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the guide, and the section(s) in which they are referenced. The appendix provides users of the guide an opportunity to navigate through the guide based on reference(s) of interest, to identify all the sections in which a particular reference appears or to determine the scope of the references.

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As the Dust Settles: Valuation Approaches for FAS 133 DIG Issue B36

By Steven D. Lash, Rebecca Kao Wang, Tara J.P. Hansen

Editor's Note: The section's GAAP listserve would be an appropriate forum for discussing concepts in this article.

As the whirlwind of activity on FAS 133 Implementation Issue B36 (DIG Issue B36 or B36) begins to fade, it is time to assess and evaluate the results and ramifications of the approaches adopted by many companies. FAS 133 DIG Issue B36, "Embedded Derivatives: Modified Coinsurance Arrangements and Debt Instruments That Incorporate Credit Risk Exposure That Are Unrelated or Only Partially Related to the Creditworthiness of the Obligor Under Those Instruments" has been effective for public companies that follow U.S. GAAP since the first fiscal quarter beginning after September 15, 2003. For most companies, year-end 2003 was the first time the embedded derivative was reported.

Most modified coinsurance (ModCo) and coinsurance with funds withheld (CFW) treaties clearly fall within the scope of B36. As companies learned, there were many other types of contracts that became caught in the web of B36, such as surplus relief treaties including coinsurance transactions with experience refunds or special commutation provisions, pension participation products, and any receivable or payable where interest is determined by reference to an actual pool of assets that contain third party credit risk. The presence of third-party credit risk triggers the need for both parties to bifurcate these embedded derivatives.

DIG Issue B36 was deliberately vague in defining the host contract and the embedded derivative, and did not specify any valuation methodologies. As companies assessed and studied compliance with DIG Issue B36, three main methodologies materialized in characterizing the derivative that should be bifurcated and valued: (1) as a credit derivative, (2) as a total return swap with a floating leg (TR Floating), and (3) as a total return swap with a fixed leg (TR Fixed). This article will examine these methods in more detail and also discuss what the results might mean to management and shareholders.

Credit Derivative

A credit derivative captures only the credit risk in the underlying portfolio of assets. To use this type of approach to characterize the derivative, a company needs to first determine if there are other risks, such as interest rate risk, that are not clearly and closely related to the host contract. Paragraph 13 of Statement 133, as amended by Statement 149, provides guidance on interest rate risk determination. Most companies have taken the position that, for their ModCo or CFW treaties covering non-variable products, interest rate risk is not clearly and closely related to the host contract. They found it difficult to argue that both conditions set out in Paragraph 13 could never exist. For example, if the interest rates increase dramatically, resulting in high lapses, a company can be forced to sell a significant portion of the supporting assets with considerable capital losses. The hybrid instrument, or the reinsurance contract, could contractually be settled so the reinsurer would not substantially recover all of its initial recorded investment. In this situation, Paragraph 13 indicates that the interest rate risk is not clearly and closely related to the host contract, so its bifurcation is required.

If, after analyzing Paragraph 13, a company determines that its interest rate risk is clearly and closely related to the host contract, only the credit risk would be bifurcated and valued. The value of the credit derivative is zero at inception, per DIG Issue B20. For future valuation dates, a measure of credit risk, such as a spread to London Interbank Offered Rate (LIBOR) or treasuries, is obtained for each asset in the underlying portfolio. The credit derivative would be calculated by isolating the change in the present value of asset cash flows attributable only to the changes in credit risk.

The advantage of a credit derivative approach is that it measures only credit risk, uncomplicated by other risk factors, and may result in the smallest derivative value, compared to other methods discussed below. The magnitude of this derivative, as compared to a TR Swap derivative, will depend a great deal upon any offsetting interest and credit spread movements. Few companies have found this method acceptable because of the difficulties in obtaining and maintaining the required credit data for a portfolio that includes assets other than fixed-income securities; for instance, real estate.

TR Swap

There are several reasons most companies have adopted the total return swap approach. First, as noted above, they determined that interest rate risk is not clearly and closely related to the host contract. A total return swap not only captures credit risk, but interest rate risk as well. Moreover, a total return swap approach provides more transparency to shareholders. For instance, interest rate risk will be reflected in a total return swap, but not in a credit derivative.

The basic formula to calculate a total return swap is:

(Market Value of Assets minus

Book Value of Assets)

minus

(Market Value of Loan minus
Book Value of Loan)

In the calculation, it is presumed that the book value of the loan will always equal the statutory reserve, which generally will equal the statutory book value of the assets. For the transactions where these amounts are not equal, adjustments to balances will need to be made in order to determine the proper asset market value to be allocated to the block. Statutory reserves and ModCo/CFW net reserves, which may reflect other items such as interest maintenance reserve (IMR) or ceding commission withheld, will be interchangeable for the rest of this discussion.

At treaty inception, the value of the derivative should be zero. However, in practice, assets supporting a treaty do not always have book values that are equal to market values at treaty inception. Adjustments to the derivative value at future valuation dates will be needed to account for this opening difference between market and book values. There are several possible approaches to account for this difference. If detailed asset data is available, a company can track the assets that give rise

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A total return swap not only captures credit risk, but interest rate risk as well.

to the opening difference. As these assets mature or are sold, the opening difference will decline and the adjustment will be amortized exactly. If detailed asset data is not available, it may be reasonable to approximate this opening adjustment runoff over the life of the assets using a simplified approach, such as a straight-line or declining-balance method. Other companies may ignore this difference if it is immaterial.

TR Floating

For a total return swap with a floating leg, the second part of the equation above collapses to near zero, assuming a regularly resetting loan rate; hence the book value of the loan will always equal the market value of the loan. Therefore, the derivative would equal the unrealized gain or loss on the portfolio. Many ceding companies have opted for this approach because of their ability to use DIG Issue B36's Financial Accounting Standard 115 (FAS 115) "mulligan," which allowed a one-time reclassification of securities from the held-to-maturity or available-for-sale categories into the trading category. Most ceding companies have made this election such that assets held in their trading accounts offset income volatility from the TR Floating embedded derivative.

There are several challenges to consider with the FAS 115 mulligan election. Assets must be reclassified in whole. This is problematic when the quota share is not 100 percent or when the assets are in the company's general account instead of a segregated portfolio. Certain assets are harder to divide into parts than others. For example, most fixed-income securities are sold in units and could, therefore, be allocated among classifications at the level of individual units; other assets, such as private placements, may not be structured into divisible units and would have to be reclassified into the trading account as a whole or not at all. Furthermore, future asset turnovers and new asset purchases will need to be assessed carefully in light of the divisibility constraint.

Obtaining the market value of an asset is not always a trivial exercise. Certain assets have no observable market value. For example, mortgage loans are not FAS 115 assets and were not required to be reported at fair market value on a quarterly basis. However, if mortgage loans are used to back a DIG Issue B36-affected reinsurance treaty, the company has to perform additional analysis to determine the fair market values at each filing date. In general, companies will have to review the underlying asset portfolios more carefully to ensure the market values are updated at each quarterly reporting date for the purposes of calculating the B36 derivative.

TR Fixed

The other approach that has had significant attention in the marketplace is a total return swap with a fixed debt host. This approach assumes the total return is paid on the portfolio in return for interest on the hypothetical fixed-rate loan. The challenges in analyzing the nature of this loan are in determining how it theoretically repays and how the interest rate on the loan is determined. If these factors are chosen appropriately, this derivative will have the same value as a credit derivative, assuming that the asset and liability cash flows are matched. If the assets and liabilities are not cash flow matched, this derivative will measure the value of a credit derivative plus the "value" of any cash flow mismatch.

Two critical items are needed to calculate the market value of the loan: the interest rate on the hypothetical loan and the payoff pattern of this loan. At inception of the swap, the rate on the loan is based on the current swap curve, which will be referred to as risk-free for the rest of this article for illustrative purposes. Moreover, at inception, the book value of the hypothetical loan is equal to the statutory reserve. There are several approaches to determining the pay down pattern of this loan.

Some have argued that the loan pay down follows that of the statutory reserve. A difficulty with this approach is that statutory reserves may increase, and when they do, the increases are future new loans that should not be reflected at the current valuation date. Other ways to determine the pay down of the loan involve the liability cash flows.

Liability cash flows typically consist of premiums, death benefits, annuity payments, surrenders, premium taxes, commissions and

expenses. There are several arguments as to whether all or a subset of these items should be used.

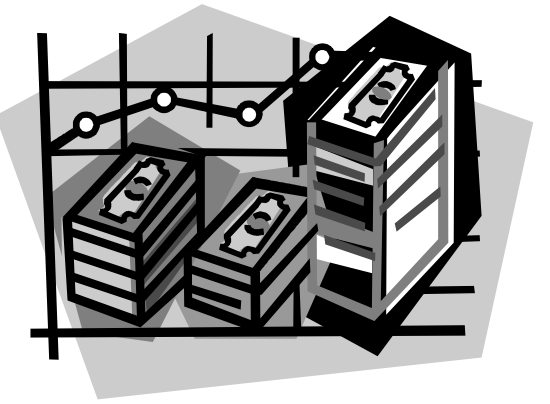
One view is to use only the premiums and benefits to represent the shape of the loan payoff. A key premise is that the level of the loan is based on the statutory reserves, which, by first principles, are determined as a function of premiums and benefits. However, this approach faces the same issue as the statutory reserve method described above, especially for certain products where premiums may be heavily front ended.

An alternate view is to use all of the liability cash flows listed above to represent the shape of the loan payoff. The argument for using this approach is that Commissioner's Reserve Valuation Method (CRVM) and Commissioner's Annuity Reserve Valuation Method (CARVM) reserves typically have a provision for expenses and therefore, expenses should be included. Additionally, when cash flow testing is performed on a statutory basis, expenses and commissions are considered. A shortcoming with this approach is that the expenses and commissions included may not relate to the run off of the loan. For example, an expense allowance in a ModCo treaty is contractually negotiated and is not related to the loan. Yet, its inclusion in the liability cash flows will produce very different results in the derivative calculation.

Another view is to use only benefits, including deaths, surrenders and annuity payments, as a basis to run off the loan. The argument for using this approach is that reserves are used for future benefits, and the pattern of the benefits best represents how the loan is being paid off over time.

The next step to consider is the determination of the appropriate fixed interest rate for a TR Fixed. Two approaches have generally been discussed: the "asset" approach and the "liability" approach. Both approaches use swap rates as the basis of setting the loan rate. Additionally, both methods fix a swap curve at a particular date and require the corresponding implied forward yield curve at each future valuation date.

The asset approach assumes the synthetic credit exposure is established or eliminated with the purchase and sale of each security in the portfolio of managed assets, and therefore, the embedded derivative relates to the "asset."



That is to say, the B36 derivative is asset driven, so the debt host must be asset-based. Those favoring the asset approach typically believe that, since the synthetic exposure to third-party credit risk in the assets first initiated the need to bifurcate this embedded derivative, then the fixed rate of the hypothetical loan should be based on the assets. The fair value of the swap in this case equals the "mark to market," or the difference between market and book values, on the assets under management offset by the mark to market on the hypothetical loan, based on the swap rates that were prevailing when the underlying assets in the portfolio were purchased. In other words, the embedded derivative relates to the portfolio of assets.

The liability approach assumes the initial host loan is a series of fixed-rate obligations starting on the later of the dates the underlying liabilities are issued or the inception of the reinsurance treaty. Those favoring the liability approach typically believe the debt host should look to the most stable and static element of the ModCo contract: the long-dated reserves themselves—and not the continuously managed asset portfolio. In this case, the fair value of the swap equals the mark to market on the assets under management, offset by the mark to market on the hypothetical loan based on the swap rates that were prevailing when the underlying policies were issued or the reinsurance treaty was initiated, for the expected duration of the policies. In other words, the embedded derivative relates to the individual policy or reinsurance issuance, the "liability."

If assets in the portfolio were never sold and the liabilities were static, both approach-

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es would generally result in derivatives of similar value, except for the effect of renewal premium and increases in assets due to increases in reserves. However, in cases where assets are sold or replaced, or there is a significant dump-in premium on existing policies, the two approaches can give drastically different results.

When an asset in the portfolio is sold and replaced, any realized capital gain or loss is usually settled through the mechanism specified in the reinsurance treaty. Under both the asset and liability approaches, the unrealized gain or loss on the replacement assets is zero after the sale, since the market value of the assets equals the book value of the assets and also equals the book value of the loan. This requires that the assuming company makes certain that the book value of the assets are always no less than the statutory reserves by making payments to the ceding company when the book value of the assets falls below the level of the reserves. The key distinction between the asset and the liability approaches is in determining the new market value of the loan, as demonstrated in the following simple example.

Simple TR Fixed Example: Asset vs. Liability Approach

At inception, assume that the market value (MV) and book value (BV) of assets as well as the MV and BV of the loan are all valued at $1,000. Thus the embedded derivative for TR Fixed is zero. Further assume that, if credit spreads widen by 1 percent, while the risk-free rates increase by 1 percent for a total interest rate movement of 2 percent, the resulting decrease in MV of the assets will be $200. Since the value of the loan only reflects risk-free rate movements, the MV of the loan becomes $900. Therefore the value of the TR Fixed derivative is equal to:

(MV Asset – BV Asset) – (MV Loan – BV Loan),
or (800 – 1000) – (900 – 1000), or –100

This amount is a liability to an assuming company or an asset to a ceding company.

Taking the posture of the assuming company, the $100 loss represents the widening of credit spreads and is reported into income. The movement in risk-free rates has no effect in this example, because the movement in the loan value offsets the movement in the asset value, assuming that there is cash flow matching between the assets and liabilities.

Suppose that in the next reporting period the ceding company sells the asset and realizes the $200 capital loss. Under both methods, the reinsurer needs to pay the ceding company $200 to bring the value of the assets equal to the value of the statutory reserves of $1,000. However, under the asset method, the original swap is viewed as having been settled and a new swap with the new asset is initiated. This new swap has a fixed interest rate at today's higher rate, and the MV and BV of the loan are equal. In sum, the derivative resets to zero and the reinsurer would report a $100 loss in income. This $100 loss in income plus the loss of $100 on the derivative in the prior period equals the total loss on the asset of $200. The derivative calculation under the asset method in the case of asset sale is as follows:

(MV Asset – BV Asset)
– (MV Loan – BVLoan),
or (1000 – 1000) – (1000 – 1000), or 0.

Under the liability approach, since the swap rate is set when the liability is established, there is no effect on the loan calculation due to asset sale, assuming the liability is still in place. Therefore, the corresponding derivative calculation under the liability method is as follows:

(MV Asset – BV Asset)
– (MV Loan – BV Loan),
or (1000 – 1000) – (900 – 1000), or 100.

This amount is an asset to an assuming company or a liability to a ceding company.

That is, the assuming company has a change in derivative of $200, with a movement from -$100 in the first period to $100 in the second period. So, at the time of the sale of the asset the reinsurer has no income impact, because the loss of $200 is offset by the positive change in derivative of $200. This $100 derivative will amortize into income over the life of the hypothetical loan.

Given the lack of clarity and guidance in DIG Issue B36, either the asset approach or the liability approach appears acceptable. The asset approach is preferred by those who like the parity of the assuming company recognizing a realized gain or loss at the same time that the ceding company does. While DIG Issue B36 is silent as to whether such a result was proscribed or even intended, there is an appeal to this parallel result. Those who prefer the liability approach believe that it is more faithful to FAS 133's concept of a host instrument, where the host is characterized in such a way as to minimize the need to be redefined frequently. They emphasize that in a typical ModCo relationship, the asset turnover is much more frequent than the liability turnover.

Table 1

Reinsurer B36 Result (000s)	9/30/2003	12/31/2003
(1) MV Asset	1,036,093	1,124,256
(2) BV Assets	969,430	1,066,913
(3) MV Loan "Asset Method"	1,074,711	1,150,542
(4) MV Loan "Liability Method"	1,103,845	1,169,313
(5) BV Loan	969,430	1,066,913
ED Using TR Floating (1) - (2)	66,663	57,343
ED Using TR Fixed "Asset Method" (1) - (2) - [(3) - (5)]	(38,618)	(26,286)
ED Using TR Fixed "Liability Method" (1) - (2) - [(4) - (5)]	(67,752)	(45,058)

Moreover, each approach also appears consistent with the guidance of DIG Issues B15, B19 and B20. Needless to say, all companies should seek the guidance and counsel of their audit firms. The SEC has acknowledged there may be different approaches to define the hypothetical host, and furthermore, the ceding company and the assuming company may arrive at different answers for the two sides of the same contract.

Real-World Example

In practice, the B36 embedded derivative calculation and analysis are much more complex than the previous example. The following analysis relates to an actual single premium fixed annuity block under a ModCo treaty reported under B36. The results have been modified to protect the confidentiality of the actual companies and agreement. This analysis is performed from the perspective of the assuming company. The analysis would be similar, but with reversed signs, from the perspective of the ceding company.

Table 1 shows the DIG Issue B36 results as of 9/30/2003 and 12/31/2003, where "ED" refers to embedded derivative.

This example demonstrates that the choice of derivative valuation method can give vastly different results for the reinsurer. Critics of B36 point to this disparity of results as the primary reason B36 makes results less transparent to management, shareholders and policyholders. However, a careful analysis of the results can offer some insight into a company's risk.

To understand the results, it is instructive to perform an attribution analysis of the derivative and split it into its component parts. Broadly, the total return derivative with a floating leg, or the unrealized gain or loss on the portfolio, is equal to a risk-free portion and a credit spread portion. That is:

TR Floating ("TRFL") = Risk Free ("RF")
plus Credit Spread ("CS")

In reality, CS includes all items except RF, such as the liquidity spread or any other spreads above the risk free rates included in the yield on an investment.

The TR Fixed derivative under the asset approach measures CS plus any value of the mismatch in cash flows between assets and liabilities, as the movements in the hypothetical loan are parallel to and offset any risk-free rate movements in the asset portfolio. The liability approach measures the same items plus the unrecognized realized gains or losses due to risk free rate movements as described in the simple example earlier. That is:

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Table 2

Value of Reinsurer's Derivative Due to:	9/30/2003	12/31/2003
(1) Risk Free Rates (RF)	95,075	74,837
(2) Credit Spreads (CS)	(28,412)	(17,495)
(3) Cash Flow Mismatch (CFM)	(10,207)	(8,791)
(4) G/L on Loan (UGL)	(29,134)	(18,772)

TR Fixed Asset Approach (TRFX) =
CS plus Cash Flow Mismatch (CFM)

TR Fixed Liability Approach (TRFXliab)=
CS plus CFM plus Unrecognized
Realized G/L on Loan (UGL)

With these broad definitions, a derivative attribution analysis can be developed to further understand the results. Several steps are needed to complete this analysis.

First, the liability cash flows are replaced by the asset cash flows to eliminate any cash flow mismatch. As CFM is eliminated, the resulting TR Fixed using the asset approach and without cash flow mismatches, TRFX2, approximates a credit risk only derivative. That is,

$$CS = TRFX2.$$

Then, RF can be solved using the following:

$$TRFL = RF + CS = RF + TRFX2,$$
or
$$RF = TRFL - TRFX2.$$

Next, the cash flow mismatch component CFM can be solved using the original TR Fixed derivative with the asset approach.

$$TRFX = CFM + CS = CFM + TRFX2,$$
or
$$CFM = TRFX - TRFX2.$$

Lastly, the UGL is calculated as the difference between liability TRFXliab and the asset approach TRFX.

$$TRFX + UGL = TRFXliab,$$
or
$$UGL = TRFXliab - TRFX.$$

These attribution components are instrumental in understanding the embedded derivative and its movement. Note that these results are estimates, since obtaining an exact measure for CS would require an asset-by-asset analysis of the credit spread component, such as the credit derivative method, which is often impractical, as described earlier. The attribution analysis for the real world example is shown in Table 2.

The TR Floating derivative equals (1) + (2). The TR Fixed "asset approach" derivative equals (2) + (3). The TR Fixed "liability approach" derivative equals (2) + (3) + (4).

Components of the attribution analysis can be validated to actual market data. A detailed analysis can be completed for each element of the derivative. An examination of market direction can provide comfort in the derivative results, as described below.

Since the inception of this transaction, risk-free rates have moved down substantially. Therefore significant gains would be expected. Rates inched upward in the fourth quarter of 2003, explaining the decrease in RF. The comparison of the fixed curve to the current swap curve as of 12/31/2003, under both the asset and liability approaches, is shown graphically in Table 3 on the next page.

As shown in Table 3, the current swap curve is much lower than the curves for the fixed leg of the swap, as interest rates have decreased since treaty inception. Furthermore, the fixed curve under the asset method is lower than the fixed curve under the liability method, which indicates that the assets have been turned over more frequently than the liabilities in the declining interest rate environment.

A considerable amount of assets were purchased prior to mid-2002. In 2002, there was a substantial increase in spreads after Enron, and the effect is shown as the negative credit

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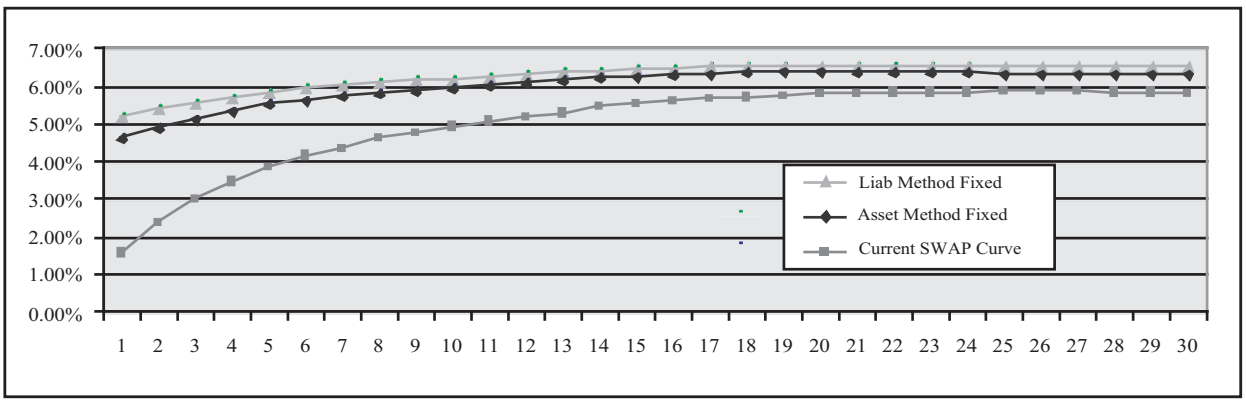
Table 3



contribution of the derivative. Spreads have dropped significantly since then and continued to drop in the fourth quarter of 2003. Additionally, the ceding company disposed of some of the contributors to this amount between the two valuation dates. Incidentally, CS was substantially more negative in prior periods.

For CFM, this portfolio had shorter asset duration than the liabilities, as shown in the graph in Table 4 below.

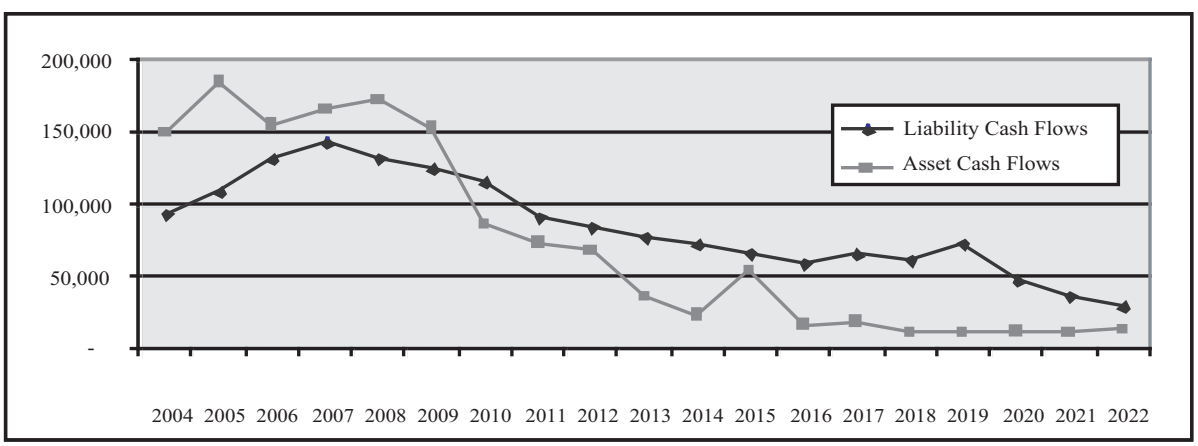
This loss indicates that the ceding company lost their interest rate "bet," having assets shorter than liabilities, as rates have continued to move downward, relative to the general level of rates since treaty inception. The reduction in this loss in the fourth quarter of 2003 reflects the rise in rates and the winning of the mismatch "bet."

Finally, the loss on the loan for the liability approach only represents the risk-free gain on assets sold that had not been recognized. The reduction in the fourth quarter reflects policyholder surrenders as well as a significant amount of new policy issues that allow for the reversal of this piece.

Conclusion

The issues around B36 will continue to cause some despair in the industry as companies try to come up with the best approach and most valuable information for management, shareholders and policyholders. Some have also predicted the demise of modified coinsurance and coinsurance funds withheld agreements, and only time will tell. This article demonstrates that useful information can be obtained and explainable results can be developed for this complex and nebulous accounting requirement. Although significant work may be needed to set up a process for these calculations, much of the information needed is often readily available, and can provide insight into the synthetic risk exposures that companies have accepted.

Table 4



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