-force block of policies.

Method 9, however, does possess a significant attribute that could make it the preferred method in a situation where the portion of the total purchase price to be allocated to the in-force business is not directly determinable. Early in our discussion of the theoretical problem of accounting for the purchase of an in-force block, we made the key assumption that we were able to assign a purchase price specifically to the in-force block. If we do not know this purchase price we cannot obtain the net assets transferred for the block. Method 9 is the only method that does not require the net assets transferred to be known. Methods 1-4 set the initial GAAP reserve equal to the net assets transferred. In methods 5-8 any excess of the initial GAAP reserve, as defined by the method, is set up as unamortized cost of purchased in-force.

Method 9 determines the GAAP reserve assumptions and net premiums by requiring that they be "consistent with" the assumptions and net premiums being used by the purchasing company on currently issued new business. "Consistent with" requires that the reserve assumptions contain similar provisions for adverse deviations and that the net premiums be the same percentage of gross premiums. In other words, Type 1, 2, or 3 assumptions will be applied to the purchased block of in-force to the extent that they are being used on currently issued new business.

We have already shown the fallacy of this approach where it can be demonstrated that the purchased block would support a different type of valuation premium than does the currently issued new business. But this demonstration assumes that we can determine the type of valuation premium that is appropriate for the purchased block, and this determination can be made only if we know the purchase price for the block.

Lacking any information about the allocated purchase price, is it not a reasonable approach to assume that the purchasing company would purchase the block at an implicit price that would produce profits similar to those being generated by their currently issued new business?

The application of method 9 to our example, if the purchase price were not known, is illustrated by calculating the implicit purchase prices that would result. The formula to be used depends on which of three situations are present with respect to the purchaser's currently issued new business:

*Type 1 net premiums.*—This situation was illustrated earlier in the basic discussion of method 9. Assuming a 2 per cent loading of gross premiums over fully delta-ized net premiums,

$$P^G = 0.98\pi = 88.20 ;$$

$$R_8^G = 1,000v_{0.06}^2 - P^G\ddot{a}_{2|0.06} = 718.59 .$$

Since  $R_8^G = R_8^* - PP$ ,

$$PP = R_8^* - R_8^G = 57.09 .$$

*Type 3 net premiums.*—An example of Type 3 net premiums would be a less-than-full provision for adverse deviations (say, only  $\frac{1}{2}$  per cent rather than 1 per cent), and net = gross premium:

$$P^G = \pi = 90 ;$$

$$R_8^G = 1,000v_{0.065}^2 - P^G\ddot{a}_{2|0.065} = 707.15 ;$$

$$PP = R_8^* - R_8^G = 68.53 .$$

*Type 2 net premiums.*—This situation would require the use of best-estimate interest and net = gross premium:

$$P^G = \pi = 90 ;$$

$$R_8^G = 1,000v_{0.07}^2 - P^G\ddot{a}_{2|0.07} = 699.33 ;$$

$$PP = R_8^s - R_8^G = 76.35 .$$

In summary, method 9 could be used when the purchase price allocable to a block of in-force is not externally determinable. The method implicitly determines purchase prices based on the profit loadings in the purchaser's currently issued new business. Such loadings would generally be appropriate for the purchased in-force if the purchaser were able to buy the acquired company at a total price that will result in the same ultimate level of profit on the in-force as he is currently realizing on new business. Such a correlation is dependent on the relative sophistication of the buyer and the seller and on competitive forces in the marketplace.

#### *Seller's Deferred Acquisition Expenses Related to Purchased In-force*

By restricting our real-world variables to interest, we have avoided the question whether the GAAP reserves should be separated into deferred acquisition expense and benefit components. Some accountants have suggested that such a separation is required on the purchaser's statements.

I believe that the concept of "fair value" for assets and liabilities, as expressed in *APB Opinion No. 16*, requires that one should look only to the present and the future in determining the accounting entries to be made upon purchase. The cost originally incurred by the seller to acquire an asset is of no significance except as one possible indication of the value of the asset. Therefore, the entire liability set up for the purchased in-force should be encompassed in the policy reserve item (of course, such a reserve must provide for future expenses). The only asset associated with the block would be any cost of the purchased in-force resulting from a reserve greater than the net assets transferred upon purchase.

#### VII. FINANCIAL STATEMENTS RESULTING FROM EACH OF THE PROPOSED METHODS

In this section are displayed the financial statements of the purchasing company for the two years following the acquisition date. The statements vary depending on the purchase price and the accounting method used. The first set of statements displays the prospective purchaser's statements if no purchase were made. Since we want to study the effect of the purchase on the purchaser's statements, we must first determine for each of the three purchase prices the effect of retaining the purchase price rather than paying it out.

A. FOR PURCHASE PRICE OF \$52.54

BALANCE SHEETS

	Beginning of 1st Year	End of 1st Year	End of 2d Year
Assets:			
Invested assets.....	<u>\$52.54</u>	<u>\$56.22</u>	<u>\$60.15</u>
Liabilities and surplus:			
Earned surplus.....	<u>\$52.54</u>	<u>\$56.22</u>	<u>\$60.15</u>

INCOME STATEMENTS

	1st Year	2d Year
Investment income (at 7%).....	<u>\$3.68</u>	<u>\$3.94</u>
Profit if no purchase.....	<u>\$3.68</u>	<u>\$3.94</u>

B. FOR PURCHASE PRICE OF \$68.53

BALANCE SHEETS

	Beginning of 1st Year	End of 1st Year	End of 2d Year
Assets:			
Invested assets.....	<u>\$68.53</u>	<u>\$73.33</u>	<u>\$78.46</u>
Liabilities and surplus:			
Earned surplus.....	<u>\$63.53</u>	<u>\$73.33</u>	<u>\$78.46</u>

INCOME STATEMENTS

	1st Year	2d Year
Investment income (at 7%).....	<u>\$4.80</u>	<u>\$5.13</u>
Profit if no purchase.....	<u>\$4.80</u>	<u>\$5.13</u>

C. FOR PURCHASE PRICE OF \$84.07

BALANCE SHEETS

	Beginning of 1st Year	End of 1st Year	End of 2d Year
Assets:			
Invested assets.....	<u>\$84.07</u>	<u>\$89.95</u>	<u>\$96.25</u>
Liabilities and surplus:			
Earned surplus.....	<u>\$84.07</u>	<u>\$89.95</u>	<u>\$96.25</u>

INCOME STATEMENTS

	1st Year	2d Year
Investment income (at 7%).....	<u>\$5.88</u>	<u>\$6.30</u>
Profit if no purchase.....	<u>\$5.88</u>	<u>\$6.30</u>

The significant figures from the above statements are those labeled "profit if no purchase." They represent the profit the purchaser would have made if he had kept funds invested in interest-bearing assets instead of using them to purchase a block of in-force business. For each of the methods studied, we shall attempt to analyze the effect of the purchase upon profit (*EPP*). *EPP* is equal to the "profit if purchase" resulting from a specific combination of purchase price and method, less the "profit if no purchase," as shown above for a specific purchase price.

Complete postpurchase financial statements are shown for all three purchase prices for the first four methods. For the remaining five methods, only the statements resulting from the "low" purchase price are shown.

*Method 1: Reserve Interest Rate Equals Best-Estimate Interest Rate*

**A. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54**

**BALANCE SHEETS**

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$723.14	\$856.89	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	69.39	87.42
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>

**INCOME STATEMENTS**

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	133.75	143.11
(-) Decrease in cost of in-force.....	0	0
(=) Profit if purchase.....	<u>\$ 16.85</u>	<u>\$ 18.03</u>
(-) Profit if no purchase.....	3.68	3.94
(=) Effect of purchase on profits.....	<u>\$ 13.17</u>	<u>\$ 14.09</u>

**B. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$68.53**

**BALANCE SHEETS**

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$707.15	\$848.62	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	68.53	77.66	87.42
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>

**INCOME STATEMENTS**

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserves.....	141.47	151.38
(-) Decrease in cost of in-force.....	0	0
(=) Profit if purchase.....	<u>\$ 9.13</u>	<u>\$ 9.76</u>
(-) Profit if no purchase.....	4.80	5.13
(=) Effect of purchase upon profit.....	<u>\$ 4.33</u>	<u>\$ 4.63</u>

**C. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$84.07**

**BALANCE SHEETS**

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	7.72	3.99	0
<b>Total.....</b>	<u>\$783.40</u>	<u>\$930.27</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
<b>Policy reserves:</b>			
Basic.....	\$691.61	\$840.59	\$1,000.00
Deficiency.....	7.72	3.99	0
Earned surplus.....	84.07	85.69	87.42
<b>Total.....</b>	<u>\$783.40</u>	<u>\$930.27</u>	<u>\$1,087.42</u>

**INCOME STATEMENTS**

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserves.....	145.25	155.42
(-) Decrease in cost of in-force.....	3.73	3.99
(=) Profit if purchase.....	<u>\$ 1.62</u>	<u>\$ 1.73</u>
(-) Profit if no purchase.....	5.88	6.30
(=) Effect of purchase upon profit....	<u>\$ (4.26)</u>	<u>\$ (4.57)</u>

*Method 2: Reserve Interest Rate Equals Fully Delta-ized Interest Rate*

A. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54

BALANCE SHEETS			
	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
<b>Total.....</b>	<b>\$775.68</b>	<b>\$926.28</b>	<b>\$1,087.42</b>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$723.14	\$857.54	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.74	87.42
<b>Total.....</b>	<b>\$775.68</b>	<b>\$926.28</b>	<b>\$1,087.42</b>

INCOME STATEMENTS		
	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserves.....	134.40	142.46
(-) Decrease in cost of in-force.....	0	0
(=) Profit if purchase.....	\$ 16.20	\$ 18.68
(-) Profit if no purchase.....	3.68	3.94
(=) Effect of purchase upon profit.....	\$ 12.52	\$ 14.74

B. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$68.53

BALANCE SHEETS			
	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	7.95	4.09	0
<b>Total.....</b>	<b>\$783.63</b>	<b>\$930.37</b>	<b>\$1,087.42</b>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$707.15	\$849.31	\$1,000.00
Deficiency.....	7.95	4.09	0
Earned surplus.....	68.53	76.97	87.42
<b>Total.....</b>	<b>\$783.63</b>	<b>\$930.37</b>	<b>\$1,087.42</b>

INCOME STATEMENTS		
	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserves.....	138.30	146.60
(-) Decrease in cost of in-force.....	3.86	4.09
(=) Profit if purchase.....	\$ 8.44	\$ 10.45
(-) Profit if no purchase.....	4.80	5.13
(=) Effect of purchase upon profit.....	\$ 3.64	\$ 5.32

**C. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$84.07**

**BALANCE SHEETS**

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	23.48	10.08	0
<b>Total</b> .....	<b>\$799.16</b>	<b>\$936.36</b>	<b>\$1,087.42</b>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$691.61	\$841.31	\$1,000.00
Deficiency.....	23.48	10.08	0
Earned surplus.....	84.07	84.97	87.42
<b>Total</b> .....	<b>\$799.16</b>	<b>\$936.36</b>	<b>\$1,087.42</b>

**INCOME STATEMENTS**

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserves.....	136.30	148.61
(-) Decrease in cost of in-force.....	13.40	10.08
(=) Profit if purchase.....	\$ 0.90	\$ 2.45
(-) Profit if no purchase.....	5.88	6.30
(=) Effect of purchase upon profit....	\$ (4.98)	\$ (3.85)

*Method 3: Reserve Interest Rate Equals Break-even Interest Rate*

**A. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54**

BALANCE SHEETS			
	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$723.14	\$857.86	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.42	87.42
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>

INCOME STATEMENTS		
	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserves.....	134.72	142.14
(-) Decrease in cost of in-force.....	0	0
(=) Profit if purchase.....	<u>\$ 15.88</u>	<u>\$ 19.00</u>
(=) Profit if no purchase.....	<u>3.68</u>	<u>3.94</u>
(=) Effect of purchase upon profit.....	<u>\$ 12.20</u>	<u>\$ 15.06</u>

**B. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$68.53**

BALANCE SHEETS			
	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$707.15	\$848.97	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	68.53	77.31	87.42
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>

INCOME STATEMENTS		
	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	141.82	151.03
(-) Decrease in cost of in-force.....	0	0
(=) Profit if purchase.....	<u>\$ 8.78</u>	<u>\$ 10.11</u>
(=) Profit if no purchase.....	<u>4.80</u>	<u>5.13</u>
(=) Effect of purchase on profits.....	<u>\$ 3.98</u>	<u>\$ 4.98</u>

**C. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$84.07**

**BALANCE SHEETS**

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
<b>Total.....</b>	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$691.61	\$840.23	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	84.07	86.05	87.42
<b>Total.....</b>	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>

**INCOME STATEMENTS**

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	148.62	159.77
(-) Decrease in cost of in-force.....	0	0
<b>(=) Profit if purchase.....</b>	<u>\$ 1.98</u>	<u>\$ 1.37</u>
<b>(-) Profit if no purchase.....</b>	<u>5.88</u>	<u>6.30</u>
<b>(=) Effect of purchase on profits.....</b>	<u>\$ (3.90)</u>	<u>\$ (4.93)</u>

*Method 4: Academy Recommendation 1 Analogy*

**A. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54**

BALANCE SHEETS			
	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$723.14	\$857.54	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.74	87.42
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>

INCOME STATEMENTS		
	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	134.40	142.46
(-) Decrease in cost of in-force.....	0	0
(=) Profit if purchase.....	<u>\$ 16.20</u>	<u>\$ 18.68</u>
(-) Profit if no purchase.....	<u>3.68</u>	<u>3.94</u>
(=) Effect of purchase on profits.....	<u>\$ 12.52</u>	<u>\$ 14.74</u>

**B. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$68.53**

BALANCE SHEETS			
	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	0	0	0
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$707.15	\$848.97	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	68.53	77.31	87.42
Total.....	<u>\$775.68</u>	<u>\$926.28</u>	<u>\$1,087.42</u>

INCOME STATEMENTS		
	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	141.82	151.03
(-) Decrease in cost of in-force.....	0	0
(=) Profit if purchase.....	<u>\$ 8.78</u>	<u>\$ 10.11</u>
(-) Profit if no purchase.....	<u>4.80</u>	<u>5.13</u>
(=) Effect of purchase on profits.....	<u>\$ 3.98</u>	<u>\$ 4.98</u>

**C. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$84.07**

**BALANCE SHEETS**

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	7.72	3.99	0
	<u>          </u>	<u>          </u>	<u>          </u>
<b>Total.....</b>	<b>\$783.40</b>	<b>\$930.27</b>	<b>\$1,087.42</b>
	<u>          </u>	<u>          </u>	<u>          </u>
<b>Liabilities:</b>			
<b>Policy reserves:</b>			
Basic.....	\$691.61	\$840.59	\$1,000.00
Deficiency.....	7.72	3.99	0
Earned surplus.....	84.07	85.69	87.42
	<u>          </u>	<u>          </u>	<u>          </u>
<b>Total.....</b>	<b>\$783.40</b>	<b>\$930.27</b>	<b>\$1,087.42</b>
	<u>          </u>	<u>          </u>	<u>          </u>

**INCOME STATEMENTS**

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	145.25	155.42
(-) Decrease in cost of in-force.....	3.73	3.99
	<u>          </u>	<u>          </u>
(=) Profit if purchase.....	\$ 1.62	\$ 1.73
(-) Profit if no purchase.....	5.88	6.30
	<u>          </u>	<u>          </u>
(=) Effect of purchase on profits.....	<b>\$ (4.26)</b>	<b>\$ (4.57)</b>
	<u>          </u>	<u>          </u>

*Method 5: Initial Reserve Equals Statutory Reserve*

FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54

BALANCE SHEETS

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	52.54	27.03	0
<b>Total.....</b>	<u>\$828.22</u>	<u>\$953.31</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$775.68	\$884.57	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.74	87.42
<b>Total.....</b>	<u>\$828.22</u>	<u>\$953.31</u>	<u>\$1,087.42</u>

INCOME STATEMENTS

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	108.89	115.43
(-) Decrease in cost of in-force.....	25.51	27.03
(=) Profit if purchase.....	<u>\$ 16.20</u>	<u>\$ 18.68</u>
(-) Profit if no purchase.....	3.68	3.94
(=) Effect of purchase on profits.....	<u>\$ 12.52</u>	<u>\$ 14.74</u>

*Method 6: Initial Reserve Equals Seller's GAAP Reserve*

FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54

BALANCE SHEETS

	After Purchase	End of 1st Year	End of 2d Year
Assets:			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	44.32	22.80	0
Total.....	<u>\$820.00</u>	<u>\$949.08</u>	<u>\$1,087.42</u>
Liabilities:			
Policy reserves:			
Basic.....	\$767.46	\$880.34	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.74	87.42
Total.....	<u>\$820.00</u>	<u>\$949.08</u>	<u>\$1,087.42</u>

INCOME STATEMENTS

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	112.88	119.66
(-) Decrease in cost of in-force.....	21.52	22.80
(=) Profit if purchase.....	<u>\$ 16.20</u>	<u>\$ 18.68</u>
(-) Profit if no purchase.....	3.68	3.94
(=) Effect of purchase on profits.....	<u>\$ 12.52</u>	<u>\$ 14.74</u>

*Method 7: Initial Reserve Equals Seller's Experience Reserve*

FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54

BALANCE SHEETS

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	36.06	18.55	0
<b>Total.....</b>	<u>\$811.74</u>	<u>\$944.83</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$759.20	\$876.09	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.74	87.42
<b>Total.....</b>	<u>\$811.74</u>	<u>\$944.83</u>	<u>\$1,087.42</u>

INCOME STATEMENTS

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	116.89	123.91
(-) Decrease in cost of in-force.....	17.51	18.55
(=) Profit if purchase.....	\$ 16.20	\$ 18.68
(-) Profit if no purchase.....	3.68	3.94
(=) Effect of purchase on profits.....	<u>\$ 12.52</u>	<u>\$ 14.74</u>

*Method 8: Initial Reserve Equals "Current Assumption" Reserve*

FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54

BALANCE SHEETS

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	27.77	14.29	0
<b>Total.....</b>	<u>\$803.45</u>	<u>\$940.57</u>	<u>\$1,087.42</u>
<b>Liabilities:</b>			
Policy reserves:			
Basic.....	\$750.91	\$871.83	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.74	87.42
<b>Total.....</b>	<u>\$803.45</u>	<u>\$940.57</u>	<u>\$1,087.42</u>

INCOME STATEMENTS

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	120.92	128.17
(-) Decrease in cost of in-force.....	13.48	14.29
(=) Profit if purchase.....	<u>\$ 16.20</u>	<u>\$ 18.68</u>
(-) Profit if no purchase.....	3.68	3.94
(=) Effect of purchase on profits.....	<u>\$ 12.52</u>	<u>\$ 14.74</u>

*Method 9: Reserve Premium Equals Gross Premium Less  
Current New-Business Loadings*

FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54

BALANCE SHEETS

	After Purchase	End of 1st Year	End of 2d Year
Assets:			
Invested assets.....	\$775.68	\$926.28	\$1,087.42
Cost of purchased in-force.....	(4.55)	(2.34)	0
Total.....	<u>\$771.13</u>	<u>\$923.94</u>	<u>\$1,087.42</u>
Liabilities:			
Policy reserves:			
Basic.....	\$718.59	\$855.20	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	52.54	68.74	87.42
Total.....	<u>\$771.13</u>	<u>\$923.94</u>	<u>\$1,087.42</u>

INCOME STATEMENTS

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	60.60	71.14
(-) Increase in policy reserve.....	136.61	144.80
(-) Decrease in cost of in-force.....	(2.21)	(2.34)
(=) Profit if purchase.....	<u>\$ 16.20</u>	<u>\$ 18.68</u>
(-) Profit if no purchase.....	3.68	3.94
(=) Effect of purchase on profits.....	<u>\$ 12.52</u>	<u>\$ 14.74</u>

VIII. ANALYSIS OF FINANCIAL STATEMENTS RESULTING  
FROM EACH OF THE PROPOSED METHODS

The profits reported on the income statements for methods 5-9 are identical with those shown for methods 2 and 4, since they all employ the fully delta-ized interest assumptions of 6 per cent in the policy reserve and for amortizing the cost of the purchased in-force. Therefore, this section will concentrate on the analysis of the statements produced by the first four methods.

Since the purchaser would usually purchase a block of in-force business with the aim of increasing profits, it behooves us to examine in some detail the effect that using a particular method would have on his reported profits. This effect is shown as the effect of purchase on profits on the income statements.

*Method 1: Reserve Interest Rate Equals Best-Estimate Interest Rate*

The *EPP*'s produced by this method are probably the most straightforward to describe. In any year, the *EPP* is equal to (1) the excess of the gross over the valuation premium, accumulated to year end, plus (2) interest for a year on the previous year's *EPP*. Algebraically,  $EPP_t = 1.07(\pi - P^G) + 0.07(EPP_{t-1})$ . Using the \$52.54 purchase price to illustrate, we have a gross premium of \$90.00, a valuation premium of \$77.69, an  $EPP_9$  of \$13.17, and an  $EPP_{10}$  of \$14.09:

$$EPP_9 = 1.07(90 - 77.69) = 13.17 ;$$

$$EPP_{10} = 1.07(90 - 77.69) + 0.07(13.17) = 14.09 .$$

*Method 2: Reserve Interest Rate Equals Fully Delta-ized Interest Rate*

For this method, the *EPP* for a year is equal to (1) the excess of the gross over the valuation premium, accumulated to year end, plus (2) excess interest (the difference between the experienced and the assumed rate) on the initial basic reserve, excluding the deficiency reserve, plus (3) interest for a year on the previous year's *EPP*. Algebraically,  $EPP_t = 1.07(\pi - P^G) + (0.07 - 0.06)(R_{t-1}^G + P^G) + 0.07(EPP_{t-1})$ . Using the \$52.54 purchase price to illustrate, we have a gross premium of \$90.00, a valuation premium of \$85.86, an eighth-year terminal reserve of \$723.14, a ninth-year terminal reserve of \$857.54, an  $EPP_9$  of \$12.52, and an  $EPP_{10}$  of \$14.74:

$$EPP_9 = 1.07(90 - 85.86) + (0.07 - 0.06)(723.14 + 85.86) = 12.52 ;$$

$$EPP_{10} = 1.07(90 - 85.86) + (0.07 - 0.06)(857.54 + 85.86) + 0.07(12.52) = 14.74 .$$

*Method 3: Reserve Interest Rate Equals Break-even Interest Rate*

For this method, the *EPP* for a year is equal to (1) excess interest on the initial reserve plus (2) interest for a year on the previous year's *EPP*. Algebraically,  $EPP_t = (0.07 - i)(R_{t-1}^e + \pi) + 0.07(EPP_{t-1})$ . Using the \$52.54 purchase price to illustrate, we have a reserve interest rate of 5.5 per cent, an eighth-year terminal reserve of \$723.14, a ninth-year terminal reserve of \$857.86, a gross premium of \$90.00, an  $EPP_9$  of \$12.20, and an  $EPP_{10}$  of \$15.06:

$$EPP_9 = (0.07 - 0.055)(723.14 + 90) = 12.20 ;$$

$$EPP_{10} = (0.07 - 0.055)(857.86 + 90) + 0.07(12.20) = 15.07$$

(rounding error) .

*Method 4: Recommendation 1 Analogy*

The formula for the *EPP* under method 4 depends on the purchase price. As we have seen before, method 4 is identical with method 1 for the \$84.07 purchase price, to method 2 for the \$52.54 price, and to method 3 for the \$68.53 price. Therefore, the logical and algebraic explanations for the *EPP*'s are obtained by reference to the appropriate equivalent method above.

Since, for the \$52.54 purchase price, the *EPP*'s resulting from the remaining five methods are equivalent to the *EPP*'s of method 2, the logical and algebraic explanations for the *EPP*'s are the same as for method 2 above. However, the bodies of the financial statements resulting from the application of the remaining methods are not identical with those shown for method 2. In particular, profits calculated before the deduction of any decrease in the cost of the in-force can vary considerably. These variations may be of significance to accountants, if not to actuaries.

## IX. CONCLUSIONS

There are three types of assets usually acquired in the purchase of a life insurance company: the fair-value statutory surplus, the block of in-force policies, and intangibles such as the agency plant. The determination of fair-value statutory surplus generally is straightforward. However, allocating the rest of the purchase price between the block of in-force policies and the intangibles requires that the purchaser place a value on the in-force business, either before or after the purchase. The remainder is then the value of the intangibles.

In Section IV it is suggested that the cost of the intangible assets be charged to the periods in which any income resulting from the employment of such intangibles is expected to emerge. To the extent that the

intangibles are expected to result in the writing of new business, the amortization of their cost should be matched to the projected GAAP profits of such new business.

Nine proposed methods of accounting for the in-force block of business are described and analyzed. Only one employs assumptions that are fully consistent with the ACFRP's Recommendation 1. This method requires that the initial GAAP basic reserve be set equal to the net assets transferred (statutory reserve less purchase price). Assumptions with respect to interest, mortality, withdrawals, and renewal expenses are determined so that the present value of the initial GAAP basic reserve and future gross premiums is equal to the present value of future expenses and benefits. Such assumptions are uniquely determinable only if it is required that all assumptions contain comparable provisions for adverse deviations. Recommendation 1 requires that the assumptions generally "be so chosen that a reasonable balance is maintained with respect to the provisions for each risk of adverse deviation."

If these reserve assumptions do not fall within the range bounded by best-estimate and fully delta-ized assumptions, the boundary assumptions must be substituted and the reserve net premium determined. When best estimates are substituted for more favorable assumptions, the solved-for net premium will be greater than the gross premium, and a deficiency reserve must be established equal to the present value of the excess of the net over gross premiums. An asset, cost of purchased in-force, is established equal to the deficiency reserve. If fully delta-ized are substituted for more conservative assumptions, the solved-for net premium will be less than the gross premium, and no deficiency arises.

Although it is argued that no other method is compatible with the ACFRP's Recommendation 1, it is recognized that, if the purchase price allocable to the in-force block is not known or determinable, a method that determines the GAAP reserve assumptions and net premium independent of the purchase price has much to recommend it. Method 9 determines the GAAP reserve assumptions and net premium by requiring that they be "consistent with" the assumptions and net premiums being used by the purchasing company on their currently issued new business. The method will produce results consistent with Recommendation 1 if the purchaser is able to buy the acquired company at a price that will result in a total profit from the in-force block similar to the total profit assumed in his currently issued new business. In the absence of any evidence to the contrary, method 9 is probably a reasonable practical solution when the portion of the total purchase price allocable to the in-force is not known.

However, the best way to account for a block of purchased in-force is to allocate a reasonable portion of the total purchase price to the asset, thus establishing the ultimate level of profits to be realized on the block. Then the application of method 4 to the block will cause profits to emerge in a manner consistent with Recommendation 1, the accounting for the purchased block then being consistent in principle with the accounting for the purchaser's own present and future business.

## DISCUSSION OF PRECEDING PAPER

STEPHEN D. BICKEL:

I would like to congratulate the author for an excellent paper on a subject that has caused much confusion among actuaries and accountants. We hope this paper will be the framework for resolving the remaining questions in this area of GAAP accounting.

It is helpful to me to think of the nine methods as being composed of two "families." The first four methods seem to be suited best to the purchase of an entire company that does not continue as a going concern and whose principal asset is a block of individual life insurance in force. In such a case the value placed on the insurance in force in the purchase transaction may be determined with reasonable precision, and this amount may be accepted as the initial reserve. If the purchased company does not continue to operate as a separate entity, only one set of GAAP reserves will have to be calculated for the business each year, and it may not be too onerous to choose a set of assumptions which reproduce substantially this predetermined amount.

The second five methods seem to be suited best for cases where the allocation of the purchase price is not straightforward or where there are serious practical problems in revaluing the reserves. In this discussion I would like to examine some situations where these methods may be useful.

Methods 5 and 6 probably have developed in cases where the purchaser wishes to hold either the statutory or the seller's GAAP reserves in all future financial statements. In such cases the following formulas for the net premium should be substituted for the author's in the example:

*Method 5:*

$$R_8^s + P^G \ddot{a}_{\overline{10}|0.03} = 1,000v_{0.03}^2, \quad R_8^s = 775.68, \quad P^G = 84.69.$$

*Method 6:*

$$R_8^{\text{Seller}} + P^G \ddot{a}_{\overline{10}|0.04} = 1,000v_{0.04}^2, \quad R_8^{\text{Seller}} = 767.46, \quad P^G = 80.09.$$

In the above formulas the statutory and historical GAAP interest assumptions of 3 and 4 per cent are used rather than the author's assumption of 6 per cent (or some other rate depending on the purchase price). By continuing these assumptions, the purchaser can use the statutory or historical GAAP reserves in future statements.

The reader should realize that it is only because the author changed the reserve interest assumption to 6 per cent that these methods produced future profits identical with those of method 4. If the interest assumptions are not changed, the income statements for the \$52.54 purchase price would be as shown in Table 1 of this discussion. Methods 5 and 6 may be useful in partial purchase situations, where the purchaser does not have the ability to perform a separate valuation each year, or in small purchases, where the amounts involved do not justify more elaborate treatment. They may also be useful if the portion of the purchase price attributable to the individual life insurance in force is not well defined. The chief theoretical objection to these methods is that revenue and costs are not matched in a manner consistent with the purchaser's other business; interest gains are too high and loading gains are too low. The error should

TABLE 1  
EFFECT OF PURCHASE ON PROFITS

	Method 4 Recommendation 1 Analogy	Method 5 Reserves = Statutory	Method 6 Reserves = GAAP
1st year . . . . .	\$12.52	\$10.91	\$11.41
2d year . . . . .	14.74	16.35	15.85
	\$27.26	\$27.26	\$27.26

operate in a conservative direction (i.e., defer earnings) in cases where reserves and interest gains are expected to increase each year after the purchase.

Method 7 seems to have some interesting possibilities as a theoretically proper solution. While assumptions as to future experience would be similar to those defined by method 9, method 7 has the advantage that net premiums are rigorously defined. I would modify the author's formula, however, to include in the seller's "experience" the capital loss on revaluation of the assets to market at the time of the purchase. If this is done, the provisions for adverse deviation after the purchase will be consistent with those that apply before the purchase.

If the assets in the example have maturities that match the policy obligations, a revaluation from 5 to 7 per cent would cause a reduction in asset values of about 4 per cent at the end of the eighth policy year. Total investment income, including the capital loss, would be 1 per cent in the

eighth policy year. Net premiums with a 1 per cent provision for adverse deviation would be as follows:

$$\begin{aligned}
 P^G &= \frac{1,000v_{0.04}^7 v_{0.00}^1 v_{0.06}^2}{\ddot{a}_{7|0.04} + v_{0.04}^7 \ddot{a}_{1|0.00} + v_{0.04}^7 v_{0.00}^1 \ddot{a}_{2|0.06}} \\
 &= 79.76 .
 \end{aligned}$$

Since this net premium is less than the gross premium, the Recommendation 1 test is satisfied as of the date of issue, using assumptions chosen on the purchase date. Future reserves calculated by this method will be independent of the portion of the purchase price allocated to the in-force business.

Financial results will be the same as for methods 4 and 9 if the "cost of purchased in-force" is amortized in proportion to premium income, as suggested by the author. The author's method effectively writes off the excess purchase price in proportion to loading gains until all loading gains are eliminated. Any additional purchase price is written off in proportion to interest gains (by increasing the valuation interest assumption to 7 per cent). The procedure for amortizing the excess purchase price was chosen because of its analogy to the procedure outlined by Recommendation 1 for determining reserve assumptions for new business.

I am not convinced that this procedure is the best for purchase accounting. From the standpoint of *APB Opinion No. 17* it seems appropriate to consider equally the future gains from all sources in determining the method of amortization, instead of using up the loading gains first. From a more practical standpoint, where it is necessary to consider gains from other lines of business or from future issues as well, it may be more convenient to project the company's earnings in the aggregate, and to amortize the cost of purchased in-force along with the portion of the purchase price which is attributable to other items.

The reader should be aware that the financial results for methods 5-9 were identical with those for method 4 only because the author assumed that interest assumptions for methods 5-9 would be chosen as outlined in method 4. Each method would produce different results if reserves were held in the stated manner and the excess price were written off in equal proportions to all gains. An illustration of the different results for each price is shown in Table 2 of this discussion.

My own conclusions regarding these methods follow.

1. All the methods satisfy Recommendation 1. The valuation assumptions contain sufficient provision for adverse deviation, and the valuation net pre-

- miums are less than gross. While method 4 utilizes a procedure for choosing interest assumptions which is analogous to the Recommendation 1 procedure for new business, it is not the only method that will match revenue and costs within the intent of the Recommendation.
2. Methods 4, 7, and 9 seem to satisfy the "fair value" requirement of *APB Opinion No. 16*, since the valuation assumptions are updated to match anticipated future experience. Under method 4 the degree of conservatism in the valuation assumptions is consistent with the portion of the purchase price ("net assets transferred") that is deemed to be attributable to the individual life insurance in force. Under method 9 the degree of conservatism is consistent with that contained in reserves for new business generated by the surviving organization. Under method 7 the provisions for adverse deviation are made consistent over the life of the purchased business. All of these methods have much to recommend them, and a particular procedure which produces results comparable to that produced by any of these methods should be considered acceptable.
  3. Methods 5 and 6 are the best practical alternatives, but they should be justified as approximations to other methods. The most satisfactory results will be achieved if the excess purchase price is written off in proportion to future gains from all sources.
  4. Method 8 seems to overemphasize future loading gains as compared with interest gains. Writing off the excess purchase price in proportion to all gains would not be conservative where interest gains are expected to increase after the purchase. The author's technique of using the loading gains first appears to be preferable for this method.
  5. Methods 5-9 have an advantage over method 4 in that the purchaser can proceed directly to determine the reserves before deciding on the purchase price. The reserve calculation defines the portion of the purchase price attributable to the ordinary in-force, rather than vice versa.

The above comments should not be considered critical of method 4; I feel it is an excellent method where the value placed on the in-force is known. I would like to ask the author to comment on some practical aspects of applying the method.

As I understand it, the starting reserve value is the statutory reserves less the discounted value of future statutory profits. In order to calculate reserves that reproduce this starting value, it seems necessary to approximate the discount from statutory for each plan as an amount per thousand or a percentage of premium. This procedure might produce unusual reserve figures for some plans and ages. Also, there may still be some discrepancy in reserves which might have to be amortized separately. It would be helpful if the author would comment on how these problems can be resolved.

**TABLE 2**  
**COMPARISON OF METHODS 4-9**

A. PURCHASE PRICE OF \$52.54  
(Assets Transferred = \$723.14)

	Gross	Investment
	Premiums	Income
1st year.....	\$90.00	\$56.92
2d year.....	90.00	67.20

RESERVES	METHOD					
	4	5	6	7	8	9
8th year.....	\$ 723.14	\$ 775.68	\$ 767.46	\$ 734.99	\$ 750.91	\$ 718.59
9th year.....	\$ 857.54	\$ 886.18	\$ 881.45	\$ 863.64	\$ 871.83	\$ 855.20
10th year.....	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00
Net premium.....	\$ 85.86	\$ 84.69	\$ 80.09	\$ 79.76	\$ 71.57	\$ 88.20
Required interest...	6%	3%	4%	6%	6%	6%
Loading 1.....	\$ 4.14	\$ 5.31	\$ 9.91	\$10.24	\$18.43	\$ 1.80
Gains 2.....	4.14	5.31	9.91	10.24	18.43	1.80
Interest 1.....	8.38	31.11	23.02	8.03	7.57	8.51
Gains 2.....	10.60	38.07	28.74	10.60	10.60	10.60
Total:						
1.....	12.52	36.42	32.93	18.27	26.00	10.31
2.....	14.74	43.38	38.65	20.84	29.03	12.40
	\$27.26	\$79.80	\$71.58	\$39.11	\$55.03	\$22.71
Decrease in cost of in-force:						
1.....	\$ 0	-\$23.98	-\$20.39	-\$ 5.54	-\$13.12	\$ 2.07
2.....	0	- 28.56	- 23.93	- 6.31	- 14.65	2.48
	\$ 0	-\$52.54	-\$44.32	-\$11.85	-\$27.77	\$ 4.55
EPP:						
1.....	\$12.52	\$12.44	\$12.54	\$12.73	\$12.88	\$12.38
2.....	14.74	14.82	14.72	14.53	14.38	14.88
	\$27.26	\$27.26	\$27.26	\$27.26	\$27.26	\$27.26

TABLE 2—Continued

B. PURCHASE PRICE OF \$68.53  
(Net Assets Transferred = \$707.15)

	Gross Premiums	Investment Income
1st year.....	\$90.00	\$55.80
2d year.....	90.00	\$66.01

RESERVES	METHOD					
	4	5	6	7	8	9
8th year.....	\$ 707.15	\$ 775.68	\$ 767.46	\$ 734.99	\$ 750.91	\$ 718.59
9th year.....	\$ 848.97	\$ 886.18	\$ 881.45	\$ 863.64	\$ 871.83	\$ 855.20
10th year.....	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00
Net premium.....	\$ 90.00	\$ 84.69	\$ 80.09	\$ 79.76	\$ 71.57	\$ 88.20
Required interest...	6.5%	3%	4%	6%	6%	6%
Loading 1.....	\$ 0	\$ 5.31	\$ 9.91	\$10.24	\$18.43	\$ 1.80
Gains 2.....	0	5.31	9.91	10.24	18.43	1.80
Interest 1.....	3.99	29.99	21.90	6.92	6.45	7.39
Gains 2.....	4.98	36.88	27.55	9.41	9.41	9.41
Total:						
1.....	3.99	35.30	31.81	17.16	24.88	9.19
2.....	4.98	42.19	37.46	19.65	27.84	11.21
	\$8.97	\$77.49	\$69.27	\$36.81	\$52.72	\$20.40
Decrease in cost of in-force.....						
1.....	\$0	-\$31.22	-\$27.70	-\$12.98	-\$20.65	-\$ 5.15
2.....	0	- 37.31	- 32.61	- 14.86	- 23.11	- 6.29
	\$0	-\$68.53	-\$60.31	-\$27.84	-\$43.76	-\$11.44
EPP:						
1.....	\$3.98	\$4.08	\$4.11	\$4.18	\$4.23	\$4.04
2.....	4.98	4.88	4.85	4.79	4.73	4.92
	\$8.96	\$8.96	\$8.96	\$8.97	\$8.96	\$8.96

TABLE 2—Continued

C. PURCHASE PRICE OF \$84.07  
(Net Assets Transferred = \$691.61)

	Gross Premiums	Investment Income
1st year.....	\$90.00	\$54.72
2d year.....	90.00	64.84

RESERVES	METHOD					
	4	5	6	7	8	9
8th year.....	\$ 691.61	\$ 775.68	\$ 767.46	\$ 743.99	\$ 750.91	\$ 718.59
9th year.....	\$ 840.59	\$ 886.18	\$ 881.45	\$ 863.64	\$ 871.83	\$ 855.20
10th year.....	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00
Net premium.....	\$ 93.99	\$ 84.69	\$ 80.09	\$ 79.76	\$ 71.57	\$ 88.20
Required interest...	7%	3%	4%	6%	6%	6%
Loading 1.....	-\$3.99	\$ 5.31	\$ 9.91	\$10.24	\$18.43	\$ 1.80
Gains 2.....	- 3.99	5.31	9.91	10.24	18.43	1.80
Interest 1.....	- 0.27	28.91	20.82	5.84	5.37	6.31
Gains 2.....	- 0.58	35.71	26.38	8.24	8.24	8.24
Total:						
1.....	- 4.26	34.22	30.73	16.08	23.80	8.11
2.....	- 4.57	41.02	36.29	18.48	26.67	10.04
	-\$8.83	\$75.24	\$67.02	\$34.56	\$50.47	\$18.15
Decrease in cost of in-force:						
1.....	\$0	-\$38.24	-\$34.78	-\$20.18	-\$27.96	-\$12.06
2.....	0	- 45.83	- 41.07	- 23.20	-31.34	- 14.92
	\$0	-\$84.07	-\$75.85	-\$43.38	-\$59.30	-\$26.98
EPP:						
1.....	-\$4.26	-\$4.02	-\$4.05	-\$4.10	-\$4.16	-\$3.95
2.....	- 4.57	- 4.81	- 4.78	- 4.72	- 4.67	- 4.88
	-\$8.83	-\$8.83	-\$8.83	-\$8.82	-\$8.83	-\$8.83

## DANIEL F. CASE:

Congratulations to Mr. Corbett on an excellent paper which is typical of the fine work he has done in the area of GAAP accounting over the years.

In writing this paper, Mr. Corbett has taken the present-day GAAP treatment of mergers and acquisitions as a given condition. That is entirely proper, since it is within the framework of present-day GAAP that actuaries must prepare the GAAP statements of life insurance companies. It may be of interest to note, however, that the Financial Accounting Standards Board currently is reviewing the question of how to account for mergers and acquisitions, which has been a highly controversial topic in the past. There is at least one course of action which the FASB could take which would have dramatic implications for purchase accounting in life insurance.

The course of action I have in mind is the one suggested in my paper "A Uniform Approach to Accounting for Bond and Common Stock Investments" (*TSA*, XXIV, 435). If that course is followed, then the policy reserves of the company whose stock is bought will not be revalued for purposes of preparing the acquiring company's GAAP statements. This fact might give rise to significant work savings.

Granted, some kind of revaluation may have been done in the course of arriving at the purchase price for the stock. However, the accounting for the stock by the acquiring company in all years including or following the acquisition would, under my suggested approach, depend only on the original reserve basis and on the write-off of a goodwill item as described in my paper. The work saving would be especially significant in cases where the company whose stock was bought continued to exist as a reporting entity, for which reserves on the original basis would have to be determined each year.

Further implications of the above-suggested course of action might arise from the logical extension of the arguments in my paper to the acquisition of a block of life insurance policies purchased directly, rather than indirectly through the purchase of common stock of the company. Such blocks of life insurance policies would be one of the types of investment, such as mortgage loans and real estate, which are not discussed in my paper but which would seem to lend themselves to the same treatment as bonds and common stocks.

I have one comment on Mr. Corbett's suggestions for dealing with acquisitions under present-day GAAP. I agree with him that the theoretically best, and most desirable, method among the ones he lists is the one he calls "Recommendation 1 Analogy." I propose, however, a slight

modification of that method. I suggest that, if inclusion of provision(s) for adverse deviation of a degree consistent with that contemplated by Recommendation 1 for newly written business produces an initial reserve for the acquired business which is lower than the initial reserve indicated by Mr. Corbett, then the lower figure be taken as the initial reserve. This is the method that is to be followed for direct purchases of blocks of in-force policies, according to Recommendation 1. In the case of direct purchases, it permits the immediate emergence of some profit to the acquiring company in some (presumably rare) circumstances. Such immediate profit recognition is consistent with the emergence of immediate profit on a direct-written single premium life insurance policy, for example.

If this approach were followed in purchases of companies (as distinguished from blocks of business alone), there would be no immediate recognition of profit, because the goodwill item would be adjusted accordingly. The practical effect of my suggested modification would, therefore, be minimal. I propose this approach mainly for consistency and suggest calling it "Recommendation 1 Equivalent."

W. H. ODELL:

This is an outstanding paper on an extremely complex subject. It substitutes some demonstrations for impressions and presents a lucid and clear analysis of some of the problems in accounting for the purchase of a life insurance company.

As the author states, the paper proceeds for the most part on the assumption that the in-force block of policies has been valued. A method is given toward the end of the paper for use where such value has not been determined. This discussion will comment briefly on the subject of determining the value of the in-force business (or another value sufficient to define the purchase reserve system) and then comment on some specific portions of the paper.

*Determining the Value of In-Force Business*

Historically the problem of defining the initial GAAP reserve has been at the heart of the questions asked about purchase reserve systems. At one time the hypothesis was advanced by many that merely saying that "the actuarial assumptions should be set as of the date of purchase" would uniquely define the purchase reserve system. Obviously, this is not the case. Taking the initial GAAP reserve or the net assets associated with the purchased in-force as the balancing item in the buyer's financial statements has also been advanced as a means of defining the purchase

reserve. This appears to beg the question. Gross premium valuation techniques are a more direct approach, but, at least to some extent, still beg the question.

Actually, it would suffice to have either, on the one hand, the net assets associated with the in-force business (or the initial GAAP reserve) or, on the other hand, the profit margin which is not capitalized in the purchase accounting but is left available for future net income defined or determinable.

It is pertinent that we might expect a buyer, in agreeing to the total consideration in a purchase transaction, to be aware of the fact that he is in a risk business (to be more precise, one in which the risk of variance from anticipated results is a distinctive feature) and hence would have introduced an element of conservatism into his bargaining to compensate for this risk that he will bear beginning with the consummation of the purchase. Otherwise, the buyer takes on a risk without compensation therefor. Also, the informed buyer presumably would desire profit from the purchased business. If he were to capitalize all such profit in the consideration he would be taking on the servicing of a block of business at no ultimate profit. Of course, bad bargains are still made. However, it does not seem appropriate to assume automatically that a buyer will take over a block of business at a price representing a break-even proposition on most realistic assumptions.

It is also pertinent to consider how much weight can be attached to the various items of information found in the files documenting the determination of the consideration for the purchase. Calculations in such files generally are made to help the parties reach agreement on the amount of the *total* consideration. The primary purpose of these calculations is *not* to determine how the total consideration is to be *allocated*. Calculations prepared for one purpose are not necessarily suitable for another purpose. Hence the calculations made to assist in determining the *total* consideration may not be suitable for determining its *allocation*.

For example, work papers prepared prior to the acquisition may indicate that the business to be purchased was valued using net level  $3\frac{1}{2}$  per cent statutory reserves but that a very liberal allowance was made for goodwill. A test calculation probably would show an unrealistically high profit margin associated with such a reserve and Type 1 (fully delta-ized) assumptions. In this event, it would be reasonable to conclude that a significant portion of the relatively high so-called goodwill amount was connected with the in-force business. A reasonable course of action would be to apply the techniques mentioned in method 9 of the paper of defining

an appropriate profit margin and calculating the initial GAAP reserve using, at least in the initial calculations, Type 1 assumptions. Goodwill and possibly other balance-sheet items would be adjusted accordingly.

To consider another example, there are situations where it is difficult to determine the precise means by which the consideration has been agreed upon. Market values of the shares of the two companies may be involved, or the price paid for his or her shares by one of the largest shareholders may enter the negotiations. In some of these cases, values will be assigned to each of the asset or liability items other than reserves, including goodwill-type items. The net asset associated with the purchased in-force becomes the balancing item. Clearly in these situations, to base the initial GAAP reserve on such a net asset amount is to make these reserves a function, at least in part, of the value assigned goodwill-type items or perhaps even values at which stock has been traded. Surely this is not intended. Again, a method such as method 9 recommends itself.

Less difficulty is encountered if the work papers prepared prior to the consummation of the transaction indicate a value assigned to the in-force business equal to the statutory reserve (of the seller or buyer) less the present value of future profits based on reasonable conservative assumptions taking into account that same reserve. While such a value might not appear at first to meet theoretically rigorous requirements, it may be perfectly sound to use in practice. However, in view of difficulties which may be encountered (the author has quite correctly pointed out in Sec. V that, "in the real world, seemingly excessive purchase prices for in-force business can result from bad judgment . . . or from the allocation of too high a portion of the total purchase price to in-force business as opposed to intangibles"), it would appear desirable to examine the resulting profit margin and the other balance-sheet items for reasonableness.

In fact, regardless of which is obtained first, the initial GAAP reserve or the profit margin, it seems desirable in all situations to review for reasonableness the resulting value of the item which is not given before assembling the final financial statements.

Can a general guide for determining either, on the one hand, the net assets associated with the in-force business (and/or the initial GAAP reserve) or, on the other hand, the profit margin be articulated? The state of the art has advanced much over the last couple of years but does not seem to have advanced to the point of providing a definitive answer. The following, therefore, is set out as a first step toward formulating such a guide:

1. Determine the profit margin from information concerning current management practice with regard to new business (and test the resulting initial GAAP reserve for reasonableness), except where
2. The work papers prepared to assist in determining the total consideration show a reserve liability or net asset associated with the in-force business (or associated profit margin) that (a) takes into account current assumptions as of the purchase date, (b) is reasonable in light of other balance-sheet items, and (c) provides a profit margin that is reasonable compared with current results for new business; take such reserve liability as the initial GAAP reserve.

Once one of these quantities is determined, the paper provides rigorous treatment and excellent guidance for development of the reserve system.

#### *Comments on Specific Areas*

In Section III of the paper it is mentioned that "if the purchaser, in arriving at the purchase price, assigned a value to the in-force business, this value . . . generally can be accepted as the amount of the purchase price to be allocated to this asset." This statement certainly has a ring of truth, especially where the calculations were performed with an eye to establishing specifically a value for the in-force by reasonable methods. However, if the objective of the calculations was simply to establish the *total* consideration and the value assigned to the in-force business was only a stepping-stone thereto, then further inquiry is in order. As noted in the first example above, an apparently zero value may be assigned to the in-force business together with a high value to goodwill-type items. At the other extreme, as pointed out in Section V of the paper, purchasers occasionally may allocate too high a portion of the total purchase price to in-force business as opposed to intangibles. Hence it appears that any value assigned to the in-force business should be examined for reasonableness in terms of the other balance-sheet items and resulting profit margins. The examination is made to decide whether the calculation was done to determine a value of the in-force which would have meaning in and of its own right or was done solely as a step in determining the total consideration, and the "value" assigned the in-force business was intended to be used only in conjunction with other balance-sheet items and not to have explicit intrinsic validity.

Section III of the paper also makes it clear that, although statutory reserves may enter the calculations at various points, they are not a determining factor. It is clearly pointed out that it is not the statutory reserve on the block of purchased business which is of importance but rather the net asset value. In fact, if the author's terminology has been

correctly understood, since the net asset value equals the statutory reserve less the purchase price, the equations for the purchase price in Section V may be rewritten as

$$PP^i = R_g^* + \pi \ddot{a}_{2|i} - 1,000v^2,$$

or

$$R_g^* - PP^i = 1,000v^2 - \pi \ddot{a}_{2|i},$$

and

$$\text{Net asset} = 1,000v^2 - \pi \ddot{a}_{2|i}.$$

Clearly, it is the net asset which demands our attention and not the statutory reserve. It is the net asset which has been agreed upon as the fair value of the excess of future benefits over future premiums.

The demonstration in Section V that eventual profit depends only on the net asset and the actual experience, with the incidence of profit depending also upon the actuarial assumptions, is a valuable addition to actuarial literature. (The author notes that refinement of the preceding statement is required in certain instances.) In this complex area of purchase accounting, it is refreshing to find a conclusion that can be paraphrased into everyday language (the profit we make on a block of purchased business depends on what we pay for it and what happens to it after we get it). Those practicing in the area are indebted to the author not only for formulating the statement but even more for demonstrating it.

It is interesting to note that the equations for the purchase price presented in this section of the paper are based on a zero profit margin. Presumably, a buyer using such formulas to determine a value to be incorporated in an offer for a block of business would incorporate enough conservatism in the actuarial assumptions to cover not only compensation for risk bearing but also an element of profit for administering the business once it had been purchased. Whether every buyer is well enough informed to attempt this, and whether such an attempt would be successful at the bargaining table, are other matters.

Indeed, throughout the paper, a zero profit margin seems to have been assumed except where the text clearly indicates otherwise. The excellent analysis of the various methods, however, does make it clear how situations with nonzero profit margins might be handled.

In Section VI the discussion of method 4 implies that the extent of provision for the risk of adverse deviation is a function of the purchase price. Is it reasonable for the provision for the risk of adverse deviation to depend on the purchase price? As a practical matter, it is probably as reasonable as having this provision depend on the gross premium charged

for the insurance contracts, as will happen from time to time in non-purchase situations. However, if the net amount of assets first assigned to the in-force business cannot (even with no profit margin) support a reserve based on fully delta-ized assumptions, this may be an indication that the net asset value and/or the other balance-sheet items should be reviewed again for reasonableness.

The discussion of method 9 mentions that the actuarial assumptions will contain the same type of provision for adverse deviation as for currently issued new business of the purchasing company. A refinement of this method is to use Type 1 assumptions, unless test calculations indicate that more liberal assumptions (but not more liberal than best estimates) are required, regardless of the assumptions used for new business. The rationale is that the purchased business represents a separate block and, therefore, may have a different degree of provision for the risk of adverse deviation than current new issues, just as different blocks of currently issued new business may have different degrees of provision.

The discussion of method 9 presents, if this discussant interprets the author's remarks correctly, the dilemma of profit margins on new business which are significantly different from those implied by the net asset. For illustration, suppose that the net asset for the purchased business, when expressed as a reserve, can be supported by valuation premiums which are 60 per cent of gross, while for new issues the valuation premiums are 80 per cent of gross, with Type 1 assumptions used in each case. Which is correct: an initial GAAP reserve equal to the net asset and valuation premiums equal to 60 per cent of gross, or a lower reserve and valuation premiums equal to 80 per cent of gross? The answer depends on which of the two alternatives is best supported by the evidence at hand. If it is clear that the net asset was determined in a manner to assign it a value accurate in its own right (as opposed to simply being an ingredient, not intended to have validity in and of itself, of the determination of the *total* consideration) and, further, that there is some aspect of the purchased business which made it reasonable to anticipate a 40 per cent profit margin thereon in the future instead of the 20 per cent being realized on new issues, then the former alternative is indicated. On the other hand, if less credence can be given to the preliminary net asset item, as where it is based simply on a statutory reserve, then the 20 per cent profit margin corresponding to that on new business might be used to define a valuation premium and hence the initial GAAP reserve. In this event, other items of the balance sheet would have to be reexamined. A situation such as this might well resolve itself into balancing, on the one hand, the reasonableness of the profit margin against, on the other

hand, the reasonableness of not only the preliminary net asset item but also the reasonableness of each other item in the balance sheet.

This leads to a particularly important consideration. The question just discussed is no less acute when the method of calculation is method 4 or some other method. If for example, method 4 indicates a profit margin of 0 per cent, as compared with a profit margin on current new business of 20 per cent, then how are we to explain the fact that management would be willing to service a block of in-force business at no profit? On the other hand, if calculations according to method 4 indicated a profit margin of 40 per cent, again compared with 20 per cent on current new issues, then how are we to explain the fact that the buyer was able to obtain such a relatively high profit margin at the bargaining table or, perhaps more importantly, why the seller is willing to forgo 40 per cent of all future gross premiums on the block of business in question? In any method the question of any difference between the profit margin associated with the initial GAAP reserve and that available on new issues

TABLE 1

## FINANCIAL STATEMENT RELATED TO PURCHASED IN-FORCE

*Method 1: Reserve Interest Rate Equals Best-Estimate Interest Rate*A. FINANCIAL STATEMENTS RESULTING FROM  
PURCHASE PRICE OF \$52.54

## BALANCE SHEETS

	After Purchase	End of 1st Year	End of 2d Year
<b>Assets:</b>			
Invested assets.....	\$723.14	\$870.06	\$1,027.26
Cost of purchased in-force	0	0	0
<b>Total.....</b>	<u>\$723.14</u>	<u>\$870.06</u>	<u>\$1,027.26</u>
<b>Liabilities:</b>			
<b>Policy reserves:</b>			
Basic.....	\$723.14	\$856.89	\$1,000.00
Deficiency.....	0	0	0
Earned surplus.....	0	13.17	27.26
<b>Total.....</b>	<u>\$723.14</u>	<u>\$870.06</u>	<u>\$1,027.26</u>

## INCOME STATEMENTS

	1st Year	2d Year
(+) Gross premium.....	\$ 90.00	\$ 90.00
(+) Investment income.....	56.92	67.20
(-) Increase in policy reserves.....	133.75	143.11
(-) Decrease in cost of in-force.....	0	0
<b>(=) Profit if purchase.....</b>	<u>\$ 13.17</u>	<u>\$ 14.09</u>

must be addressed. In any case where the two are not the same, the question arises whether the difference is reasonable.

The author explores certain difficulties that may be encountered with method 9. These are overcome if the requirement that the assumptions be "consistent with" those on current new business is removed and the purchased business is looked upon as a separate block. Also, as pointed out by the author, the theoretical difficulties are removed where no information is available about the purchase price for the block.

The financial statements presented in Section VII are very helpful in promoting an understanding of the paper. The fact that the effect of purchase on profits cannot be determined directly from the financial statements of the surviving company is taken into account by adjusting those statements for the profit if there is no purchase. Those interested in examining a financial statement that does not show statutory reserve figures and relates solely to the entity that has been purchased might find it of interest to rework one or two of these tables on that basis, which can be done easily with the data supplied in the paper. Table 1 of this discussion shows the first of the financial statements in the paper recalculated on that basis.

Mr. Corbett deserves our appreciation for an excellent and helpful paper.

(AUTHOR'S REVIEW OF DISCUSSION)

GARY CORBETT:

Since the primary reason for writing this paper was to provide a forum for discussion of a problem that had received little attention and commentary, I was gratified to receive the three discussions from Messrs. Bickel, Case, and Odell. All three have served on the Academy's Committee on Financial Reporting and are as fully conversant with the problem of accounting for the purchase of a life insurance company as I am.

We are fortunate that the three discussions were written from different points of view, so that each adds to the total content of the paper. Mr. Bickel is the most specific, criticizing certain of my approaches and suggesting others as being preferable. Mr. Case's response supports a radically different approach to the problem of purchase accounting—an approach not currently permitted under GAAP. Mr. Odell stresses some of the practical problems involved in applying the preferred methods of the paper. In particular, he emphasizes the need to subject all methods to the test of reasonableness.

Mr. Bickel and I obviously have different interpretations of Recom-

mentation 1. He concludes that a method satisfies the Recommendation provided that the valuation assumptions used contain sufficient provision for adverse deviation and that the valuation net premium is less than gross. The key phrase is "*sufficient* provision for adverse deviation" (my italics). Neither the Recommendation nor its accompanying Interpretations are specific as to what constitutes "sufficient provision for adverse deviation." However, one can find strong support for the view that such provision is limited. The Recommendation describes the calculation of Type 1 valuation premiums, which are based on assumptions that include such provision, and establishes such premiums as the maximum valuation premiums that can be used. If provision for adverse deviation had no limit, no maximum premium would exist. Further, the Recommendation, in paragraph 5, requires that assumptions for Type 1 valuation premiums "be so chosen that a reasonable balance is maintained with respect to the provisions for each risk of adverse deviation." This requirement certainly would prohibit the use of statutory assumptions, wherein the provision for adverse deviation in the interest rate is considerably greater than in the assumptions for mortality, withdrawals, or renewal expenses.

For the purpose of the paper, I defined 6 per cent as the assumed investment rate for the next two years that contained full provision for adverse deviations. I might have used a lower rate, but I do claim that there is some limit below which one cannot go.

For the above reasons, I cannot accept Mr. Bickel's conclusion that "all the methods satisfy Recommendation 1." Methods 5 and 6, with 3 and 4 per cent required interest, do not satisfy Recommendation 1. The fact that any error resulting from the use of these methods should operate in a conservative direction (i.e., defer earnings) does not constitute sufficient justification.

Mr. Bickel correctly points out that methods 5 and 6 produce profits identical with those of method 4 only because I used a constant reserve interest assumption of 6 per cent. However, as argued in Section VI of the paper, no other rate satisfies Recommendation 1.

Mr. Bickel has redefined my method 7 (initial reserve equals seller's experience reserve) so that it bears more of a relationship to method 9 (reserve premium equals gross premiums less current new-business loadings) than it does to method 7. My method 7 was one of a family of four methods (methods 5-8) that defined an initial reserve. Only experience prior to the time of acquisition was employed. Mr. Bickel combines past experience with future expectations to produce a defined reserve premium. Commenting specifically on his proposed method, I question the use

of provisions for adverse deviations based on past experience. I do agree with the necessity to include the capital gain or loss on revaluation of the assets to market at the time of purchase. My comments on method 9 in the paper would apply equally to Mr. Bickel's modification of method 7. My concern is centered in whether the implicit purchase price determined by these methods represents the reality of the purchase situation.

Mr. Bickel suggests amortizing the cost of the purchased in-force in proportion to expected gains from all sources (only loading and interest in the example) rather than in proportion to expected premium income. Implementing his suggestion would require the determination of a specific best-estimate rate of interest and the calculation of projected future earnings. Although a best-estimate interest rate is used in the example, in the real world it need not be set explicitly if the reserve interest rate is one that provides for the risks of adverse deviation. Following Mr. Bickel's suggestion would result in the best-estimate interest rate always directly affecting reported profits rather than simply constituting a boundary condition.

Mr. Bickel's financial summary for method 4 and a purchase price of \$84.07 shows a \$93.99 net premium and no deficiency reserves. Although the effect on profit is the same as if one were to hold deficiency reserves and an offset cost of in-force, I believe that accepted actuarial principles would require the latter approach or, alternatively, the reduction of the net premium to \$90 accompanied by an increase in the basic reserves.

In his final paragraph Mr. Bickel raises the question of how to allocate the initial reserve among plan-age cells. This is not a problem if the purchase price allocable to the purchased in-force was determined by summing the values of components of the in-force. These values could be the present value of future statutory profits, or \$ $x$  per thousand of permanent insurance plus \$ $y$  per thousand of term insurance, or other more or less arbitrary measures. If the present value of future statutory profits is the basis for the value, the initial reserve for each plan-age cell can be established exactly. In practice, groupings probably would be made. If more arbitrary methods of valuation were used, similarly arbitrary methods of allocating value to plan-age cells must be employed. The accuracy of the reserves for individual cells is of no real importance. It is only the total, probably by line, that is significant in the reported financial results. The allocation of the initial reserve need be accurate only to the level of detail that financial results are to be reported.

Having submitted a discussion of Mr. Case's 1972 paper, I am quite familiar with its contents. I would agree that if the concepts expressed in his paper became generally accepted accounting principles, the prob-

lem of accounting for all forms of equity investments would be much lessened. But, as Mr. Case notes, my paper was written entirely within the framework of existing generally accepted accounting and actuarial principles.

Mr. Case suggests modifying method 4 by, as I understand him, placing a floor under the net premium. The difference (per cent or dollar) between gross and net premiums on the acquired business could be no greater than the difference on newly written business. This procedure would permit, under certain circumstances, an immediate emergence of profit to the acquiring company. He states that, according to Recommendation 1, this is the method to be followed for direct purchases of blocks of in-force policies and that it is consistent with the treatment of a single premium life policy.

First, I cannot find any place where Recommendation 1 mandates, or even permits, such treatment for purchases of blocks of in-force policies. Second, I feel the analogy to single premium life to be inappropriate. Under GAAP some profit is expected to emerge in proportion to premiums. The fact that the entire premium is paid upon issue is the only reason that there is immediate profit emergence in the case of a single premium life policy. The payment of the single premium constitutes a very important segment of the total insurance transactions on that policy. The purchase of an in-force block of policies is entirely a financial transaction and does not in any way move the insurance contract nearer to completion. Third, under GAAP, purchases do not cause immediate profits to be reported.

Much of Mr. Odell's discussion concerns itself with the desirability of reviewing for reasonableness the initial reserve or the profit margin, whichever is derived from the other. I was probably at fault in emphasizing the need under method 9 to check the implicit purchase price for reasonableness without pointing out the need to apply the same test to the net premium and the loading that result from the application of method 4. I like Mr. Odell's suggested first step toward formulating a guide for articulating the initial reserve and the profit margin.

I appreciate his emphasizing that it is the net asset transferred that demands our attention and not the statutory reserve. Eventual profit indeed depends only on the net asset transferred and the actual experience.

Mr. Odell notes that the equations for the purchase price are based on a zero profit margin. This was not my intention. The three purchase prices should be regarded as arbitrary examples. Whether or not they result in profits will depend only on emerging experience. However, under the assumptions of the paper the GAAP earnings resulting from the \$52.54,

\$68.53, and \$84.07 purchase prices will yield 32, 13, and 2 per cent rates of return, respectively, on the buyer's investment. A 32 per cent rate of return on an investment is hardly a zero profit margin.

Mr. Odell suggests a refinement of method 9, using Type 1 assumptions, regardless of the assumptions used for new business. I believe his suggestion to be incomplete, since it defined only one of the three variables: reserve assumptions, net premium, and the initial reserve. Two of the three must be defined in order to fully describe a method. All nine methods in the paper define the reserve assumptions. The first eight define the initial reserve and solve for the net premium; the ninth defines the net premium and solves for the initial reserves.

Mr. Odell presents financial statements in the same form as does Mr. Bickel. The investment income has been reduced by the amount that would have been earned if no purchase had been made. In retrospect, this probably would have been a better way to present the financial statements in the paper.

My thanks to Messrs. Bickel, Case, and Odell for taking the time to write their discussions. I know they would join me in expressing the hope that neither theirs nor mine are the last words to be said on the subject of accounting for the purchase of a life insurance company.