

GAAP AND THE CASUALTY ACTUARY

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BIOGRAPHY:

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ABSTRACT:

This paper presents a general summary of the conceptual framework that underlies Generally Accepted Accounting Principles (GAAP) in the United States, and discusses the application of GAAP to insurance. Particular emphasis is placed on whether loss reserves should be discounted in GAAP financial statements, and if they are discounted whether a "margin for the risk of adverse deviation" should be included in the reserves. In the emerging accounting literature, the appropriateness of such a margin has been questioned. Through a simple illustrative example, the paper describes several alternative financial statement presentations, and argues that the use of discounted reserves with appropriately determined margins is consistent with GAAP.

GAAP AND THE CASUALTY ACTUARY

INTRODUCTION

Most casualty actuaries have a solid understanding of and familiarity with statutory accounting and the annual statement. Our own Syllabus of Examination is laden (some might say burdened) with materials describing the various schedules and their historical evolution. By education and experience, statutory accounting principles and conventions are a part of our actuarial culture.

However, the same cannot be said for Generally Accepted Accounting Principles (GAAP). While many actuaries are familiar with the major adjustments that are typically necessary to shift from a statutory to a GAAP basis, the actuarial literature gives GAAP relatively "short shrift." This puts us at a disadvantage as a profession when GAAP accounting issues emerge; we need to speak the accounting profession's language if we are to influence their thinking.

An example of such an emerging issue is loss reserve discounting, which the accounting profession is actively discussing. While their discussion of the issue will be a long term project with any firm conclusions several years off, the actuarial profession needs to be an active voice in that discussion now, lest actuarial and accounting principles end up in conflict down the road.

Of particular concern to the author is the potential that margins for adverse deviation may not be considered appropriate in GAAP loss reserves. Currently, the use of undiscounted reserves results in an implicit margin equal to the amount of the discount. Some members of the accounting profession have questioned the retention of any such margin if and when reserves are discounted.

The purpose of this paper is to foster a better dialogue between the accounting and actuarial professions, both in general and specifically relating to the loss reserve discounting issue. The paper includes a general summary of the

accounting concepts that underlie GAAP, which should be a useful reference to actuaries involved in GAAP issues. In addition, the paper discusses the specific application of those concepts to insurance, with special focus on the discounting issue.

PROLOGUE: AN ILLUSTRATIVE EXAMPLE

Insurance contracts involve the exchange of assets that are certain for liabilities that are uncertain, either in amount or timing or both. Insureds pay fixed premiums to the insurer, for which the insurer assumes responsibility for a defined set of contingent liabilities from the insured.

For purposes of illustration, we have constructed a simple insurance contract with the following characteristics:

- A fixed premium of \$926 is paid in mid-1981 for coverage against any loss occurrences during a one year period from 7/1/1981 to 7/1/1982.
- Expected loss payments are \$1,000 in mid-1983. Payments are expected to be delayed for two years until 1983 due to reporting and settlement lags. The timing and amount of actual loss payments is uncertain.
- Interest is earned at 10% per year on all available cash. For simplicity, interest is credited annually, rather than continuously.
- There are no expenses or taxes.

The \$926 premium consists of a loss provision of \$826 (the present value at 10% of the expected \$1,000 loss payment), and a profit provision of \$100. The \$100 profit produces what is believed by the actuary pricing the contract to be an adequate return for the risk assumed. Exhibit 1 describes the insurance contract schematically. As can be seen, the contract produces an accumulated profit of

\$121 at the end of 1983, after the expected claims have been paid. The \$121 represents the \$100 profit at the inception of the policy accumulated at 10% interest for two years.

The \$121 accumulated profit is the actual cash profit on the contract, and is determined entirely by the cash flow and interest assumption. At this point, the question of how (and when) the profit on this contract should be recognized in financial statements has not been specified.

Exhibit 1

	<-- 1981 -->		<-- 1982 -->		<-- 1983 -->	
	12/80	12/81	12/82	12/83		
Cash Flow:						
Premium Receipt		926				
Interest Receipts			93			
Loss Payment					102	(1,000)
Cash Balance:	0	926	1,019			121
Period of Coverage:		<----->				
Period of Service:		<----->				

As a starting point towards addressing the recognition question, consider the traditional financial statement presentation for this contract, as displayed in Exhibit 2. Under this presentation:

- The premium is recognized as revenue ratably over the coverage period.
- The interest is recognized as revenue when it is received.
- The losses are fully recognized as an expense at the time they occur.

This pattern of revenue and expense is accomplished via the establishment of the unearned premium and loss reserve liabilities shown at the bottom of Exhibit 2. These reserves serve to convert the cash transactions to an accrual basis. The basis of the valuation of the liabilities parallels the income conventions stated above:

- A liability is established at the end of 1981 for the portion of the collected premium that is associated with coverage that has not yet been provided.
- A liability is established at each year end for the full value of all unpaid losses that have occurred on coverage that has been provided.

Note in Exhibit 2 that total net income is still \$121, although the pattern of recognition of net income might be characterized as odd by someone unfamiliar with insurance accounting.

Exhibit 2

	<-- 1981 -->		<-- 1982 -->		<-- 1983 -->	
	12/80	12/81	12/82	12/83	12/83	12/83
Revenue:						
Premium		463	463	0		
Investment Income		0	93	102		
Expense:						
Losses		(500)	(500)	0		
Net Income		(37)	56	102		
Assets	0	926	1,019	121		
Liabilities						
Unearned Premium	0	463	0	0		
Loss Reserves	0	500	1,000	0		
Equity	0	(37)	19	121		

For the sake of argument, consider two alternative financial statement presentations that might be employed for the same contract. First, in Exhibit 3, the unearned premium reserve has been eliminated. Instead, the present value of the \$1,000 of expected losses is established as a liability immediately. The effects of these changes are several.

- The full \$926 premium is recognized as revenue in the first year.
- Losses are also recognized in the first year, at their present value; in subsequent years the discount is amortized, with the amortization offset by interest income.
- The \$100 profit on the policy is "front-ended"; in subsequent years the \$100 profit accumulates with interest.

Exhibit 3

	<-- 1981 -->		<-- 1982 -->		<-- 1983 -->	
	12/80	12/81	12/82	12/83	12/83	12/83
Revenue:						
Premium		926	0	0	0	
Investment Income		0	93	102		
Expense:						
Losses		(826)	(83)	(91)		
Net Income		100	10	11		
Assets	0	926	1,019	121		
Liabilities						
Loss Reserves	0	826	909	0		
Equity	0	100	110	121		

In contrast, in Exhibit 4 the loss reserves have been eliminated. Instead, the entire premium is treated as unearned until the loss is settled. In fact, the

unearned premium is increased by the interest earned each year. The effects of these changes are:

- No revenue or expense is recognized until the third year. Prior to that year, interest income is used to fund the unearned policy liabilities, for which a single reserve is established.
- The profit on the policy is "back-ended"; no profit is recognized until the third year, when the full accumulated profit of \$121 is released.

Exhibit 4

	<-- 1981 -->		<-- 1982 -->		<-- 1983 -->	
	12/80	12/81	12/82	12/82	12/83	12/83
Revenue:						
Premium		0	(93)		1,019	
Investment Income		0	93		102	
Expense:						
Losses		0	0		(1,000)	
Net Income		0	0		121	
Assets	0	926	1,019			121
Liabilities						
Unearned Premium	0	926	1,019			0
Equity	0	0	0			121

The key point is that none of the three financial statement presentations in Exhibits 2, 3, or 4 are, per se, right or wrong. Each accurately reflects the true economic gain on the contract. Each presentation takes its own approach as to when revenue, expense and income are recognized, and what constitutes an appropriate valuation of the assets and liabilities generated by the contract. The presentation in Exhibit 2 is traditional. The proponents of discounting might think the presentation in Exhibit 3 is closer to economic reality. And,

while some might dismiss the presentation in Exhibit 4 as unrealistic, it actually approximates accounting procedures used by Lloyd's syndicates. Other presentations, more radical than the alternatives presented, might be considered.

Finally, in comparing the three alternative financial statements, it is apparent that decisions about when revenue, expense and income are recognized in the income statement are inextricably linked to decisions about the valuation of the assets and liabilities in the balance sheet (the accountants would say that the two "articulate"). Changing the amount of an asset or liability forces a change in the timing of income, and vice versa. Thus, any discussion about whether loss reserves should be discounted, for example, must consider the income statement as well as the balance sheet.

GAAP ACCOUNTING CONCEPTS

In order to construct the most appropriate financial statement presentation, one must look to the purposes, uses and principles underlying that financial statement. Under GAAP, these are embodied in Statements of Financial Accounting Concepts issued by the Financial Accounting Standards Board (FASB). The Statements of Financial Accounting Concepts set forth fundamentals on which GAAP standards can be based. They enunciate the "conceptual framework" underlying GAAP. What follows is a synopsis of several of those statements.¹

Objectives of GAAP Financial Reporting

Concept Statement Number 1 establishes the objectives of general purpose financial reporting by business enterprises.

Financial reporting should provide information that is useful to present and potential investors and creditors and other users in making rational investment,

¹ In preparing the synopsis the author has borrowed liberally from the actual phraseology of the Statements. In the interests of continuity, quotation marks have not been used. The complete text of the Statements can be found in Accounting Standards, published by the FASB.

credit and similar business and economic decisions. The information provided should help users in assessing the amounts, timing and uncertainty of prospective cash flows to the enterprise, and should provide information about the economic resources of the enterprise (assets), and the claims against those resources (liabilities). Financial reporting is expected to provide information about an enterprise's financial performance during a period and about how management has discharged its stewardship responsibility to owners.

Elements of Financial Statements

Concept Statement Number 6 defines the elements, or fundamental building blocks, of all financial statements and describes the concepts that underlie those elements.

Assets are probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events. An asset has three essential characteristics:

1. It creates a capacity to produce a future net cash inflow.
2. A particular entity can obtain the benefit from it and control other's access to it.
3. The event giving rise to the entity's right to or control of the benefit has already occurred.

The kinds of items that qualify as assets under this definition are also commonly called economic resources. Once acquired, an asset continues as an asset of the entity until the entity collects it, transfers it to another entity, uses it up, or until some other event destroys its cash producing capacity.

Liabilities are probable future sacrifices of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to

other entities in the future as a result of past transactions or events. A liability has three essential characteristics:

1. It embodies a present duty or responsibility to one or more other entities that entails settlement by the probable future transfer or use of assets at a determinable date, on occurrence of a specified event, or on demand.
2. The duty or responsibility is such that the entity has little or no discretion to avoid the future sacrifice.
3. The transaction or other event obligating the entity has already happened.

Most liabilities stem from human inventions, such as contracts and laws that facilitate the functioning of the economy by permitting delay - delay in payment, delay in delivery, and so on. Once incurred, a liability continues as a liability of the entity until the entity settles it, or another event discharges it or cancels the entity's responsibility to settle it.

Equity is the residual interest in the assets of an entity that remains after deducting its liabilities. It is a residual, affected by all events that increase or decrease total assets by different amounts than they increase or decrease total liabilities.

An entity's assets, liabilities and equity all pertain to the same set of probable future economic benefits. Assets are probable future economic benefits owned or controlled by that entity. The entity's liabilities are claims to its assets by other entities, with equity representing the residual after probable settlement of those liabilities. Assets and liabilities are not amounts of money entered on the balance sheet; those are merely monetary representations of them.

Revenues are inflows or other enhancements of assets of an entity from producing or delivering goods or services that constitute the entity's main operations.

Revenues represent actual or expected cash inflows (or the equivalent) that have occurred or will eventuate as a result of the entity's main operations.

Expenses are outflows or other using up of assets or incurrences of liabilities from producing or delivering goods or services or carrying out other activities that constitute the entity's main operations. Expenses represent actual or expected cash outflows (or the equivalent) that have occurred or will eventuate as a result of the entity's main operations.

Gains (Losses) are increases (decreases) in equity arising from peripheral or incidental transactions or events that are not part of the entity's main operations. Gains and losses result from incidental transactions or events from the environment that may be beyond the control of the entity or its management.

Recognition and Measurement

Concept Statement Number 5 discusses how and when financial statement items should be recognized and measured.

Recognition is the process of formally recording or incorporating an item into the financial statements as an asset, liability, revenue, expense or the like. For assets and liabilities, recognition involves recording not only an initial value, but also subsequent changes in that value.

Recognition of revenues and gains involves consideration of two factors, (a) being realized or realizable and (b) being earned, with sometimes one and sometimes the other being the more important consideration.

- (a) Revenues and gains are not recognized until they are realized or realizable. Revenues and gains are realized when goods or services or other assets are exchanged for cash or claims to cash. Revenues or gains are realizable when related assets received or held are readily convertible to known amounts of cash or claims to cash.

b) Revenues are not recognized until earned. Revenue earning activities involve delivering or producing goods, rendering services or other activities that constitute its main operations. Revenues are earned when the entity has substantially accomplished what it must do to be entitled to the revenues.

Expenses and losses are generally recognized when an entity's economic benefits are used in producing or delivering goods or rendering services, or when previously recognized assets are expected to provide reduced or no further benefits.

Items reported in financial statements are measured by different attributes. Five different attributes are used in present practice to value assets (liabilities):

1. Historical Cost (historical proceeds)

Property, plant, equipment and inventories are usually reported at their historical cost, the amount of cash paid to acquire them. The reported value of such assets are usually adjusted after their acquisition via depreciation or amortization. Liabilities that involve obligations to provide goods or services to customers are generally reported at historical proceeds, the cash received when the obligation was incurred. The reported value of these liabilities may also be adjusted subsequent to their assumption.

2. Current Cost

Some inventories are reported at the current cost of replacing them.

3. Current Market Value

Some investments in marketable securities are reported at their current market value. Other assets that are expected to be sold at prices lower than their previously reported values are marked to market. Some

liabilities that involve marketable commodities and securities are also reported at current market value.

4. Net Realizable (settlement) Value

Short term receivables and some inventories are reported at their net realizable value, which is the non-discounted amount of cash into which an asset is expected to be converted in the due course of business, less any direct costs necessary to make the conversion. Similarly, liabilities that involve known or estimated amounts of money payable at unknown future dates are generally reported at their settlement value.

5. Present Value of Future Cash Flows

Long term receivables are reported at their present value, discounted at the implicit or historical rate. Long term payables are similarly reported.

The choice of the attribute used to value the asset or liability is dependent on the reliability of the attribute as a measure. Reliability rests on the representational faithfulness of the measure, which is the correspondence or agreement between a measure or description and the phenomenon it purports to represent. Reliability also rests on the degree to which the measure is verifiable, consistent and free from bias.

There is a place for conservatism in measurement because business activities are surrounded by uncertainty. Since a preference to err on the side of understating income and equity introduces a bias into financial reporting, conservatism tends to conflict with representational faithfulness and neutrality. Conservatism should not connote deliberate, consistent understatement of income and equity. Rather, conservatism should connote a prudent reaction to uncertainty.

APPLICATION OF FAS CONCEPTS TO INSURANCE

Premium Revenue Recognition

Returning to our illustrative insurance contract, it seems obvious that since the premium and the interest are both inflows stemming from the company's main operation (selling the insurance contract), that both are revenues.

Not so obvious is the appropriate timing of the recognition of those revenues. Traditionally, premiums have been earned proportionally over the term of the policy, under the presumption that if the policy were cancelled the unearned portion of the premium would be returned to the insured. For a going-concern insurer, what is the likelihood of such a cancellation? Except for situations of non-payment or fraud, insurers are prohibited from cancelling most policies. Insureds can cancel mid-term, but doing so typically invokes a short rate penalty such that only a portion of the unearned premium would be returned. In most situations, the bulk of the unearned premium at any point is, in fact, subsequently earned.

Under these circumstances, it is at least arguable that, having written the policy, the insurer has "substantially accomplished what it must do to be entitled to" the premium revenue. While some allowance for expected premium returns (based on actual experience) due to cancellations might be appropriate, a strong argument can be made that premium should be taken into revenue when it is written.

The counter-argument is that revenue earning involves the rendering of a service, which in this case is the providing of coverage. However, if this is the case, then cannot that same argument be extended to recognize that the claim handling services associated with our hypothetical policy extend over two years? If so, shouldn't some of the premium not be earned until all of the claim services are provided?

A better approach would be to recognize that the "service" being provided is the transfer of risk, which is essentially accomplished when the policy is written.

An additional point in favor of recognizing premium as revenue when the policy is written is that written premium is a better measure of performance relating to the generation of business. Written premium is also a better indicator of current financial commitments for users of the financial statements.

Loss Recognition

Losses are the principal expense associated with insurance contracts, representing the actual or expected future cash outflows that have occurred or will eventuate as a result of the entity's main operations.

Determining the appropriate method of recognition for the loss liabilities is more problematical because of the present GAAP practice of measuring liabilities by different attributes. Those who favor the continued use of full value loss reserves believe that net settlement value is the most representationally faithful measure of the loss liabilities, since the amounts and timing of the actual payments are not known. Others, who favor discounting, support present value as being more representationally faithful, arguing that discounting will result in financial statements that better reflect the economics of the insurance business. Existing GAAP literature is of limited help in resolving this debate.

In an effort to assist in the resolution of the issue, the author would like to return to the illustrative policy introduced earlier, and consider three variants to it. Assume that the policy is the same as was previously described, with the following alternative additional conditions:

Case A: Uncertainty as to the amount and timing of the loss is completely resolved at 12/81. While the loss may not be paid until later, its timing and amount become known at 12/81.

Case B: Uncertainty as to the amount and timing of the loss is completely unresolved until the loss is paid. Up until that point, no additional information becomes available to reduce the uncertainty regarding the loss.

Case C: Uncertainty as to the amount and timing of the loss is resolved gradually over time. Specifically, 50% of the uncertainty is removed at 12/81, and 75% of the uncertainty is removed at 12/82.

The key question is whether, given identical expected cash flows, these three policies deserve identical financial statement treatment under GAAP. (Obviously the author doesn't think so, or he wouldn't have presented them.) The first point that should be recognized is that neither the traditional accounting treatment with full value reserves, nor a proposed accounting treatment with discounted reserves would distinguish between these three cases. In both treatments, liability measurement and income recognition focus entirely on expectation without consideration of the uncertainty of that expectation.

In each of these cases, a liability must be established at 12/81 and 12/82 for an expected payment of \$1000 in 1983. However, it is hard to argue that those liabilities should be valued in the same manner. The liabilities are different in each case; the goal of representational faithfulness argues they should be valued differently.

In Case A, the liability at 12/81 consists of future payments of known amount and timing. Under the circumstances, it can be argued that the most relevant financial attribute to measure those liabilities would be their present value, discounted at the 10% interest rate. Dedicated funds of that amount could be set aside at 12/81 with maturities perfectly matched to the liabilities. Those funds would accumulate, mature and be spent discharging the liabilities, with no further gains or losses. This case represents one polar extreme, where no uncertainty exists.

In this case, the financial statement would be expected to look like Exhibit 5A, which is essentially the same as Exhibit 3. The loss reserve at 12/81 is \$826 which is the present value of the expected loss payment. At 12/82, the reserve grows to \$909, reflecting one year's less interest.

As was noted earlier, in this case the profits on the policy are front-ended. The entire \$100 profit is released in 1981; subsequent years reflect only the accumulation of interest on that profit.

In contrast, in Case B, the liability at 12/81 consists of payments of uncertain amount and timing. Under these circumstances, it can be argued that the most relevant financial attribute to measure the liabilities would be the associated historical proceeds, the premium received when the contract was written. In theory at least, another carrier would assume the policy for the same premium, producing for that carrier the same profit for taking the same risk as was inherent in the original pricing of the contract. In essence, the historical proceeds represent the market value of the liabilities as of 12/81, which has not changed since the policy was issued. This case represents the other polar extreme where the uncertainty is undiminished from that present at policy issuance.

In this case, the financial statement would be expected to look like Exhibit 5B. The loss reserve at 12/81 is \$926, the same as the premium, such that no net income occurs. The loss reserve at 12/82 is \$1,009, consisting of the present value of the expected losses (\$909) plus a \$100 profit margin. This represents the market value of the liabilities at that time. Since the risk is the same as it was under the original policy, it is reasonable to assume that the required return would be the same also.

Essentially, in Case B, the profit margin in the rate becomes the margin in the loss reserves. The latter margin does not reflect the actuary's or management's desire to be artificially conservative by putting a "cushion" in the reserves.

Exhibit 5A

	<-- 1981 -->		<-- 1982 -->		<-- 1983 -->	
	12/80	12/81	12/82	12/83	12/80	12/83
Revenue:						
Premium		926	0	0		0
Investment Income		0	93	102		102
Expense:						
Losses		(826)	(83)	(91)		(91)
Net Income		100	10	11		11
Assets	0	926	1,019	121		
Liabilities						
Loss Reserves	0	826	909	0		
Equity	0	100	110	121		

Exhibit 5B

	<-- 1981 -->		<-- 1982 -->		<-- 1983 -->	
	12/80	12/81	12/82	12/83	12/80	12/83
Revenue:						
Premium		926	0	0		0
Investment Income		0	93	102		102
Expense:						
Losses		(926)	(83)	9		9
Net Income		0	10	111		111
Assets	0	926	1,019	121		
Liabilities						
Loss Reserves	0	926	1,009	0		
Equity	0	0	10	121		

Exhibit 5C

	<-- 1981 -->		<-- 1982 -->		<-- 1983 -->	
	12/80	12/81	12/82	12/83	12/80	12/83
Revenue:						
Premium		926	0	0		0
Investment Income		0	93	102		102
Expense:						
Losses		(876)	(58)	(66)		(66)
Net Income		50	35	36		36
Assets	0	926	1,019	121		
Liabilities						
Loss Reserves	0	876	934	0		
Equity	0	50	85	121		

Rather it reflects the market's predisposition that insurance liabilities be valued to include a return for risk taking.

In Case B, the profits on the policy are back-ended. The entire \$100 profit is not released until 1983. Interest on the profit is unchanged from Case A.

Comparing Case A to Case B, one sees that in both cases profits are released at the point where the risk is eliminated. Since the profit was in exchange for transferring the risk from the insured to the insurer, it is intuitively pleasing to recognize the profit when the risk is finally resolved.

Case C reflects a middle ground between cases A and B. In Case 5C, the risk is gradually, rather than suddenly dissipated. This is a more realistic situation, and is included to illustrate the problems of implementing the accounting approach being advocated.

In order to estimate a theoretical market value for the liabilities in Case C, it will be necessary to postulate a functional relationship between levels of risk and return. For the sake of simplicity only, we will assume that the relationship is linear. Thus, in Case 5C, the reserves at 12/81 should reflect the present value of the losses plus one half of the original profit (since one half of the risk remains). Similarly, at 12/82 the reserves should reflect the present value of the losses plus one fourth of the original profit. These represent what we would anticipate the market would charge as premium for a transfer of these liabilities.

As can be seen in Exhibit 5C, this causes the profits on the policy to be released gradually over time, as the risk originally assumed under the policy dissipates.

In reality, the problem of the measurement of risk and the determination of margins appropriate to the risk are more complex than the simple linear example

presented here. However, the key point is that the reserve margin problem in financial statements and the profit margin problem in pricing are fundamentally the same problem. The only difference between the two is their frame of reference: one is anterior to the coverage triggering event, the other is posterior to it.

In summary, comparing the three cases presented above and displayed in Exhibit 5, it can be seen that the concept of margins in loss reserves is wedded to the concept of releasing profits as risk is extinguished. Margins are not included in the loss reserves merely for the sake of conservatism. Rather, reserves are established initially at the level of the premiums which include a profit for the transfer of risk. The reserves are adjusted subsequently by amortization of the discount and reduction of the margin as the risk dissipates. This causes a gradual release of profits over the life of the liabilities. Profits are neither dramatically accelerated as they would be by discounting without margins; nor are they distorted as is the case when full value reserves are utilized.

CONCLUSION

This paper has been designed to explore several issues that are interrelated and complex. It is hoped that, by the use of a simple model, the reader will gain an appreciation for the issues. The discussion presented is not intended to be the "definitive word" on these issues; rather it is intended to serve as a starting point. In particular, the author hopes that others will pick up the challenge of developing a more refined model for determining risk margins. Such a model will be necessary for any implementation of the general approach discussed in this paper.