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Some Observations on Fair Value Accounting

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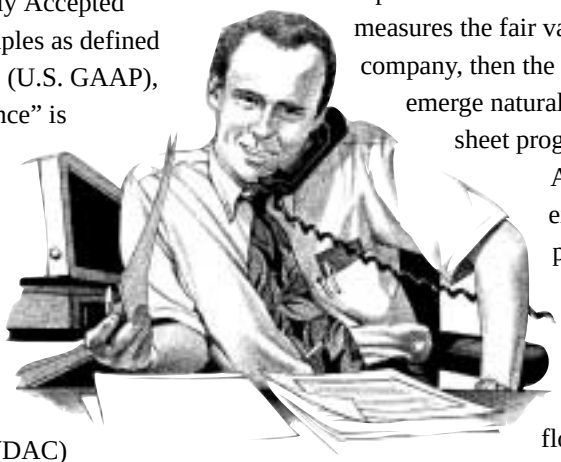
In our first exposure to accounting, the balance sheet was fundamental. It is an instantaneous snapshot of an enterprise's net worth, defined as assets minus liabilities. Only after understanding the balance sheet were we able to grasp the concept of earnings. Earnings are defined as the change in the balance sheet net worth. To get a better understanding of the sources of earnings, we learned to prepare an income statement, including individual income and expense items. Collectively, all such items reconcile changes in the balance sheet.

Under Generally Accepted Accounting Principles as defined for life companies (U.S. GAAP), earnings "emergence" is considered more important than the balance sheet, which is severely bent to suit that purpose. The intangible Deferred Acquisition Cost (DAC) asset arises out of money spent in the past, written off over a set period, in proportion to premiums, gross profits, or some other convenient quantity. This intangible asset must be carried on the balance sheet to reconcile the reported earnings. Therefore, the balance sheet is difficult to interpret as a meaningful snapshot of assets minus liabilities.



But if we are investing in an enterprise, or lending it money, we want to measure its ability to deliver future earnings, or at least pay its bills. Such an evaluation is necessarily prospective in nature. Our actuarial training emphasizes prospective calculations. We certainly price our products that way, and rational business decisions look only at the present situation, and how a proposed course of action will affect the future wealth of the enterprise. Our problem is to restore the balance sheet to its rightful role of measuring an enterprise's net worth. Such a valuation is based solely on prospective actuarial considerations, calibrated to actual market values whenever possible. The net worth of the company will reflect the estimated market value of its asset and liability components. If the balance sheet measures the fair value of a company, then the earnings will emerge naturally as the balance sheet progresses.

An asset may exist because of a past expenditure; but its actuarial value arises solely out of its future cash flows, as perceived in a public market or some reasonable proxy. For example, a common stock commands a market value equal to what someone else is willing to pay for it. In the long run, a stock is worthless unless it has some chance of paying dividends someday, although not necessarily to the present owner. Because dividends are impossible without earnings, the marketplace responds to earnings expectations.

In recent months, several excellent articles in the *Financial Reporter* and elsewhere have dealt with "fair value accounting," an idea that is catching on in some other countries. In fair value accounting, the value of each asset and liability is the price that two knowledgeable traders would agree on in a free market.

The writers have pointed out that assets are relatively easy; their fair value is the same as their market value, easily ascertainable because they are traded every day in large volumes.

Unfortunately, getting a fair value for insurance liabilities is more difficult. They are not "publicly traded" except in a very limited sense. One example involves reinsurance transactions, but these "trades" are usually not "public" knowledge, and occur sporadically in low volume. In this article, I will discuss one possible approach to this problem.

Some authors have suggested discounting liability cash flows at zero-coupon rates, derived from the assets. For example, a conventional coupon bond provides a series of interest payments, followed by a lump sum for its face value. Knowing the market values for various maturities at a given time, we can extract the market value of each of the zero-coupon components.

Consider the following publicly traded bonds (Table 1). Note that the coupon rates and yields were chosen randomly, and the years remaining are at 6-month intervals. The nominal yield to maturity is the yield curve corresponding to the class of investments. Because of past market value fluctuations, the nominal yield to maturity probably differs from the original yield to maturity on the purchase date. The market values are the present value of the maturity value and coupon stream, at the nominal yield to maturity.

continued on page 6

Some Observations on Fair Value Accounting

continued from page 5

Table 1 — Bond Parameters

	Bond 1	Bond 2	Bond 3	Bond 4
Face Value (Maturity Value)	$100	$100	$100	$100
Nominal Coupon Rate	8.0000%	8.5000%	7.5000%	6.0000%
Semi-annual Coupon	$4.0000	$4.2500	$3.7500	$3.0000
Years remaining to Maturity	0.5	1.0	1.5	2.0
Nominal Yield to Maturity	7.0000%	7.1000%	7.3000%	7.5000%
Market Value	$100.4831	$101.3288	$100.2794	$97.2615

The resulting cash flows are shown in Table 2. At time 0.0 (the present), either we purchase the bond or forgo selling an existing bond. In either case, that's considered a negative cash flow equal to the market value.

Table 2 — Future Cash Flows for Each Bond

Time (years)	Bond 1	Bond 2	Bond 3	Bond 4
0.0	($100.4831)	($101.3288)	($100.2794)	($97.2615)
0.5	$104.0000	$4.2500	$3.7500	$3.0000
1.0		$104.2500	$3.7500	$3.0000
1.5			$103.7500	$3.0000
2.0				$103.0000

For each bond, using its nominal yield to maturity (Table 1), we can generate discount factors and apply them to its Table 2 cash flows. By definition of yield to maturity, we know that the sum of the discounted cash flows is zero. That means generating a separate set of discount factors for each bond, based on its own yield rate. However, in Table 3, we apply a uniform set of discount factors to all the bonds, but we still want each sum of discounted flows to be zero. We follow this recipe.

- For Bond 1, we need just two discount factors. At time 0.0, the factor must be 1.0000000. Half a year later, we use 0.9661837, derived algebraically to achieve the required sum of zero.
- For Bond 2, at times 0.0 and 0.5, we use the Bond 1 discount factors. At time 1.0, we use 0.9325901, chosen so that the discounted Bond 2 cash flows add up to zero.
- For Bond 3, we use the Bond 2 discount factors, and append a new discount factor of 0.8979181 at time 1.5.
- For Bond 4, we use the Bond 3 discount factors, and append a new discount factor of 0.8628294 at time 2.0.

Table 3 — Cash Flows, Discounted Using Uniform Discount Factors

Time (years)	Discount Factor	Bond 1	Bond 2	Bond 3	Bond 4
0.0	1.0000000	($100.4831)	($101.3288)	($100.2794)	($97.2615)
0.5	0.9661837	$100.4831	$4.1063	$3.6232	$2.8986
1.0	0.9325901		$97.2225	$3.4972	$2.7978
1.5	0.8979181			$93.1590	$2.6938
2.0	0.8628294				$88.8714
Total Present Value		**$0.0000**	**$0.0000**	**$0.0000**	**$0.0000**

In Table 4, each discount factor is expressed in terms of its nominal semiannual yield. The yield for 0.5 years is no surprise; it's the yield to maturity for Bond 1. The other bonds are more complicated. For example, Bond 4 uses 7.0000% on its cash flow at time 0.5; but 7.1021% applies to its cash flow at time 1.0 (the entire 12-month period). 7.3088% applies concurrently to the 18-month discount period of the next cash flow; and 7.5147% applies concurrently for its 24-month period.

Table 4 — Nominal Yiel Rates Corresponding to the Uniform Discount factors

Time (years)	Discount Factor	Equivalent Nominal Yield Rate
0.0	1.0000000	–
0.5	0.9661837	7.0000%
1.0	0.9325901	7.1021%
1.5	0.8979181	7.3088%
2.0	0.8628294	7.5147%

None of these nominal interest rates are really important, nor do we need to know the yields to maturity. All we really need are the market values of the assorted assets and their future cash flows. From these, we derive the discount factors as above. Each discount factor represents the "fair value" that the market has implicitly assigned to a single cash flow. A liability cash flow is the same as an asset flow, but in the other direction. So, in the absence of a public market for liabilities, we can discount each future liability cash flow, using our array of zero-coupon discount factors. For private placements and other assets with a limited market, we can use similar discounting. In performing these calculations, we must recognize that all cash flows are contingent, among both assets and liabilities.

- Among assets, bonds have credit risks, and stocks have unknown future earnings. Therefore, in Table 3 above, we should have multiplied each cash flow by its probability of being realized, according to the published bond-rating. This introduces a new actuarial assumption, and results in lighter discounts (because defaults must necessarily decrease our yield). Should we assume that bonds are held to maturity? If not, then we would also need an assumed trading incidence and realized sales price. Both of these are very sensitive to yield curve fluctuations.
- Among insurance liabilities, the cash flows are subject to mortality, lapse, and other contingencies. We are already accustomed to dealing with them.

This zero-coupon method raises several questions and additional observations.

1. Ideally, the zero-coupon calculation should be performed on the investment portfolio as a whole, probably segmented by line of business. Therefore, the required calculations will be considerably more complicated.

2. Some life insurance liabilities could extend for 50 or 75 years. Of course, few assets run that long. One remedy is to extend our discount factors using the longest observed interest rate, derived from the above method.

3. Any general-purpose method will have to include assets other than bonds.

4. The zero-coupon calculation does not measure the degree of asset-liability matching. Even with severe mismatching, the zero-coupon calculation may proceed smoothly. A badly-matched portfolio will result in a quarterly earnings roller coaster. A company with a well-matched portfolio will report earnings that are less sensitive to shifting yield curves.

5. For newly-issued single premium life or annuities, the fair value is what the policyholder has just paid the company, less acquisition costs and company profit. The net result is the "fair value" using our zero-coupon method, where as usual, the company profit is the balancing item.

   In this formulation, fair value is the product of the competing interests of
   a. insurance shoppers willing to pay a certain price,

   b. agents willing to do their work for a certain level of compensation, and

   c. insurance companies that seek a certain profit.

   Each of these free-market players operates solely in its own interest, but is constrained by the other players and by our legal environment.

6. For annual premium policies, we can view the stream of premiums as purchasing one-year term coverage and annual increases in paid up value. Thus, each policy is really a series of single premium purchases that can be analyzed as in item 5 above. This approach seems valid if we consider each renewal premium as a conscious purchasing decision. In that case, each paid premium will generate a profit only when it is received.

Some writers have observed that fair value accounting will front-end the profits. In item 5 above, single premium profits are taken entirely on the issue

Some Observations on Fair Value Accounting
continued from page 7

date. The anticipated profit is taken at the point of sale. The same could happen to annual premium policies, although item 6 offers a way to spread them over the premium paying period, treating each successful premium collection as a new sale. Under fair value accounting, subsequent profits and losses emerge only on deviations from expected, as expressed in the actuarial assumptions.

I believe that such front ending is more relevant to the purpose of financial reporting, which is helping the public to estimate the value of the company's stock. Here, a policy is sold with a certain profit expectation, which fully emerges at the time of sale. It does not seem appropriate to report subsequent profit merely for meeting original expectations. Gains or losses after issue should reflect only genuine deviations from these expectations. In particular, an adverse deviation from original expectations should be reported as a loss on that block of business. If we believe that the deterioration is permanent, we should change our assumptions and report all the future losses immediately, just as required under current U.S. GAAP.

On the other side of the coin, if the environment has permanently improved, we should likewise modify the assumptions appropriately. That's exactly what the market would do if it had the data available. U.S. GAAP has a mixed approach to such improvements.

Under U.S. GAAP, expected mortality profits (for example) are the valuation mortality minus the expected actual claims. Deviations from expected actual claims are an additional profit component. This method of disclosure is probably not very understandable to the share-buying public.

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To some extent, U.S. GAAP very roughly recognizes a fair value process. A depreciated asset has an original purchase price (market value), and many assets certainly lose market value as they age. Depreciation schedules are an attempt to simulate this erosion. The DAC asset relies on the company's initial judgment. Nobody would have paid the compensation without some apparent prospective business justification. U.S. GAAP requires ongoing monitoring of prospective DAC recoverability (ignoring past acquisition costs), implicitly recognizing the sole source of all values. Substituting the DAC recoverability ceiling for the DAC asset would probably move us closer to the spirit of fair value accounting.

Should fair value accounting replace U.S. GAAP? Any abrupt abandonment of U.S. GAAP would complicate year-by-year comparisons, because fair value accounting produces such hugely different results. Probably both methods should be publicly available. On the other hand, life insurance reporting is already cursed with at least three sets of books, (Statutory, U.S. GAAP, and Tax) and it would be a pity to make it four!

Meanwhile, stocks continue to trade at seemingly arbitrary multiples of GAAP book value (often greatly exceeding 100% during bull markets, but sometimes well below that level, especially in our own industry). This certainly suggests that the market implicitly adjusts our GAAP balance sheet. If we devise a credible system of fair value reporting, how would stock prices relate to this new book value? Dare we hope for some ratio closer to 100%?

By adjusting published GAAP statements, stock analysts already do a "quasi-fair value" financial statement. They must do this work with limited data and rule-of-thumb approximations, all under a cloud of conflicting interests. Can't we do better a better job in our own shop?

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