SOCIETY OF ACTUARIES

Article from:

Risk Management

March 2009 – Issue 15

An ERM Approach to Income Tax Risk

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THIS ARTICLE is intended to overview a number of Enterprise Risk Management (ERM) issues that arise when one considers the impact of income tax on a fair value accounting system. The article starts by developing a high level three step model of an income tax structure that can be used to understand a number of risk issues. Among the questions we use this model to address are

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1. How do we decide if one tax jurisdiction is better or worse than another? The jurisdiction with the lowest tax rate may, or may not, be the best answer.

2. How should income tax affect economic capital? We'll argue that an income tax structure effectively shares risk between a company and the tax man. This leads to a reduction in economic required capital.

3. Which income tax issues should impact the fair value of individual assets or liabilities on a fair value balance sheet? We'll get different answers depending on whether we take an "exit value" or a "going concern" point of view.

4. Are there any new balance sheet items that should appear in a fair value accounting system other than those with which we are already familiar? The current IFRS balance sheet is roughly consistent with an "exit value" point of view. A number of additional line items would be needed to make the balance sheet consistent with the "going concern" point of view taken the by European CFO Forum's approach to Market Consistent Embedded Value (MCEV).

The article concludes by arguing that the risk management community needs to decide whether it wants to manage tax related issues using the going concern model or an exit value approach.

Most of this article is written from the perspective of a stock company with shareholders but the main risk conclusions apply to other types of ownership structures as well.

HIGH LEVEL MODEL OF AN INCOME TAX STRUCTURE

Imagine a world with no income tax at all. We have an insurance entity XYZ Corp. that has determined that it needs $10 of economic capital. XYZ Corp.'s economic balance sheet looks like this:

Assets		Liabilities
MVA = 100		MVL = 90
		EC = 10
Total = 100		Total = 100

XYZ's actuaries have engineered the insurance products so that $1 of profit margin is released each year to pay for the cost of capital which we assume is 10 percent. If the interest rate earned on surplus assets is i then the expected return to shareholders on economic capital is

$$\frac{10i+1}{10} = i + 10\%.$$

STEP 1: A VERY SIMPLE TAX STRUCTURE

To start, assume the tax man takes 35 percent of all economic income (plus or minus). At this stage in our model we allow negative income taxes so there is complete risk sharing with the tax man. What are the consequences? The first consequence is that we no longer need to hold $10 of economic capital. Due to the risk sharing $6.50 is now sufficient so $3.50 can be paid out immediately to the shareholder. Assuming this has been done, and the insurance product has not been re-priced, the expected return to shareholders is now

$$\frac{(6.5\,i+1)*.65}{6.5} = .65\,i + 10\%.$$

The shareholder is, almost, neutral. The impact of the assumed tax structure is to reduce the shareholder's return by 35 percent of the interest earned on the pre tax capital. In the MCEV literature this is referred to as frictional cost.

In order to fully compensate the shareholder for this frictional cost the actuaries would have to increase the product's profit margin by the interest forgone on the capital which the tax man has implicitly contributed i.e., 3.5i. Assuming i = five percent the new margin is 1.18 = 1 + .05 × 3.5. Note that this is not the same as grossing up the pre tax profit margin to 1/(1-.35) = 1.54 as might seem intuitive.

"The lower tax rate is offset by higher economic capital."

Two high level conclusions at this stage of the argument are

- Income taxes are somewhat like shareholder dividends in that they compensate the tax man for implicitly contributing 35 percent of the economic capital. For the remainder of this article it will be useful to think of the tax man as a special class of investor.

- The frictional cost issue is an example of a bias that favors the tax man at the expense of the common shareholder, unless the company passes the cost through to the policyholder.

STEP 2: THE TAX MAN INTRODUCES HIS OWN ACCOUNTING SYSTEM (but we still allow negative income tax)

In most tax jurisdictions companies must put together tax balance sheets and tax income statements that can be very different from their economic or accounting financial statements. However, in most jurisdictions it is still possible to understand the difference between taxable income and economic income as a combination of temporary differences and permanent differences. A little bit of algebra may help here.

Let's assume we can calculate income tax as follows (we'll pick up any shortcomings of this assumption in Step 3 of our tax model).

$$Income\ Tax = Tax\ Rate\ [(ACF - \Delta A^{Tax} - PD^{A}) - (LCF - \Delta V^{Tax} + PD^{L})]$$

Here *ACF* is the Asset Cash Flow received from invested assets and ΔA^{Tax} is the change in tax base of the company's assets. These two terms add up to the taxable investment income generated by the assets. The term $-PD^{A}$ represents a permanent difference[1] to taxable investment income arising from the assets.

The taxable investment income is offset by an analogous term coming from the liability side of the balance sheet which one could think of as the tax deductible interest along with any relevant liability related permanent differences.

The details of how tax values are determined, and what qualifies as a permanent difference, vary greatly by tax jurisdiction and the legal status of the tax payer. Fortunately, we won't need to know most of these details but some life insurance examples may help to clarify the discussion. The last example in this list will be important later.

- For many jurisdictions a bond asset is valued at amortized cost for tax purposes. In the United States this rule is used unless the bond was bought at a discount. The U.S. tax regime does not recognize any amortization of purchase discount as taxable income until the bond is sold or matures.

- In most jurisdictions the tax base of an asset resets to market value when the asset is sold.

- In the United States, an example of a favorable permanent difference is the Dividend Received Deduction or DRD which allows a portion of the dividends received from assets to be deducted from taxable income.

- In Canada, life insurers must pay a federal investment income tax on behalf of their policyholders. This tax is not deductible when computing the company's corporate income tax in the province of Quebec. This is an example of an unfavorable permanent difference.

- In the United States, equity investments are generally valued at cost for tax purposes. In Canada they are valued at market on the tax balance sheet.

- In most European jurisdictions the tax base of an insurance liability resets to market if sold from one insurer to another. This is not true in the United States where the tax base of an insurance liability is effectively fixed by a formula defined in the tax code.

How does this impact the company's relationship with the tax man? One way to analyze the situation is to break the income tax payments into three pieces that we will call asset taxes, economic taxes and liability taxes in this article.

FOOTNOTES:

[1] Our sign convention for permanent differences is that a positive amount is favorable to the company.

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The is done by adding and subtracting the Economic Investment Income (*Econ II*) and Economic Required Interest (*Econ Req'd I*) from the basic tax equation. We then write

$$\begin{aligned} \textit{Income Tax} = & \\ & \textit{Tax Rate}\ \{[(ACF - \Delta A^{Tax} - PD^{A}) - \textit{Econ II}] && \text{Asset Tax} \\ & +[\textit{Econ II} - \textit{Econ Req'd I}\,] && \text{Economic Tax} \\ & +[\textit{Econ Req'd I} - (LCF - \Delta V^{Tax} + PD^{L})]\} && \text{Liability Tax} \end{aligned}$$

The middle term in this equation is, roughly, the income tax payable in Step 1 of our tax model while the first and last terms clearly reflect the impact of timing differences and permanent differences coming from the assets and liabilities respectively.

STEP 3: THE "TAX MAN'S PUT" OPTION

No doubt most readers of this article are ready to point out that the first two steps of the tax model outlined here have missed a significant element. In terms of the tax man as shareholder concept he not only defines his own dividend mechanism (Step 2) but he is usually able to limit his downside participation in the company's fortunes. Again, the details of how this works vary greatly from one tax jurisdiction to another. We will refer to this limit on the ability of the company to pass risk through to the tax man as the "Tax Man's Put" option.

Some specific examples of the "Tax Man's Put" at work are

- Most tax codes do not allow negative taxes per se. Tax losses can often be carried back to prior years or carried forward to future years. There are usually well defined limits on how much of this can be done.

- In Canada, non-capital tax losses can be carried back three years and forward indefinitely. Capital losses can be carried back three years and forward indefinitely but can only be applied against capital gains.

- In the United States capital losses on some asset sales can only be used to offset capital gains on similar assets.

This kind of rule puts some constraints on a company's ability to manage the asset taxes described in Step 2. Interestingly this is not entirely a one way street. It is the author's experience that tax specialists in many tax jurisdictions are fully aware of tools and transactions that can manage the potential impact of the "Tax Man's Put." This is often a significant activity within a company's tax department.

TAX MODEL SUMMARY

While short on detail the three step model developed so far does go a long way toward explaining the economic relationship between the company and the tax man. Because risk is being shared with the tax man he can be thought of as a special class of investor. From a risk perspective income tax payments are therefore more like shareholder dividends than expenses.

It is quite possible that a tax structure of this type can work to the shareholder's advantage. In a jurisdiction, such as the United States, the company has some freedom to manage the asset taxes while a conservative liability tax valuation basis can create a negative liability tax. The net result could well be that the present value of actual taxes is less than the present value of economic taxes.

Since the economic taxes are essentially the "right" taxes for the risk being transferred (remember the shareholder was paid $3.50 in Step 1), this could mean that the tax man is being paid less than he should be paid relative to the risk he is taking. If this is, in fact, the case then the tax structure is working to the advantage of the actual shareholders even though income taxes are being paid.

In terms of the first question posed at the beginning of this article we see that an enterprise wide perspective needs to be taken when considering an issue such as moving business from one tax jurisdiction to another. If we move business into a lower tax rate jurisdiction a large part of the benefit of the lower tax rate is offset by the cost of holding higher amounts of economic capital. Additional issues such as frictional cost, timing differences, permanent differences and the "Tax Man's Put" therefore need to be considered before drawing a conclusion.

IMPACT ON A FAIR VALUE BALANCE SHEET

In this section we'll use the simple tax model to understand how tax issues should impact a fair value balance sheet.

Assume we have an asset on the balance sheet whose observable transfer or market price is A. If we sell the asset and receive cash of A we generate marginal taxable income equal to $\tau[A - A^{Tax}]$ where τ is the current marginal tax rate. If we take an "exit value" philosophy toward the balance sheet then the asset should be valued at $A + \tau[A^{Tax} - A]$ to reflect the net cash on hand after the asset sale. This can be done by putting a Deferred Tax on Asset (*DToA*) line item onto the asset side of the balance sheet. In this case $DToA = \tau[A^{Tax} - A]$. Similarly we need a Deferred Tax item on the liability side $DToL = \tau[V^{Tax} - V]$ where V is the transfer price of the liability. The balance sheet now looks like this.

	Assets	Liabilities
Transfer Price	A	V
Deferred Tax	*DToA*	*DToL*
Market Value	$MVA = A + DToA$	$MVL = V + DToL$
		Capital
Total Balance Sheet	$MVA = A + DToA$	$MVL + Capital$

We next ask whether income tax issues should impact the prices at which financial instruments trade in the market place. As a general principle, we can say that a tax issue will affect the transfer price to the extent that it impacts all relevant market participants in the same way. Some examples help to clarify this idea:

- In the United States, most U.S. tax payers receive a tax benefit by owning a municipal bond. This benefit is reflected in observed market prices.
- If an insurance liability generates a permanent difference this will be a benefit or cost to all legally empowered insurance carriers in that jurisdiction. Two insurers negotiating the transfer of such an insurance liability should therefore put a value on the permanent difference.

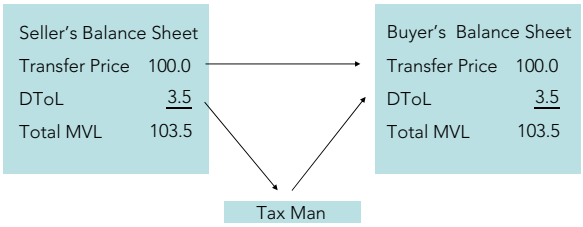
  Simple arbitrage arguments show that if a financial instrument generates a tax benefit in the amount τPD then this cash flow needs to be grossed up by $1/(1-\tau)$ before it is included in the instrument's cash flow stream and discounted into the transfer price. When this transfer price adjustment is tax affected through the *DToA* or *DToL* the net impact on the balance sheet is just the risk neutral present value of the tax benefit or cost.
- If an asset generates no permanent differences then arbitrage arguments show that the transfer price of the asset should equal the risk neutral present value of that asset's cash flows *provided the tax base of the asset resets to market when it is traded.* Since the tax base of most assets do reset to market, in most jurisdictions, this explains why most modern finance books can ignore tax issues.

If the tax base of the asset did not reset to market then the simple act of buying an asset would generate a taxable gain or loss. This would affect the transfer price.

- As noted earlier, in the United States the tax base of an insurance liability does not change when it is transferred from one carrier to another. As illustrated in the graphic below the main implication is that the entire *MVL* effectively moves from seller to buyer with the *DToL* passing indirectly via the tax man.

Simple Insurance Block Transaction (U.S.)

Example: Transfer Price = 100, Tax Value = 110, Tax Rate = τ 35%



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Once this picture is appreciated arbitrage arguments show that the total *MVL* must be the risk neutral present value of liability cash flows, distributable earnings and future liability[2] income taxes. The transfer price of the liability is then determined from the relation $MVL = V + \tau[V^{Tax} - V]$ since this is the price at which an insurer is indifferent between manufacturing the liability itself or paying a third party to do it.

In this article I will refer to this valuation model as the "going concern" approach since this is also the value we would put on the liability (or asset) if we were selling it to ourselves. In general this is different from the standard valuation approach which I will call the "exit value" model. The reason the two values are different is that a market transaction usually changes the present value of taxes payable to the tax man and that change in value must work its way through to the transacting parties.

If we work through all the algebra we find that to calculate the transfer price in the "going concern" model we need to do the following calculation:

$$ {}_tV = E_t^Q \frac{CF_{t+1} - i_t\tau({}_tV^{Tax} - {}_tV) + \frac{DE_{t+1} - \tau PD_{t+1}^L}{1-\tau} + {}_{t+1}V}{1+i_t}. $$

In this formula *CF* represents the cash flow being valued, *DE* is a distributable earnings term and E_t^Q is the risk neutral expectation operator. The key new feature to emerge here is the term $-i_t\tau({}_tV^{Tax} - {}_tV) = -i_t DToL$. What the analysis has told us is that when the tax base of a financial instrument does not reset to market on sale then the transfer price should be reduced by the present value of interest earnings on the *DToL*. This effectively turns the *DToL* into an interest bearing liability.

An intuitive way to understand this result is to think of the *DToL* as an interest free loan from the Tax Man to the company. If positive, this creates an economic benefit and if negative this creates an economic drag. Since this benefit or cost is the same for all relevant holders of the insurance liability it makes sense that the markets would recognize[3] it in an arm's length transaction. In this article we will call this transfer price adjustment the Value of Liability Timing Differences *(VLTD)*.

A short summary of the above discussion is that tax issues can affect the prices at which financial instruments trade in the market place. Two simple rules have emerged:

- Permanent differences are reflected in transfer prices.
- Temporary differences are generally not reflected in transfer prices. U.S. insurance liabilities are an important exception.

ENTITY SPECIFIC TAX ISSUES

The discussion so far has ignored a number a number of tax issues that are entity specific in the sense that we cannot look to an external market to put a value on them. Four examples that will be briefly discussed here are

- The Value of Asset Timing Differences (*VATD*) and the Value of Liability Timing Differences in jurisdictions where the tax base resets to market on sale.
- Tax Loss Carry Forwards
- Frictional Cost on non-hedgeable risk capital
- The "Tax Man's Put"

One thing all of these issues have in common is that they have value to an insurer when viewed from a going concern perspective but may have no value at all, or a very different value, when an exit value perspective is taken. We can't finalize the balance sheet until we take a position.

The *VATD* arises from the idea that an asset could be worth more, or less, to an insurer than it is to an external party. If an asset has a large unrealized gain then selling the asset immediately accelerates the payment of income taxes that would otherwise be paid at some point in the future. The asset is therefore worth more to the current owner than it is to an external third party. The reverse could also be true.

FOOTNOTES:

[2] As defined in Step 2 of the simple tax model.
[3] Note that we aren't really saying anything new here. Traditional actuarial appraisal methods recognize these tax issues, and others, since they are based on "going concern" principles.

If we knew how long we were going to keep each asset then we could put a value on the timing differences by using the "going concern" valuation model described earlier for U.S. insurance liabilities. This would give us a new going concern adjusted transfer price $GCA = A + VATD$ and a new deferred tax item $DToA = \tau[A^{Tax} - GCA]$.

The *VATD* issue is not part of most[4] accounting models at this time which makes the issue almost invisible from a risk management perspective. In the author's opinion this is not good ERM practice.

Tax Loss Carry Forwards are considered by most current accounting models. In terms of our simple tax model we can value a tax loss carry forward as a sequence of future permanent differences. There is a practical issue of estimating how quickly the losses can be used.

In Step 1 of our tax model we introduced the idea of frictional cost equal to the tax on the interest earned on economic capital. To the extent this capital is required for non-hedgeable risk then the frictional cost can be covered off by adjusting the insurer's profit margins as indicated earlier. However, if the capital is there because the insurer is taking credit risk or mismatch risk, risks that could in theory be hedged away, then the insurer must absorb the frictional cost loss. A true going concern approach to the balance sheet would present value this frictional cost and establish an appropriate liability.

The "Tax Man's Put" liability can thought of as the final item needed to get a going concern balance sheet right after all of the other items have been valued in isolation. In practice this would require some modeling to see if the other balance sheet items are over or under providing for future taxes.

A model going concern balance sheet is illustrated in the table above. It should be compared to the exit value model presented earlier.

	Assets	Liabilities
Transfer Price	*A*	*V*[5]
Tax Timing Differences	*VATD*	*VLTD (0 in the United States)*
Going Concern Value	*GCA=A+VATD*	*GCV=V+VLTD*
Deferred Tax	*DToA*	*DToL*
Market Consistent Value	*MVA=GC A +DToA*	*MVL = GCV + DToL*
		Frictional Cost etc.
		Tax Man's Put
		Capital = MCEV
Total Balance Sheet	*MVA =GC A+ DToA*	*Total Liabilities & MCEV*

If someone asks whether all relevant taxes have been included somewhere in the balance sheet we can answer in the affirmative. Going back to the tax model introduced earlier we can are now in a position to make the following statements

1. All asset related taxes are captured on the asset side of the balance sheet. Permanent differences are reflected in the transfer price while timing differences are captured through a combination of the *VATD* and *DToA*.

2. All liability related taxes are captured in the same way as above.

3. Economic Taxes are in a number of different places. If the liabilities have been valued using the cost of capital approach to setting fair value margins then most of the economic taxes are already captured in the transfer price of the liability. One exception is the frictional cost tax on any economic capital which was not contemplated in the liability valuation. An example could be the frictional cost associated with holding hedgeable risk.

FOOTNOTES:

[4] One exception is Canadian GAAP. For the past decade Canadian actuaries have been putting a value on the timing differences, for assets backing actuarial liabilities, and then presenting them as an adjustment to the actuarial liabilities.

[5] The *VLTD* is included in the transfer price *V* in the United States.

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Compared to IFRS this is a very strange looking balance sheet but it can be shown that this is what the balance sheet must look like if we want to comply with the European CFO Forum's Market Consistent Embedded Value (MCEV) principles. A key difference between MCEV and IFRS is that MCEV takes the going concern philosophy to heart whereas IFRS is largely, but not completely, on an exit value basis.

The table below compares IFRS and MCEV to theoretically "pure" implementations of the exit value and going concern concepts for the entity specific issues discussed in this article.

Issue	"exit value"	"going concern"	IFRS	MCEV
Timing Differences	No, if tax base resets on sale	Yes	No	Yes
Tax Loss Carry Fwd	No	Yes	Yes	Yes
Frictional Costs	No	Yes	No	Yes
Tax Man's Put	No	Yes	Yes	Yes

CONCLUSIONS

This article has surveyed a wide range of tax and risk related issues. One very clear ERM issue to emerge is that we have to decide whether we want to manage risk using the "exit value" model implicit in IFRS or adopt the "going concern" model that is consistent with MCEV. Both points of view have merit but they can lead to different risk management conclusions.

For example, going concern actuarial liabilities are typically longer than their exit value counter parts. This has A/L M implications.

The going concern model is broadly consistent with the traditional actuarial appraisal approach to valuing an insurance enterprise. Unfortunately, fully implementing this approach would require a number of modifications to the IFRS balance sheet. In the author's opinion this is what the risk management community should lobby for. If we don't, then we could end up working with financial statements that don't reflect all of the relevant economics. This would not be good for ERM practice as most managements will likely focus on risk as measured by those financial statements.

ACKNOWLEDGEMENTS

The author would like to acknowledge a number of friends and colleagues who took the trouble to review and comment on an earlier draft of this article. They are Chris Humphreys, FSA, FCIA, Luke Girard, FSA, CERA, FCIA, and Mark Polking, CPA. ✦