Article from:

The Financial Reporter

September 2001 – Issue 47

On the Fair Value of Business Acquired (part I of II)

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There is a fair amount of controversy surrounding the approach Jim Milholland [4] advocates for determining the value of business acquired (VOBA) for insurance purchase GAAP. VOBA (also known as PVP, PVFP, CIP, VIF) is the intangible asset representing the value assigned to contracts already in force. It is the portion of the total purchase price deemed attributable to existing business. It is the prospective mark-to-market of the familiar DPAC intangible asset. Long duration life contracts, in particular, would seem to require a VOBA asset, since profits in the later durations have not been earned by the purchase date. Here I will refer to the Milholland method for calculating VOBA as "MdM."

Milholland's approach is attractive, since it directly derives VOBA from a statutory appraisal. When we use actuarial appraisals to set purchase and sale prices for blocks of business, the resulting VOBA marks the balance sheet to market. Any "economic goodwill," or price paid in excess of the actuarial appraisal value of the in-force block will be allocated to GAAP goodwill, so it has also been called the "fixed goodwill" method. Ordinary direct methods (such as the EITF method, see [5] pg. 390-391) may unfairly depress earnings. They do that because they keep implicit, and may ignore, certain necessary costs insurers face when they assume risks. This translates into an excessively high VOBA and high VOBA amortization costs. The root cause of the problem is lack of clarity about the mechanism which links risk margins, cash flows, and the risk discount rate.

The dispute among accountants is whether the actuarial appraisal method - based on statutory profits and allowance for the cost of capital — distorts the resulting VOBA. "How can this stat stuff be GAAP?" is a common reaction. In this article I will try to show why MdM is consistent with direct fair valuation of an insurer's liabilities, which is what GAAP purchase accounting is all about. I will apply some of the insights that have come to light over the last few years which link the indirect actuarial appraisal valuation method to the direct "option pricing" valuation method. The bottom line is, MdM can work. However, accountants should be aware that when an actuarial appraisal clearly misrepresents the true value of a block of business, it is wrong to apply MdM. We would reject an appraisal that unfairly distorts operating expenses. The same should happen when an appraisal uses a distorted hurdle rate.

In this half of the article I will recap MdM, derive an alternate decomposition, and then interpret it using the fair valuation approach described by Luke Girard [1][2]. I'll provide a simple example to illustrate the formulas and concepts. The second installment will focus on the link between PGAAP earnings, cash flows, and the risk discount rate. It will illustrate pricing and reporting in several practical situations.

MdM Algebra

MdM uses two equations to solve for two unknowns, VOBA and the related deferred tax liability. Recall that it starts with a fair and complete buyer's actuarial appraisal of the block of business. I will use the following notation:

VOBA	Value of business acquired
DTL	GAAP deferred tax liability
ES	After tax market value of excess surplus assets
TS	Pretax book value of required surplus
EV	Appraisal value of in-force block, net of the cost of capital
PVDE	Present value of distributable earnings = TS + EV
SV	Statutory reserves
TV	Tax reserve
PGV	PGAAP reserves
PD	Tax basis proxy DAC asset balance

BVA	GAAP book value of invested assets backing SV and TS
MVA	Market value of invested assets backing SV and TS
TVA	Tax value of invested assets backing SV and TS
GW	Goodwill
PP	Purchase price

Note PP = GW + ES + PVDE
The tax rate is assumed to be 35%. In this article GW, ES and non-modeled assets/liabilities are all zero.

The MdM simultaneous equations are:

a) VOBA = EV + (PGV − SV) − (MVA − BVA) + DTL
b) DTL = 35% * [(VOBA + MVA − PD − TVA) − (PGV − TV)]

Here (b) is simply the definition of the deferred tax liability. VOBA is a pretax temporary difference while appraisal values are typically after tax, so we have to add back the DTL in (a).

In words, (a) says the VOBA is the same as the intangible portion of the appraisal value, increased to offset any PGAAP liabilities that were understated in the stat appraisal, decreased to offset any PGAAP assets that were understated in the stat appraisal, plus the amount of deferred tax liability. Since the GAAP balance sheet will show initial equity equal to the purchase price, goodwill will show up only if the buyer pays more than the appraisal value for the in-force block.

One can of course solve the original equations if all the data are available and we have high confidence in data quality. As an alternative to reviewing the stat reserves, we can solve (a) directly from the GAAP and tax books alone. Make the assumption that BVA = SV + TS and then combine the terms EV+TS and substitute with PVDE.

Then (a) reduces to:

(a1) VOBA = PVDE + PGV − MVA + DTL

and substituting the definition of DTL from (b) gives:

c) VOBA = [PVDE − 35%*(TVA + PD − TV)] / (1−35%) − (MVA − PGV)

These terms have a natural interpretation in Luke Girard's work on the fair value of liabilities.

Fair Value Algebra

Girard[1, 2] demonstrates that it is always possible to rearrange the elements of an ordinary indirect actuarial appraisal into the form

d) DDE = RSA + (1-35%)* (MVA' − MVL) + 35%*(TA' − TL), where

DDE   Discounted value of distributable earnings

RSA   Market value of the assets supporting target surplus

MVA'   Market value of assets supporting statutory reserves

TA'   Tax basis assets supporting statutory reserves, including tax DAC

TL   Tax basis liabilities supporting statutory reserves

RP   Required profit = capital charge on what the shareholder owns

MVL   Market value of liabilities, defined below

This is an algebraic decomposition, which is proved recursively. We can apply it regardless of the hurdle rate used in the appraisal.

Girard does it with a special definition of MVL. MVL is the present value, at the asset portfolio yield, of benefits, expenses, future premium, and an item called "required profit". Required profit is a charge, at the cost of capital rate, for required surplus, reserve conservatism, and tax timing differences. Each of these is part of what the shareholder owns at a given point in the projection. Alternately we can load required profit into a spread below the portfolio yield to define a discount rate to apply to product cash flows only. In either case we can perform a direct valuation of asset and liability cash flows, and reproduce the actuarial

appraisal value. We can do this for any given interest rate path and vector of hurdle rates.

To skip ahead for a moment, which set of interest rate paths and vector of hurdle rates is correct? I would advocate starting with a market-derived economic scenario set to value assets and liabilities consistently but separately. Pure insurance issues, such as uncertainty in non-economic assumptions, may further reduce the value investors would pay for the direct liability cash flows. Given the value and the fair return for assets and liabilities separately, we can determine a consistent vector of hurdle rates for net free cash flow. In practice, this approach could be used to check if the scenarios, assumptions and hurdle rates used in the appraisal process generate a materially different value from the market-based value.

In reviewing Girard [1,2], note the subscripts. MVL_t and RP_{t+1} appear circular. Next period required profit depends on today's liability but to value the liability we need required profit. It turns out it is possible to revise the definitions to remove the circularity, to start at the ending year of the projection and work backwards. That helps avoid spreadsheet errors. The original definitions are used below since they are more intuitive.

Girard defines a "tax basis adjustment" item TBA', equal to the last term of equation (d). This is capital currently invested in an interest-free loan to the government. To see that, suppose we sold the business tomorrow (and ignore tax items triggered by the sale). The buyer would assume assets with a tax value equal to TA' and tax liabilities equal to TL. That would create taxable income of TA' − TL, and the buyer would need to pay TBA' to the government. Since statutory assets backing reserves always equal statutory reserves, TBA' is residual, best estimate statutory deferred tax asset (with no valuation allowances). Note that most of this work was published before the codification of statutory accounting, so we need to distinguish TBA' from the actual statutory deferred tax liability or asset, which should be counted with the other statutory reserves or assets.

Girard [1,2] separates required surplus from the market value of other product

assets, and from the consideration of tax assets in TBA'. This is for ease of exposition. Without changing the resulting RP or MVL, we can throw them back in for this discussion of VOBA. Let

PVDE =   DDE

by definition

MVA =   MVA' + RSA
TA   =   TA' + tax basis of surplus assets
TBA =   35%* (TA − TL) = TBA' + 35%* tax basis of surplus assets

So (d) becomes

(d1) PVDE = (1−35%)*(MVA − MVL) + TBA

and related required profit is:

RP_{t+1} = (k − i) * (MVA_t − MVL_t) + [k/(1−35%)]*TBA_t

where k is the cost of capital hurdle rate and i is the return on invested assets, MVA_t

Note if TA = MVA and TL = MVL, (d1) simplifies to PVDE = MVA − MVL.

Fronting tax payments is in effect a tax on the fair value of future profits at a rate higher than the statutory percentage.

By substituting in (c) we derive:

(e) VOBA = [PVDE − TBA] / (1 − 35%) − (MVA − PGV)

In words, to calculate VOBA under (e), start with an actuarial appraisal, reduce it by the tax basis adjustment, gross it up for the tax rate, and subtract the net tangible insurance assets on the PGAAP balance sheet. This is one of the simplest and cleanest ways to apply MdM.

We need the two-step process in (e) of subtracting the TBA and then grossing up for taxes precisely because FAS 109 requires an undiscounted tax liability. There is no need to distinguish between

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temporary and permanent tax differences in this calculation. All the future tax benefits or costs are in PVDE, while TBA just reallocates part of that value to the portion that would be paid to the government at sale.

Further simplification is possible:

(f1)   VOBA = (MVA − MVL) − (MVA − PGV) using (d1) and (e)

(f2)   VOBA = PV[asset CF less liability CF and RP, at portfolio yield] − (MVA − PGV)

(f3)   VOBA = PV[pretax reported PGAAP profit margins, at a risk rate]

The profit margins in (f3) consist of earned revenues and incurred expenses for the product portfolio. Common practice is to discount the PGAAP earnings at a "reasonable risk rate," which actuaries and accountants negotiate under professional scrutiny.

By definition of MVL, (f2) follows from (f1) and shows VOBA is the same as the value of all future asset and liability cash flows, less those generated by "excess" invested assets (invested assets held in excess of the PGAAP liability).

To apply (f2), we could also project the best estimate asset cash flows, benefits and expenses together, then discount at a "risk rate." Here RP exactly measures the load for the cost of capital in the appraisal. The correct "risk rate" to apply in this situation would simply load RP as a spread onto the portfolio return. Since this calculation is highly leveraged, it may easily produce a risk rate outside of the 8% − 15% range.

The Link to GAAP

(f3) follows from (f2) with several transformations. First note that the PV of the excess asset cash flows at the portfolio yield should equal the market value of the excess assets. We are left with

(f2.1) VOBA = PV[product asset CF less liability CF and RP, at portfolio yield]

which says that VOBA is the best estimate (fully prospective) pretax investment, benefit and expense cashflows for the product portfolio, again discounted at a rate which depends on the portfolio yield and RP.

Now, what is the risk rate in (f3)? According to the minutes of the July 23, 1992 EITF meeting minutes (described in [5], p 391), the key factors to consider in establishing the risk rate are: the yields generated on similar currently issued business; the cost of capital to the acquiring entity; the discount rate implicit in the seller's offering price; the general interest rate environment; and the potential impact of changes in the regulatory environment. Critically, accounting conventions govern the relationship between the explicit *cash flows* in (f2.1) and projected future *profit margins*. The mapping between the systems used to project these two is often inexact. But let's face it, even if we could get around the systems issue, the ordinary practice of financial reporting involves setting up a range of implicit as well as sanctioned explicit margins and pads to projected earnings — which is another way of expressing our uncertainty about what the actual earnings will turn out to be.

Now, required profit (RP) as calculated above is an indirect function of our uncertainty about actual earnings. I contend that the EITF guidance is vague enough that it will usually be possible to load the calculated RP amount into reasonable (perhaps implicit) conservatism in the PGAAP reporting methods and assumptions, and to negotiate a risk rate, such that the relationship in (f3) holds. If benefit cash flows really were quite certain, there ought to be low statutory reserves, a low capital requirement and / or a low cost of capital hurdle rate, resulting in a small RP. There would also be no basis to dispute the PGAAP reserves with the auditors.

The simple example attached below has a relatively bald-faced example of what can happen under FAS 60. "True" best estimate benefits and expense cash

flows in the last period are $940. If we can make the case that $957 is a plausible, reasonable expectation for the cash flow, and then discount this at 5.3% instead of the actual asset yield of 6.9%, we get the PGAAP reserve in the example of $909. Having argued this far, it is straightforward to discount the resulting profit margin, which is the interest on the reserve less the incurred benefits, at 16% to come up with the desired VOBA.

Clearly, the risk rate must adjust for the accounting conventions that link profit margins on a GAAP basis to expected cash flows, and (like the appraisal hurdle rate) it also depends heavily on leverage. The resulting risk rate may fall outside of the 8% − 15% range, but it is hard to say whether that is unreasonable because of the wide range of functions it performs.

Finally, and most intuitively, further simplifying (f1) gives:

(g)   VOBA = PGV − MVL,

VOBA should be the margin in the PGAAP reserves, in addition to that required in a fair valuation of the liabilities. Conversely, if PGAAP reserves are fully at fair value, fully consistent with expected cash flow and risk, there should be no VOBA. Now, I don't think it is desirable to replace the reserve accounting software with currently available cash flow testing software. It is more practical to produce the PGAAP reserve with incremental changes to the methods, assumptions and data in the GAAP reporting system. Milholland[4] provides an example in which UL PGAAP liability is calculated directly, and it is greater than the account value because of a relatively high crediting rate on current policies. Initial VOBA can come from a separate appraisal calculation.

QED for installment 1 of the article — (f3) and (g) show that MdM can be consistent with GAAP. Clearly (f3) says nothing about the future amortization basis. There is no support for using statutory distributable earnings as a substitute for the required amortization basis, that is, in place of premium for FAS60, gross profits for FAS 97 and gross margins for FAS 120 products.

Note again that all of the values above

should be calculated from the buyer's perspective at the purchase date. Planned expense cuts should boost PVDE, for example. TBA should include any tax assets and liabilities that are created at the purchase, for example through an election to treat the purchase of a company's stock as if it were the direct purchase of assets. PVDE should also include tax benefits or losses created at sale. When the buyer will only take cash, for example, the sale of assets can affect the IMR and the resulting PVDE above.

If all the values are calculated from the buyer's perspective, it stands to reason that the PGAAP liability and the VOBA should also make some allowance for the friction costs that insurers necessarily incur when they assume risks in a regulated market. Under the EITF approach, these friction costs would likely be included implicitly in the valuation assumptions. MdM is simply making one of those costs explicit. The decomposition in (f3) shows the wide range of complex duties that the discount rate handles under the EITF method. Among others, it allows for uncertainty in assumptions, tax timing costs, capital costs, timing differences between when margins are earned and cash flows are paid, and leverage. To decide if the risk rate is reasonable, we need to allow for all those functions explicitly.

The best evidence that MdM is appropriate is its consistency with the appraisal hurdle rate. Given that a particular block is worth X at a hurdle rate of H, what happens if the buyer then pays X to acquire the block? Under MdM, as under fair value, the reported rate of return on equity will also turn out to be H.

If the appraisal assumptions supporting PVDE in (e) are unrealistic and off-market though, the result may be garbage. The hurdle rate is usually one of the most critical assumptions in an appraisal. As we have seen, the paradigm that projects net leveraged cash flows and discounts at a hurdle rate is a frighteningly blunt instrument. It is a challenge to demonstrate that the hurdle rate is consistent with the assumptions driving the cash flows. For instance, one can allow a margin for interest rate risk by projecting path-dependent cash flows under a scenario set; or one can use a level

scenario projection and a high discount rate. How high? Well, ask three experts and get three answers. Auditors feel manipulated by such expert opinion; their natural reaction is to disallow consideration for the cost of capital.

Fortunately a new and better understanding of what hurdle rates are and where they come from is emerging from all the recent debate on fair value. It turns out that by decomposing the functions that the risk rate performs, we can produce a stable, auditable value for the cost of capital.

The Price of Capital

In equilibrium marginal costs adjust to equal marginal price. But why is it that appraisals are usually performed with a flat constant IRR hurdle rate? It seems to imply that the acquirer will manage leverage, product mix, and overall investment risk to maintain a constant rate of return. Setting this "transfer pricing" role aside for the moment, over the life of the projection the leverage, policyholder risk, and investment risk are changing from period to period. It must be that marginal required rate of return, or "price" for the value tied up in this particular business, is changing as well.

Following Girard [1,2], if we start with a cost of capital, we can derive RP and the liability spread that produces the same value for the company. What if we don't know the hurdle rate or the price of the block? Following Girard [3], if we start with the right liability spread we can derive the implied net hurdle rate, or price of capital at that time.

The basic relationship is that

[MV assets , less value of tax costs] * (1+i)
− [Fair value of liabilities , less value of tax costs] * (1+d)
= Distributable earnings

The right asset spread is provided by investment professionals' interpretation of market rates. The right liability spread depends on the credit risk of the buyer and on investors' appetite for uncertainty in the liability cash flows. Tax costs play a critical role. The right discount rate to apply to distributable earnings is a function of the after-tax value and risk on each side of the balance sheet. This

approach can be used to determine the value of a block of business directly, under a particular scenario. Given the block's value, we can compute a level IRR consistent with future distributable earnings in that scenario. The approach can be applied with a multi-scenario set, to validate the hurdle rate level and appraisal sensitivities.

The discussion of required profit (RP) above is incomplete. One major component of it involves the taxes paid on the investment income of the assets that support conservatism in the stat reserves and target surplus. The next half of the article will shine a spotlight on that relationship. Accountants should accept MdM when it applies a leverage- and risk- adjusted hurdle rate, because the resulting "cost of capital" performs the same function that implicit and explicit margins for conservatism perform in ordinary GAAP reporting.

PGAAP is one area where fair value analysis for liabilities clearly has a place. There are complications and challenges with directly valuing assets and insurance liabilities, but the potential gains are tremendous. The gains include internal consistency, transparency, direct extension to the investment environment, and auditability. Better information provides the opportunity to create value.

Simple Example

A simple one-period example is available from the author, which applies the formulas described above. In a multiperiod projection, the beginning of period MVL must accumulate to pay benefit, expense and required profit cash flows at the end of each period and fund the MVL at the end of the period. If you're interested in receiving a copy of the spreadsheet, e-mail Joe Koltisko at *joseph_koltisko@agfg. com.*

Application tips

Here is a brief recap of some considerations presented in this article:

- To apply MdM, for example as in (e), evidence is needed that the appraisal hurdle rate is appropriate and consistent with value and risk on each side of the balance sheet. Sources of

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evidence include capital raising activities, pricing policies, debt structure, comparable transactions — all may provide some insight. Direct estimation based on the price of capital will be described in the next installment.

- Be sure that all the transactions and adjustments that will occur at close are included in the appraisal's present value of distributable earnings. These include tax and statutory effects triggered by the sale.

- In general, valuation spreads carry too much of the burden. When it is unclear where a spread comes from or how it functions, try translating it into an explicit load to cash flows. Ideally, the dollar amount and timing of such cash flow loads should be reconciled to explicit fees or potential variation in assumptions.

- Where possible, when applying a discount rate to net leveraged cash flows,

validate the result with a separate calculation of the value of the components. The appropriate discount rate for an insurer's liabilities includes a positive load for contribution to credit risk, and an adjustment downward to charge for tax costs.

- MdM does not support the use of distributable earnings as a proxy for the required amortization basis. At a minimum, capital flows and statutory conservatism need to come out of the DE stream if it is to be used for this. Since these items are greater in the early years, the net effect of using DE rather than product margins as the amortization basis probably is to front-end amortization expense for FAS 97 products.
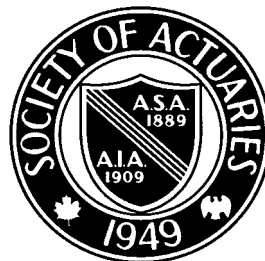
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