行政院金融監督管理委員會九十四年度委託研究計畫

以財務再保險、限定再保險移轉災害風險之研究

(二)

委託單位：行政院金融監督管理委員會保險局
研究單位：英商信利保險經紀人股份有限公司
研究人員：林治平、黃範、宋明哲、林勳發及
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第一節 財務再保險、限定再保險的訂價

由於現有一大系列具潛力之財務與限定風險商品，按照每一特定商品之需求，每一商品之定價方法不同。整個保險定價不是一精密科學，尤以 ART/FFR 產品為然。有些基本原則運用於每一商品，也有若干因素會影響定價。關於傳統保險承保能量，保公司在市場上運作，因為這種定價依照市場情況大大不同。當保險承保能量不足時，保險市場進入上揚週期，而價格上漲; 當保險能量充足時，保險公司對同一業務從事競爭而價格下降。資本之獲得性進一步影響訂價，因為保險市獲得更多資本(過去之 WTC 與 Katrina 颶風事件)，則新保險承保能量充足。因此，保險市場平靜不致上揚。此外，每一保險提供者經常檢討其本身之風險業務量(portfolio)，並希望分散其風險至另一領域，因而促使保險公司/再保險公司為獲得業務更加競爭。

這些因素也影響各種財務再保/ART 商品之訂價。保險市場上揚之結果，保險價格上漲，因而，有更多專屬保險公司會成立。同樣地，保險市上揚情況會導致其他型式之財務再保險/ART 包括限定風險、或有資本及巨災債券等等，增加利益。諷刺的是，就某些實例而言，保險市場疲軟可能導致客戶在損失未滿期責任移轉上增加利益。由於客戶在市場上揚週期自留更危險於其資產負債表上，該客戶便在其資產負債表上增長負債尾巴。若保險市場隨後進疲軟市場週期，客戶透過未滿期責任移轉，移轉整個保險責任至「渴望」保險費收入之市場，則可增加利益，因而，損失未滿期責任移轉保險單之訂價更具競爭性。

下列事項對專屬保險、或有資本及巨災債券之定價構之一甚簡單之概要，並對限定風險方案包括損失未滿期債任移轉與逆向發展保險之訂價構成更詳細之概要。

第一項　專屬保險

一家專屬保險公司，其保險單之訂價大都由下述兩事項決定:

(1) 母公司

(2) 公司所在地國之監理官員。監理官員通常要求專屬保險公司以商業價格(費率) 承保客戶之危險，而對特別可預料之風險業務量(portfolio)可能根據預計之損失成本之邊際利潤訂價。請記住，監理官員會要求專屬保險公司須某種償債能力邊際，所以，通常防止提供很大之賠款限額。監理官員特別規定專屬保險公司針對下列因素評估其暴露之限額:

(1) 所得與保險費

(2) 再保險保障

(3) 資本與盈餘

(4) 有母公司之保證。

第二項　或有資本

如本報告內較早之解釋，或有資本有轉化一種風險(即商標損失、政治行為、巨災等等)為購買人之支付能力，以償還後續各年期之理賠賠款之效果。因此，索取之價格應根據下列事項釐定:

(1) 購買人之信用風險: (即信用評等為 AA 等級之購買人支付或有資本之價錢較評為 BB 等級之購買人為少)。

(2) 或有資本保險單基於觸發事故發生之可能性及其預期之付款方式。

(3) 保險公司/再保險公司提供契約之資本成本。

請記牢，或有資本契約提供者會經常評估其在傳統保險市場之賺錢能力。若據其觀察斷定，傳統保險價錢高，或有資本解決方法之價格可能上漲因提供者喜歡用其承保能量提供他認為過度膨漲之傳統保險價格。

第三項　巨災債券

參加巨災債券投資之投資人都想在超過他自正常資本市場投資所能獲之利潤外，再尋求獲得一回收率。典型的投資報酬率之最低訂價係以美國國庫券(T-Bill)及或倫敦銀行同業拆款利率(LIBOR)為基礎，超過 T-Bill 或 LIBOR 的差額即為投資人期待賺取其所承擔危險之保險費。因此，就加州地震為例，投資人與其顧問均會評估在什麼強度(由購買人決定)以上才會發生地震事故之可能性並依據察知在啟動點以上有損失發生之可能性，附加巨災債券費用。

上述每一種商品除純價格(費率)外，通常，還應考慮加上安排費用/佣金。比較而言，過去，巨災債券安排之費用的確非常貴，而更簡單之解決方法如或有資本、限定風險、或專屬保險之安排，費用比較貴。由於利潤分享之特色(大多數保險安排，利潤分享很普通)，限定方案在購買人與出賣人之間一定提供一個風險因素。所有限定風險保險契約均約定保險期間之累積限額，也有購買人分享利潤機制。

就理論價格而言，教師可能看下列資料:

限額:　US$10,000,000/每次損失
　　US$20,000,000/每年累計總額
　　US$40,000,000/保險期間累計總額
保險期間:　5 年
經驗帳分攤:　90%

在這範例中，保險人對每一事故提列 US$10,000,000 承保能量，於保險期間，每次支付不超過 US$20,000,000，而於整個保險期間支 US$40,000,000。被保險人則每年支付 US$7,000,000 保險費，其中 90% 保險費分攤至保險人之經驗帳戶。這項危險看起來如下:

保險期間累計總額: US$40,000,000.
總保險費: US$35,000,000
經驗帳:US$31,500,000
在這個範例中，保險人將檢討被保險人所建議之風險並期待承接此期間發生之損失。限定保險人/再保險人將提供 US$8,500,000 純風險移轉能量，於經驗巨災基金用完後生效。順次，限定保險人/ 再保險人自留其承接風險邊際(margin)US$3,500,000.

每一限定契約之架構與訂價應特別適合每一暴露之風險。基本定義適用於所有形式之限定契約包括自留融資、賠款責任移轉合約及回溯累積合約等等。請注意，此保險商品不像傳統保險商品，客戶可獲得保險人之經驗帳戶基金所生之利益，而且若無理賠發生或理賠發生比預期少，則所有經驗基金(減已付理賠賠款)應退還購買人，以資補償。

餘額風險移轉至經驗帳戶依風險與原始風險在性質上為長尾或短尾而異。長尾允許經驗帳戶基金有較長之時間並加計所生之利息，以減少限定風險保險人/再保險人所提供風險移轉之要素。談到短尾風險，幾乎無時間累積基金，因而對保險單更暴露純風險移轉部份。限定保險人/再保險人收支邊際保險費反映其認知，於超過經驗帳戶基金時發生損失之可能性。由上述範例可看出，限定風險保險人/再保險人於保險期間真正只暴露於第三風險之發生。

第二節　傳統保險商品及財務再保險商品價格比較

FFR 公司再保契約絕對會依據保險公司預估承接再保險契約之風險資本（capital at risk）作為訂價考量因素之一，然而此並非表示其他傳統的再保公司未將風險資本列入再保險保費計算考量，而是強調 FFR 公司之再保險契約的訂價與一般再保公司訂價方式是有差異的。

傳統再保公司再保費訂價最常考量因素為損失機率與在超出單純風險率可承保範圍情況下之預估最大可能性之損失。附加保險費（Loading）則為了抵補保險公司營運成本、佣金費用、經濟物價波動衍生損失、以及自留合理利潤等而加計在總保費內。

在 FFR，一般再保公司大部份都是先著手分析最大下跌風險（maximum downside）（即再保公司因再保契約理賠時需籌借支付所需負擔之資金成本），有時亦稱此類資本支出為風險資本（captial at risk），因此再保公司便依據他們可能承擔之風險成本加計合理報酬後作為計算再保保險費訂價參考。再保保險費因而由兩要素構成：一是再保公司預估再保險損失額之資金成本，另一則是再保公司預期之合理報酬。

FFR 公司與其他一般再保公司不同的是，風險資本的利率成本會明確載明於 FFR 之再保契約，也就是說當再保公司資產負債表顯示為正資產（positive balance）時，風險資本會從正資產值（借方餘額）中扣除；倘若再保公司資產負債表顯示為負資產（negative balance）時，風險資本會加計於負資產值（貸方餘額），如此作法資金成本便可以與再保公司之預估報酬分開計算表示。在傳統的承保契約內，超額損失不是被視為不可能會發生（clean，即無超額損失），就是可能突然發生超額損失在某一年度內。在一個沒有考量超額損失的再保契約中，再保公司可能會給予分保人再保契約續期保費上的優惠（依市場情況彈性調整保費優惠）。但如果當再保契

約發生損失時，再保公司極有可能調高續期保費以彌補其已發生之損失缺口。

以下範例我們將以承保同一保險公司之傳統型合約再保險契約（quota share treaty）與償債比率型合約再保險契約（solvency quota share）兩者訂價作一比較。當然我們會儘量依真實狀況引用數據作範例解說，但請注意 Heath Lambert 它並非為一家保險公司。

當再保公司評估合約再保險時，通常會考量其淨綜合成本率（net combined ratio）一換言之，即為總再保險費扣除佣金費用與理賠支出後之金額。而再保公司的預期報酬（margin，總再保險費扣除淨綜合成本率）將視原保險合約內容之潛在風險而有所不同。舉例來說，當原保險合約（original business）存有發生巨災損害之可能性時，再保公司勢必會提高預期報酬率以補貼未來合約再保險發生巨災損失時需籌資賠償之資金成本。

倘若原保險合約之損失發生機率雖低但單獨個案損失金額非常高時，再保公司還會要求更多的報酬利潤。上述通常發生於合約再保險之保費收入與理賠額間無法取得平衡，或是保費佔最大損失額之比率很低時。例如：總再保費收入僅佔原保契約保險金額之 10%，以利再保公司保留部份自有資金因應無法確定何時發生之巨額損害。

巨災準備金（catastrophe margin）與重大損失準備金（severe loss margin）皆可採用以佣金彌補超額損失方式而降低留存比率。
為了不分散我們想強調的重點，在範例中暫時不考量巨災準備金與重大損失準備金的計算，我們反而應該評估一份汽車比率分擔再保險契約如何平衡損益以及其巨災風險之衡量。

所有與原保險合約（portfolio）相關之任何準備金皆應列入第一考量。我們假設 Motor Insurance Company（MIC 公司）其平均賠損率（average loss ratio）為 69.74%、MIC 公司支付車廠仲介商 10%佣金、以及其內部作業成本（internal cost）為 7.5%，因此得出 MIC 公司之平均淨綜合成本率（average net combined ratio）為 87.24%（=69.74%+10.00%+7.50%），且其報酬應為 12.76%（100%總保費減去 87.24%淨綜合成本率）。由於承保此再保契約有獲利空間，故接下來我們可以考量合理的再保佣金支出。

傳統合約再保險之再保佣金主要是再保公司給付給分保公司經營管理此再保單之管銷費用以彌補分保公司最初的佣金費用與內部作業成本，而在 MIC 公司一例中，此兩項費用率合計為 17.50%。由於再保公司評估承接此合約再保險業務將可享有不錯的報酬，而提供分保公司 20%佣金的話，分保公司可額外賺得 2.5%的利潤（此額外利潤便是已支付成本與實際已獲得佣金收入之差異值），反觀再保公司的報酬率則由 12.76%降為 10.26%。

再保公司最後一項考量重點便是衡量此合約再保險可能發生之最大損失率，即依據不同時間表分析並預估可能發生最大損失額，如下表所示：

10 年發生 1 次最大損失額	-9.89
20 年發生 1 次最大損失額	-17.38
50 年發生 1 次最大損失額	-26.68
100 年發生 1 次最大損失額	-33.14
200 年發生 1 次最大損失額	-38.86
500 年發生 1 次最大損失額	-45.68

表中我們可看出來：100 年最大損失值中發生 1 次而產生的金額損失，需耗費相當於該再保契約 3 年的平均淨利額（也就是說再保公司一年內給付 33.50，才能在後續三年後賺回該筆金額）。再保公司若是滿意這樣的報酬率，便願意給付 20%平準型再保佣金而承接該再保合約。

現在我們回頭來看 FFR 公司在相同之合約再保險契約下是如何評估風險與制定保費價格。

第一個考量步驟都是相同的，亦即判斷此一合約再保險是否具有相當獲利性。延續前例，FFR 評估 MIC 公司分保出來的再保合約，其平均淨利潤與傳統再保公司計算結果一樣皆為 12.76%，也都認同 MIC 公司之合約再保險是值得投資。

MIC 公司表示他們想要儘量調低再保險契約之比率分擔，換言之追求其最大淨益，FFR 核保人員因而提議將平準型佣金 20%改為梯次再保佣金計算方式（sliding-scale commission）以確保再保公司得享有 6%利潤率。此模型架構下最後求出：(1) 損失率 94%時，再保公司佣金支出需降為 0%，以及(2) 損失率降為 34%時，再保公司最高佣金支出可負擔到 60%之兩種不同結果。因此倘若損失率低於 94%時，再保公司最終會獲取 6%之分保保費收入。

保險公司可考量各項風險移轉因素並將再保契約依模型架構作一分析。我們首先假設在沒有損失率上限（loss ratio cap）的情況，再保風險與保費定價評估：

10 年發生 1 次最大損失額	6.00
20 年發生 1 次最大損失額	2.62
50 年發生 1 次最大損失額	-6.68
100 年發生 1 次最大損失額	-13.14
200 年發生 1 次最大損失額	-18.86
500 年發生 1 次最大損失額	-25.68

保險公司如果認為原保險契約中最大損失額可能會超出它可從再保公司獲得賠償金，而決定設下 115%損失率之限制時，該保險契約即轉為“限定” （finite）再保險合約。而先前損失率計算修正如下表所示：

10 年發生 1 次最大損失額	6.00
20 年發生 1 次最大損失額	2.62
50 年發生 1 次最大損失額	-6.68
100 年發生 1 次最大損失額	-13.14
200 年發生 1 次最大損失額	-15.00
500 年發生 1 次最大損失額	-15.00

合約再保險在有限額保險風險之條件下，再保公司在原保險合約損失率介於 94%~115%間會向分保公司收取 6%~21%的保險費，以保障其 6%的報酬。此觀念與停損合約（stop loss treaty）非常相似，而僅差異在它是合約再保險。

FFR 建議案下之 trade-off 是指保險公司可藉由再保險方式降低其保險契約之損失額，但同時也可能因而減少其利潤。

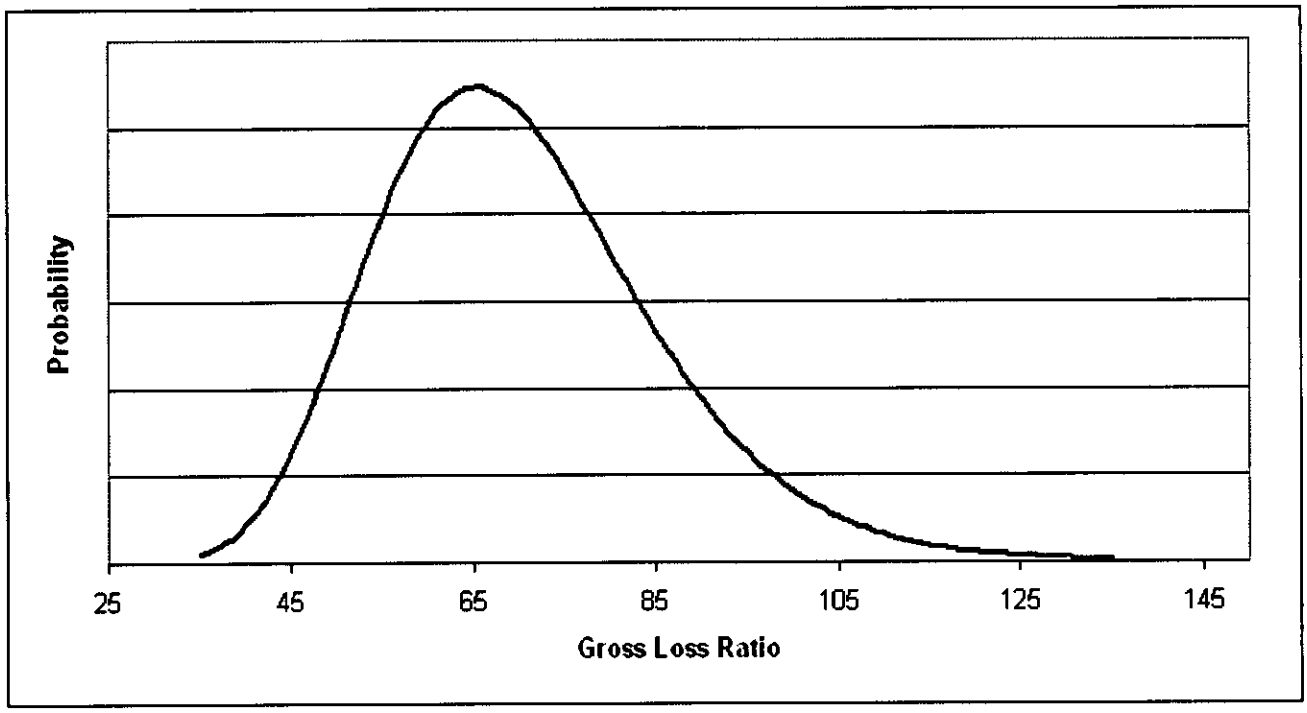
圖一：FFR 定價模型－以汽車保險公司為例

汽車保險公司之資產配置

損失率分配：　　對數常態分配

參數：　　4.22　　0.22

平均總損失率：　　69.74%



保險公司支付車商之佣金

成本：　　10.00%

內部作業成本：　　7.50%

平均淨利率：　　12.76%　　保費收入扣除理賠金與各項費用

表一：FFR 定價模型－以汽車保險公司為例

汽車保險公司之傳統合約再保險之利潤模型

分出比率：	50%	
分保佣金收入比率：	20%	平準型佣金制

再保公司面：

再保險保費收入比率：	100.00	
支付分保公司之佣金比率：	20.00	
再保理合約賠償比率：	69.74	
再保平均淨利潤：	10.26	*
模型下之平均再保淨利潤：	10.34	*
模型下之最小再保淨利潤：	-82.48	
模型下之最小再保淨利潤/再保平均淨利潤：	-797.98%	

* 由於再保契約之保費收入與保險理賠皆由原保險人與再保公司依約定比例共同分擔，保險公司依平均淨損失率計算得出之平均淨利潤與再保公司之再保平均淨利潤顯示相當。

10 年發生 1 次最大損失額	-9.89
20 年發生 1 次最大損失額	-17.38
50 年發生 1 次最大損失額	-26.68
100 年發生 1 次最大損失額	-33.14
200 年發生 1 次最大損失額	-38.86
500 年發生 1 次最大損失額	-45.68

表二：FFR 定價模型－以汽車保險公司為例

汽車保險公司之合約再保險之利潤模型

分出比率：		50%
分保佣金收入比率：	最低	0%
	損失率	94%
	最高	60%
	損失率	34%
	暫定損失率：	24%
損失率上限		115%

再保公司面

再保險保費收入比率：	100.00
支付分保公司之佣金比率：	24.26
再保理合約賠償比率：	69.74
再保平均淨利潤：	6.00

模型下之平均再保淨利潤：	5.40
模型下之最小再保淨利潤：	-15.00

模型下之最小再保淨利潤／再保平均淨利潤： -277.76%

依照梯次再保佣金計算方式，分保人與再保公司分擔保費收入與保險理賠不再均等比例。再保公司放棄可能獲取最大再保利潤但却至少保有最小利潤率，因此在梯次再保佣金架構下，原始計算出的“再保平均淨利潤”與“模型下之平均再保淨利潤”便不吻合。

	沒有損失率上限	有損失率上限
10 年發生 1 次最大損失額	6.00	6.00
20 年發生 1 次最大損失額	2.62	2.62
30 年發生 1 次最大損失額	-6.68	-6.68
100 年發生 1 次最大損失額	-13.14	-13.14
200 年發生 1 次最大損失額	-18.86	-15.00
500 年發生 1 次最大損失額	-25.68	-15.00

第三節　財務再保險、限定再保險與傳統再保險在商品結構與功用的成本效率的比較分析

任何再保成本效能的研究，考慮所有可能的結果是重要的，不能只考慮前置費用與購買額度的比率。這種研究方式近幾年相當流行，尤其在作動態財務分析（DFA: Dynamic Financial Analysis）與實施全方位風險管理（或企業風險管理 ）(ERM: Enterprise Risk Management) 時。

ERM 分析在歐洲市場已變得更受人注意，它已融入清償能力 II 的法案中，清償能力 II 要求監理上應以模型為基礎，對監理的對象要求要建立業務的財務模型，該模型要經由與監理官的討論以及獲得外部精算師的同意，資本的要求要奠基在極端情境上，極端情境包括負尾內的分析，例如：可以承保兩百五十年損失一次的極端情境所需的資本，清償能力 II 將在風險基礎資本制度章節中再詳加說明。

完整的 ERM 分析超越本報告範圍，然而為了比較限定再保險與傳統再保險的成本效能，我們建構兩個基本的隨機模型，稱為隨機模型是因部份資料取自合適的損失分配中的一組隨機賠款資料。

兩個假設範例如下：

Retro Re　　這是正要應用限定再保險的一家再保公司

Minnow Ins　這是正要比較傳統比例再保險與財務再保險的保險公司

接下來是每一情況更詳細的說明與結果.

一、Retro Re 的情況

這家公司正在研究超額損失一千萬第一層轉再保的安排，由於市場艱困，針對該層詢價的結果是 35% 的費率－保費是三百五十萬－恢復一次再保責任加繳百分百保費，這遠超過這家公司願意支付的。

因此這家公司改以限定再保險方式詢價：

層次:	一千萬 xs 一千萬
價格:	4,375,000 (費率 43.75%)
利潤佣金:	50%
恢復責任:	一次, 加繳 100%保費
最大賠款:	30,000,000 三年期

初期保費高，但這家公司如經驗良好，可賺取利潤佣金。

這家公司估計就這一層言，每年沒有損失的機率是百分之八十。

這家公司該考慮哪一層？

(一) Retro Re 的模型

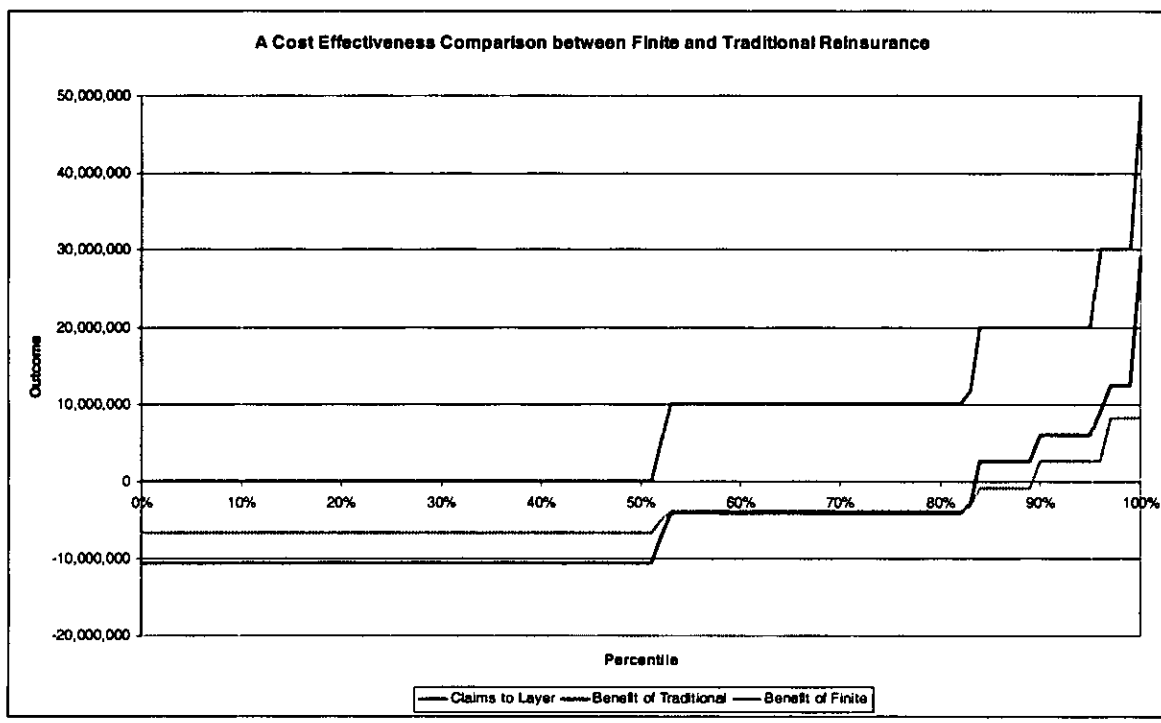
根據超額損失一千萬無損失機率為 80% 為基礎，模型建構了一組隨機賠款分佈，為簡化計這層次發生損失的話，均假設全損－因此就需要每年全損的次數 (賠款次數)，使用 Poisson 分配可完成如下：

損失次數	機率
0	80%
1	16.37%
2	1.64%
3	0.11%
4	0.01%
更多次	1.87%

隨機賠款次數在三年限定再保下，將產生 5000 次，三年每年的賠款資料在傳統再保與限定再保合約架構下，分別運算其結果，對 Retro Re 的績效會產生影響。這項過程就是一種隨機過程，結果分析是分別在傳統再保險與限定再保險合約架構下進行。

(二) 結果分析

最後的結果分析摘要如下圖二：



圖二 財務再保與傳統再保之成本效率比較

從圖示的結果看，似乎令人沮喪，其中的解釋摘要如下－每一數據(每層賠款、傳統再保險效益、限定再保險效益)的值，其區間依對應的百分位比繪製，觀察每層賠款曲線，約 51% 無賠款 (圖左半部紅色曲線)。圖中可看出以一千萬級距增加，主要是因吾人假設所有全損賠款是一千萬。

傳統再保險效益與限定再保險效益在圖左方是負值－這正如預期，因為 Retro Re 此時只付保費，並無再保險賠款攤回，限定再保險淨成本(也就是利潤佣金淨額)在此時是較低的。

在 52% 至 82%區間，傳統再保險效益與限定再保險效益幾乎相同－這是一次全損三年表現的結果，超過第 83% 時，傳統再保險效益高過限定再保險效益，差距直到第 99%仍甚小－因這是三年期超過三千萬賠款，但最高限只有三千萬所致。

兩項重要的觀察值得留意：

1. 從第 90 % 百分位開始，限定再保險呈現正的效益(對再保險人是項損失)，這顯示限定再保符合 10:10 經驗法則(閱其他章節)。
2. 限定再保險效益曲線比傳統再保險效益曲線平坦，顯示限定再保險較少風險被移轉，限定再保險人在經驗良好的年度(低於第 51% 百分位時)會減少利潤，在經驗不良的年度(高過第 82% 百分位時)會增加利潤。

對 Retro Re 言，傳統再保險整體計算的結果，三年下來平均成本(對再保險人是利潤)是 5,613,200，以同一基礎下，限定再保險三年下來平均成本是 4,182,313，總節省成本是 1,430,887，在極端經驗不良的年度，限定再保險保障額度低，因有三千萬的限額所致－因此限定再保險的平均賠款攤回是 74,000，比傳統再保險少，總節省成本 1,430,887 扣除 74,000 後是 1,356,887，此數才是利用限定再保險，不用傳統再保險，績效改善的淨額。

二、Minnow Ins 的情況

MIC (Minnow Insurance Company) 保險公司是一家小規模但在汽車責任險業務獲利豐厚的公司，它們的專業是在計程車與私人租用車責任險方面，因為它們發現這類業務比一般常見的汽車責任更少競爭，這家公司為了維持資本的高報酬，它們一直以最少的邊際清償能力來經營，但現在由於主要競爭對手退出計程車責任險市場，導致 MIC 有機會增加它們的業務組合，變成市場的較大玩家。

銀行業正想對 MIC 的業務發揮更大的影響力，對 MIC 而言，運用資本市場是一可能的解決方案，因此 MIC 不是考慮傳統比例再保險就是財務再保險的安排。

傳統比例再保險合約架構：

分保百分比：	50%
佣金：	毛保費的 20 %
損失率限額：	130%

財務再保險合約架構：

分保百分比：	50%
佣金：	固定佣金 25 % 損失率 95%時，最低 0% 損失率 0%時，最高 95% 佣金以 1:1 為基礎調整
損失自負額:	損失率 95% 至 105% 間，分保人承擔 100% 的損失
損失率限額：	120%

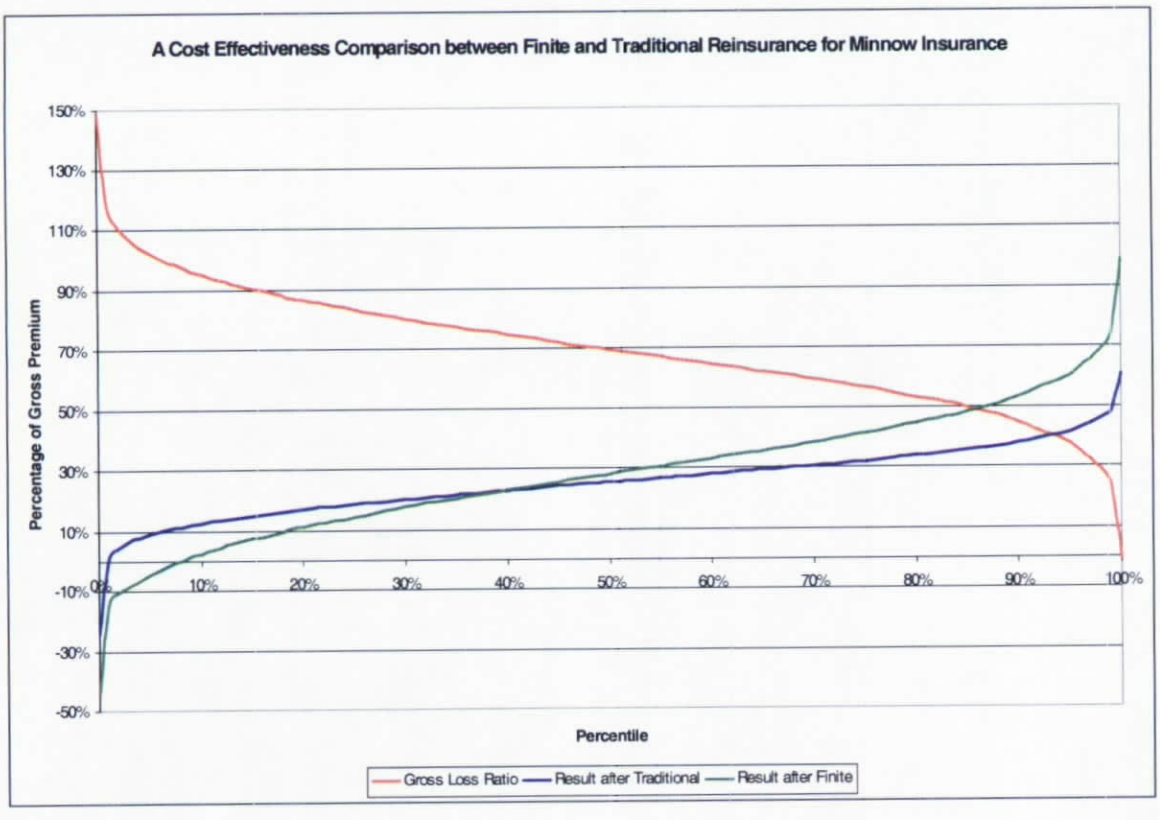
(一) MIC 模型

MIC 估計平均的終極損失率為毛保費的百分之七十，標準差正負20%，因此我們用常態分配建構 5000 年的毛損失率資料，利用這些毛損失率分別在傳統再保險與限定再保險架構下運算其結果。

結果分析

MIC 安排再保後的結果以百分位的區間如下圖三，為了比較圖中顯示三種變數，它們是毛損失率，安排傳統再保險後的百分比，與安排限定再保後的百分比，後兩項是指安排再保後，MIC 利潤與毛保費的比例。

圖三 Minnow 保險之財務再保與傳統再保之成本效率比較



(二) 結果分析

除了毛損失率變動方向與 Retro Re 相反外，該圖顯示的結果類似 Retro Re 的結果，有意思的是對 MIC 言，毛損失率越高，淨結果越低。

我們可看到圖左方損失率高時，安排傳統再保險的結果優於安排限定再保險後的結果，反之，圖右方損失率低時，安排限定再保險的結果優於安排傳統再保險後的結果。

再看 Retro Re 的結果，在經驗良好的年度限定再保險較便宜，但它在經驗不良的年度，卻承擔較多的風險。

從圖中可看出，安排限定再保險後的結果，其曲線較安排傳統再保險的曲線為陡，主要是因較少的風險移轉至再保合約，這主要是限定再保險合約採用階梯式佣金，這種方式是佣金與損失率間以 1:1 反比例為基礎，在損失率 0%至 95% 之間階梯式佣金差異所產生的結果。

整體限定再保對 MIC 產生了占毛保費 27.97% 的平均結果，此結果與傳統再保險的 25.16% 比較，限定再保險對 MIC 的貢獻足足提升了 2.81%，限定再保險的缺點是在毛損失率 105%至 120% 間很少風險被移轉－這也許無法滿足 MIC 或監理單位的要求。

兩種再保險提供了傳統清償能力的紓解功能(毛保費 50%的分保規定，與各地區監理的規定有關)。然而，在清償能力 II 法規下，限定再保的效益較傳統再保險低，因為 250 年發生一次損失，限定再保險將使 MIC 產生極壞的結果。

表三 RETRO RE

A Cost Effectiveness Comparison Between Finite Reinsurance and Traditional Reinsurance

Traditional Cover					
Purchased seperately for each of three years					
Limit		10,000,000	Excess	10,000,000	
Price		3,500,000			
Reinstatement		1 @ 100%			
Finite Reinsurance Cover					
A three year deal					
Limit		10,000,000	Excess	10,000,000	
Price		4,375,000			
Profit Commission		50.00%			
Reinstatement		1 @ 100%			
Maximum Recovery		30,000,000			
Probabilities					
Probabiliy for Each Year					
No Loss		80.00%			
1st Loss		16.37%			
2nd Loss		1.64%			
3rd Loss		0.11%			
4th Loss		0.01%			
Higher Loss Count		1.87%			
Year 1					
	28.96%	Traditional	Finite		
Loss 1		0	0		
Loss 2		0	0	0	0
Year 2					
	57.95%	Traditional	Finite		
Loss 1		0	0		
Loss 2		0	0	0	0
Year 3					
	53.34%	Traditional	Finite		
Loss 1		0	0		
Loss 2		0	0	0	0
Year 1		Traditional	Finite		0
Premium		3,500,000	4,375,000		
Recovery		0	0		
Benefit		-3,500,000	-4,375,000		
Year 2		Traditional	Finite		
Premium		3,500,000	4,375,000		
Recovery		0	0		
Benefit		-3,500,000	-4,375,000		
Year 3		Traditional	Finite		
Premium		3,500,000	4,375,000		
Recovery		0	0		
Benefit		-3,500,000	-4,375,000		
Overall		Traditional	Finite		
Premium		10,500,000	13,125,000		
Recovery		0	0		
Profit Commission		0	6,562,500		
Benefit		-10,500,000	-6,562,500		

表四 MINNOW INSURANCE

A Cost Effectiveness Comparison Between Finite Reinsurance and Traditional Reinsurance

Traditional Cover					
Cession	50.00%				
Commission	20.00%				
Loss Ratio Cap	130.00%				
Finite Reinsurance Cover					
Cession	50.00%				
Commission	25.00%	max	95.00%	at LR	0.00%
		min	0.00%	at LR	95.00%
Loss Corridor	100.00%	for LR	95.00%	to	105.00%
Loss Ratio Cap	120.00%				
Probabilities					
Average LR	70.00%				
Standard Deviation	20.00%				

Results

80.81%	Traditional	Finite
Gross Premium	100.00%	100.00%
Premium Ceded	50.00%	50.00%
Net Premium	50.00%	50.00%
Commission	10.00%	7.10%
Gross Claims	80.81%	80.81%
QS Recovery	40.40%	40.40%
Loss Corridor	0.00%	0.00%
Loss Ratio Cap	0.00%	0.00%
Net Claims	40.40%	40.40%
Result	19.60%	16.69%

第四節　財務再保險/限定再保險的會計議題

第一項 財務再保/限定再保概論

限定再保(Finite Reinsurance) 一詞，乃從財務再保（ Financial Reinsurance ）演變而來，自美國財務會計準則委員會（FASB: Financial Accounting Standards Boards）發佈第 113 號[1]公報以來，國際市場上，即通用“ 限定再保”一詞，不再使用[2]“ 財務再保”一詞。

壹、財務/限定再保的意義與性質

限定再保是新興風險移轉（ART: Alternative Risk Transfer）市場中的新商品之一，限定再保是指再保險人承擔有限的風險移轉，而且此項風險移轉是受法令限制[3]的再保險合約，限定再保與傳統再保截然不同，至為顯然。

限定再保移轉的是有限的核保風險（ Underwriting Risk ）與時間風險（ Timing Risk ），兼具實質風險移轉與風險融通（ Risk Financing ）的功能。 它與傳統再保不同的是限定再保可承保傳統再保所承保的核保風險外，它還可承保利率匯率等財務風險，再者，傳統再保除不將預定投資收益納入保費的計算外，採取的是盈餘佣金（ Profit Commission ）制度，但限定再保在訂約時，即將預定投資收益納入保費的計算中，透過經驗帳戶，訂約雙方分享利潤。

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[1] 該公報是美國財務會計準則委員會（FASB: Financial Accounting Standards Boards）於 1992 年 12 月 15 日發佈，該公報編號 113 號，內容是關於“ 長期與短期再保契約的會計處理與報告”。

[2] 美國財務會計準則委員會（FASB: Financial Accounting Standards Boards）發佈 113 號公報前，壽險市場慣用財務再保（Financial Reinsurance），而產險市場慣用限定再保（Finite Reinsurance）， 113 號公報公佈後，“ 財務再保”一詞除少數仍使用外，幾乎消聲匿跡考其原因，“ 財務再保”一詞有令人有財務窗飾的不良印象，且從名詞中，無法判斷是否有風險移轉所致。

[3] 例如，台灣政府公佈的保險業辦理財務再保險業務處理要的第三點中，針對所謂顯著危險，有 10-10 rule 的要求。

此外，限定再保與財務再保不同的是財務再保只是風險融通的再保合約，並不具備實質核保風險移轉之行為，財務再保只是移轉時間風險。換言之，限定再保是財務再保的變種，其性質混合了傳統再保與財務再保的特質。

限定再保有很多類別[4]，但共同的性質如下：1) 它通常是多年期合約，2）它有累積責任限額，3）它有利潤分享機制， 4) 它會存在經驗帳戶。

最後，限定再保可對保險公司提供下列五大功能：1）擴大財務的自主性，2）提供穩定的現金流量規劃，3）改善美化財務結構，4）提升承保能量，5）增進公司價值改善公司形象。限定再保由於發生過一些弊端，但又有市場的需求，未來成長空間如何，實難精準預料。

貳、財務/限定再保的類別

限定再保可劃分為兩種，一為追溯式的限定再保，另一為預期式的限定再保。追溯式的限定再保與預期式的限定再保，還可各進一步劃分為兩種，追溯式的限定再保可分為賠款責任移轉合約（ LPTs: Loss Portfolio Transfer ）與回溯累積合約（ ADCs: Adverse Development Covers ），而預期式的限定再保可分為限額比率合約（FQSs: Finite Quota Shares)與分散損失合約（ SLTs: Spread Loss Treaty)。

一、賠款責任移轉合約

所謂賠款責任移轉合約（LPTs ）係將保險公司過去承保年度發生的未決賠款責任，轉讓給再保險人的合約。可能轉讓的是保險公司的全部業務或部分業務，LPTs 的再保賠款限額，通常等於所轉讓的賠款準備金。再保險人承受未決賠款責任，取得的對價約等於已提存的賠款準備金，外加反

[4] 限定再保的主要類別，參閱本文中所述。

映時間風險的承保保費以及任何認知到的不足準備金之淨現值，再保險人也會收取一筆費用彌補再保險人的邊際利潤與發生的交易成本，例如保險業務的分析成本。雙方之間可能還會就承保成本的分攤訂立一項契約前的協議，這要看交易是否簽成而定。

在 LPTs 中，再保險人承擔的主要風險為時間風險， 也就是承擔未決賠款責任的結案時間，可能比原先預期的時間提早的時間風險。當然，在簽訂合約時，再保險人預期的時間是應該如原先的估計或更慢。若是更慢，則再保險人所獲得的投資收益就可能比預期的多，能為再保險人創造淨利。該淨利則與保險公司分享，且會事先約定。

保險公司從 LPTs 中，也能獲得許多效益。免除不確定就是重大的效益，但 LPTs 的真正價值在於改善交易當年度資產負債表中的數據表現，第一：它可降低綜合比率，因為未來可能的投資收益可回饋到當期的承保收益；第二：它可提高清償能力，因為分給再保險人的責任會大於所繳的再保保費，所以賠款準備金隱含的折現值，可強化保險公司的保單持有人盈餘，進而強化公司的清償能力。

二、回溯累積合約

與 LPTs 一樣，回溯累積合約（ ADCs ）也是追溯式的限定再保，但就所提供的保障內容而言，ADCs 卻是一個獨特的商品，在 ADCs 結構中，沒有賠款準備金的移轉，ADCs 之所以應運而生，是因為保險公司擔心最終發生的賠款會大於已提存的賠款準備金，所以 ADCs 之風險主要在於準備金不足的風險，其次才是時間風險。

雖然時間風險不是主要的風險，但時間風險在 ADCs 的價格計算中，的確扮演著重要的角色，再保險人要計算的是最終發生的賠款大於已提存的賠款準備金需要多久的時間，期間越長，則再保險人整個價格計算中之

投資收入比例就越大，所以在 ADCs 結構中，是採用金錢的時間價值達到更有成本效益的保障。

三、限額比率合約

在傳統比例式再保合約中，再保險人暴露的風險，只限於相關保單所訂之責任限度，反之，FQSs 則明訂再保險人之責任總額上限，不論相關之保單是否訂有責任限度，再保險人的契約責任是固定的，這就是傳統與限額比率合約再保 (FQSs)間的主要差異。

兩者間的其他明顯差異是 FQSs 中的分保佣金採用梯階佣金的方式，此一方式，佣金比例是隨損失率而異，例如損失率減少 1%，則所付佣金就會增加 1%，反之亦然，但仍有下限與上限的規定，此一機制對相關原保險業務績效的敏感度更為提高，若是損率好，則保險人可承受大部份的結果。若損率不佳時，則保險人之佣金下降，再保險人則可保留較大比例之保費做為補償。

FQSs 另一項不同的特徵是 FQSs 通常有固定期限，一般是 3 年到 5 年之間，在傳統的比例式再保合約裡，雖然雙方都可能預期比例式再保合約會有一定長的期間，但總是每年續約一次。

FQSs 的主要用途是為了滿足相關的法律規定，釋出盈餘，在美國市場中，這是規模比較小的原保險公司常用的方式，在美國，每當保險人增加新業務時（創造保費成長），就必須立即將獲取成本認列為費用，即使新業務之利潤在許多年之後才會顯現及認列，對保單持有人盈餘比較小的保險人來說，FQSs 讓保險人能以比較有效率的方法取得融資，創造保費收入的成長。

當然，FQSs 也能提供傳統的比例式再保合約所提供的相同利益，提高承保能量及降低被再保險人核保損益之波動性。傳統上，分保人是將一部分未滿期保費轉讓給再保險人，以收取分保佣金，在分保人的財務報表中，分保佣金被認列為當期收入，用以提高保險人之法定盈餘。這項交易主要的用意是希望轉讓給再保險人之保費，包括其投資收入，能填補預估之賠款，為可能預估的錯誤提供足夠的彌補空間，若實際賠款超過預估，再保險人就能回收合約期發生的超額理賠。

四、分散損失合約

分散損失合約（ SLTs ）是明示或暗示的多年期交易，假如是暗示的合約，合約中也會有條款保障分保人之經濟利益以延續合約，亦即若分保人不續約，則分保人可能喪失利潤分享機制，或責任限度可能“ 崩盤”到只剩下原規模的一小部份（ 註：通常是所付保費之 10%）。

SLTs 保費可分躉繳或年繳，並在扣除再保險人之利潤安全邊際後轉到經驗帳戶，經驗帳戶內的資金則按契約約定的利率生息，若有賠款發生，則賠款支付先由經驗帳戶內的資金支應，若這些資金不足，則再保險人就會支付超過該經驗帳戶資金的賠款金額，若經驗帳戶出現負的餘額，則 SLTs 有相關契約條款，讓分保人有義務，必須支付全部或部份負餘額，同樣地，也會有契約條款，讓分保人參與分享經驗帳戶內的任何正餘額。

對 SLTs 分保人來說，其主要利益在於 SLTs 能順利處理每年賠款之變異，而且它還是一種可提供資產負債表表外，彈性地建立等值準備金的有效方法，同時，就中期而言，它也對透過自負額或巨災損失的理財所建立的基金，提供一個有效的節稅工具，它確實是非常有用的管理工具，可處理傳統市場不可承保的風險。

第二項 台灣財務再保/限定再保的會計監理

目前我國針對限定再保/財務再保的稅負與會計處理，缺乏相關的規定，本章僅就民國 92 年 7 月 18 日生效，由財政部發佈的“保險業辦理財務再保險業務處理要點”，以及財政部前保險主管簡松棋教授所著“保險會計原理與實務”一書的第十四章第八節“財務再保險交易的會計處理”，加以整理說明。

壹、台灣保險監理機關對財務再保險的定義

根據財政部發佈的“保險業辦理財務再保險業務處理要點”的第二點，所謂財務再保險係指“保險人交付再保險費於再保險人，再保險人提供財務融通，並對於保險人所承擔顯著危險所致之損失，負擔賠償責任之契約”。第三點又定義所謂“顯著危險，係指保險人所移轉之危險，發生損失機率大於百分之十，其應收受再保險人款項現值與應交付再保險人款項現值之比率絕對值大於百分之十”，又第四點規定，“財務再保險契約所移轉之危險，於財產保險包括承保危險與時間危險；於人身保險視業務種類與契約期間不同，包括死亡率、生存率、殘疾率、解約率、投資報酬率或費用危險等一個或多個危險”。

綜觀前述，我國監理機關對財務再保的定義，名稱為財務再保險，但實質乃是限定再保險，根據第一章所述，限定再保與財務再保不同，而且根據美國財務會計準則委員會發佈的 113 號公報與國際會計監理對財務再保已不認定是再保險交易來看，我國相關要點中之用語實有調整的必要，其次，第三點的“顯著危險”採用的就是所謂的“10/10 Rule”，“10/10 Rule”經驗法則可否沿用，應依國情與監理上的需要重新評估。

貳、財務再保險業務處理要點中有關財務與會計的規定

根據”保險業辦理財務再保險業務處理要點”第五、第六、第七、 第八與第十一點來看，所規定的都是原則性問題。例如：第六點的第三項只規定應記載會計處理方式，如何處理並未規範，再如，第五點的第五項只規定應包括保險人與再保險人間之帳務處理，如何處理也未規範，兩者是否均依據“ 我國保險業統一會計制度”處理，也未說明，所有的要點也未說明稅負的規定，以及是否依現行傳統再保稅負的規定，也未說明，畢竟限定再保與傳統再保大不同。

綜觀前述，依簡松棋教授在其所著"保險會計原理與實務"一書的第十四章第八節第 458 頁，倒數第三行”由於財務再保險與傳統再保險不同，其會計處理原則與傳統再保險方式有別，惟目前實務上，係以現行再保險會計科目分設子目，以資區別"來看，我國目前對限定再保在稅負與會計處理上，均完全沿用傳統再保的規定處理，需不需要分開？理論上有必要，實務上沒規範，實務上需不需要進一步規範？也是需重新評估。

參、現行台灣財務再保險交易的會計處理

簡松棋教授在其所著“ 保險會計原理與實務”一書的第十四章第八節“ 財務再保險交易的會計處理”中，均依據我國壽險公會財務會計研究小組在民國 91 年 1 月 30 日所提出的“ 人壽保險業辦理財務再保險會計處理原則草案”來說明現行我國財務再保險交易的會計處理與稅負，該草案所提出的會計處理四項原則，摘要如下：

1）會計處理原則應在合約期間，維持明確與一致性，因重大原因必須變更者，應將其理由及對財務報表之影響在有關財務報表內作必要之註釋，這項原則與“ 保險業辦理財務再保險業務處理要點”的第八點與第十一點的精神不謀而合。

2）包含保險風險具體轉嫁之契約，應視為再保險契約，其收付款項應視為損益帳項，未符合風險轉嫁規則之契約，則應視為當事人彼此間之委託款項，其相關於契約的金額不可視為損益帳項。

3）辦理財務再保險時應檢附相關憑證，並應依其交易之經濟實質內容，遵照一般公認的會計原則，於季報與年度報表中翔實紀錄。

4）辦理財務再保險之會計處理原則，除依相關法令另有規定者外，應於現行會計科目下增設子目，並列註財務再保險的險名，與原有其他明細子目並列。此外，財務再保相關交易的稅負與傳統再保雷同，包括了營業稅與營利事業所得稅。

第三項 美國財務再保/限定再保的會計監理

壹、FAS 113 與 EITF 93-6

由於財務再保/限定再保經營的成功，導致美國聯邦會計標準委員會（FASB: Federal Accounting Standards Board）於 1991 年開始關切財務再保/限定再保的會計處理，該委員會主要關切的重點是保險人資產負債表真實性是否遭到扭曲，與保險人和再保險人並非以更適當的財務會計處理方式處理財務再保/限定再保的交易活動，現有傳統會計規範不足以使分保公司在如何說明財務與限定再保方面，作出有效地主觀判斷，愈來愈多的證明顯示，再保險人提供的，只是分保公司風險自留的方式，在會計處理上，也將其當作一般再保交易來處理，1992 年安得魯 (Andrew) 颶風損失提供美國證券交易管理委員會（SEC: Security and Exchange Commission）明確之證據，顯示財務再保險誇張了保險人之營運成果，被保損失為美金 X 佰萬，保險人回報給 SEC 之總額僅為美金 Y 佰萬，其差額即為安排財務再保所致。

美國聯邦會計標準委員會（FASB）對此事的反應，顯示在 1992 年 12 月 15 日公佈的 113 號公報中，並於 1993 年 7 月正式採用聯邦會計標準委員會下的“現行議題工作小組”（EITF: Emerging Issues Task Force）所公佈的 93-6 號公報，113 號公報的影響是重大的，該公報並未提及財務再保/限定再保，但提及風險移轉的主要議題以及何種風險移轉合約可被視為“再保險”契約，為了風險移轉合約必須承擔“顯著”的保險風險（Insurance Risk）與時間風險（Timing Risk），始可被視為再保合約之故，該公報建立了風險移轉的測試模式，只移轉時間風險之合約，不再被認為是再保合約，113 號公報也禁止保險公司以扣除再保後的淨額提報，同時要求再保險攤回賠款項目應作為資產列報，負債應包括再保險總額。

93-6 號公報要求保險公司要揭露財務再保險，多年期基金巨災再保的成長情形，並規定保險人要將在這些安排下的合約義務當作資產負債表內的負債列報。

這些公報有兩個主要效應：第一，財務再保合約若僅含時間風險，不得再以再保會計處理的方式處理；第二，再保險攤回賠款項目作為資產列報，對大多數的保險公司而言，是為重要的變革，兩種效應的任何一種，均足以結束財務再保市場，但當這兩種變革一起觀察時，財務再保的市場大門，鐵被鎖上並閂住。此等公報的實施，造成了財務再保被限定再保取代的現象。

可能為了不讓保險市場感到訝異，FAS 113 嚴格的規定中，並未對“ 顯著性”有所定義，“ 顯著性”無正式定義，導致業者持續不斷的爭辨，也產生持續的不確定感。然而，市場實務經驗形成一項可接受的法則，即損失中的 10% 有 10% 的機率移轉至再保險人時，即視為風險移轉合約，此即所謂的 10:10 測試。

貳、LPTs 的會計處理

在此以賠款責任移轉合約（LPTs ）為例，說明財務再保/限定再保的會計處理方式，假設下列是安固保險公司（Solid Insurance Company）簡化後的財務報表。

1) LPTs 購買前

於本例中，假設簽單保費 = 滿期保費，從安固保險公司的財報數據中，顯示的重要比率如下：

保費對盈餘比：3.33 比 1
500,000 / 150,000

損失率：80%
400,000 / 500,000

費用率：30%
150,000 / 500,000

綜合比率：110%
550,000 / 500,000

LPTs 合約 1 月 1 日生效，所以簽單業務含括到 1 月 1 日之前，而未決賠款是應在 1 月 1 日之後清結者。

安固保險公司希望移轉未決賠款準備金 400,000 元中的 100,000 元，再保險人估計，若要承受這筆 100,000 元的最終賠款，需向安固保險公司收取一筆現金 60,000 元的保費。

再保險人估計 60,000 元保費的投資收入之成長會比所移轉之未決賠款準備金之預估賠款支付模式快，若預估賠款支付模式比投資收入之成長還快，則所賺得之投資收入加上 60,000 元將不足以填補最後的賠款給付 － 時間風險 － 而再保險人也會因 LPTs 蒙受虧損，所以預估賠款支付模式的準確性對再保險人的承保分析是相當重要的，LPTs 之基本訂價將視再保險人對預估賠款支付模式所做之分析而定，預估賠款支付越快，所收之保費就越高。

2）購買 LPTs 後

安固保險公司之財務報表如下：

在資產負債表的資產部分，LPTs 使現金從 100 減至 40（註: 對照購買 LPTs 前的相關金額，此處是以千元為單位，之後金額亦以千元為單位），因為其中的 60 已流向再保險人，在負債部分，未決賠款則減少 100 成為 300，而總負債也隨之減為 750，安固保險公司因此可載入獲得 40 的“利潤”，雖然資產減少，但保單持有人盈餘卻從 150 增加至 190，損益表也顯示營運結果有 40 的"利潤"。

安固保險公司的主要財務比率變成：

保費對盈餘比：2.32 比 1（3.33 比 1）
440 / 190

在提高盈餘時，保費金額則減少。

損失率：68.2%（80%）

雖然保費降 60，但未決賠款準備金則減少 100，所以整體損失率也降至 68.2%。

費用率：34.1%（30%）

保費減少，所以費用率增加。

綜合比率：102.3%（110%）
未決賠款準備金減少，導致綜合比率也從 110%往下降。

參、多年期會計

限定再保或結構性交易（ForS：Finite or Structured deals）的使用對分保人資產負債表中的再保帳項會有顯著影響，這主要來自 ForS 交易是多年期架構，同時包括如利潤佣金或總累積賠款限額的特質，在這架構下，多年期的安排對資產負債表中的資產與負債帳戶將產生影響，而不是如傳統再保險只影響損益帳戶。

為了顯示這個過程，我們將登載在再保險雜誌由位於瑞士的 Allianz-ART 的兩位先生所寫的一篇文章中的簡例加以補充說明，這篇文章主要突顯 ForS 交易條款影響的重要性，Allianz-ART 是全球 ART 相當著名專業的再保公司。在此，我們必需指出 Heath Lambert 不是會計專業公司，本節是與會計專業人員討論後，進一步引發的論題。我們以傳統再保險交易對分保人損益帳戶的影響開始，接著說明 ForS 交易的影響。

表三、表四均顯示三年期的帳戶資料，為了簡化實例，每年的帳戶資料不是有賠案就是沒有賠案，這就導致八種可能的情況 (每年有兩種可能的情況)。表三、表四格式如同樹形或像瀑布，第一年分有賠案與沒有賠案兩種情況，第二年又依據第一年的有賠案與沒有賠案每一情況，再細分為有賠案與沒有賠案兩種情況，同理，第三年又就第二年的每一情況，又再細分為有賠案與沒有賠案兩種情況。這種方式可顯示上一年度對未來年度對再保交易報表與帳戶的影響。

一、傳統再保險的會計處理

表三（“傳統再保險三年期會計處理範例”）顯示傳統超額損失再保險的會計處理，詳細交易資料如下：

每年限額	70,000,000
再保費	14,000,000
利潤佣金	NIL
購買基礎	每年續約

表三每年的有賠案與沒賠案兩種情況均顯示“ 實際保費支付”為14,000,000，有賠案的情況下，每年也均顯示“ 實際賠款收回”為70,000,000，這兩種帳項均會影響損益帳戶，所有的“ 應計保費的變動”與“ 應計利潤佣金的變動”均為零，每年沒有賠案的情況下，分保人的淨成本為 14,000,000，而有賠案的情況下，淨成本為負的 56,000,000 (換言之，對分保人是有利的)。

從表三中吾人可瞭解傳統再保險交易僅影響損益帳戶 (注意：表三是稍為簡化且假設賠款走勢如吾人預期)，從表三吾人也可瞭解無任何資產負債帳項“ 應計保費的變動”與“ 應計利潤佣金的變動”) 受到影響，每年每一情況均維持不變，過去年度的結果對未來無影響，顯示期間延長不是此法的特徵。

傳統再保險會計是簡易的，再保交易對報表與帳戶的影響，在再保合約一開始簽訂時即極為明確。再者，傳統再保險一般也只影響損益帳戶與報表。

二、三年期 ForS 再保險會計處理

表四 (“ForS 再保險三年期會計處理範例”) 格式如同表三，詳細交易資料如下：

每年限額	70,000,000
累積總限額	100,000,000 (三年期)

再保費	20,000,000
利潤佣金	60%
購買基礎	三年期

“實際保費支付”與“實際賠款收回”兩帳項類似表一傳統再保險的情況，每年的“實際保費支付”改成 20,000,000 ，在有賠案的情況下，“實際賠款收回”亦為 70,000,000。 表三與表四的差別，在於“應計保費的變動”與“應計利潤佣金的變動”兩個帳項，傳統再保下是為零，在 ForS 下，吾人逐一說明其變動：

(一) 應計保費的變動

定義：這是個負債帳項，分保人應於未來時日支付再保費，ForS 再保交易受到賠案影響時，未來再保費就會被耗費掉一部份，在本範例中，第一年賠案發生，再保賠款收回為 70,000,000，這代表三年累積總限額 100,000,000 的 70%。此意即相對地，再保費實際才支應 33.3%(三分之一) ，然真正應另行支付 36.7% (70%扣除 33.3%)，也就是未來再保費在分保人支付前已耗費掉 36.7%。也就是說應計再保費應為 22,000,000 (每年再保費 20,000,000，三年 60,000,000，因此 60,000,000 乘 36.7% 是為 22,000,000)，這應計再保費在未支付給再保險人之前在報表與帳戶上均應顯示為負債。(注意：假如不以應計記帳為基礎，未來兩年分保人需再支付再保費 40,000,000 然再保險保障額度只剩 30,000,000 (100,000,000 扣除 70,000,000)，這將不能滿足風險移轉的特質，蓋因保費高於保險額度)。

(二) 應計利潤佣金的變動

定義-這是個資產帳項，分保人在未來時日將收到的利潤佣金，分保人支付第一年再保費不久，資產負債表中就需顯示未來再保人應付利潤佣金的資產帳戶，在本範例中，分保人支付第一年再保費 20,000,000 後，在無賠案發生時，分保人可預期將有 12,000,000 (20,000,000 乘 60%) 的利潤佣金，這項應計利潤佣金在分保人的報表與帳戶中應列示為資產帳項。一旦分保人的報表與帳戶顯示出應計再保費與應計利潤佣金時，ForS 交易就變得更為複雜。

我們將著重兩個範例：

1) 第一年發生賠案

以現金基礎的會計而言，分保人帳上應顯示利得 50,000,000，蓋因已支付再保費 20,000,000 再保賠款收回 70,000,000。 實際的情況更複雜，蓋因第一年發生賠案時，帳上會產生負債應計 22,000,000 的再保費 (前面已有討論, 未來再保費已被耗費)，這項負債的產生，對分保人來說，將使再保利得同等減少，只剩 28,000,000 (50,000,000 扣除 22,000,000)。

2) 第一年沒有賠案，第二年才有賠案

第一年分保人支付再保費 20,000,000 沒有賠案，產生應計利潤佣金 12,000,000。

如果接著的第二年才發生賠案，將產生如下的變動：

應計利潤佣金帳的變動－第一年產生的應計利潤佣金 12,000,000，將喪失掉。

應計再保費帳的變動-合約累積總限額已耗費 70%，然而只有支付總再保費的 66.6% (33.3% 加 33.3%)，第二年分保人資產負債表中應顯示負債應

計再保費 2,000,000 (60,000,000 乘 3.4%)。

至第二年為止，分保人整體利得是：

再保費	-20,000,000
再保賠款收回	+70,000,000
應計再保費	-2,000,000
應計利潤佣金	-12,000,000
總成本 (利得)	-36,000,000

上列所顯示的數據是有趣的，在第二年才發生賠案，分保人的再保利得與第一年發生賠案的利得不同，誠然，由表四可看出，每年整體 ForS 的利得高度依賴過去年度的經驗 —過去經驗的結果會影響未來主要是由於三年期合約中的利潤佣金總額與累積總限額的約定。

表五　傳統再保險三年期會計處理範例

Period of Accounting	3	Years
Annual Limit	70,000,000	
Total Aggregate Limit	210,000,000	
Annual Premium	14,000,000	
Profit Commission at Expiry	0%	
Probability of Loss in any one Year	10.00%	

Year 1	No Loss	Loss
Actual Premium Paid (Cost to P&L)	14,000,000	14,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000
Change in Premium Accrual (a Liability)	0	0
Change in Profit Commission Accrual (an Asset)	0	0
Net Cost (-ve = Benefit) (Overall Position)	14,000,000	-56,000,000

Year 2	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	14,000,000	14,000,000	14,000,000	14,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	70,000,000
Change in Premium Accrual (a Liability)	0	0	0	0
Change in Profit Commission Accrual (an Asset)	0	0	0	0
Net Cost (-ve = Benefit) (Overall Position)	14,000,000	-56,000,000	14,000,000	-56,000,000

Year 3	No Loss	Loss	No Loss	Loss	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	70,000,000	0	70,000,000	0	70,000,000
Change in Premium Accrual (a Liability)	0	0	0	0	0	0	0	0
Change in Profit Commission Accrual (an Asset)	0	0	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall Position)	14,000,000	-56,000,000	14,000,000	-56,000,000	14,000,000	-56,000,000	14,000,000	-56,000,000
Overall								
Actual Premium Paid (P&L Account)	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000
Actual Claim Recovered (P&L Account)	0	70,000,000	70,000,000	140,000,000	70,000,000	140,000,000	140,000,000	210,000,000
Actual Profit Commission Received (P&L Account)	0	0	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall to P&L Account)	42,000,000	-28,000,000	-28,000,000	-98,000,000	-28,000,000	-98,000,000	-98,000,000	-168,000,000
Losses above Aggregate Limit	0	0	0	0	0	0	0	0
Probability	72.90%	8.10%	8.10%	0.90%	8.10%	0.90%	0.90%	0.10%
Partial Expected Cost	30,618,000	-2,268,000	-2,268,000	-882,000	-2,268,000	-882,000	-882,000	-168,000

Overall Expected Cost	21,000,000
Expected Loss Above Aggregate Limit	0

表六 Example of the Accounting of a Multi-Year Structured Deal

Period of Deal	3	Years
Annual Limit	70,000,000	
Total Aggregate Limit	100,000,000	
Annual Premium	20,000,000	
Profit Commission at Expiry	60%	
Probability of Loss in any one Year	10.00%	

Year 1	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000
Change in Premium Accrual (a Liability)	0	22,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-28,000,000

Year 2	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	30,000,000
Change in Premium Accrual (a Liability)	0	2,000,000	-11,000,000	-2,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	-12,000,000	0	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-36,000,000	9,000,000	-12,000,000

Year 3	No Loss	Loss	No Loss	Loss	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	30,000,000	0	30,000,000	0	0
Change in Premium Accrual (a Liability)	0	0	-2,000,000	-2,000,000	-11,000,000	-11,000,000	-20,000,000	-20,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	-24,000,000	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-26,000,000	18,000,000	-12,000,000	9,000,000	-21,000,000	0	0
Overall								
Actual Premium Paid (P&L Account)	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
Actual Claim Recovered (P&L Account)	0	70,000,000	70,000,000	100,000,000	70,000,000	100,000,000	100,000,000	100,000,000
Actual Profit Commission Received (P&L Account)	36,000,000	0	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall to P&L Account)	24,000,000	-10,000,000	-10,000,000	-40,000,000	-10,000,000	-40,000,000	-40,000,000	-40,000,000
Losses above Aggregate Limit	0	0	0	40,000,000	0	40,000,000	40,000,000	110,000,000
Probability	72.90%	8.10%	8.10%	0.90%	8.10%	0.90%	0.90%	0.10%
Partial Expected Cost	17,496,000	-810,000	-810,000	-360,000	-810,000	-360,000	-360,000	-40,000

Overall Expected Cost	13,946,000
Expected Loss Above Aggregate Limit	1,190,000

肆、鏡影會計

前面多年期會計的討論告訴吾人的就是 ForS 多年期的再保交易會影響分保人的資產與負債帳項。在 ForS 範例中，應計利潤佣金是當作分保人的資產，直到賠案發生與可能的利潤佣金喪失時。

分保人資產負債表中資產負債的產生是很自然的結果——項交易從分保人的觀點是資產，從再保人的觀點確定代表是一項負債嗎？假如並非如此，資產是無中生有的而且會對合約雙方的財務狀況產生時好時壞的誤導，資產的誤列也會使交易雙方的一方產生財務狀況比不是 ForS 交易時為“ 好”的情形 (過去的 ForS 就有這項問題)，鏡影會計就是在處理這項議題。

鏡影會計界定再保人應如何從他們的觀點，說明一項交易，本質上，鏡影會計要求分保人與再保人來自同一交易時，金額應相同，但帳項科目是相反的——方是利得時，對另一方就是損失，一方是資產時，對另一方就是負債。

我們現在應用鏡影會計在多年期 ForS 再保交易中，(這裡不說明傳統再保的鏡影會計， 因為很清楚的一方列借方費用(例如：分保人支付的再保費)，另一方就是認列收入 (例如：再保人的簽單再保費收入)。

一、 ForS 範例的鏡影會計

從再保人的觀點說明 ForS 範例的交易，將左方表格中的每一項目從新定義後，產生右方的表格。

分保人觀點	再保人觀點
實際保費支出(P&L 的成本)	保費收入 (P&L 的收益)
實際賠款攤回(P&L 的效益)	實際賠款支付(P&L 的成本)
應計保費(負債)	應計保費 (資產)
應計利潤佣金(資產)	應計利潤佣金(負債)
淨成本(負值=效益)	淨效益(負值=成本)

以這種方式我們可確定收入、支出、資產與負債在交易雙方取得公平的分配。現在我們看之前的一個範例，這範例是第一年發生賠案後，再保人的情況，其結果是再保人產生淨成本 28,000,000－此在分保人中產生 28,000,000 的鏡影效益，同樣，在第一年沒賠案，第二年發生賠案的範例中，再保人產生淨成本 36,000,000，這也反應分保人 36,000,000 的鏡影效益。

二、鏡影會計最近的發展

現在許多限定再保合約要求應包括分保人與再保人間鏡影會計處理條款，在 "後-Spitzer"的年代，所有買賣雙方所有的經濟交易內容均需透明化－鏡影會計的要求是達成該目標的基本步驟之一。

表七 ForS 再保險三年期會計處理範例

Period of Deal	3	Years
Annual Limit	70,000,000	
Total Aggregate Limit	100,000,000	
Annual Premium	20,000,000	
Profit Commission at Expiry	60%	
Probability of Loss in any one Year	10.00%	

Year 1	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000
Change in Premium Accrual (a Liability)	0	22,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-28,000,000

Year 2	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	30,000,000
Change in Premium Accrual (a Liability)	0	2,000,000	-11,000,000	-2,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	-12,000,000	0	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-36,000,000	9,000,000	-12,000,000

Year 3	No Loss	Loss	No Loss	Loss	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	30,000,000	0	30,000,000	0	0
Change in Premium Accrual (a Liability)	0	0	-2,000,000	-2,000,000	-11,000,000	-11,000,000	-20,000,000	-20,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	-24,000,000	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-26,000,000	18,000,000	-12,000,000	9,000,000	-21,000,000	0	0
Overall								
Actual Premium Paid (P&L Account)	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
Actual Claim Recovered (P&L Account)	0	70,000,000	70,000,000	100,000,000	70,000,000	100,000,000	100,000,000	100,000,000
Actual Profit Commission Received (P&L Account)	36,000,000	0	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall to P&L Account)	24,000,000	-10,000,000	-10,000,000	-40,000,000	-10,000,000	-40,000,000	-40,000,000	-40,000,000
Losses above Aggregate Limit	0	0	0	40,000,000	0	40,000,000	40,000,000	110,000,000
Probability	72.90%	8.10%	8.10%	0.90%	8.10%	0.90%	0.90%	0.10%
Partial Expected Cost	17,496,000	-810,000	-810,000	-360,000	-810,000	-360,000	-360,000	-40,000
Overall Expected Cost	13,946,000							
Expected Loss Above Aggregate Limit	1,190,000							

三、分開會計原則

由於「分開會計原則」(bifurcated accounting，以下簡稱 BA）之起源在此份報告別處已介紹過，故此處我們僅討論 BA 實務作業面之用意。

BA 起源於有限再保險單使用在包含不止一個項目之需求逐漸增加。實務上一個不含任何（或包含極小）轉嫁風險之保單與一個明顯存在承保風險但其發生機率微乎其微之保單，兩者可說是具有相同的保險風險。舉例來說，每單位限額之償債能力可用一個合併比率（＝市場承擔之損失／該國家可能發生之最大損失）來衡量，該比率最高不得超出 100%；也就是說，市場承擔之損失只能少於或最多等於該國家可能發生之最大損失，以表示其仍具備一定之償債能力。前述 BA 會計處理原則的優點便是整份保險契約（由兩個項目同時構成時）可視為再保險保單而解釋之。

然而在 BA 的處理原則下，此問題便不再存在。前述列舉之保險契約在分開會計處理原則（BA）下可視保險風險是否可移轉而分別處理之。最高限額內之保險風險（capped quota share）應依存入基礎留存相當數額，而發生機率微乎其微之保險風險則可採用再保險方式轉移。不過，用此種分開會計原則處理保險契約時，會消弭單純在其它方面只採用再保險處理而產生的好處。

第四項 財務再保/限定再保會計處理準則

壹、英國財務再保/限定再保會計處理準則的演變

在保險監理上，英國向來採取較為寬鬆的政策，針對財務再保/限定再保的監理，一直以來並無特別法加以規範，僅在會計處理準則中規範，1991年時，英國特許會計師學院（ICA: Institute of Chartered Accountants）下的保險委員會針對產險財務再保會計處理進行討論，並以“產險財務再保會計：一篇討論性的文章”(Accounting for Non-Life Financial Reinsurance: A Discussion Paper) 為題發表。

該篇文章討論的議題主要包括建立指引的必需性，風險移轉，契約本質測試，契約類別與契約辨識指引。關於建立指引的必需性方面，保險委員會認為假如將財務再保當作傳統再保處理，分保人與再保人的財務報表將產生誤導，承保損益也將被扭曲，其次，風險移轉方面，委員會將保險公司風險分為核保風險，時間風險，投資報酬風險，信用風險與費用風險五種。從會計觀點而言，一項契約如沒有移轉核保風險與/或時間風險，委員會認為就不是再保契約，然而，如沒有移轉核保風險，但有移轉時間風險，委員會認為仍足以認定是再保契約。關於契約辨識指引方面，委員會認為再保人承擔分保人已發生賠款或未來賠款的特定比例時，核保風險才算移轉。再者，契約條款的訂定不以事先設定在核保損益的特定金額為基礎，而應依核保損益與再保費的關係，維持合理的變動。

假如契約不被認定是再保契約，分保人支付的保險費以"委託款項"認列，再保人則應將此款項視為負債項目，因此，分保人支付的保險費與從再保人攤回的預計賠款產生差異時，該差異應在雙方各自帳目中依契約期間以"投資收入"或"利息費用"科目攤銷。

嗣後，英國特許會計師學院為了充分揭露此種交易的本質，發佈財務報告草案（Financial Reporting Exposure Draft），亦即"交易實質內容報告"（Reporting the Substance of Transactions），為當時英國保險監理機構－工商部（DTI: Department of Trade and Industry）採用，是為財務報告準則第五號（FRS5: Financial Reporting Standard 5）。在 1994 年英國特許會計師學院另發佈"FRS5 在產物保險交易的應用"（Application of FRS5 to General Insurance Transactions），是為 FRAG35/94 公報。該公報在 1998 年併入英國保險協會（ABI: Association of British Insurers）所發佈的"保險業會計處理建議書"（SORP: Statement of Recommended Practice for Accounting for Insurance Business）中。

最近，英國新的保險監理機構－金融服務總署（FSA: Financial Services Authority）為了更明確規範財務再保/限定再保，在 2002 年發佈聯合咨詢公報 144 號（CP144：Consultation Paper 144），該公報名為"保險業使用財務創新的監理新方法"（A new regulation approach to insurance firm's use of financial engineering），該公報是試圖以較嚴格的方式規範保險公司，然當時仍未制定相關的監理法規。或許，在 2005 年後[5]會出現也說不定。

貳、財務報告準則第五號（FRS 5）

FRS 5 的要旨是要求保險人或再保險人對各項交易的實質內容，必需透過適當的會計處理，在財務報表中作出適切的反應，並且能被使用者充分了解及運用，該準則重要內容分成兩部份：一為規範適用範圍；另一為對何謂"實質交易"的認定，前者所謂的交易不僅指單一交易也包括團體交易，但不適用下列的交易行為：1) 遠期與期貨交易；2) 外匯與利率交換合約；3）價格或指數連動交易； 4) 購買承諾與訂單；5) 勞動合約。後者對"實質交易"的認定是廣義地指會增減相關資產或負債的交易而言。該準則

[5] 因為在 2005 年，英國 FSA 開始起草進行關於財務再保報表揭露草案。

並進一步要求，如交易活動無顯著的波動或無顯著風險存在的情況下，所有相關的資產必需全數認列，反之，所有相關的資產無需認列。

參、保險業會計處理建議書（SORP）

SORP 適用於公司法與一般公認會計處理準則所要求的 9A 表格中之所有的保險公司與團體，包括一般與長期業務，SORP 第五部份"實質再保險交易之財務報告"重點有：1) 依 FRS5 再保險交易的實質內容，應該完全認列於當年度資產負債表中； 2) 再保契約需有顯著的保險風險的移轉；3) 分保人或再保險人應有合理的可能性會發生顯著的損失；4) 再保契約的風險移轉應分風險移轉與融資兩部份分別入帳認列，不被認定為再保險者，再保險費支出必需以存款或借出款認列於資產項下；5) 分保人應於資產負債表中揭露並說明再保契約，並使使用者清楚其影響。

肆、聯合咨詢公報 144 號（CP144）

聯合咨詢公報 144 號主要目的是向外咨詢各方意見，以利金融服務總署(FSA) 制定保險業使用財務創新工具之監理法規，該公報重點包括：1) 使用財務創新工具的理由；2)財務創新工具的監理利益不得超過原有風波移轉與其附加價值的總合；3)必需全面檢視財務創新工具對風險管理的影響；4)必需遵守相關的會計處理與提存準備金的要求；5)財務報表必需充分揭露；6)必需有適當的監理檢查；7)財務創新需符合高標的管理水準；8) 針對交易對手的信用風險，應提存適當的準備金。

伍、英國財務再保/限定再保稅負處理

英國財務再保/限定再保稅負處理，需遵守一般公認會計準則，此外並無特別規定，根據金融服務總署(FSA) IPRU[6] (INS) 附錄 9.2 的第 26 節規定，保險人的年度報酬表格應提報給金融服務總署(FSA)，且應將分進與分出業務報酬分別表示，並依一般公認會計準則處理相關稅負。

[6] FSA, Interim Prudential Sourcebook: Insurers Vol.2, Appendix 9.2, paragraph 26

第五項 英美財務再保/限定再保會計監理的比較

英美兩國對財務再保/限定再保認定上，最大的不同在於保險風險（Insurance Risk）的決定，根據 FRAG 35/94，英國監理上認定只要合約上移轉核保風險（Underwriting Risk）與時間風險（Timing Risk）的任何一個，即可視為再保合約，根據 FAS 113，美國監理上，則認定合約上需移轉核保風險與時間風險，始視為再保合約，因此，同樣的交易合約，在英美會面臨不同的監理命運。

其次，英美在會計監理的架構上，亦有所不同，美國在會計監理上，則分兩套系統，一般公認會計準則（GAAP）與 FAS 113 主要針對一般企業的交易，為達監理清償能力的目的，美國保險監理官協會（NAIC：National Association of Insurance Commissioners）所發佈的模範法定會計的第 22 章，是為法定會計準則（SAP：Statutory Accounting Principles），則僅適用於保險業，一般而言，這兩套系統，在費用實現的認定上會有顯著的不同，但在收入實現的認定上，則大致相同，因此，在美國，同樣的限定再保合約，在此兩套系統下，處理的方法可能不同。例如：在一般公認會計準則（GAAP）與 FAS 113 處理系統下，來自追溯再保合約收益的遞延與認列，不是依據利息法（The Interest Method）就是回收法（The Recovery Method），然而，在模範法定會計的第 22 章處理系統下，來自追溯再保合約收益，以"其他收益"表達，同時以"特別盈餘"分別認列，直至賠款攤回實現時，同一交易，兩套不同的財務報告手法，徒增保險人的作業負擔。

在英國方面，會計監理上，主要依據一般公認會計準則（GAAP），同時考量 FRS 5、FRAG35/94、SORP 與 FSA IPRU(INS) 的規範，對來自追溯再保合約收益，藉由表現在"資產負債"科目上，減縮了法定會計準則（SAP:Statutory Accounting Principles）與英國一般公認會計準則（GAAP）的縫隙，此種監理架構，明顯與美國不同，此外，美國 FAS 113、

EITF 93-6 與模範法定會計的第 22 章對財務再保/限定再保的會計處理比英國的處理方式，更為特定，FAS 113 對追溯再保合約與預期再保合約，會計處理上不同，預期再保合約的再保費以預付基礎處理並依合約期間攤銷轉帳，追溯再保合約的再保費以應收再保賠款處理，但金額不能高於相對應的負債金額，英國對追溯再保合約與預期再保合約的處理與美國一般公認會計準則（GAAP）對預期再保合約的處理雷同。再者，英國對多年期的追溯再保合約沒有特殊的處理方式，美國的 EITF 93-6 則有特定的規範。

最後，英美會計監理上，雖有不同，但同樣有不完美處。對再保的定義，在各別國內可能互相衝突，會計組織與法院判決對再保“ 經濟本質”（Economic Substance）的認定，可能不儘相同。此外，對財務再保/限定再保的相關議題與其中的技術處理，可能需審慎考慮。例如，有些合約僅承擔極為有限的核保風險，即使滿足了再保的定義要求，但對其準備金的提存與交易合約的可靠性應審慎判斷。

第六項 國際會計組織對財務再保/限定再保的監理

ART 監理上主要的議題是風險移轉，會計處理，與資訊揭露的問題。這些議題的監理之所以重要，在於 ART 可能被誤用及保險公司可能對保戶，投資人與包括監理官的其他利害關係人作不實的報導，可慶幸的是絕大部份 ART 交易沒有負面或不良企圖，但有極少數"惡質"交易出現，使 ART 蒙上一些陰影。

壹、會計監理

此處我們將聚焦在第 4 號國際財務報告準則（IFRS 4：International Financial Reporting Standard 4），這號準則是會計準則，這會計準則是國際會計準則委員會（IASB: International Accounting Standard Board）下的保險契約專案之第一層面的工作成果，IASB 的意圖就是產生第一份綜合性的保險契約會計準則，保險契約專案有次序地被一分為二，那就是產生綜合性保險會計準則的問題屬於 Phase II (第二個層面)不應耽擱完成會計準則所需的一些要件屬於 Phase I (第一個層面)。

IFRS 4 準則 2005 年一月一號生效，這對保險公司財務報表報導的方式有顯著的影響，幾乎所有上市的保險公司(與非保險團體)的合併帳戶均應符合 IFRS，包括 IFRS 4，的規定編製。

IASB 認為 IFRS 4 對 Phase II 是個墊腳石，IASB 已確認要"調查所有相關的觀念與實務上的問題並謹慎完成，一旦完畢就不能延遲將 IFRS 4 納入完成 Phase II 的工作中"。然而，綜合性會計準則的完成仍有些延誤，IASB 在 2004 年九月開始啟動 Phase II 的工作，成立保險工作小組（IWG：Insurance Working Group）開始深思建立未來長期的會計準則，但從最近 IASB 工作計劃中，可察覺到委員會並不預期在 2006 年第三季出版公報，在 2011 年前要求所有的公司遵循最終版的保險會計準則是不太可能了。

會計準則對形成 ART 的環境上，扮演重要的角色，回溯一下，1993 年美國 FASB 113 號公報發佈後，隨即改變了整個 ART 市場，FASB 113 號公報認為財務再保險不能再被認定是保險，因此對購買者的利益不再，ART 市場中，代之而起的是限定再保險，它不但可因應市場的激烈競爭，也能符合新的會計準備的要求，針對保險契約的 IFRS 4 國際會計準則的生效，對 ART 的衝擊可能又會像美國 FASB 113 號公報對 ART 的衝擊一樣。

貳、IFRS 4 對 ART 的衝擊

僅僅具有理財特性的契約（只移轉時間風險的契約）會計準則不再認定是個保險契約，也不適用以保險會計的方式處理，這反應一個事實，那就是許多國家現行的會計準則，尤其在美國，美國的一般公認會計準則（GAAP：Generally Accepted Accounting Principles）要求有移轉核保風險與時間風險的契約才能被視為再保險契約。

含有在相當遙遠的未來，才對承保損失賠付的條款，這種再保安排是不符合保險風險移轉的要求，這些條款包括：浮動式自留額，" Last Dollar Paid"的機制，數年期的自留額與雙重起動。

針對會減少再保人部份責任或全部責任的交易，保險人必需說明或揭露存在於雙方的任何附約或意向書。

對分保業務，IFRS 4 會計準則要求兩項特定的報告：

1. 保險的定義與風險移轉

有顯著保險風險移轉的契約才是保險契約，那就是說，假如未來不確定的事故對另一方(保戶)產生不利影響時，從另一方 (保戶)接受顯著保險風險的一方(保險人)才依約補償給保戶的契約才是保險契約，任何情況下，只有在承保事故能夠引起保險人賠付顯著的額外利益給另一方時，保險風險的移轉才被會計準則視為顯著，因此，假如契約並沒有移轉顯著的風險，IFRS 4 就不認定它是項保險契約，這就明顯地惕除了財務再保合約不是保險契約，因為財務再保合約只具法律形式，但契約條款卻約定，在再保人承受被保損失後，保險風險又回歸給保戶之故。

2. 衡量與脫鉤

IFRS 4 會計準則要求有保險與投資成份的契約應該脫鉤，同時在下列兩項條件均滿足時，必需個別說明：

- 保險人能夠個別地衡量投資成份(也就是不考慮保險成份的情況下)
- 起因於投資成份的權利與義務，保險人的會計政策並不要求要確認

假如保險人能滿足上面第一項條件，但無法滿足第二項條件，那麼脫鉤是被允許的，但不是必要的要求，因此是否脫鉤，要視保險人的會計政策而定。

這項要求最典型的例子，就是保戶收到損失補償，但契約卻要求保戶在未來年度要退回賠款，此種情事實起因於契約的投資成份，IFRS 4 會計準則要求，假如保險人的會計政策要求把賠款認列為收入，不是認列為責任，那麼就一定要脫鉤處理，假如保險人的會計政策要求把賠款認列為責

任，那麼 IFRS 4 會計準則的要求，只是允許脫鉤，但不是必要。

IFRS 4 會計準則也明顯地要求，風險量的與質的資訊必需詳盡揭露，對 ART 商品的再保負債面應完整的報告，同時應該在保險人的資產負債表中，藉由再保賠款攤回明白地揭露另一方的風險訊息。

參、法律監理

國際保險監理官協會（IAIS: International Association of Insurance Supervisors）剛出版一份有關“風險移轉、限定再保的揭露與分析”的指引，同時對限定再保的監理完成如下的一些結論：

一、適當揭露與會計處理的各種方式

有各種方式可以確保限定再保的適當揭露與會計處理，IAIS 認為這些不同的方式無非反應當地市場的情況與當地一般監理的方式，指引也提及對限定再保的監理許多國家也正在評估。

各國所採用的監理實務與程序不外採取原則為基礎的監理方式與規範為基礎的監理方式或兩者兼具的方式。

原則為基礎的監理方式強調高層管理人員與董事會的責任，這種監理方式傾向確保高層管理對公司的政策與程序必需書面化，對所謂的同意必需適當，監理風險的評估主要是要證實公司的政策與程序是否有適當的規範與是否可接受，此外，原則為基礎的監理方式要求高層管理人員必需揭露監理上被認為重要的任何事項。

規範為基礎的監理方式在監理的要求上更明確，在監理的程序上更詳實具體，例如：要求再保合約必需事先核准，這種監理方式的精神在於不太仰賴公司高層管理人員與董事會，更仰賴的是透過獨立監理單位與來自政府的監測。

不管何種監理方式，保險監理官對限定再保最關注的是保險公司管理層甚麼地方會濫用限定再保，何時會故意精心設計限定再保的內容並誤導大眾，例如：親密公司間的內部合約，或經第三者訂定內部合約，或作一些契約外的協議均可能隱瞞保險公司的利害關係人，監理者與債權人，就這些情況來說，限定再保與其他監理官不必然能夠防範的欺騙型態沒甚兩樣。

二、監理方式範例

下列監理方式的範例可被應用在限定再保上：

- 執行實地稽查，包括對再保安排的評估與詢問公司管理層對有限風險移轉合約的使用情形。
- 關於風險移轉是否有適當的說明與附約內容是否有附在給監理單位的報告中每年要求公司高層管理人員證實。
- 在年度報告中，要求公司必需報告限定再保交易數量與細節。
- 要求必需作年度精算報告 (報告中應包括再保詳情) 與為了評估保險公司再保管理系統的適切性，擴大精算師的責任(再保管理系統包括風險移轉、管理哲學、與書面化的適當性)。
- 要求公司稽核人員提供關於財務報表與其他工作文件的稽核報告。
- 要求所有的有限風險移轉的安排必需事前獲得核准(在某些國家在這方面有實質上的困難)。
- 要求所有與親密公司的再保交易應事先獲得核准，且需證明這些交易符合市場規範。
- 關於保險公司的內部控管與再保安排的管理過程，執行再保管理策略

(管理策略書需董事會簽署) 的年度檢查，保險公司的再保管理策略每年必需送至監理機關。

- 關於實施嚴謹風險管理制度，風險移轉的自我評估，與精準的財務報告， 包括每年對監理機關的報告等方面的重要性，必需經由監理機關出具信函給保險公司以強化董事會與高層管理的責任。
- 對有疑點的再保安排執行調查，這些調查需請保險公司提供額外的會計與精算報告。
- 針對風險移轉的適當性，分析每一份再保合約(目前只有一個國家如此)。
- 完全禁止限定再保(好幾個國家是如此)。
- 關於保險人與再保人的再保安排，某些國家採取風險基礎的監理方式。
- 保險公司管理上如有威脅到清償能力的情事或有詐欺之虞之情事，要求稽核人員與精算師在給監理單位的報告上需加以揭發。

三、進一步檢查的方向

即使混合採用上述監理的方式，要能偵查到每一有疑點的再保安排是不太可能的，下列是給監理單位作進一步檢查的指引。

- 將包括在單一合約的各險種分開檢查。
- 進一步檢查對保險人與再保人均無商業敏感性的合約(例如：附約中有無改變語意的語句)。
- 進一步檢查不遵循正常作業程序與指引的再保合約。
- 進一步檢查臨近年底或臨近年底與前一年才安排的再保合約(目的是檢查保險公司是否有掩飾那年不良的財務狀況)。
- 進一步檢查文件日期是否有不一致或有落差的地方(目的是檢查日期是否為了掩飾而被更改)。
- 進一步檢查混合的合約－正常合約與異常合約混在一起成為單一的合約，此時如要進一步檢查需分開檢查。

四、IAIS 的建議

IAIS 建議在評估風險移轉方面，監理官應該：

- 評估每年的再保管理策略 (經董事會簽署完成)，再保管理策略應有合理的再保規劃且能管理與降低保險公司承受的風險。
- 瞭解交易的本質比形式重要，特別要瞭解保險人與再保人為何要進行交易。
- 能夠決定真正移轉的是何種風險，如何移轉以及為何這項移轉對雙方是必需的。
- 檢查所有再保交易的文件(包括成交暫保條、承保條、再保協議與任何附帶文件)，這可幫助瞭解整個交易的結構與它們的真實性。
- 能夠要求保險人進行交易的風險移轉分析與交易經濟價值的分析(包括任何個別合約或附約或內部合約)，必要時，監理官能親自分析。

關於會計與揭露問題，IAIS 認為監理官應有能力去證實保險公司已對可能減少或消除再保人責任的任何個別契約或附約或意向書已作揭露及說明。

假如風險移轉不可接受，揭露及會計上又沒反應出交易的經濟價值，監理官應使用公權力採取糾正行動，包括不允許該交易當作再保交易以及對重大事項部份重編報表。

五、資訊分享與監理機構間的合作

最後，IAIS 對國際間的資訊分享與監理機構的合作已準備就緒，IAIS 認為透過國際間監理機構的合作與關於各國訊息結合一起時，各國所得訊息是否適切的訊息分享，可增強監理的有效性，IAIS 也很清楚，即使有這層國際合作，也無法完全保證可清楚瞭解所有限定再保被濫用的情事。國際間資訊科技的聯結對 IAIS 是否運作成功是個關鍵，透過國際網路間訊息的交換，各國監理官在必要時可立即採取糾正行動，同時以清楚客觀的標準特許資訊應公開，各國應訂資訊特許公開相關的法令，如此可免除握有關鍵訊息的人不及時提供訊息或誤導訊息的困擾，這可參閱 IAIS 核心準則第十五條。

資訊分享與監理機構的合作可參閱 IAIS 核心準則第五條 IAIS 認為在評估限定再保交易時，這項合作是相當有幫助的，為了有助於該項跨國合作，IAIS 已在 2002 年發行資訊交換的監理準則(Supervisory Standard on the Exchange of Information)，該準則特別適用在機密資訊，同時該準則對適當資訊分享應包括的要項也提供指引，適當資訊分享也被規範在 1997 年意向書法案(Model Memorandum of Understanding)中，資訊分享協議應包括：

- 資訊交換的目的
- 交換資訊的義務
- 接收資訊的監理機構對資訊保密的標準，包括它們是否可將資訊二次傳遞給同國度的其他政府單位。
- 除了提供資訊的監理機構原先同意的目的外，接收資訊的監理機構要將該資訊作為其他用途時，在使用該資訊前應獲得提供資訊的監理機構的明確同意。

第五節　10/10 經驗法則

美國財務會計準則委員會 FASB（Financial Accounting Standards Board）於 1992 年發佈 113 號公報（FAS113）規範短期與長期再保險契約之會計處理與財務報表揭露原則。FAS113 公報要求分保公司（ceding company）為了消除與再保險契約有關的損失或負債，不揭露在資產負債表上，則被保人（即分保公司）應將再保險契約上可能發生顯著的風險轉移給再保公司，而再保公司必須面臨遭受顯著損失的可能性而受理承保。FAS113 公報界定合法運用限定再保險的情況。然而它並未詳述更多明確的規定與處理方式。

保險公司與會計師事務所已建立一個基本處理原則，也就是說：指再保人依再保險合約內容，發生 10%損失之可能性應至少為 10%，以作為合約是否具有顯著風險移轉之判斷。一般稱此種檢測方法為 10/10 經驗法則。

但是仍有評論家爭論限定再保險契約中 10%乘上 10%應為 1%，而 1%算不上是顯著的風險值。為此美國財務會計準則委員會 FASB 近期決定會將此爭議列入新法增修討論案的議程內。

儘管有些公司宣稱堅持遵守 10/10 經驗法則，但亦可能同意以附加信件的方式，要求再保公司承擔所有的損失。AIG 便是以此方式與 General Re 安排限定再保險合約，而安隆公司亦有一個附加合約，掩飾其偽造的資產負債表的帳外交易的真實性，不讓稽核會計師 Arthur Anderse 發現。當然，這些合約附件都在規避稽核人員的注意。

然而至少 FASB 有可能要求分保公司應符合潛在風險可能發生的機率與損失程度之最低門檻。FASB 董事長 Robert Herz 也支持國際會計準則委員會 IASB（International Accounting Standards Board）對於再保險契約之分保公司不可以將再保險負債自其財務報表中移除之提示，即便該再保

險風險已 100%移轉出去。

沒有監理機關呈現更明確的監理目的，很難預測分保公司與再保公司在其財報表會如何反應。但倘若 FASB 遵循 Mr. Herze 建議的話，許多美國公司將必須重新調整公司現行採用的會計政策以及重新揭露公司的財務狀況。

此外稽核單位也將更關注與再保險相關的交易行為，也由於稽核單位特別仔細的審查，購買限定再保險的分保公司也將較以往更加謹慎。

最後，10/10 經驗法則是否以 20/20 經驗法則替代，應依台灣保險市場的成熟度而定，台灣保險市場與風險管理市場的成熟度與英美市場相較，落差仍大。因此，建議 20/20 經驗法法則不宜取代 10/10 經驗法則，此建議無非是待台灣市場更成熟後，再考慮。

第六節　財務再保險、限定再保險商品之現金流量表

在限定再保險市場內有兩種基本的架構：

- 風險自留
- 風險移轉

兩種架構皆可運用於「限額比率再保合約 Finite Quote Share（FQS）」或「分散損失合約 Spread Loss Covers（SLC）」，端看再保險契約保費和理賠金支付的移轉是如何發生的。很明顯地，在限額比率再保合約架構上，所移轉之再保險費係扣除再保險佣金之淨額，然而原理是一樣的。部份細節會依以下狀況而改變

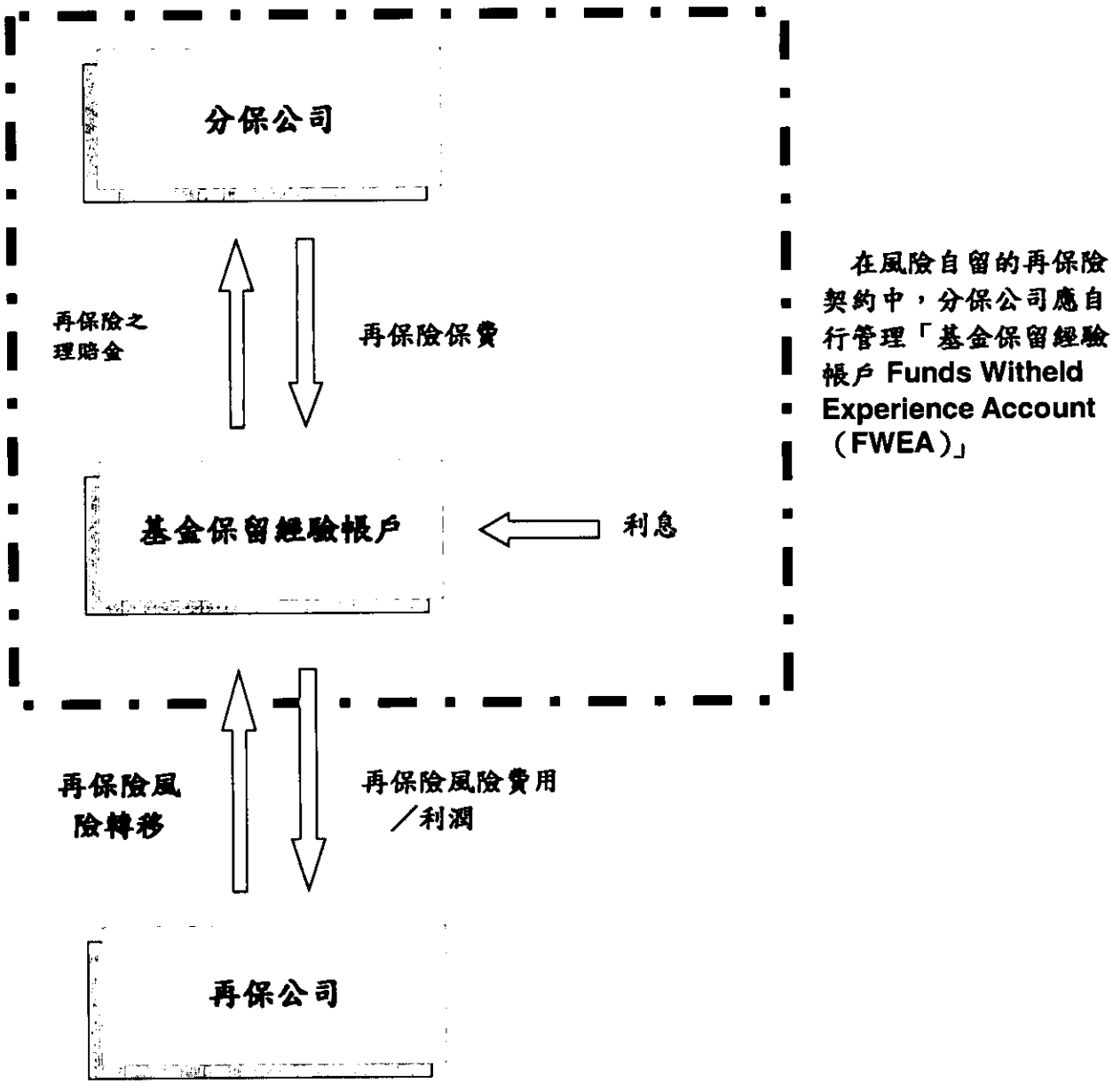
- 那一方持有合約中之基金
- 交易餘額（表達於損益項目下）是否以現金實際支付，或該再保險契約已表達於資產負債表中的資產或負債項目下

在風險自留的再保險契約中，分保公司應自行管理「基金保留經驗帳戶 Funds Witheld Experience Account（FWEA）」。此種帳戶類似信託付款帳戶（escrow account），現金實際支付，但是很有可能以資產或負債型式在資產負債表中被持有。例如在合約中分保公司將持有支付再保險人再保費等額之負債，而非實際支付再保費給再保險人。同樣地，再保險理賠金給付也可能當作資產型式而被持有（即再保公司欠分保公司的理賠金）。而實際上視同現金給付給分保公司的金額將是再保公司的利潤（margin）。

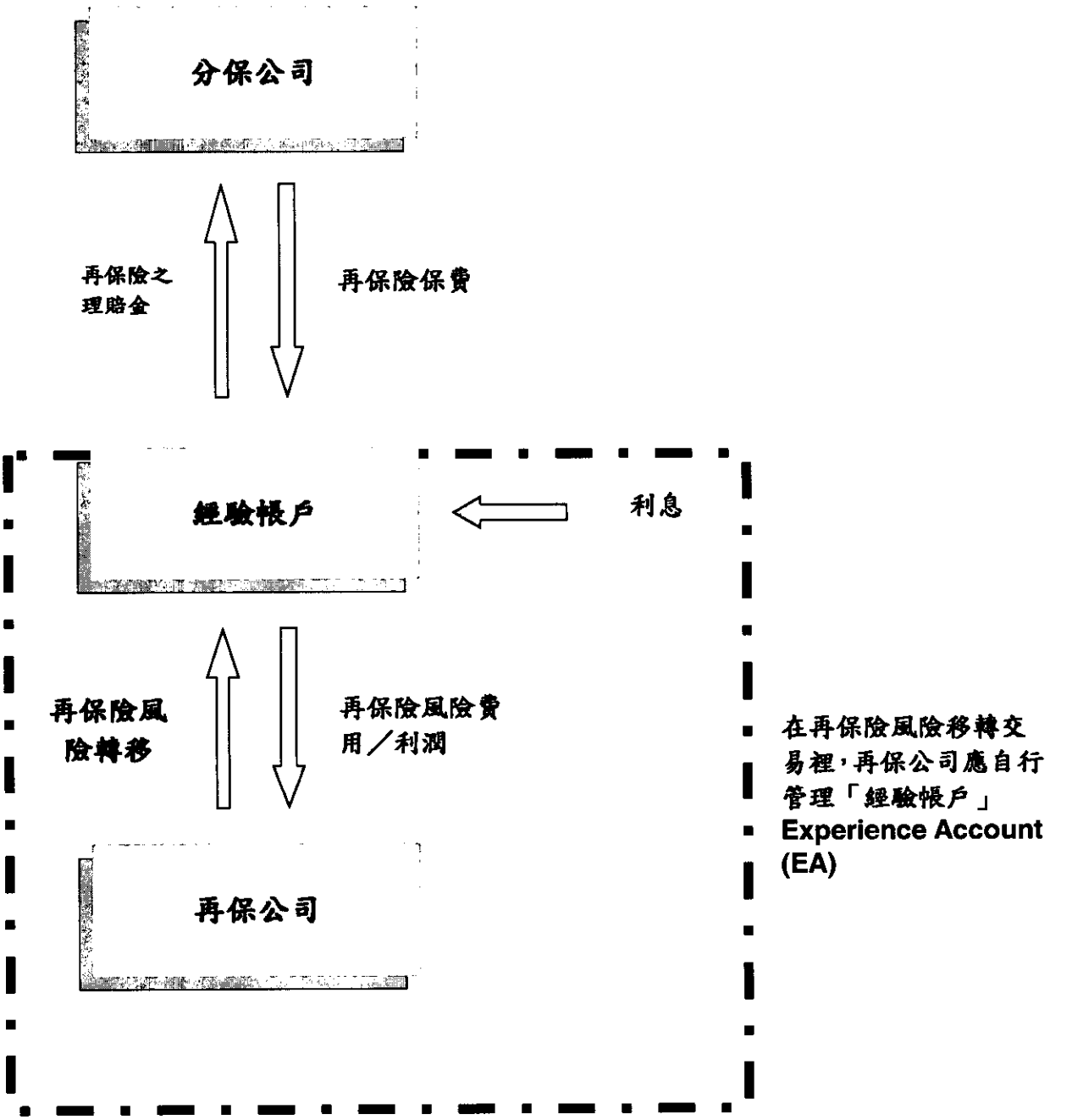
在風險移轉的交易裡，再保公司將持有「經驗帳戶 Experience Account（EA）」且以實際現金支付交易餘額。

對於上述兩種 FWEA 或 EA 架構而言，皆存有其優缺點，而事實上要選擇何種架構，端視所設計之交易欲達成之目的而定。

圖四（再保險風險自留）


分保公司
再保險之理賠金
再保險保費
基金保留經驗帳戶
利息
在風險自留的再保險契約中，分保公司應自行管理「基金保留經驗帳戶 Funds Witheld Experience Account（FWEA）」
再保險風險轉移
再保險風險費用／利潤
再保公司

圖五（再保險風險移轉）


分保公司
再保險之
理賠金
再保險保費
經驗帳戶
利息
再保險風
險轉移
再保險風險費
用／利潤
再保公司
在再保險風險移轉交易裡，再保公司應自行管理「經驗帳戶」Experience Account (EA)

第七節　財務再保險、限定再保險在巨災風險融通上扮演的角色

在先前所討論過的各式各樣 FFR 商品中，大部分但非全部皆具有潛在的可能性，可應用在巨災風險的財務融通 (Catastrophe Financing, CF)。可提供另類形式財務融通的商品有下列數種：

- 分散損失合約(Spread Loss Covers)
- 巨災交換合約(Cat Swaps)
- 巨災債券合約(Cat Bonds)
- 或有資本合約(Contingent Capital)

僅能有限度或無法應用於巨災風險財務融通的商品則有下列數種：

- 清償能力比例合約(Solvency Quota Shares)
- 賠款責任移轉合約(Loss Portfolio Tansfers)
- 回溯累積合約(Adverse Development Covers)

在有關賠款責任(Portfolio)的範圍內，賠款責任移轉合約與回溯累積合約中已包含了巨災損失，然而屆時這些產品被認為是造成巨災理賠將會充分地發展且大量賠付的主要原因。

現在將詳細說明前述四項可應用於另類形式財務融通的產品。這四項產品的排列順序是有用意的，我們將從巨災暴露風險較低的產品往巨災風險較高的產品做說明。當所需保費占購買限額 (通常是大於 20%)達到顯著比例時，分散損失合約才真正發揮作用，而巨災債券則是在暴露單位相當微小時運作最好。

第一項 虛擬國家－Avalon－的巨災財務應用情形

為了說明巨災財務的應用情況，我們虛設一個國家，名為 Avalon。

Avalon 是一個相當繁榮的島國，但常受颶風與地震的侵襲。居民的保險安排是由 Avalon 的保險公司 ICA (Insurance Corporation Avalon) 提供，ICA 是國有獨占的保險公司。ICA 發現：巨災危險暴露近年來快速的增加，是由於 Avalon 的經濟繁榮。在成本鉅幅增加且傳統保險市場亦缺乏承保能量的情形下，對其傳統巨災保險安排計劃造成相當大的壓力。

因此，ICA 決定重新架構它們的再保險購買決策。

整個過程從 ICA 委託一個巨災模型規劃公司，對於 ICA 公司所面對的巨災暴露單位建立模型開始，這份研究的結果請參考圖六，根據這份研究結果 ICA 確定該公司的再保險條件為：颶風五億元及地震十五億元，這些數據是以一百年內發生一次以上的颶風，以及兩百五十年內發生不到一次的地震，為基礎計算得來的。

ICA 的再保經紀人隨即將上述的再保險條件，送到保險市場中尋求傳統再保險安排方式的報價。上述的結果請參考表五。這二種再保險安排計劃的總成本超過一億兩千七百五十萬元，這樣的費用在 ICA 巨災保費收入一億五千萬中占了相當大的比例。對於上述任一計劃發生全損的危險事故時，保險計劃的成本加上兩千五百萬的自留額以及復效保費的總額將超過該年度 ICA 的巨災保費收入。因此在這樣的保險費率下，市場反映出來的結果是地震保險計劃的承保能量不足。

因此，ICA 要求它的再保經紀人以另類風險移轉的商品為基礎，提供新的保險建議。

壹、分散損失合約

分散損失合約的運作方式正如其名－它的原則就是將任一年度內的巨災不確定成本以固定預算費用的方式轉換分散在一段期間內的巨災財務融通成本。重點是確保每一年度的固定預算金額足以承擔這段期間內的巨災成本與再保人的邊際利潤。

以往，分散損失合約的架構為下列兩者之一：

- 損失前基金法（ 預期法）
- 損失後基金法（ 追溯法）

由於先前許多濫用的案例，使得近來損失後基金法 (追溯法) 逐漸不被接受。因此我們將專注在以損失前基金法 (預期法) 來解決 Avalon 的巨災財務融通問題。

在 2500 萬 XL 2500 萬的二層超額再保險安排計劃中，我們發現傳統再保市場的傳統綜合費率是 50.1%－包含颶風保險費率是 26.58%及地震保險費率 23.52%。這項成本是與綜合純損失成本 27.06% (分別包含 14.97%的颶風損失成本與 12.09%的地震純損失成本)相比計算得來的。

因此本例的分散損失合約架構是由 2500 萬 XL 2500 萬的超額損失保險計劃同時承保颶風與地震二種風險組合而成的。它也可以在承保颶風及地震之保險計劃中，擴大包括 5000 萬 XL 5000 萬超額損失層的復效保險費成本。這樣的分散損失合約其每年成本總計為一千零五十萬，包括九百五十萬的危險保費，一百萬的再保人邊際利潤(詳見表九)。這個分散損失合約應該與花費 1250 萬，提供更多保障(兩個颶風限額及兩個地震限額)，但有復效給付特色，且不包括 5000 萬 XL 5000 萬超額損失層的復效保費的傳統個別層次再保險安排，進行比較。

傳統層次（Traditional Layer）

儘管 5000 萬 XL 5000 萬的超賠責任亦可被視為是分散損失合約，由於分散損失合約的風險移轉是相對有限的，因此 ICA 對於較小的分散損失合約基礎更感到適合。

在分散損失合約基礎下，1 億 XL 1 億及 3 億 XL 2 億的賠款責任額度下因承擔太少的暴露單位以致於無法有效運作，但是在巨災債券市場中則有許多的暴露單位。對於上述層次的再保安排計劃唯一的建議就是考慮綜合颶風與地震二種危險事故保障－在這樣的基礎下，3 億 XL 2 億這層的超額賠款責任安排看起來是特別吸引人的。(參考表八)。

ICA 的經紀人對於 5 億 XL 5 億的地震風險市場具有足夠的能量是具有信心的－因此決定將此層的風險保留在傳統保險市場中處理。

貳、巨災債券

由於地震損失超過十億的可能性非常小，因此被認為可以巨災債券的方式來處理此一危險，於是 ICA 決定設立一個特別目的機制(Special Purpose Vehicle)－Camelot Re.－以此名稱進入債券市場。Camelot Re 將發行三億五千萬的債券用以提供 ICA 在超過十億的賠償責任之上再提供三億五千萬不具恢復效力的承保能量。

這層特性如下：

年度啟動機率	0.62%
年度預期損失	0.54%
年度結束機率	0.47%

優惠的報價費率 3.5%可在資本市場中取得的，並且投資人渴望將他們的投資組合與美國、日本等災害事故的正常發行機構分開。債券發行時，Camelot Re 會收到三億五千萬的資金，並以倫敦銀行同業拆款利率(LIBOR)為投資報酬率投資高報酬短期的證券。ICA 會收到以 3.5%計算保費的 Cover Note－Camelot Re 將以這些保費支付，超過倫敦銀行同業拆款利率(LIBOR)價差之金額給債券投資人。

參、或有資本

ICA 仍然短缺一億五千萬的承保能量。經與政府機構討論後，政府決定為這頂層一億五千萬的危險暴露單位，安排一億五千萬的或有資本以補足這個缺口，政府為 ICA 再保的最後保證，且由政府擔任最高層風險的保證人是最合適的。

從政府觀點來看問題是在重大震災發生後，ICA 會面臨各方財務的需求，或有資本將被用以支付 ICA 所需的金額，而政府的其他資金則可用於其他用途，例如：震災後食物的安排與災民收容所。

向資本市場詢價並達成一億五千萬或有資本選擇權費用為 0.5% 之協議。或有資本的啟動器是地震模型損失達十二億五千萬時 (考慮到實際損失與模型損失間可能存在的基差風險，所以把安全邊際是訂在十三億五千萬)，當啟動本機制的事故發生時，一億五千萬將成為 Avalon 政府可立即使用的資金，並約定以十五年期的票券 LIBOR 附加 0.5% 的票息做為交換條件。

第二項 傳統再保險風險移轉法與另類再保險風險移轉法之比較

先前在檢討重新架構 ICA 公司的再保險安排過程中，引發他們詳細檢驗下列兩種再保險結構風險移轉法的內容：

- 傳統再保險風險移轉法
- 另類再保險風險移轉法

傳統與另類再保險風險移轉法之摘要詳見圖七與圖八。

為了比較兩種風險移轉法，ICA 委託製作了一個隨機模型。此模型會採用另一家巨災模型公司所產生之損失分配函數中，以隨機方式抽出之理賠金額，分別計算傳統與另類再保險結構下可回收理賠金額，上述電腦產生結果也會各別以“利益（benefit）”形式儲存再作後續分析（在此引用“利益”是因為每一個建議的層級(proposed layer)都是負“利益”，即為成本之意），此模型將可運用 5,000 年資料。

我們為 ICA 公司保險契約組合建立這種模型，而“利益”計算出來的結果也顯示在表八裡，一些吸引人注意的重點如下所述：

- 當兩個風險移轉法無法完全進行比較時（參閱如下），另類再保險風險移轉法下負擔的成本約 20%，低於傳統再保險風險移轉法的成本。
- 分散損失合約(SLC)顯示已建立基金保留經驗帳戶（FWEA），因為計算出來的成本（3,022,172 元）比再保公司 1 百萬元的利潤還要高。
- 在綜合巨災層級以及地震再保險契約裡，另類再保險風險移轉法提供較少的復效保障。（但是 ICA 真的需要傳統再保險風險移轉法給它們那麼多次的復效保障嗎？）
- 另類再保險風險移轉法提供較大的承保範圍，因為 SLC 會支付 50 百萬 xs 50 百萬元層級的復效保費。
- 發行巨災債券（catastrophe bond）也許比傳統巨災風險移轉稍貴，

然而發行巨災債券分散巨災風險方式有助於以較少的債券風險進場投資新興風險移轉工具。

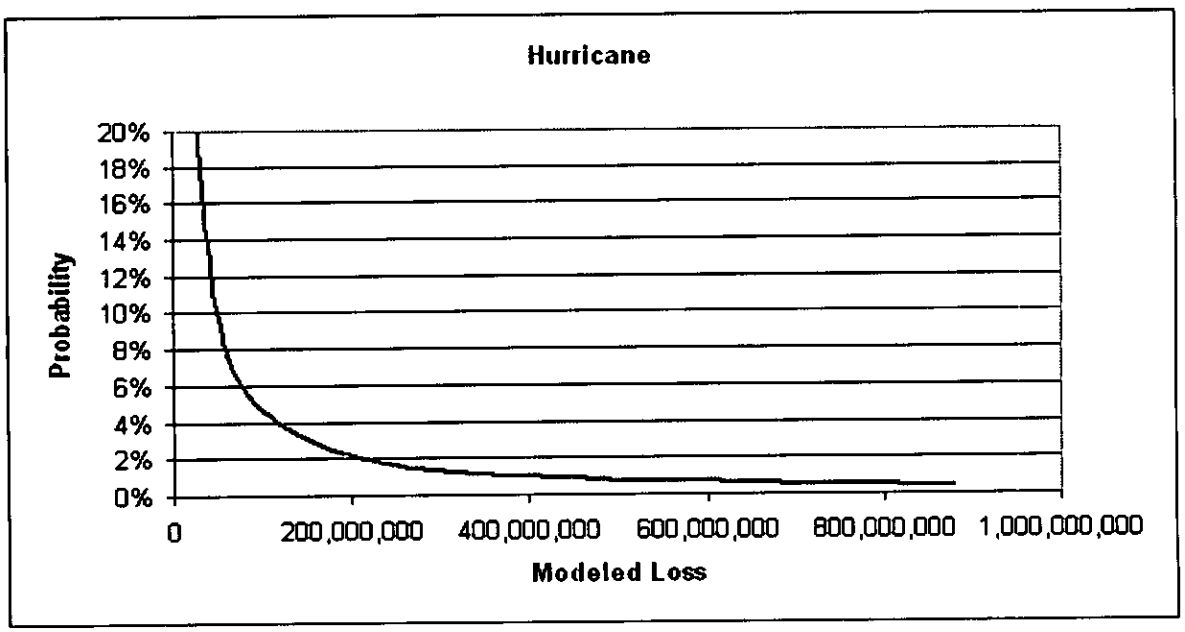
- 或有資本層級似乎是個有吸引力的替代工具。
- 值得注意的是不管是發行巨災債券或是或有資本，兩者皆不包含復效條款。

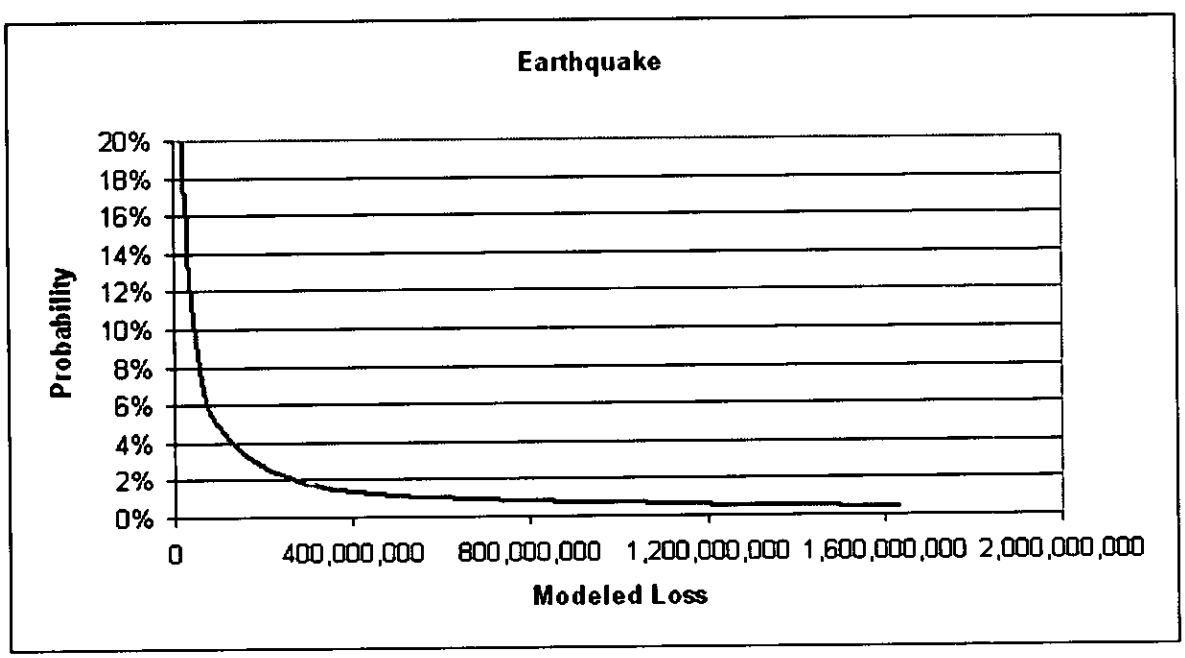
圖九以百分比分析法表示再保險利益的結果值。在此可以看出不論在何種損失假設情況下，另類再保險風險移轉法總是可以提供較多的保障給ICA。

我們並未替 ICA 公司進行任何風險基礎資本（risk based captial）分析，因為對於公營企業而言，風險資本的規範並無太大意義，第三章第三節我們再來深入討論風險基礎資本議題。

圖六 －模型分析 Avalon 的巨災風險

發生頻率期間	每年發生率	颶風	地震
5 年發生一次	20.00%	27,341,180	20,084,333
10 年發生一次	10.00%	50,577,261	43,773,479
20 年發生一次	5.00%	93,560,678	95,403,590
50 年發生一次	2.00%	210,974,833	267,204,593
100 年發生一次	1.00%	390,273,174	582,368,094
250 年發生一次	0.40%	880,047,256	1,631,085,684





表八 －ICA 公司之傳統再保險風險移轉法報價

颶風

再保險限額	超額再保	保險純費率	再保險報價費率	貨幣成本
25,000,000	25,000,000	14.97%	26.58%	6,644,436
50,000,000	50,000,000	6.85%	16.78%	8,387,989
100,000,000	100,000,000	3.14%	10.33%	10,332,026
300,000,000	200,000,000	1.27%	5.80%	17,397,628
475,000,000	25,000,000		9.00%	42,762,080

地震

再保險限額	超額再保	保險純費率	再保險報價費率	貨幣成本
25,000,000	25,000,000	12.09%	23.52%	5,879,703
50,000,000	50,000,000	6.53%	16.28%	8,140,989
100,000,000	100,000,000	3.52%	11.11%	11,109,564
300,000,000	200,000,000	1.72%	7.06%	21,167,325
500,000,000	500,000,000	0.84%	4.46%	22,277,240
500,000,000	1,000,000,000	0.52%	3.25%	16,248,531
1,475,000,000	25,000,000		5.75%	84,823,352

綜合報價

再保險限額	超額再保	保險純費率	再保險報價費率	貨幣成本
50,000,000	50,000,000	13.38%	24.93%	12,466,691
100,000,000	100,000,000	6.66%	16.49%	16,486,310
300,000,000	200,000,000	2.99%	10.02%	30,054,936

所有層級都有一次 100%復效保障

表九－ICA 公司之分散損失（SLC）再保險風險移轉法報價

颶風與地震災害之合併承保

再保險限額	超額再保	貨幣限額	保險純費率	純貨幣成本
25,000,000	25,000,000	25,000,000	27.06%	6,765,741

復效保費保障－颶風

再保險限額	超額再保	貨幣限額	保險純費率	純貨幣成本
50,000,000	50,000,000	8,387,989	6.85%	574,996

復效保費保障－地震

再保險限額	超額再保	貨幣限額	保險純費率	純貨幣成本
50,000,000	50,000,000	8,140,989	6.53%	531,347

整體天災再保險之條件限制

貨幣限額	保險純費率	純貨幣成本
41,528,978	18.96%	7,872,083

分散損失再保險風險移轉法之報價

年度再保風險保費	9,500,000
A 部份	2500 萬 XL 2500 萬 綜合颶風及地震險再保，附加一次免復效保費
B 部份	關於颶風險(50m xs 50m 層保障)之復效保費計$8,387,989 元
C 部份	關於地震險(50m xs 50m 層保障)之復效保費計$8,140,989 元
年度最高理賠限額	63,289,828

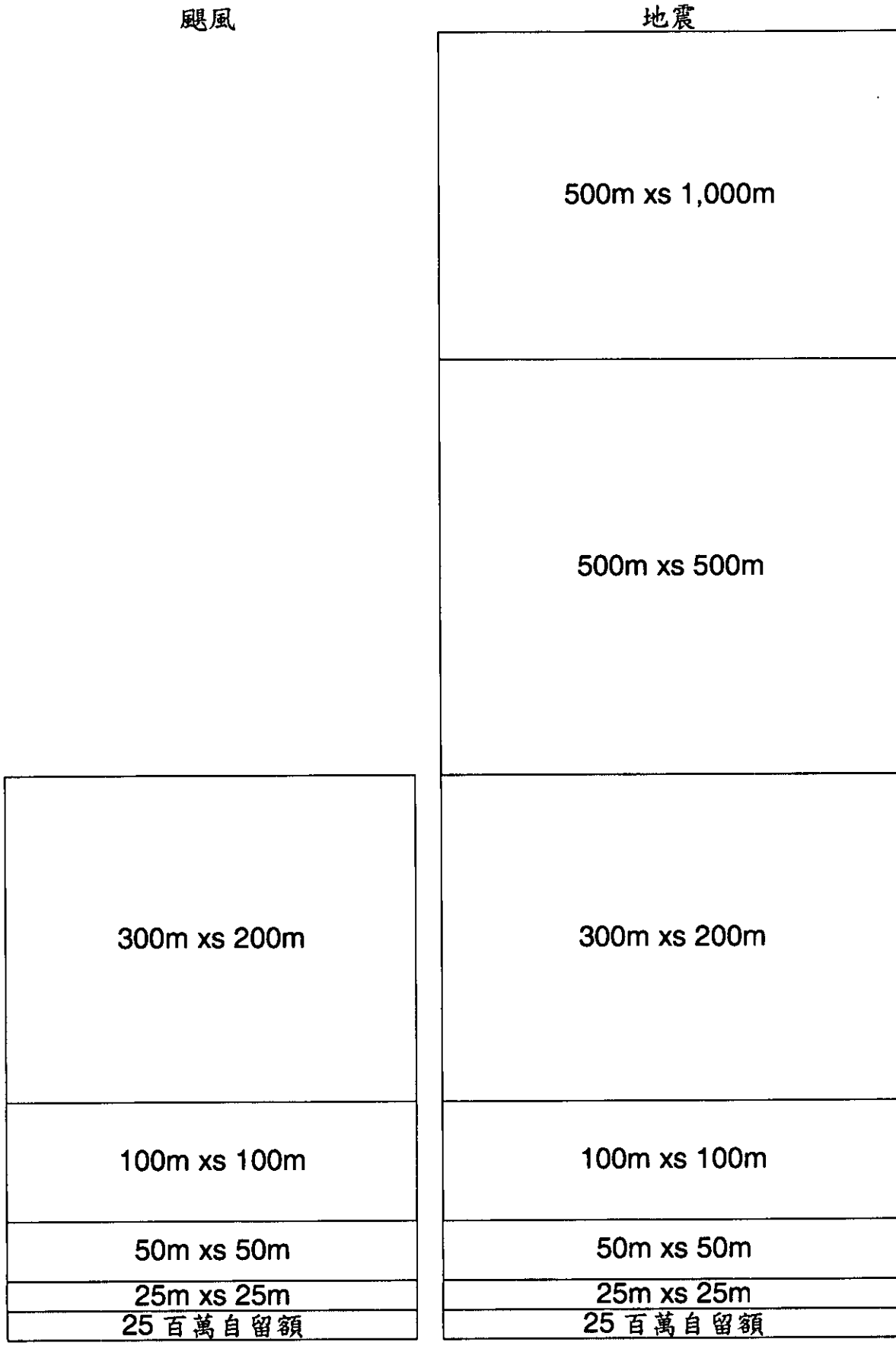
每年再保公司應得利潤	1,000,000
整體每年成本	10,500,000
會計基準	只有再保公司應得利潤，保費與巨災理賠損失列計於基金保留經驗帳戶「Funds Witheld Experience」上
風險移轉	如果 FWEA 帳戶面臨存款不足而遭帳戶取消時（即表示巨災理賠損失超過再保保費收入），分保公司應就不足額部份給付 90%予再保公司。

表十－Camelot 再保險

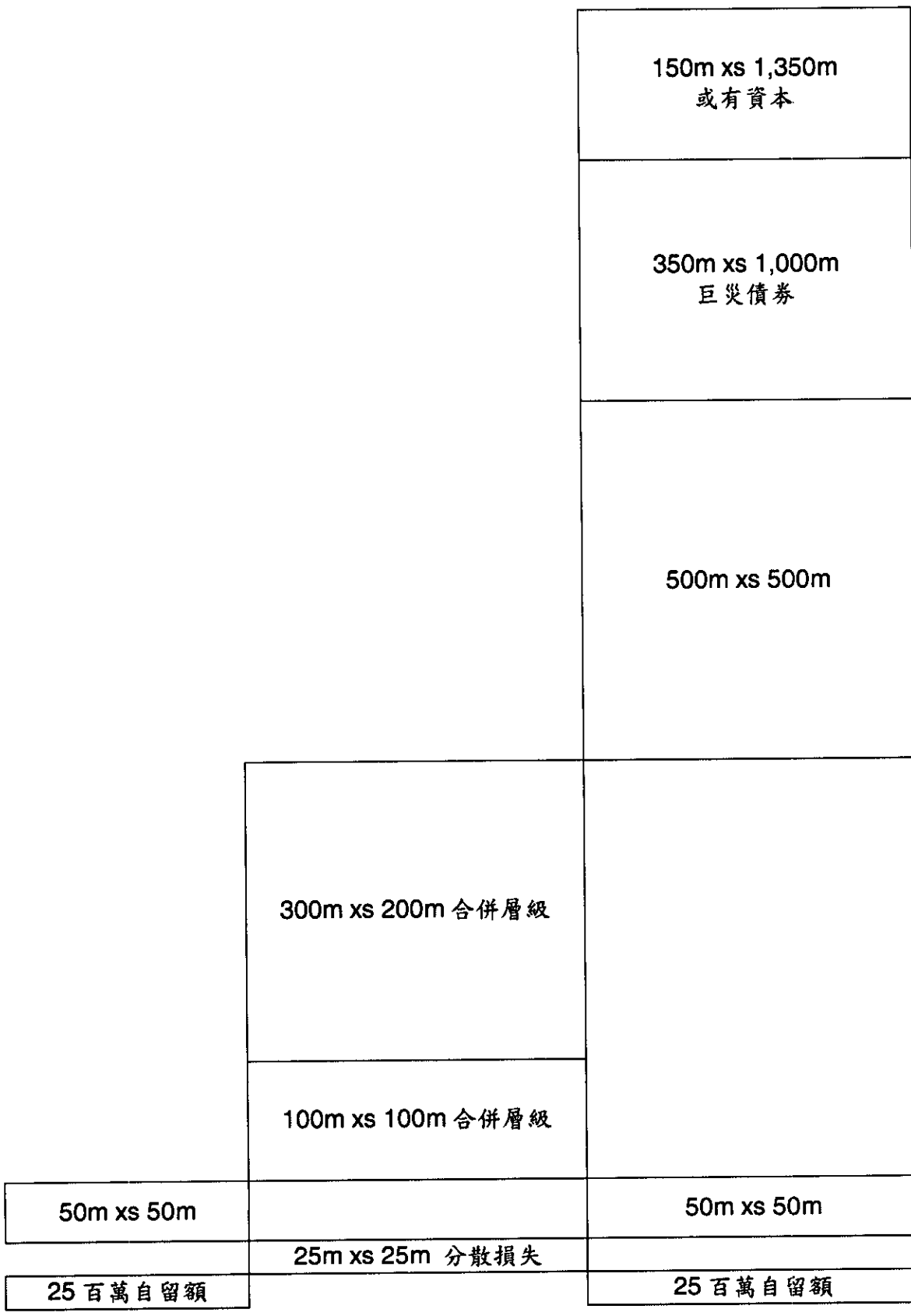
各層級發生機率

	再保險限額	超額再保
	350,000,000	1,000,000,000
年度啟動機率		0.62%
年度預估損失		0.54%
年度結束機率		0.47%

圖七－Avalon 保險公司之傳統再保險風險移轉法之架構



圖八－Avalon 保險公司之另類再保險風險移轉法之架構

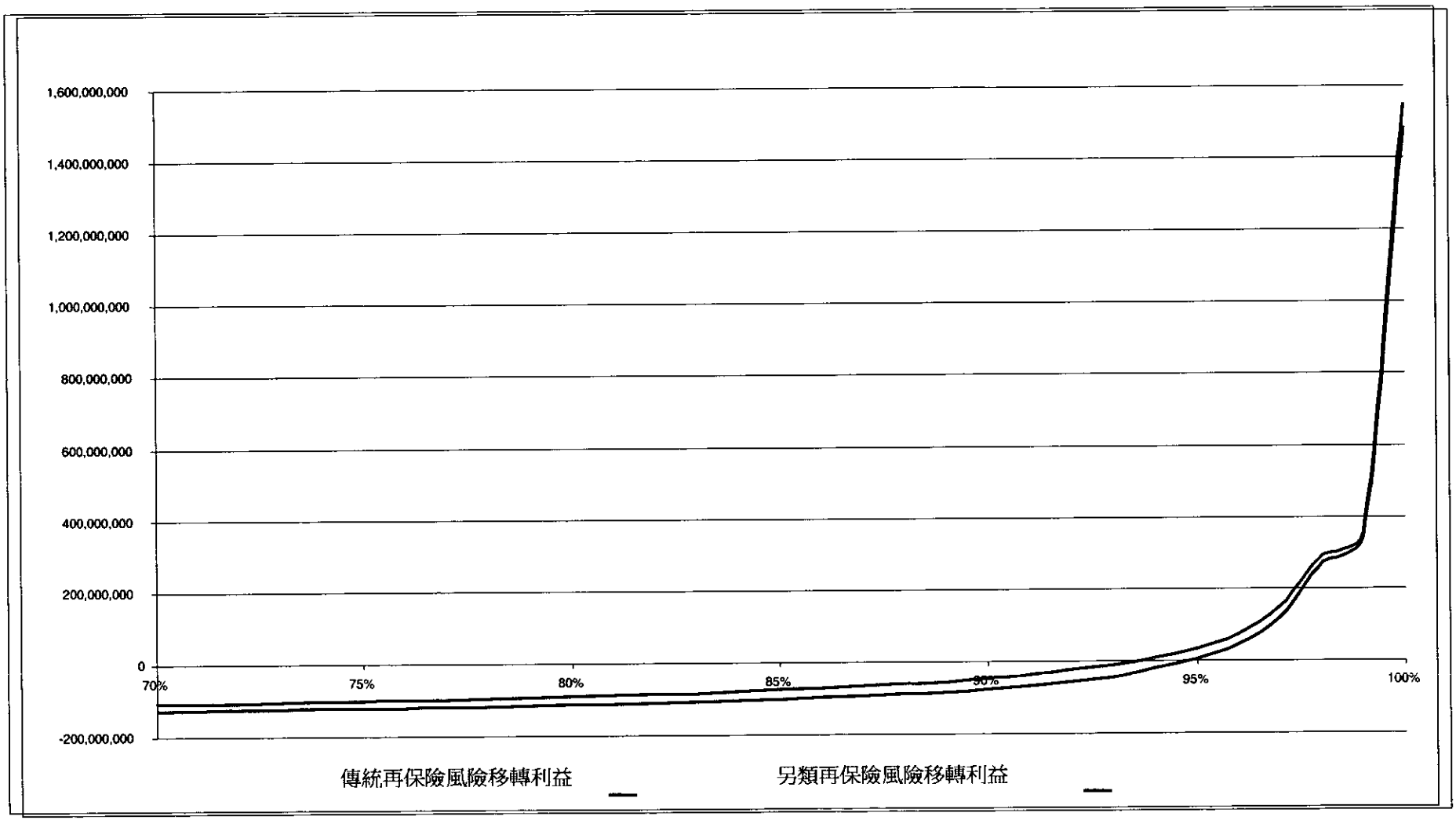


表十一－Avalon 保險公司之傳統與另類再保險兩種風險移轉法之成本效益比較

傳統再保險風險移轉法	再保險保費	平均利益
颶風 25m xs 25m	6,644,436	-4,091,290
地震 25m xs 25m	5,879,703	-3,790,131
颶風 50m xs 50m	8,387,989	-5,840,336
地震 50m xs 50m	8,140,989	-5,691,482
颶風 100m xs 100m	10,332,026	-7,933,370
地震 100m xs 100m	11,109,564	-8,426,219
颶風 300m xs 200m	17,397,628	-14,446,471
地震 300m xs 200m	21,167,325	-17,227,863
地震 500m xs 500m	22,277,240	-18,785,587
地震 500m xs 500m	16,248,531	-14,016,394
整體		-100,249,143

另類再保險風險移轉法	再保險保費	平均利益
分散損失 25m xs 25m	10,500,000	-3,022,172
颶風 50m xs 50m	8,387,989	-5,840,336
地震 50m xs 50m	8,140,989	-5,691,482
合併 100m xs 100m	16,486,310	-11,413,255
合併 300m xs 200m	30,054,936	-22,911,766
地震 500m xs 500m	22,277,240	-18,785,587
巨災債券 350m xs 1000m	12,250,000	-10,542,888
或有資本 150m xs 1350m	750,000	-946,000
整體		-79,153,486

圖九 再保險利益之百分比分析



Pricing of FFR Products

Due to the vast array of potential financial and Finite Risk products available, the method of pricing each product varies according to the requirements of each particular product. The pricing of insurance as a whole and in particular ART/FFR product is not a precise science. Whilst there are some basic principals applying to each product, there are a number of external factors that effect pricing. As far as traditional insurance capacity is concerned, Insurers do operate in a market place. As such, pricing varies according to market condition to a large degree. When insurance capacity is short, the insurance market enters a hard cycle and prices increase. When insurance capacity is plentiful, Insurers compete for the same business and prices reduce. Pricing is further affected by the availability of capital as more capital becomes available to the insurance market (i.e. post WTC and post Hurricane Katrina) new insurance capacity is full and therefore has a calming influence on what would otherwise be a significantly hardening insurance market. In addition, each provider of insurance constantly reviews it own portfolio of risks and an increased desire to spread its risk into another area, will cause the Insurer/Reinsurer to be more competitive in order to acquire business.

These factors also affect the pricing of various financial reinsurance/ART products. The hardening of the insurance market results in increased insurance prices and thereby the formation of more captives. Similarly hard insurance market conditions tend to lead to increased interest in various other forms of financial reinsurance/ART including Finite Risk, Contingent Capital and CAT Bonds etc. Ironically, in certain cases softening of the insurance market may lead to an increased interest from clients in Loss Portfolio Transfer's. As a client retains more risk on his own balance sheet during a hard market cycle, he builds up his tail of liabilities on the balance sheet. If the insurance market subsequently enters a soft market cycle that client may have an increased interest in transferring the entire book of liabilities via a Loss Portfolio Transfer to a market who is "hungry" for a premium income and thereby pricing Loss Portfolio Transfer policy more competitively.

The following constitutes a very brief overview of pricing for Captives Contingent Capital and CAT Bond and a more in detailed review of pricing for Finite Risk Programmes including Loss Portfolio Transfer and Adverse Development Covers.

Captives

Pricing policy for a Captive insurance company is largely determined by a) its parent and b) the regulator of the country of domicile of the captive. Regulators usually require Captives to write at the commercial prices however clients with a particularly predictable portfolio of exposures could seek to price at an margin over projected loss costs. It is worth bearing in mind that Captives are required by their regulators to meet certain solvency margins and are usually there for precluded from providing very large limits of indemnity. Typically regulators require limits exposed by Captive insurance companies to be assessed against:

a) income and premium
b) reinsurance protection
c) capital and surplus
d) any parent company guarantees that exist

Contingent Capital

As explain earlier in this report, Contingent Capital can have the effect of transforming one type of risk (i.e brand damage, political action, catastrophe etc) into the ability of the buyer to repay a "claim" of a subsequent period of years. Accordingly the price that is charged for a) a credit risk of the buyer - (i.e a AA rated buyer will pay less for a Contingent Capital solution than a BB rated buyer b) Contingent Capital policy will be based on a likelihood of a triggering event occurring and its expected pay out pattern and c) cost of Capital of the Insurer/Reinsurer providing the contract.

It should be born in mind that the provider of the Contingent Capital Contract will constantly be assessing his ability to make money in the traditional market place and if that perception concludes that prices are high for traditional insurance, the price for Contingent Capital Solutions may well increase due to that provider preference to use his capacity to provide traditional insurance at what he considers to be over inflated prices.

Catastrophe Bonds

Essentially investors participating in a Catastrophe Bond are seeking to secure a rate of return in excess of what they can achieve from normal capital market investments. Typically the base of floor pricing for investment return is set at US Treasury bills and/or liable in the margin above ? or ? is the premium investor expects is the premium the investor expects to make for the risk he is assuming. Accordingly, in the case of a catastrophe on for Californian earthquake, investors and all their advisors will assess the likelihood of an event occurring above a certain magnitude (as determined by the buyer) and load the cost of the CAT Bond according to the perceived likelihood of loss occurring above the trigger.

Addition to the pure pricing of each of the above products, there are usually arrangement fees/ brokerage to be considered. By way of comparison, historically CAT Bonds have proven to be very expensive to arrange whereas more simple solutions such as Contingent Capital Finite Risk and/or Captives have been comparatively expensive to arrange. Finite Risk programmes do offer an element of risk between the buyer and the seller due to the significant profit sharing feature which is common in most placements. All Finite contracts have an aggregate limit of liability over the term and a significant profit sharing mechanism for the buyer.

A theoretical price instructor might look as follows:

Limit: $10,000,000 each loss / $20,000,000 annual aggregate / $40,000,000 term aggregate

Term: 5 Years

Premium: $7,000,000 per annum

Experience count contribution 90%

In this example the finite insurers providing $10,000,000 capacity for each event, for the no event pay no more than $20,000,000 in one year during the term and $40,000,000 over the entire term of the policy. Return for this the Insured agrees to pay £7,000,000 per annum premium with 90% of the premium contributing to an experience count to the insure, the risk looks as follows:

$40,000,000

.....

$35,000,000 Premium

£31, 500,000 (plus interest) Experience Count

In this case the insurer will have reviewed the risk proposed by the client and will expect the experience count to cover losses occurring during the period. The Finite insurers / reinsurer will be offering $8,500,000 of pure risk transfer capacity which attaches after experience CAT funds have been exhausted in return for which the Finite insurer/reinsurer retains his margin of $3.5m for the risk assumed.

The structure and pricing of each finite contract is specifically tailored to each risk exposed. The basic pricing techniques apply to all forms of Finite contract including retention financing, Loss Portfolio Transfers, adverse development covers etc. It should be noted that unlike traditional insurance products, the client derives the benefit of interest on experience account funds held by insurers and in the event that no claims occur or claims are better than expected, then all experience account funds (less any claims paid) are returned to the buyer on compensation.

The balance risk transfer to experience count varies according to risk and whether the original risk is long or short tail in nature. Long tail risks allow a longer period of time for experience count funds plus interest to build up thereby reduce the element of risk transfer that is provided by the Finite insurer / reinsurer. Conversing short tail risk leave very little time for the build up of funds thereby more exposing

the pure risk transfer portion to the policy. The margin charged by the Finite insurer/reinsurer reflects his perception of the likelihood of loss occurring in excess of experience account funds. As can be noted by the example above, the Finite insurer/reinsurer is really only exposed to a third event occurring during the policy term.

Pricing Comparison Between A Traditional and A FFR Product

FFR products are almost invariably priced based on underwriters' estimation of their capital at risk for the contract in question. This should not be taken to mean that traditional reinsurers do not consider capital at risk in their calculations, rather that the emphasis is different.

In traditional reinsurance most consideration is given to the frequency and severity of the losses expected to a given coverage and therefrom to the derivation of a pure or risk rate. Loadings are then applied to the pure rate to allow for costs, commissions, fluctuations and profit margin in order to derive the rate actually charged – the final premium.

In FFR the reinsurer would most normally start with their maximum downside (the amount of cash they are funding or the maximum amount they might have to fund), sometimes called the capital at risk. The premium would then be structured to provide the desired return on this capital at risk. This is most often referred to as the reinsurer margin. The premium is thus made up of two elements – a risk premium to fund the expected losses and a reinsurer margin to provide the reinsurer's return.

FFR products also differ from traditional reinsurance in that the issue of interest is normally dealt with explicitly in the contract. This could apply either to interest credits on positive balances or interest debits on negative reinsurer balances. Such interest calculations operate separately from the reinsurers margin. Under a traditional coverage, such as an excess of loss layer, the contract will either be "clean" (ie no losses) or suffer a loss in any one year. In the case of a clean contract, the reinsurer may give a discount at renewal (depending on market conditions) – if there is a loss, chances are that the reinsurer will attempt to recoup some of their deficit by increasing the price at renewal.

Comparison of the Pricing of an FFR Product with a Traditional Product

In this example we shall compare the "pricing" of a traditional quota share treaty with that of a solvency quota share for the same book of business. Whilst we have made the actual figures as realistic as possible, we must point out that Heath Lambert are not underwriters!

Where a traditional quota shares are being rated, it is normal for underwriters to consider their net combined ratio – in other words, premium received less commission and claims. The margin an underwriter requires (premiums less net combined ratio) will depend very much on the type of portfolio being covered. For example, where the original business is exposed to catastrophe perils, the underwriter will require a higher margin in order to build up a fund which can be used to pay catastrophe losses when these occur.

A further margin may be required for infrequent but severe individual losses – this is often the case where the "balance" of the treaty (premium divided by limit) is low or is "un-balanced". For example, where the premium is only 10% of the limit of the treaty it makes sense for the underwriter to build up some excess funds to allow for a severe loss every once in a while.

Both these items – the catastrophe margin and the severe loss margin – can be rated for using excess of loss techniques with the commission then being reduced by an amount comparable to the excess of loss rate required.

We shall ignore these two margins in our example since their calculation will distract from the points we are attempting to make. We shall therefore consider a motor quota share treaty – such a portfolio should be both well balanced and relatively unexposed to catastrophe perils.

The first consideration is whether there is any margin available within the portfolio in question. Our hypothetical company, Motor Insurance Company (MIC), has an average loss ratio of 69.74%, they pay original brokerage to their producers of 10% and have internal costs of 7.50%. The company thus operates to an average net combined ratio of 87.24% (69.74%+10.00%+7.50%) giving an operating margin of 12.76% (100.00% premium minus 87.24% net combined ratio). There is therefore profit available within the portfolio and we can proceed to consider a reasonable reinsurance commission.

The reinsurance commission paid on a traditional quota share is primarily there to cover the cedant's original brokerage and internal costs for administering the portfolio. In MIC's case these two items total 17.50%. Since the underwriter can see a good margin within this portfolio, the proposal is to offer the cedant a 20% commission, thus giving the cedant an extra 2.50% of profit for writing the business (the difference between costs paid out and commission actually received. This commission gives our traditional reinsurance underwriter an average margin of 10.26% based on the average loss ratio.

The last check the reinsurance underwriter makes is to consider the maximum likely downside that will experience on the treaty. This is studied by considering the negative results which could be expected over various timescales. These figures are shown here:

1 in 10 Year Position	-9.89
1 in 20 Year Position	-17.38
1 in 50 Year Position	-26.68
1 in 100 Year Position	-33.14
1 in 200 Year Position	-38.86
1 in 500 Year Position	-45.68

What we see here is that a 1 in 100 year poor result would take roughly 3 years' worth of the treaty's average result to "be paid-back" (ie the underwriter could pay out 33.50 in one year and the treaty would then earn this money back over the subsequent three years). The underwriter is comfortable with this and therefore issues a firm quotation for the traditional quota share at a flat reinsurance commission of 20.00%

We now turn to consider the thought process of an FFR underwriter looking at the same reinsurance submission.

The first steps are the same – to discern if there is a margin available within the portfolio in question. The FFR underwriter's conclusion will be the same as for the traditional underwriter – there is an average margin of 12.76% within the portfolio and the proposal is therefore worth consideration.

MIC have indicated that they would like to minimise the cost of their quota share – in other words, to maximise their commission. The FFR underwriter therefore proposes a sliding-scale commission to give a reinsurer margin of 6%. This is achieved by having a minimum commission of 0% at 94% loss ratio and a maximum commission of 60% at 34% loss ratio. Thus whatever the loss ratio below 94%, the reinsurer will ultimately receive 6% of ceded premium whatever the loss ratio.

The underwriter would then model the portfolio and consider the risk transfer element of the deal. The first run of figures without a loss ratio cap were calculated to be as follows:

1 in 10 Year Position	6.00
1 in 20 Year Position	2.62
1 in 50 Year Position	-6.68
1 in 100 Year Position	-13.14
1 in 200 Year Position	-18.86
1 in 500 Year Position	-25.68

The underwriter considers the negative results on this treaty to be more than he can fund from the reinsurance margin and thus decides to impose a loss ratio cap of 115% - the treaty thus becomes "finite". The revised calculations are summarised here:

1 in 10 Year Position	6.00
1 in 20 Year Position	2.62
1 in 50 Year Position	-6.68
1 in 100 Year Position	-13.14
1 in 200 Year Position	-15.00
1 in 500 Year Position	-15.00

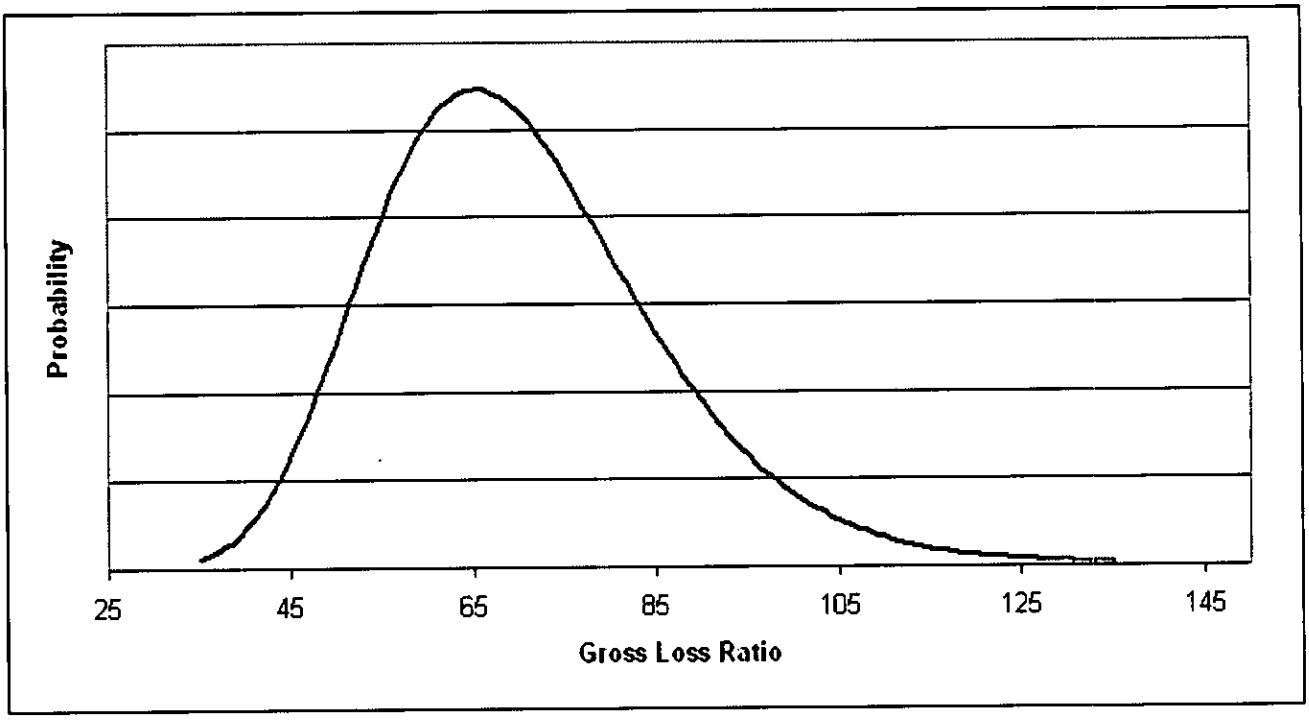
With the cap the reinsurer is providing cover of 21% of gross premium from 94% loss ratio up to 115% loss ratio for a margin of 6% of premium – this looks very much like a stop loss treaty, although the structure is a quota share!

The trade-off in the FFR solution is less downside coverage from the reinsurance but less upside cost.

Example of the Pricing of FFR Products - Motor Insurance Company

Motor Insurance Company Portfolio

Loss Ratio Distribution:	LogNormal	
Parameters:	4.22	0.22
Average Gross Loss Ratio:	69.74%	



Original Brokerage:	10.00%	
Internal Costs:	7.50%	
Average Margin:	12.76%	Premium less Claims and Expenses

Example of the Pricing of FFR Products - Motor Insurance Company

Traditional Quota Share for Motor Insurance Company

Percentage Ceded:	50%		
Commission:	20%		Flat Commission
Reinsurer's Result			
Premium Received:	100.00		
Commission Paid:	20.00		
Claims Paid:	69.74		
Average Result:	10.26	*	
Average Modeled Result:	10.34	*	
Worst Modeled Result:	-82.48		
Worst Result / Average Result:	-797.98%		

* Since premiums and claims are shared on a simple proportional basis, the average result calculated based on the average loss ratio is in good agreement with the modeled result

1 in 10 Year Position:	-9.89
1 in 20 Year Position:	-17.38
1 in 50 Year Position:	-26.68
1 in 100 Year Position:	-33.14
1 in 200 Year Position:	-38.86
1 in 500 Year Position:	-45.68

Example of the Pricing of FFR Products - Motor Insurance Company

FFR Quota Share for Motor Insurance Company

Percentage Ceded:		50%
Commission:	Min	0%
	at Loss Ratio	94%
	Max	60%
	at Loss Ratio	34%
	Provisional:	24%
Loss Ratio Cap:		115%

Reinsurer's Result

Premium Received:	100.00	
Commission Paid:	24.26	
Claims Paid:	69.74	
Average Result:	6.00	*
Average Modeled Result:	5.40	*
Worst Modeled Result:	-15.00	
Worst Result / Average Result:	-277.76%	

* The use of a sliding scale commission creates an imbalance in the sharing of premium and claims between cedant and reinsurer. The reinsurer has given up all the upside but kept an element of the downside - thus the naïve calculation of "Average Result" does not agree with the "Average Modeled Result".

	No Loss Ratio Cap	With Loss Ratio Cap
1 in 10 Year Position:	6.00	6.00
1 in 20 Year Position:	2.62	2.62
1 in 50 Year Position:	-6.68	-6.68
1 in 100 Year Position:	-13.14	-13.14
1 in 200 Year Position:	-18.86	-15.00
1 in 500 Year Position:	-25.68	-15.00

A Cost Effectiveness Comparison between Finite Reinsurance and Traditional Reinsurance

Introduction

When studying the cost effectiveness of any form of reinsurance, it is important to consider the whole range of possible outcomes rather than just the up-front cost against the limit purchased. This type of study has become very common in recent years and in its most advanced form is known as Dynamic Financial Analysis (DFA) or Enterprise Risk Management (ERM).

As an interjection it is worth mentioning that ERM analysis is soon to become far more prominent within the European Market as part of the Solvency II initiative. Solvency II involves a far more model-based approach to regulation with each entity required to build a financial model of their business for agreement with external actuaries and discussion with regulators. Capital requirements will then be based on the extreme scenarios included within the negative tail of this analysis, such as the capital required to cover a 1 in 250 year loss. Solvency II is discussed in more detail in the section on Risk Based Capital Requirements.

Full ERM analysis is beyond the scope of this report, however we have constructed two basic stochastic models in order to make example comparisons between the cost effectiveness of Finite and Traditional reinsurance products. The models are "stochastic" since part of their input comes from a fixed set of random claims data drawn from a suitable loss distribution.

Our two hypothetical examples were as follows:

Retro Re	A reinsurance company studying a Finite alternative to a low level retro excess of loss layer.
Minnow Ins	An insurance company comparing a Traditional quota share with a Financial (or Solvency) Quota Share arrangement.

More detailed descriptions of each model and their results follow.

The Retro Re Scenario

Retro Re are studying the renewal of their first retrocession layer of 10m xs 10m. Due to hard market conditions the best quotation they can achieve for this layer is 35% rate on line – a premium of 3.5m – with one reinstatement at 100% premium. This is more than Retro Re are willing to pay.

Retro Re have therefore obtained a quotation for a Finite reinsurance product on the following basis:

Layer:	10,000,000 xs 10,000,000
Price:	4,375,000 (43.75% rate on line)
Profit Commission:	50%
Reinstatement:	1 @ 100% per annum
Maximum Recovery:	30,000,000 over the 3 year period of the contract

While the initial premium on the Finite alternative is higher, Retro Re can earn a significant profit commission should their experience be good.

Retro Re estimates that there is an 80% probability that this layer will be loss free in any one year.

Which layer should Retro Re consider?

The Retro Re Model

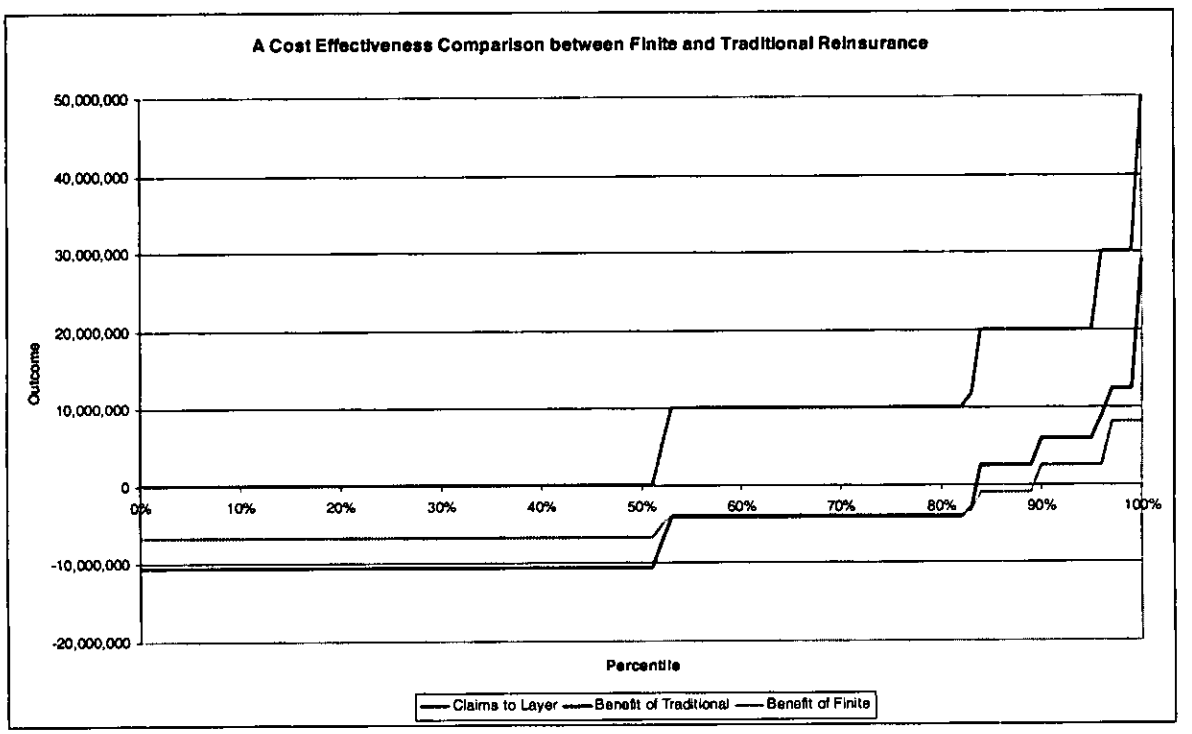
Our model was built to generate a fixed set of random claims based on the information that the layer 10m xs 10m will be loss free 80% of the time. As a simplification we assumed that when a loss occurs it will be a total loss to this layer – thus all that is required is to generate the number of total losses for each year (the "claim count"). This was accomplished using the Poisson distribution:

Loss Number	**Probability**
0	80.00%
1	16.37%
2	1.64%
3	0.11%
4	0.01%
Higher Losses	1.87%

Random "claim counts" were generated for 5,000 periods of 3 years since the Finite deal under investigation is itself a 3 year product. Each set of 3 years' claims were then put through both the Traditional and the Finite protections, the benefit to Retro Re calculated and this benefit then stored into a list of outcomes. It is this process to which the phrase "stochastic" refers. Analysis could then be carried-out on the sets of outcomes generated for the Traditional and Finite coverages.

Analysis of Outcomes for Retro Re

Our analysis of the outcomes from our stochastic model can best be summarised as shown in the following graph:



This representation may at first seem daunting, however the interpretation can be summarised as follows – for each quantity measured (Claims to Layer, Benefit of Traditional, Benefit of Finite) the range of values have been plotted against their corresponding percentiles. Thus, taking the Claims to Layer as an example, in 51% of outcomes there are no claims (the left hand half of the red Claims to Layer graph). This same graph increases in distinct steps of 10m due to the fact that we assume all claims to be total losses to the limit of 10m.

The graphs of Benefit of Traditional and Benefit of Finite show negative figures at the left hand side – this is as expected since in these areas Retro Re are paying a premium and not making any recoveries. The net cost of the Finite deal (ie net of profit commission) is lower in this section of the graph.

For the range of percentiles from 52% up to 82% the Finite and Traditional deals are almost indistinguishable – this is the range of outcomes where one total loss has been generated over the 3 year period. Above the 83rd percentile the Traditional deal has more benefit than the Finite deal. The margin is small until the 99th percentile is reached – this is the region where more than 30m of claims occur during the 3 years and the 30m overall cap on the Finite deal comes into play.

Two further important observations may be made:

1. The Finite deal has positive benefit (ie is a loss to the reinsurer) from the 90th percentile upwards. This could be seen as helping the suggested deal qualify as reinsurance under the 10:10 rule (see other chapters).

2. The relative flatness of the Finite graph compared with the graph for the Traditional coverage is indicative of the reduced risk transfer under the Finite deal. The Finite reinsurer has traded a reduced profit in the good years (percentiles below 51%) for a reduced downside in the bad years (percentiles above 82%).

Overall we calculated the Traditional deal to have an average cost to Retro Re (profit to the reinsurer) of 5,613,200 over the 3 years. The Finite deal has a cost of 4,182,313 based on the same claims set for an overall saving of 1,430,887. For extremely poor periods of three years the Finite deal gives less coverage due to the 30m aggregate cap – for this reason the average recovery under the Finite deal is 74,000 less than for the Traditional coverage. This could be deducted from the 1,430,887 cost saving to give a net improvement of 1,356,887 over the Traditional deal.

The Minnow Insurance Scenario

Minnow Insurance Company (MIC) are a small but profitable underwriter of motor liability business. Their specialisation is in insuring taxis and private hire companies where they find less competition than for the more standard motor products. The company has always been operating near their minimum solvency margin in order to keep a high return on capital but now the withdrawal of a major competitor from the taxi market has created an opportunity for Minnow to increase their portfolio and become a bigger player (fish?!).

Approaching the capital markets is one possible solution for Minnow, however the banks are seeking too much influence in Minnow's business plan. Minnow are therefore considering either Traditional or Financial quota share arrangements.

The Traditional quota share has the following structure:

Percentage Cession:	50%
Commission:	20% on gross
Loss Ratio Cap:	130%

while the Financial quota share is structured as follows:

Percentage Cession:	50%
Commission:	provisional 25%, minimum 0% at loss ratio 95%, maximum 95% at loss ratio 0%, adjusting on a 1:1 basis.
Loss Corridor:	cedant to retain 100% of all losses from 95% loss ratio up to 105% loss ratio.
Loss Ratio Cap:	120%

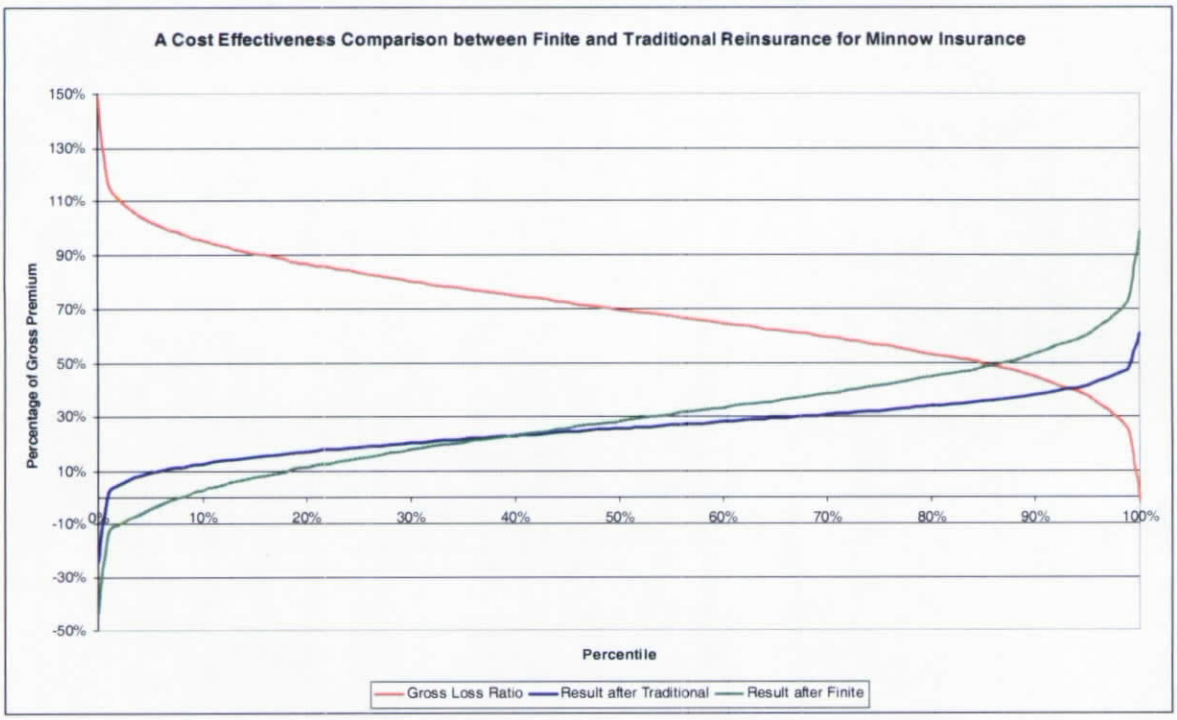
The Minnow Insurance Model

Minnow estimate their average ultimate loss ratio to be 70% on gross premiums with a standard deviation of +/- 20%. We therefore used the Normal distribution to generate 5,000 years of gross loss ratio data. These gross loss ratios were then run through the two reinsurance structures and the final results to Minnow were then stored.

Analysis of Outcomes for Minnow Insurance

The results to Minnow after reinsurance were plotted against percentile ranges. For comparative purposes the three variables plotted were the Gross Loss Ratio, the percentage result to Minnow after the Traditional reinsurance ("Result after Traditional") and the percentage "Result after Finite". In the latter two cases, "percentage result" refers to the percentage of gross premium Minnow would account as profit after reinsurance.

The graph is shown overleaf:



This representation of results is very similar to that shown for Retro Re except that the percentiles for "Gross Loss Ratio" run in reverse. This makes sense in that the higher the gross loss ratio the lower the net result to Minnow Insurance.

What we see is that at high loss ratios (the left hand side of the chart) Minnow's result is better after Traditional reinsurance than it would be after the Finite alternative. Conversely at low loss ratios (right hand side) Minnow's result is better after Finite than it is after the Traditional. Once again, and as seen for Retro Re, the Finite alternative is less costly in the good years but provides less risk transfer in the bad years.

In this representation of the results the Finite graph is steeper than the graph for the Traditional coverage since less risk is transferred to the reinsurance. This is a consequence of the wide sliding-scale commission which effectively leaves all the variation in results between 0% loss ratio and 95% loss ratio with Minnow Insurance via the 1:1 inverse proportionality between commission and loss ratio.

Overall the Finite deal would leave Minnow with an average result of 27.97% of gross premiums compared with 25.16% for the Traditional coverage – thus the Finite deal seems to offer an improvement of 2.81% of gross in Minnow's result. The downside of the Finite deal is that only a very little risk transfer is involved for gross loss ratios of 105% up to 120% - this may not be enough to satisfy either Minnow or Minnow's Regulatory Authorities.

Both deals provide traditional solvency relief (a 50% cession of gross premium, subject to individual territorial regulations). However, under Solvency II-style regulations, the benefit of this Finite deal would be considerably lower than for the Traditional deal since for 1 in 250 year loss figures the Finite deal leaves Minnow with a far worse result.

RETRO RE
A Cost Effectiveness Comparison Between Finite Reinsurance and Traditional Reinsurance

Traditional Cover
Purchased seperately for each of three years

Limit	10,000,000	Excess	10,000,000
Price	3,500,000		
Reinstatement	1 @ 100%		

Finite Reinsurance Cover
A three year deal

Limit	10,000,000	Excess	10,000,000
Price	4,375,000		
Profit Commission	50.00%		
Reinstatement	1 @ 100%		
Maximum Recovery	30,000,000		

Probabilities
Probabiliy for Each Year

No Loss	80.00%
1st Loss	16.37%
2nd Loss	1.64%
3rd Loss	0.11%
4th Loss	0.01%
Higher Loss Count	1.87%

Year 1					
	28.96%	Traditional	Finite		
Loss 1		0	0		
Loss 2		0	0	0	0
Year 2					
	57.95%	Traditional	Finite		
Loss 1		0	0		
Loss 2		0	0	0	0
Year 3					
	53.34%	Traditional	Finite		
Loss 1		0	0		
Loss 2		0	0	0	0
Year 1		Traditional	Finite		0
Premium		3,500,000	4,375,000		
Recovery		0	0		
Benefit		-3,500,000	-4,375,000		
Year 2		Traditional	Finite		
Premium		3,500,000	4,375,000		
Recovery		0	0		
Benefit		-3,500,000	-4,375,000		
Year 3		Traditional	Finite		
Premium		3,500,000	4,375,000		
Recovery		0	0		
Benefit		-3,500,000	-4,375,000		
Overall		Traditional	Finite		
Premium		10,500,000	13,125,000		
Recovery		0	0		
Profit Commission		0	6,562,500		
Benefit		-10,500,000	-6,562,500		

MINNOW INSURANCE

A Cost Effectiveness Comparison Between Finite Reinsurance and Traditional Reinsurance

Traditional Cover					
Cession	50.00%				
Commission	20.00%				
Loss Ratio Cap	130.00%				
Finite Reinsurance Cover					
Cession	50.00%				
Commission	25.00%	max	95.00%	at LR	0.00%
		min	0.00%	at LR	95.00%
Loss Corridor	100.00%	for LR	95.00%	to	105.00%
Loss Ratio Cap	120.00%				
Probabilities					
Average LR	70.00%				
Standard Deviation	20.00%				

Results

80.81%	Traditional	Finite
Gross Premium	100.00%	100.00%
Premium Ceded	50.00%	50.00%
Net Premium	50.00%	50.00%
Commission	10.00%	7.10%
Gross Claims	80.81%	80.81%
QS Recovery	40.40%	40.40%
Loss Corridor	0.00%	0.00%
Loss Ratio Cap	0.00%	0.00%
Net Claims	40.40%	40.40%
Result	19.60%	16.69%

Tax and Accounting Issues on FFR Products

Accounting intervention shapes the market – FASB 113 and EITF 93-6

The US Federal Accounting Standards Board (FASB) became concerned in 1991 by the success of financial and finite reinsurance. Their key concerns were that the true position of insurer balance sheets was being distorted and that insurers and reinsurers were taking advantage of reinsurance accounting where financing accounting was more appropriate. As noted above, the existing guidance was scant and effectively cedants made subjective judgements on how to account for financial and finite reinsurance. There was a growing body of evidence of transactions where the economic reality was that the reinsurer was providing no more than pure financing of a risk retained by the cedant and accounting for the transaction as reinsurance.

FASB's response was regulation 113 introduced on 15th December 1992 and EITF 93-6 formally adopted by FASB in July 1993.[see section X for a detailed discussion of these regulations] The impact of 113 was substantial. The regulation does not mention financial or finite reinsurance but it addresses the key issue of risk transfer and therefore what can be considered a contract of 'reinsurance'. It established a risk transfer test, so in order to be defined as reinsurance a contract must assume "significant" insurance risk and timing risk. Pure timing risk was no longer sufficient to qualify a contract as reinsurance. 113 also eliminated the practice of insurance companies reporting their liabilities net of reinsurance, requiring reisurance recoverables to be reported as assets and liabilities to be reported gross of reinsurance credits.

93-6 addressed an important growth area of financial reinsurance, multi-year funded catastrophe reinsurance, and required insurers to report funding obligations under these arrangements as balance sheet liabilities.

These regulations had two key effects. First, financial reinsurance contracts, containing only timing risk could no longer be given reinsurance accounting treatment. Second, the requirement to report reinsurance recoverables as assets was a significant change for most insurance companies. Either of these changes on their own would be sufficient to close the market for financial reinsurance arrangements. But the two together meant that the door to the market was locked and bolted. With the implementation of these regulations financial reinsurance was supplanted by finite reinsurance.

Perhaps in order to avoid being too prescriptive FASB, to the surprise - and consternation - of the marketplace, did not define the term 'significant' within 113. Indeed there is still no formal definition and this has created a continuing debate and uncertainity for practitioners. Market activity has led to an accepted convention, that risk transfer was achieved by there being a 10% probability of a loss 10% to the reinsurer, the so-called 10:10 test.

Anecdotally it is said that the Hurricane Andrew loss of 1992 provided the conclusive evidence to the SEC of the way that financial reinsurance was manipulating the results of insurers. While it was agreed that the insured loss was USD X million the insurer returns reported to the SEC only totalled USDY million, the difference being the effect of financial reinsurance arrangements. [Example]

Regulatory issues connected with ART

Background

The primary regulatory issues for the ART market are the adequacy of risk transfer within transactions and appropriate accounting and disclosure of transactions. These issues tend to be highlighted by the misuse of ART instruments in order to misrepresent the financial position of the insurer to policyholders, investors and other stakeholders including regulators. This is regrettable since the vast majority of ART transactions are undertaken without any negative or inappropriate intent, but the few 'rogue' transactions do display the sector in a poor light which it does not deserve.

1) Accounting

Introduction

In this section we shall concentrate on International Financial Reporting Standard 4 (IFRS 4). This is the accounting standard produced from the first phase of the International Accounting Standards Board's (IASB) Insurance Contracts Project. The IASB's intention is to create the first comprehensive standard for the accounting of insurance contracts. The project has been split in two phases in order that problematic aspects (Phase II) of creating a comprehensive insurance accounting standard should not delay those elements of the standard that could be completed (Phase I).

IFRS 4 became effective on 1st January 2005, and will have a significant impact on the way that most insurance companies report their financial statements. The consolidated accounts of almost all listed insurance (and non-insurance groups) will be prepared in compliance with IFRS, including IFRS 4 – Insurance Contracts[footnote, see Fitch 'Mind the GAAP' footnote 1]

The IASB considers that IFRS 4 should be considered a stepping stone to Phase II and has confirmed that it is 'committed to completing Phase II without delay once it has investigated all relevant conceptual and practical questions and completed its full due process'. However a comprehensive standard may still be some time away. The IASB launched the second phase of the project in September 2004, establishing an Insurance Working Group (IWG) to start deliberations on a future permanent standard. But the most recent work plan to be released by the IASB notes that the Board does not expect to publish an initial discussion paper before the third quarter 2006 and it is unlikely that the industry would be required to apply the final insurance standard before 2011.

As noted in the history section of this report accounting standards play a key role in setting the environment for alternative risk transfer instruments. To recap, the introduction of FASB 113 in the US

in 1993 transformed the ART marketplace. The requirements of FASB 113 meant that financial reinsurance transactions could no longer be accounted as insurance and accordingly the benefits to buyers of such transactions were lost. As the benefits of financial reinsurance fell away the marketplace responded with finite reinsurance products which could satisfy the competing demands of the market participants and the new accounting standards. The introduction of IFRS 4 – Insurance Contracts is likely to create a global accounting environment for ART similar to the US after the introduction of FASB 113.

IFRS 4's impact on ART

Under the standard a contract with only financing characteristics (it has only timing risk) would not be considered an insurance contract and not be given insurance accounting treatment. This reflects current accounting standards in a number of jurisdictions, most notably in the USA, where US GAAP requires both underwriting risk and timing risk to be present for a contract to be treated as reinsurance.

Where a reinsurance has provisions which make the payment of covered losses remote the arrangement risks failing the insurance risk transfer requirement. Such provisions could include; floating retentions, 'last dollar paid' mechanisms, multiple year retentions and dual triggers.

Insurers must have accounted for and disclosed any side agreements or understandings that exist between the parties to a transaction that would serve to reduce in part or the whole of the reinsurer's obligations.

The standard requires two specific reporting requirements for ceded reinsurance;

1. Definition of an insurance contract and risk transfer.
   An insurance contract is defined as a contract with **significant insurance risk transfer**, that is, 'a contract under which one party (the insurer) accepts significant insurance risk from another party (the policyholder) by agreeing to compensate the policyholder if a specified uncertain future event (the insured event) adversely affects the policyholder.' Insurance risk is significant under the standard only if an insured event could cause an insurer to pay significant additional benefits in any scenario. Therefore under IFRS 4 if a contract does not transfer significant insurance risk it is not a contract of insurance. This explicitly excludes financial reinsurance contracts which have the legal form of insurance but where contractual provision(s) ensure that insurance risk is passed back to the policyholder after such contracts sustain insured losses.

2. Measurement and unbundling.
   The standard requires that contracts which have investment and insurance features to be unbundled and accounted for separately if both of the following conditions can be met:

   - The insurer can measure the deposit component separately (i.e. without considering

the insurance component).

- The insurer's accounting policies do not otherwise require it to recognise all obligations and rights arising from the deposit component.

Unbundling is permitted, but not required, if the insurer can measure the deposit component separately as in (i) above but its accounting policies require it to recognise all obligations and rights arising from the deposit component. Therefore whether unbundling is required or not depends on the insurer's accounting policies on recognition of obligations and rights arising from the deposit component.

An example of the application of this reporting requirement would be where a policyholder receives compensation for losses from an insurer, but the contract obliges the policyholder to repay the compensation in future years. This obligation arises from a deposit component. IFRS 4 requires the contract to be unbundled if the policyholders accounting policies permit it to recognise the compensation as income without recognising the resulting obligation. The standard permits unbundling, but does not require it, if the policyholder's accounting policies require it to recognise the resulting obligation.

IFRS 4 also requires significantly more detailed quantitative and qualitative information on risk exposures. Most importantly for ART insurance liabilities are to be reported gross of reinsurance and there is to be explicit disclosure of counterparty risk by presenting reinsurance recoverables on the insurer's balance sheet.

2) Regulation

Introduction

The International Association of Insurance Supervisors (IAIS) have just published a guidance paper on Risk Transfer, Disclosure and Analysis of Finite Reinsurance and have come to the following conclusions on the supervision of finite reinsurance.

A variety of approaches to proper disclosure and accounting treatment

There are a range of approaches which can be taken to ensure that finite reinsurance transactions are being disclosed and accounted for properly. In the opinion of the IAIS the range of approaches reflects the local market conditions and the general supervisory approach taken within a jurisdiction. The guidance also notes that the supervisory approach to finite reinsurance is currently under review in many jurisdictions.

The supervisory practices and procedures used seem to reflect where a jurisdiction falls along the continuum of supervisory approaches from a principles-based approach to a rules-based approach, or a combination of the two.

A principles-based approach emphasises the responsibility of senior management and the board. The preference is to ensure that senior management have properly agreed and documented policies and procedures. Supervisory risk assessments are carried out to verify that policies and procedures are properly defined and acceptable. In addition in a principles-based system senior management is required to disclose any matter which they believe to be of regulatory significance.

A rules-based approach will have supervisory requirements which are more definitive and the supervisory procedures are more detailed, for example requiring prior approval of reinsurance contracts. Following this approach there is less reliance on management and board oversight and more reliance on independent supervisory and government testing.

Irrespective of the supervisory approach, the main concern of insurance supervisors with finite reinsurance is when the transactions are deliberately constructed to mislead or where there is abuse by the insurer's management. For example, interlinked contracts between related parties or via third parties, or 'off contract' arrangements which are concealed from the insurer's stakeholders, supervisors and creditors. In this regard finite reinsurance is no different from any other type of deception which supervisors cannot necessarily prevent.

Examples of supervisory approach

The following are examples of the supervisory approaches that can be applied to finite reinsurance;

- Conducting on site inspections which include the review of reinsurance programmes and the questioning of management on the use of limited risk transfer contracts.

- The requirement that companies provide an annual attestation by senior management with regard to whether risk transfer has been appropriately accounted for and side agreements are reflected in the supervisory reporting returns.

- Require companies to explicitly report on amounts and details of finite reinsurance transactions in the annual supervisory returns.

- The supervisory review of actuarial reports (which include details on reinsurance) and the expansion of the actuary's responsibility to assess the adequacy of the insurer's reinsurance management system (to include risk transfer, philosophy, and the adequacy of documentation).

- The supervisory review of auditors reports on the financial statements and related working papers.

- Requiring all limited risk transfer arrangements to receive prior supervisory approval (in some jurisdictions this requirement may be subject to materiality limits).

- Requiring that all reinsurance transactions with related parties must receive prior supervisory

approval and it must be demonstrated that they are at market terms and conditions.

- Conducting an annual review of reinsurance management strategy (signed off by the board of directors) with regard to the insurer's internal control environment and processes for management review of reinsurance arrangements. The reinsurance management strategy should be submitted to the supervisor annually.

- Highlighting board and senior management responsibilities via supervisory letters to companies regarding the importance of rigorous risk management, self-assessment of risk transfer, and the accurate reporting of the financial statement; including the requirement for the insurer to report back to the supervisor annually.

- The conduct of supervisory investigations into questionable reinsurance arrangements; these investigations often include the requirement for additional accounting and actuarial review.

- Analyse every reinsurance contract for adequate risk transfer (this only occurs in one jurisdiction).

- Ban the use of finite reinsurance (several jurisdictions take this approach).

- Some jurisdictions apply a risk-based supervisory approach with regard to the review of reinsurance arrangements for insurers and reinsurers.

- Require auditors and actuaries to 'whistle blow' by reporting to the supervisor where the activities of management may threaten the solvency of the insurer or where potential fraudulent activities are suspected.

Indicators for further investigation

Even using a blend of the example approaches set out above it is not always possible to detect every questionable reinsurance arrangement. The following are indicators to supervisors that further analysis may be required.

- Disparate lines of business are included within a single treaty

- Contracts which do not appear to be commercially sensible for either the insurer or the reinsurer (are there side agreements which change the meaning).

- Contracts which have been placed without following the cedant's normal process and guidelines for reinsurance.

- Contracts which are placed very close to the end of the cedant's financial year and covering

that year or earlier years (Is the aim to disguise bad results for that financial year).

- Inconsistencies or gaps in the dating of the documentation (has an agreement been backdated to give the appearance that it was reached before the end of the reporting period?).

- Blended covers – when they cover a combination of a single contract with a normal reinsurance arrangement. When this is done, the two covers should be evaluated separately.

IAIS recommendations

The IAIS recommends that in assessing risk transfer supervisors should;

- Review annual reinsurance management strategy (that has been signed off by the board), which sets out a coherent reinsurance programme designed to manage and mitigate the risks assumed in the underlying policies issued by the ceding insurer.

- Understand that the substance rather than the form of the transaction is crucial, especially if it is not clear why the ceding insurer and the reinsurer would enter into the agreement.

- Determine which types of risk are actually transferred and how, and why such transfer is commercially sensible for both the cedant and the reinsurer.

- Have access to all reinsurance documentation (placement slips, cover notes, reinsurance agreements and any addenda thereto) as an aid to understanding the structure of the agreements and their underlying commercial reality.

- Have the ability to require insurers to undertake an analysis of risk transfer and the economic value of the transaction (including the effect of any separate or side agreements or interlinked contracts), when necessary, this analysis should be available to supervisors.

With regard to accounting and disclosure the IAIS believes that supervisors should have the ability to verify that insurers have disclosed and accounted for any separate or side agreement or understandings that exist between the reinsurance agreement parties that would serve to reduce, offset or eliminate the reinsurer's obligations.

In cases where there is not acceptable risk transfer and the disclosure and accounting do not reflect the true economic value of the transaction, supervisors should have the power to take corrective action that could include not allowing credit for the transaction as reinsurance and requiring restatement of the financial position where material.

Information sharing and co-operation between regulators

Finally the IAIS has set out its position on information sharing and supervisory co-operation. The IAIS believes that effective supervision is enhanced through international co-operation among supervisors and sharing information about the fitness and propriety of the individuals involved in putting the arrangements together. Although the association is also clear that even with co-operation there cannot be a guarantee that all cases of misuse of finite reinsurance will be uncovered. IT is key to the IAIS that supervisors should have the power to take corrective action and, where needed, impose sanctions based upon clear and objective criteria that are publicly disclosed. Jurisdictions should ensure that legislation provides for sanctions against individuals who withhold information from the supervisory authority, provide information that is intended to mislead the supervisory authority or fail to provide information in a timely fashion. This is provided in the IAIS Core Principle 15.

There should also be supervisory co-operation and information sharing between relevant supervisors (IAIS Core Principle 5). The IAIS believes that such co-operation can be helpful when reviewing finite reinsurance transactions. To facilitate cross-border co-operation the IAIS has issued a Supervisory Standard on the Exchange of Information (2002) which applies particularly to restricted or confidential information, the standard also gives guidance on some of the elements that an optimal information sharing agreement might include. Optimal information sharing is also covered in the Model Memorandum of Understanding (1997), agreements to share information should include;

- The purpose of the information exchange
- Obligations to exchange information
- The standard of professional secrecy to be exercised by the recipient supervisor, including the onward transmission of information by the recipient supervisor to other government agencies in their jurisdiction
- The need for the express agreement of the supervisor supplying the information prior to use by the recipient supervisor for purposes other than those for which they gave their original agreement.

Multi Year Accounting

The use of Finite or Structured (ForS) deals can have a significant impact on the effect of reinsurance on a cedant's balance sheet. This comes about where the ForS deal is structured over a multi-year period and includes features such as a profit commission or an overall aggregate recoverable cap. In such structures the multi-year deal gives rise to assets and liabilities on the balance sheet rather than just influencing the profit and loss account as would be the case with a Traditional reinsurance coverage.

In order to show this process, we have expanded an example of a poorly structured ForS deal first published in Reinsurance Magazine in an article written by XXXXXX and XXXXXX of Allianz-ART in Switzerland. This article was designed to highlight the importance of thinking through the impact of clauses and conditions within the ForS reinsurance arena. Allianz-ART is a globally respected reinsurer specialising in alternative solutions.

We should point out that Heath Lambert is not an accountancy practice and thus this section should be treated as raising topics for further discussion with fully qualified professional accounting practitioners.

We shall start by looking at the effect of an equivalent Traditional deal on the reinsured's profit and loss account with the discussion of the ForS deal to follow.

Method for Studying the Accounting

The attached exhibits 1 and 2 each show three years of accounts. In each year the reinsurance in question can either respond to a loss or run clean (we have assumed only total losses in order to simplify the example). This leads to eight possible outcomes by the end of year three (two possibilities in year one * two possibilities in year two * two possibilities in year three).

Our exhibits are also structured in this manner with a large heading for "No Loss" and "Loss" in year one above two smaller headings "No Loss" and "Loss" in year two. Year three has a further two headings under each of those in year two – we can think of this structure either as a tree or as a cascade.

This method of displaying the effect of reinsurance on the report and accounts allows us to see the effect of the propagation of previous years' results into future years, assuming that the reinsurance in question operates in this manner.

Accounting of a Traditional Reinsurance

The attached exhibit 1 ("Example of the Accounting of Three Years of a Traditional Deal") shows how a Traditional excess of loss reinsurance would be accounted. The deal in question is an aggregate excess of loss with details as follows:

Annual Limit:	70,000,000
Premium:	14,000,000
Profit Commission:	nil
Basis of Purchase:	Annual renewal

In each year of account we see an "Actual Premium Paid" of 14,000,000 across all combinations of "No Loss" and "Loss". Under those sections headed "Loss" we also see a figure for "Actual Claim Recovered" of 70,000,000. Both these items affect the Profit and Loss Account. In all cases the items "Change in Premium Accrual" and "Change in Profit Commission Accrual" contain zero entries. Those items headed "No Loss" show an "Net Cost" to the cedant of 14,000,000 while those including a recovery have a "Net Cost" of -56,000,000 (in other words, a benefit).

What we are seeing in exhibit 1 is that the Traditional reinsurance is only having an impact on the Profit and Loss account of the client (NB this is a slight simplification since we are assuming that all recoveries from the reinsurance are collected within the corresponding year of account). There are no assets or liabilities (Premium or Profit Commission Accruals) set-up due to the terms of the reinsurance since each year of account of the reinsurance stands on its' own. Past results have no impact on the future position, propagation is not a feature.

In Traditional reinsurance, accounting is simple and the possible impact on the report and accounts is easily defined at the inception of the contract. Furthermore, it is generally the case that the impact of the reinsurance is contained within the Profit and Loss side of the report and accounts.

Accounting of a Three Year ForS Reinsurance

Exhibit 2 ("Example of the Accounting of a Multi-Year Structured Deal") follows the same format as previously discussed. In exhibit 2, the reinsurance in question is a multi-year ForS deal structured as follows:

Annual Limit:	70,000,000
Overall Aggregate Limit:	100,000,000 over three years
Premium:	20,000,000
Profit Commission:	60%
Basis of Purchase:	Three year deal

For each year of account the first two rows "Actual Premium Paid" and "Actual Claim Recovered" look very similar to those for the Traditional reinsurance deal. In each case the premium (in this case 20,000,000) comes out of the profit and loss account as a cost. In those sections headed "Loss" there is also a figure of 70,000,000 for "Actual Claim Recovered".

The difference comes in the sections "Change in Premium Accrual" and "Change in Profit Commission Accrual" which contained zeros in the Traditional reinsurance example. In the ForS example, we start seeing figures in these sections of the balance sheet:

Change in Premium Accrual

Definition – a liability, the cedant must pay this premium at a future date.

When the ForS deal is impacted with a loss, it may be that a portion of future premium has already been utilised.

In our example, with a loss in year one, a total of 70,000,000 is recovered. This figure represents 70% of the overall three-year aggregate limit of the ForS contract (100,000,000). At the same time the cedant has only paid 33.33% (20,000,000) of the overall premium for the three years – thus 36.67% of future premium has been used before the cedant has paid it.

This gives rise to a Premium Accrual of 22,000,000 (36.67% of the 60,000,000 premium payable over the three years). The Premium Accrual sits as a liability on the balance sheet in the report and accounts until the future premium has been paid to the reinsurer.

(NB Where accrual accounting is not utilised, the cedant will pay 40,000,000 of premium over the next two years whilst only having the benefit of 30,000,000 of cover (due to the overall aggregate limit). This would not qualify as risk transfer since the premiums are bigger than the claims the cedant can possibly recover!)

Change in Profit Commission Accrual

Definition – an asset, the cedant will receive a profit commission at a future date.

As soon as the cedant pays the first year premium, an asset is created on their balance sheet relating to future profit commission payable. In our example, the cedant pays 20,000,000 but can expect a future profit commission of 60% (12,000,000), assuming no loss. The Profit Commission Accrual sits as an asset on the balance sheet in the report and accounts.

Once items start appearing on the cedant's balance sheet in the "Premium Accrual" and "Profit Commission Accrual" items, the functioning of our ForS deal becomes far more complicated.

We shall look at two examples:

"Loss" in Year One

Naïve accounting would suggest that the ForS contract should have a benefit of 50,000,000 to the cedant since 20,000,000 premium has been paid and 70,000,000 recovered.

The actual position is more complicated since the loss in year 1 creates a liability of 22,000,000 by way of a Premium Accrual (as discussed above, a portion of future premium has already been utilised). The creation of this liability reduces the benefit of the reinsurance by the same amount and thus the overall benefit to the cedant is only 28,000,000 (50,000,000 minus the 22,000,000 premium accrual).

"Loss" in Year Two after "No Loss" in Year One

After a clean first year the cedant has paid 20,000,000 and has an asset of 12,000,000 as a Profit Commission Accrual.

If a loss then occurs in year two, the following changes occur:

Profit Commission Accrual – the cedant loses the expectation of future profit and thus loses the 12,000,000 Profit Commission Accrual asset created in year one.

Premium Accrual – 70% of the total limit of the contract has been used, however only 66.66% of the total premium has been paid. A Premium Accrual of 2,000,000 is therefore set-up as a liability within the cedant's balance sheet.
The overall benefit to the cedant in year two is thus calculated as follows:

Premium Paid:	-20,000,000
Claim Recovered:	+70,000,000
Premium Accrual:	-2,000,000
Profit Commission Accrual:	-12,000,000

Overall Cost (Benefit): -36,000,000

What is very interesting here is that our calculated benefit to the cedant after a loss in year two is different to the figure calculated after a loss in year one. Indeed, looking more broadly at exhibit 2 reveals that the cost (benefit) of this ForS contract in any one year is highly dependant upon the past experience – propagation of results is occurring due to the overall aggregate limit and overall profit commission included in the terms of the three year deal.

Example of the Accounting of Three Years of a Traditional Deal

Period of Accounting	3 Years								
Annual Limit	70,000,000								
Total Aggregate Limit	210,000,000								
Annual Premium	14,000,000								
Profit Commission at Expiry	0%						Probability of Loss in any one Year		10.00%
Year 1	No Loss				Loss				
Actual Premium Paid (Cost to P&L)	14,000,000				14,000,000				
Actual Claim Recovered (Benefit to P&L)	0				70,000,000				
Change in Premium Accrual (a Liability)	0				0				
Change in Profit Commission Accrual (an Asset)	0				0				
Net Cost (-ve = Benefit) (Overall Position)	14,000,000				-56,000,000				
Year 2	No Loss		Loss		No Loss		Loss		
Actual Premium Paid (Cost to P&L)	14,000,000		14,000,000		14,000,000		14,000,000		
Actual Claim Recovered (Benefit to P&L)	0		70,000,000		0		70,000,000		
Change in Premium Accrual (a Liability)	0		0		0		0		
Change in Profit Commission Accrual (an Asset)	0		0		0		0		
Net Cost (-ve = Benefit) (Overall Position)	14,000,000		-56,000,000		14,000,000		-56,000,000		
Year 3	No Loss	Loss	No Loss	Loss	No Loss	Loss	No Loss	Loss	
Actual Premium Paid (Cost to P&L)	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	70,000,000	0	70,000,000	0	70,000,000	
Change in Premium Accrual (a Liability)	0	0	0	0	0	0	0	0	
Change in Profit Commission Accrual (an Asset)	0	0	0	0	0	0	0	0	
Net Cost (-ve = Benefit) (Overall Position)	14,000,000	-56,000,000	14,000,000	-56,000,000	14,000,000	-56,000,000	14,000,000	-56,000,000	
Overall									
Actual Premium Paid (P&L Account)	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000	42,000,000	
Actual Claim Recovered (P&L Account)	0	70,000,000	70,000,000	140,000,000	70,000,000	140,000,000	140,000,000	210,000,000	
Actual Profit Commission Received (P&L Account)	0	0	0	0	0	0	0	0	
Net Cost (-ve = Benefit) (Overall to P&L Account)	42,000,000	-28,000,000	-28,000,000	-98,000,000	-28,000,000	-98,000,000	-98,000,000	-168,000,000	
Losses above Aggregate Limit	0	0	0	0	0	0	0	0	
Probability	72.90%	8.10%	8.10%	0.90%	8.10%	0.90%	0.90%	0.10%	
Partial Expected Cost	30,618,000	-2,268,000	-2,268,000	-882,000	-2,268,000	-882,000	-882,000	-168,000	
Overall Expected Cost	21,000,000								
Expected Loss Above Aggregate Limit	0								

Example of the Accounting of a Multi-Year Structured Deal

Period of Deal	3	Years	
Annual Limit	70,000,000		
Total Aggregate Limit	100,000,000		
Annual Premium	20,000,000		
Profit Commission at Expiry	60%	Probability of Loss in any one Year	10.00%

Year 1	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000
Change in Premium Accrual (a Liability)	0	22,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-28,000,000

Year 2	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	30,000,000
Change in Premium Accrual (a Liability)	0	2,000,000	-11,000,000	-2,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	-12,000,000	0	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-36,000,000	9,000,000	-12,000,000

Year 3	No Loss	Loss	No Loss	Loss	No Loss	Loss	No Loss	Loss
Actual Premium Paid (Cost to P&L)	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Recovered (Benefit to P&L)	0	70,000,000	0	30,000,000	0	30,000,000	0	0
Change in Premium Accrual (a Liability)	0	0	-2,000,000	-2,000,000	-11,000,000	-11,000,000	-20,000,000	-20,000,000
Change in Profit Commission Accrual (an Asset)	12,000,000	-24,000,000	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall Position)	8,000,000	-26,000,000	18,000,000	-12,000,000	9,000,000	-21,000,000	0	0
Overall								
Actual Premium Paid (P&L Account)	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
Actual Claim Recovered (P&L Account)	0	70,000,000	70,000,000	100,000,000	70,000,000	100,000,000	100,000,000	100,000,000
Actual Profit Commission Received (P&L Account)	36,000,000	0	0	0	0	0	0	0
Net Cost (-ve = Benefit) (Overall to P&L Account)	24,000,000	-10,000,000	-10,000,000	-40,000,000	-10,000,000	-40,000,000	-40,000,000	-40,000,000
Losses above Aggregate Limit	0	0	0	40,000,000	0	40,000,000	40,000,000	110,000,000
Probability	72.90%	8.10%	8.10%	0.90%	8.10%	0.90%	0.90%	0.10%
Partial Expected Cost	17,496,000	-810,000	-810,000	-360,000	-810,000	-360,000	-360,000	-40,000
Overall Expected Cost	13,946,000							
Expected Loss Above Aggregate Limit	1,190,000							

Mirror Accounting

The previous section on the multi year accounting of Finite or Structured (ForS) reinsurance introduced us to the concept of reinsurance affecting the assets and liabilities of the purchaser. In the ForS example, the Profit Commission Accrual was created as an asset of the cedant until such time as a loss occurred and the potential for profit commission was lost.

This creation of assets and liabilities on the cedant's balance sheet should have a corollary – surely an asset created from a transaction from the cedant's point of view should represent a liability from the reinsurer's viewpoint? If this were not the case, assets could be created almost out of "thin air" leading to a misstatement of the ebb and flow in the financial position between the two parties. A misstatement of assets could also make one of the parties to a transaction appear financially "stronger" than would otherwise be the case (this has problem with some Finite transactions in the past). Mirror Accounting is the principal which addresses this issue.

Mirror Accounting defines how a reinsurer should account for a transaction from their point of view. In essence the principal of Mirror Accounting states that cedant and reinsurer should account exactly the same figures from a transaction but with the sign reversed – a profit for one side should be a loss to the other, an asset for one side should be a liability for the other.

We shall now apply the principal of Mirror Accounting to the ForS example from the section on Multi Year Accounting. (We shall not study the mirror accounting of the Traditional example since it is clear that a debit on one side (eg Premium Paid by the cedant) represents an income on the other (in this case Premium Written by the reinsurer)).

Mirror Accounting of the ForS Example

Exhibit 3 shows the ForS example transaction from the viewpoint of the reinsurer. To create this exhibit all that has been required is to change the definition of each of fields in exhibit 2:

Exhibit 2 – Cedant's View	Exhibit 3 – Reinsurer's View
Actual Premium Paid (Cost to P&L)	Premium Received (Income to P&L)
Actual Claim Recovered (Benefit to P&L)	Actual Claim Paid (Cost to P&L)
Premium Accrual (a Liability)	Premium Accrual (an Asset)
Profit Commission Accrual (an Asset)	Profit Commission Accrual (a Liability)
Net Cost (-ve = Benefit)	Net Benefit (-ve = Cost)

In this way we can guarantee the fair allocation of incomes, outgoes, assets and liabilities between the two parties to this transaction. If we now look at the reinsurer's position after a "Loss" in year one (one of the examples studied before) we see a cost of 28,000,000 – exactly the mirror of the benefit of 28,000,000 we calculated for the cedant. Likewise the position after "No Loss" in year one and a "Loss" in year two shows a cost of 36,000,000 to the reinsurer. Once again, the reinsurer's position mirrors the position of the cedant.

Latest Developments in Mirror Accounting

Many ForS deals now include a clause requiring mirror accounting between Cedant and Reinsurer. In the "post-Spitzer" era both the buyers and sellers of structured products fully appreciate the need for the full economics of all transactions to be transparent – the requirement for Mirror Accounting is one of the fundamental steps in achieving this.

Example of the Mirror Accounting of a Multi-Year Structured Deal

Period of Deal	3	Years	
Annual Limit	70,000,000		
Total Aggregate Limit	100,000,000		
Annual Premium	20,000,000		
Profit Commission at Expiry	60%	Probability of Loss in any one Year	10.00%

Year 1	No Loss	Loss
Premium Received (Income to P&L)	20,000,000	20,000,000
Actual Claim Paid (Cost to P&L)	0	70,000,000
Change in Premium Accrual (an Asset)	0	22,000,000
Change in Profit Commission Accrual (a Liability)	12,000,000	0
Net Benefit (-ve = Cost) (Overall Position)	8,000,000	-28,000,000

Year 2	No Loss	Loss	No Loss	Loss
Premium Received (Income to P&L)	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Paid (Cost to P&L)	0	70,000,000	0	30,000,000
Change in Premium Accrual (an Asset)	0	2,000,000	-11,000,000	-2,000,000
Change in Profit Commission Accrual (a Liability)	12,000,000	-12,000,000	0	0
Net Benefit (-ve = Cost) (Overall Position)	8,000,000	-36,000,000	9,000,000	-12,000,000

Year 3	No Loss	Loss	No Loss	Loss	No Loss	Loss	No Loss	Loss
Premium Received (Income to P&L)	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Actual Claim Paid (Cost to P&L)	0	70,000,000	0	30,000,000	0	30,000,000	0	0
Change in Premium Accrual (an Asset)	0	0	-2,000,000	-2,000,000	-11,000,000	-11,000,000	-20,000,000	-20,000,000
Change in Profit Commission Accrual (a Liability)	12,000,000	-24,000,000	0	0	0	0	0	0
Net Benefit (-ve = Cost) (Overall Position)	8,000,000	-26,000,000	18,000,000	-12,000,000	9,000,000	-21,000,000	0	0
Overall								
Premium Recieved (P&L Account)	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
Actual Claim Paid (P&L Account)	0	70,000,000	70,000,000	100,000,000	70,000,000	100,000,000	100,000,000	100,000,000
Actual Profit Commission Paid (P&L Account)	36,000,000	0	0	0	0	0	0	0
Net Benefit (-ve = Cost) (Overall to P&L Account)	24,000,000	-10,000,000	-10,000,000	-40,000,000	-10,000,000	-40,000,000	-40,000,000	-40,000,000
Losses above Aggregate Limit	0	0	0	40,000,000	0	40,000,000	40,000,000	110,000,000
Probability	72.90%	8.10%	8.10%	0.90%	8.10%	0.90%	0.90%	0.10%
Partial Expected Benefit	17,496,000	-810,000	-810,000	-360,000	-810,000	-360,000	-360,000	-40,000

Overall Expected Benefit	13,946,000
Expected Saving from Aggregate Limit	1,190,000

Bifurcated Accounting

The background to the principle of bifurcated accounting (BA) has been introduced elsewhere in this report. Here we shall discuss what BA means in practice.

BA came about due to a growth in the use of finite slips containing more than one section. In this practice a section containing no (or little) risk transfer was matched up with a section apparently containing risk transfer but at a very remote level. An example of this could be to match a solvency quota share with a combined ratio cap at 100% with a market loss warranty layer excess of a country's probable maximum loss. The advantage of this under previous accounting rules was that the whole slip (consisting of the two sections) could be accounted for as reinsurance with any corresponding accounting advantages.

Under the principle of BA this is often no longer the case. The example contract mentioned above would now have the separate sections accounted separately, with the capped quota share accounted on a deposit basis and the remote loss warranty layer accounted as reinsurance. Bifurcating (unbundling) the contract in this way removes the accounting benefits which would otherwise have arisen under purely reinsurance accounting.

10/10 Rule

The Financial Accounting Standards Board (FASB), the American financial accounting standard body, set in their Statement of Financial Accounting Standards No. 113 (FAS113) in1992 a guidance for accounting and reporting for reinsurance of both short-duration and long-duration contracts. FAS113 requires that to enable a ceding enterprise to remove a loss or liability relating to insurance risk from its balance sheet, the buyer/reinsured of such insurance contract must transfer a "significant" amount of risk to the seller/reinsurer; and the seller/reinsurer must face a "significant" likelihood of a loss. This sets a line distinguishing the legitimate use of finite reinsurance from the illegitimate. However, there lacks of more specific guidance.

The insurance and accounting industries have established a rule of thumb that says that the seller of an insurance contract must face at least a 10 percent chance of a 10 percent loss on the liability. It is generally called "10/10" rule.

But critics of finite reinsurance argued that 10 percent times 10 percent equals only 1 percent, and that is not a significant amount of risk. Hence FASB's recent decision to put the issue on its agenda for possible new rule-making.

But even some companies that declare to adhere to the "10/10" rule-of-thumb may agree in side letters that they will make sellers whole for any losses. AIG did that with its General Re finite coverage and Enron had a side agreement that masked the true nature of its spurious off-balance-sheet deals from auditor Arthur Andersen. Such letters, of course, escape the attention of auditors.

At the minimum, however, FASB is likely to require buyers to meet a minimum threshold for the estimated severity and frequency of the potential losses. FASB chairman Robert Herz also side in one event that the board might follow the lead of the International Accounting Standards Board (IASB) on this question, in which case insurance would be treated like any other financial instrument. That would mean that insurance buyers couldn't move liabilities off their balance sheets even if 100 percent of the risk for them had been transferred.

Without a clearer picture of regulators' intentions, it's impossible to predict what companies would do in response. But if FASB goes as far as Herz suggests, many U.S. companies would have to unwind or restructure many existing policies, and then restate their results.

Also auditors are paying more and more attention to these transactions, and because of the extra scrutiny, finite-risk buyers are far more cautious than they used to be.

The Cash Flowchart for FFR Products

There are really two basic structures within the finite reinsurance market

- Funds Witheld
- Funds Transferred

Both of these structures can be applied to either Finite Quota Shares (FQS) or Spread Loss Covers (SLC) since whatever the basis of the underlying reinsurance, all that is occurring is a transfer of premiums and claims payments. Obviously in a quota share structure, the premium transferred will be net of ceding commission, however the principle is the same. The aspects that change are

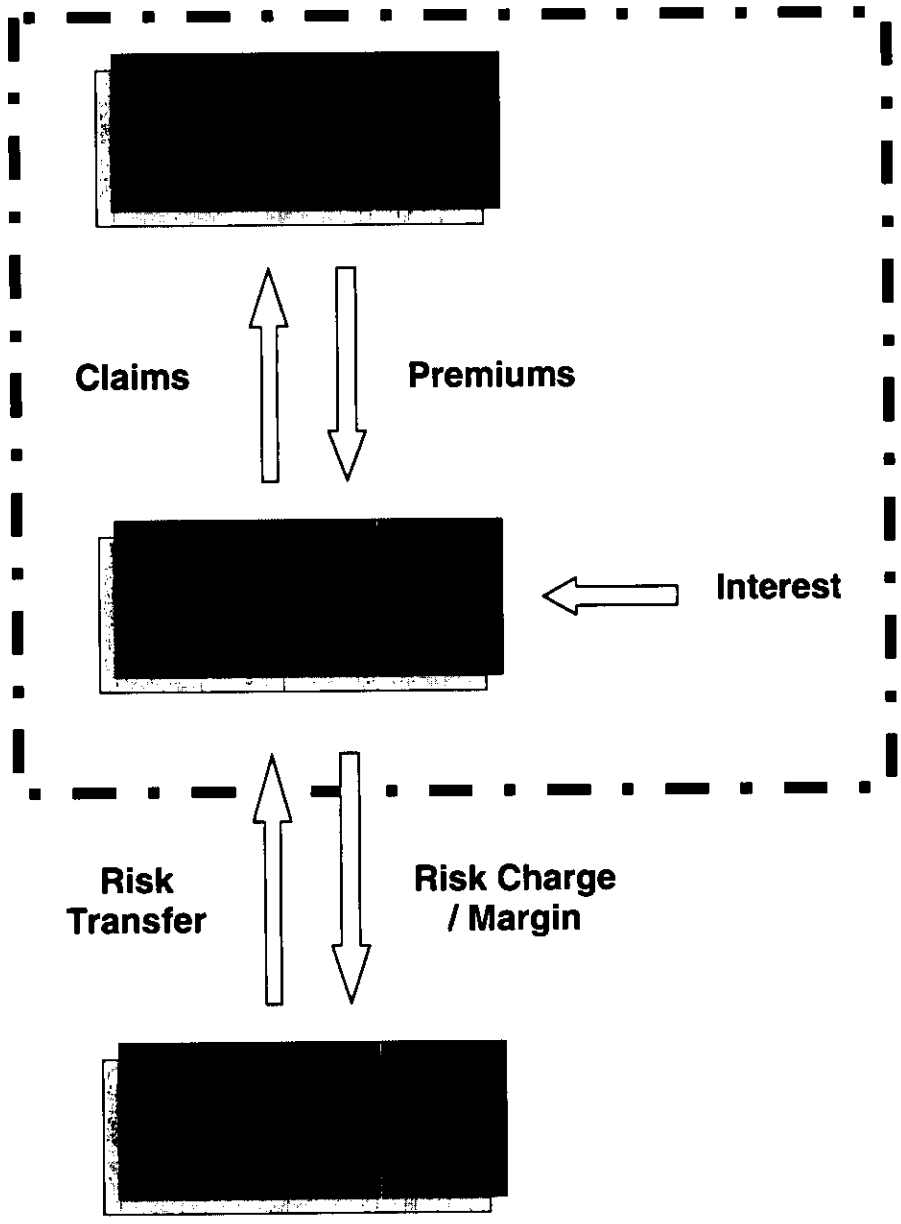
- Where the funds within the contract are held
- Whether cash is actually paid (profit and loss account items) or the contract is accounted via asset and liability items on the balance sheet

In a funds withheld contract the cedant administers a Funds Witheld Experience Account (FWEA). This could be some form of escrow account where cash is actually paid, but is far more likely to be held in the form of assets and/or liabilities on the balance sheet. As an example, rather than paying a premium to the reinsurer, the cedant would hold a liability for the amount of premium within the contract. Likewise claim payments would often be held as assets (money owed to the cedant by the reinsurer). The item that would actually be paid as cash would be the reinsurer's margin.

In a funds transferred transaction the reinsurer would hold the Experience Account and cash would actually be paid over.

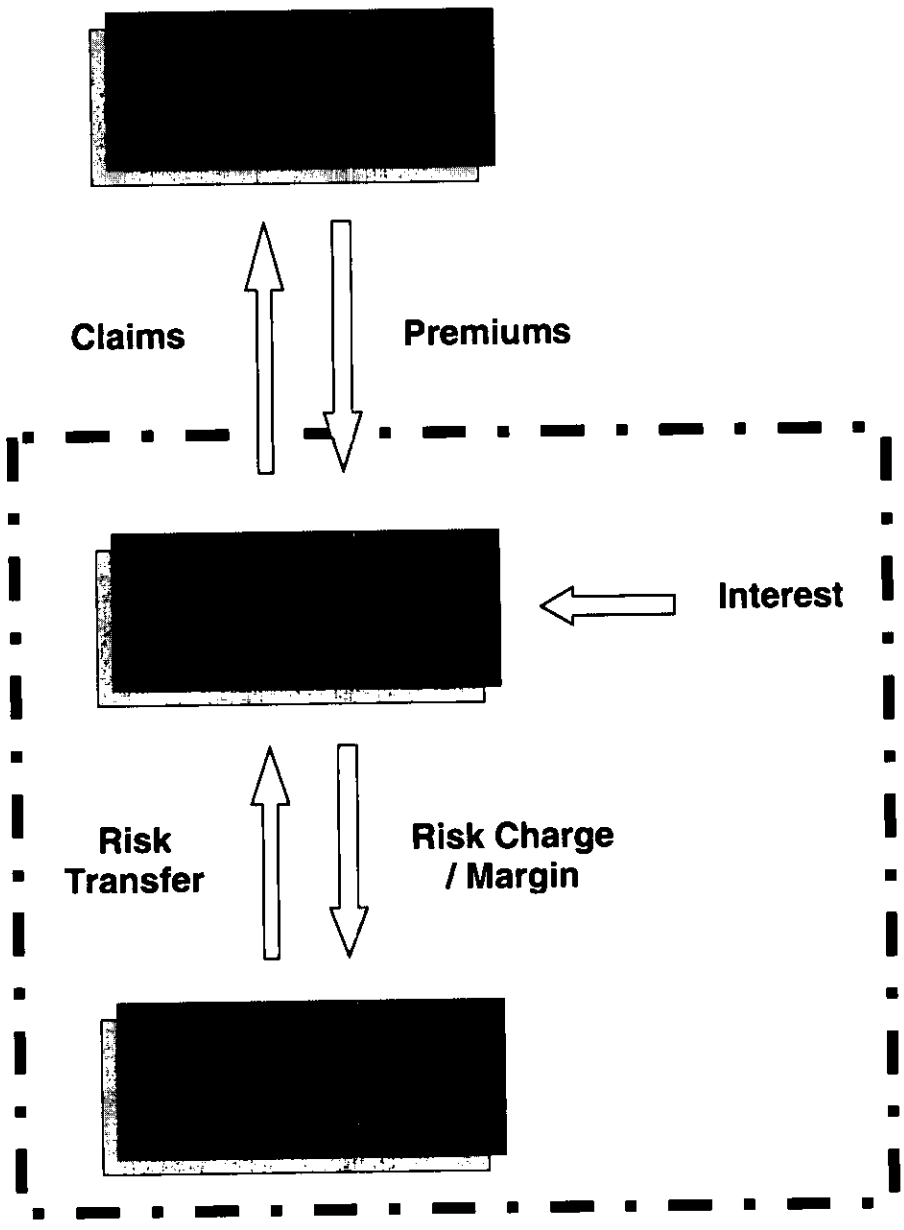
There are advantages and disadvantages to either structure and the actual choice would depend on what the transaction is being designed to achieve.

Funds Withheld



In a funds withheld structure, the ***cedant*** holds the funds withheld experience account.

Funds Transferred



In a funds transferred structure, the ***reinsurer*** holds the experience account.

The Role of FFR in assisting the Financing of "Catastrophes"

Introduction

Most, but not all, of the various types of FFR products we have discussed have potential applicability to catastrophe financing (CF). The products which can offer alternative forms of financing are as follows:

- Spread Loss Covers
- Cat Swaps
- Cat Bonds
- Contingent Capital

Products with limited or no applicability to CF are:

- Solvency Quota Shares
- Loss Portfolio Transfers
- Adverse Development Covers

The latter two items (LPT and ADC) may include catastrophe losses within the portfolio concerned, however by the time these products are considered any catastrophe claims will generally be fully developed and mostly paid.

We shall now look at each of the four applicable products in more detail. The order in which we have listed the products is intentional – as we move through the list we will be moving from the lower level of catastrophe exposure towards the upper level. Spread Loss Covers only really function when the premium charged is a significant percentage of the limit purchased (normally over 20%) while Cat Bonds work best when the exposure is remote.

Avalon

In order to provide an example for our study, we shall use the case of a hypothetical country we shall call Avalon.

Avalon is a prosperous island nation exposed to the perils of both hurricane and earthquake. Insurance coverage for the inhabitants is provided by the Insurance Corporation of Avalon (ICA), a State owned monopoly insurer. The ICA have seen their exposure to catastrophe perils increase rapidly in recent years due an economic boom in Avalon. This has put considerable pressure on their traditional catastrophe programme with exponentially increasing cost and a lack of capacity in the traditional market place.

The ICA therefore decides to completely re-structure their reinsurance purchases.

The process starts when the ICA commission a third party cat modelling firm to model their exposures. The results of this study are shown in exhibit 1. Based on this study the ICA define their reinsurance requirement to be 500m of cover in respect of hurricane and 1.5bn in respect of earthquake. These figures represent just over a 1 in 100 year hurricane and just under a 1 in 250 year earthquake.

ICA's brokers are then sent into the market to obtain quotations for traditional reinsurance coverage. The results are shown in exhibit 2. The overall cost of just over 127.5m for the two programmes represents a significant proportion of ICA's catastrophe income of 150m. In the event of a total loss to either programme, the cost of the programmes plus the 25m retention plus reinstatement premiums will be more than ICA's catastrophe income for that year. Furthermore the feedback from the market is that there is not enough capacity for the earthquake programme at these prices.

ICA therefore request that their brokers make suggestions based on alternative risk transfer products.

Spread Loss Cover

Spread Loss Covers (SLCs) work exactly as the name suggests – the principle is to spread the cost of CF over a period of time by turning the uncertain cost of catastrophes in any one year into a fixed budgetary expense. The key is to ensure that the fixed annual budget is sufficient to cover the cost of catastrophes over time plus the reinsurer's margin.

In the past, SLCs were structured in one of two ways:

- Pre Loss Funded (Prospective)
- Post Loss Funded (Retrospective)

More recently Post Loss Funding (and retrospective covers in general) has very much fallen out of acceptance due to a number of cases of abuse. We shall therefore concentrate on a Pre Loss Funded (or prospective) solution for CF in Avalon.

Considering the two layers of 25m excess 25m we see a combined traditional rate on line of 50.1% from the traditional market – 26.58% for the hurricane coverage and 23.52% for the earthquake. This cost compares with a combined pure loss cost of 27.06% (14.97% and 12.09% for hurricane and earthquake respectively).

An SLC is therefore structured to cover hurricane and earthquake for 25m excess 25m on a combined basis. The SLC is also extended to include the cost of reinstatement premiums for the layer 50m excess 50m of both the hurricane and earthquake programmes. The SLC on this basis has a total annual cost of 10.5m made up of 9.5m risk premium and 1m reinsurer margin (see exhibit 3 for details). This should be compared with a cost of 12.5m for the separate traditional layers which provide more cover (two hurricane limits and two earthquake limits) but feature paid reinstatements and do not cover the reinstatement premiums for the 50m excess 50m layers.

Traditional Layers

Whilst the layer 50m excess 50m could also be considered on a spread loss basis, ICA are more comfortable with a smaller limit on a spread loss basis since the risk transfer within the spread loss product is relatively limited.

The 100m excess 100m and 300m excess 200m carry too little exposure to work effectively on a spread loss basis and too much exposure for the cat bond markets. The only suggestion for these layers would be to consider combined hurricane / earthquake coverage – the 300m excess 200m looks particularly attractive on this basis (see exhibit 2).

ICA's brokers are confident that the market has enough capacity for the earthquake layer 500m excess 500m – thus the decision is made to keep this layer also in the traditional market.

Catastrophe Bond

Above 1bn for earthquake the probability of loss is low enough for a cat bond to be considered. ICA therefore decide to set-up a special purpose vehicle – Camelot Re – to access the bond markets. Camelot Re will issue 350m in bonds in order to provide 350m of capacity to ICA via a layer of 350m excess 1bn with no reinstatement. This layer has the following characteristics:

Annual Attachment Probability	0.62%
Annual Expected Loss	0.54%
Annual Exhaustion Probability	0.47%

A favourable quotation at a principle rate of 3.50% is obtained from the capital markets, eager to spread their portfolios away from the normal issues associated with US and Japanese perils. The bond issue takes place, Camelot Re receive their 350m and invest the money in highly rated short term securities providing return at LIBOR. A cover note is issued to ICA at a premium of 3.50% rate on line – Camelot Re will use this premium to pay the bond investors their spread over LIBOR.

Contingent Capital

ICA are still 150m short of their desired capacity. After discussions with the Government the decision is taken (by the Government) to arrange 150m in contingent capital for the top 150m of exposure. The Government has always guaranteed ICA as a reinsurer of last resort and they are comfortable with the additional exposure at this level.

The problem from the Government's point of view is the freeing up of cash for ICA at a time when there will be many other calls on their finances after a major earthquake. The contingent capital will be used to pay ICA the money they need while leaving other governmental resources free for other purposes such as arranging food and shelter for the poor.

The capital markets are approached and an option fee of 0.5% of the 150m in contingent capital is agreed. The trigger for the contingent capital is a modelled loss of 1.25bn from earthquake (a margin was built in below the 1.35bn "attachment point" required in order to allow for possible basis risk between the actual loss and the modelled loss). In the event that the facility is triggered, 150m will become immediately available to the Government of Avalon in exchange for 15 year notes carrying a coupon of LIBOR plus 0.5%.

Comparing the Traditional and Alternative Structures

ICA's reinsurance re-structuring process discussed above led to two potential programmes for them to consider:

- A Traditional Reinsurance Structure
- An Alternative Reinsurance Structure

Summaries of these two programmes are shown in exhibits 5 and 6.

In order to make a comparison between these two structures, ICA commission a stochastic model. The model will take as inputs claims drawn randomly from the loss distributions compiled by the third party cat modelling firm. The potential recoveries from the traditional and alternative programmes are then calculated and the results stored for further analysis in the form of the "benefit" calculated for each layer (we put the term "benefit" in quotes since what we will see are negative "benefits" (ie costs) for each of the proposed layers. The model will utilise 5,000 "years" of this data.

We built such a model for ICA's portfolio. The results of the "benefit" calculations are shown in exhibit 7. Some interesting points from this:

- Whilst the programmes are not totally comparable (see below), the alternative programme carries a cost around 20% less than that calculated for the traditional programme.

- The SLC shows that the FWEA is building-up since the calculated cost (3,022,172) is greater than the reinsurer margin of 1m.

- The alternative programme gives less sideways cover in the combined layers and in the earthquake layers (but do ICA really need as many reinstatements as the traditional programme gives them?).

- The alternative programme gives more coverage in that the reinstatement premiums for the 50m xs 50m layers are paid by the SLC.

- The catastrophe bond is, perhaps, slightly more expensive than the traditional equivalent, although gives access to new markets and carries less security risk.

- The contingent capital layer looks like an interesting alternative.

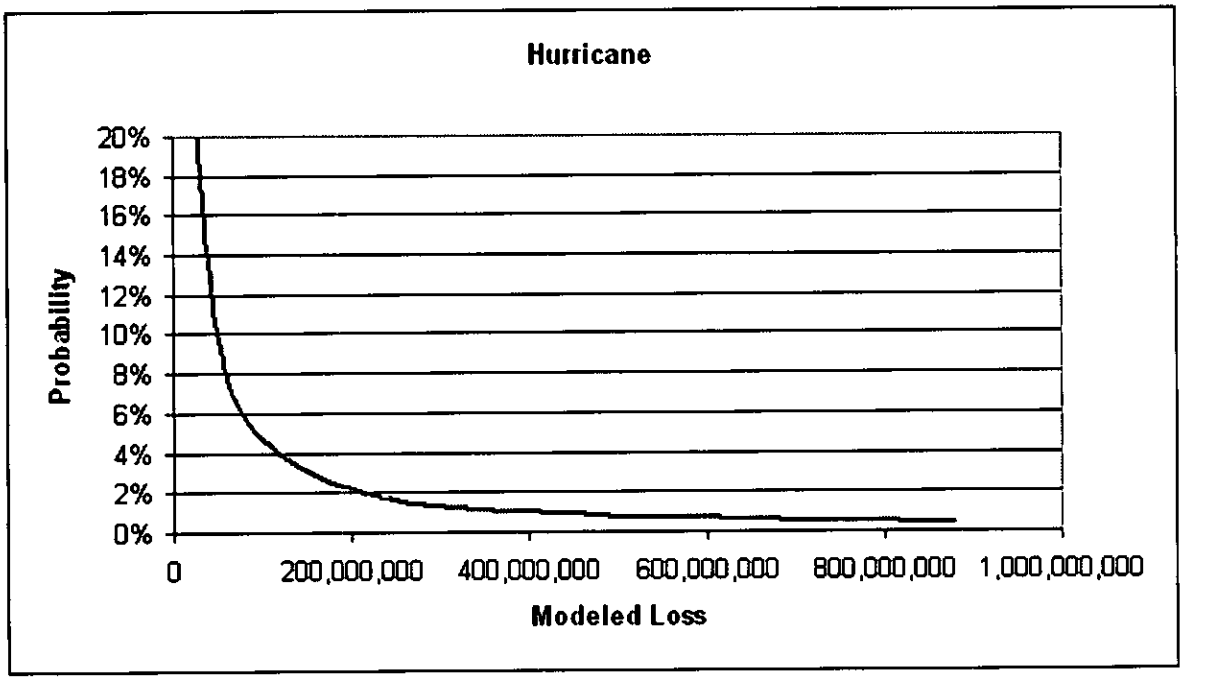
- It should of course be noted that neither the catastrophe bond nor the contingent capital structure include a reinstatement.

Exhibit 8 gives the percentile analysis of the reinsurance benefit outcomes from our analysis. What we see here is that the alternative structure always provides more benefit to ICA over the loss scenarios generated by our model.

We did not carry-out any risk based capital analysis for ICA since for government owned entities the concept of a capital requirement loses most of its meaning. See chapter 15 for a discussion of risk based capital.

Exhibit 1 - Modeled Catastrophe Exposures for Avalon

Return Period	Annual Probability	Hurricane	Earthquake
1 in 5 Years	20.00%	27,341,180	20,084,333
1 in 10 Years	10.00%	50,577,261	43,773,479
1 in 20 Years	5.00%	93,560,678	95,403,590
1 in 50 Years	2.00%	210,974,833	267,204,593
1 in 100 Years	1.00%	390,273,174	582,368,094
1 in 250 Years	0.40%	880,047,256	1,631,085,684



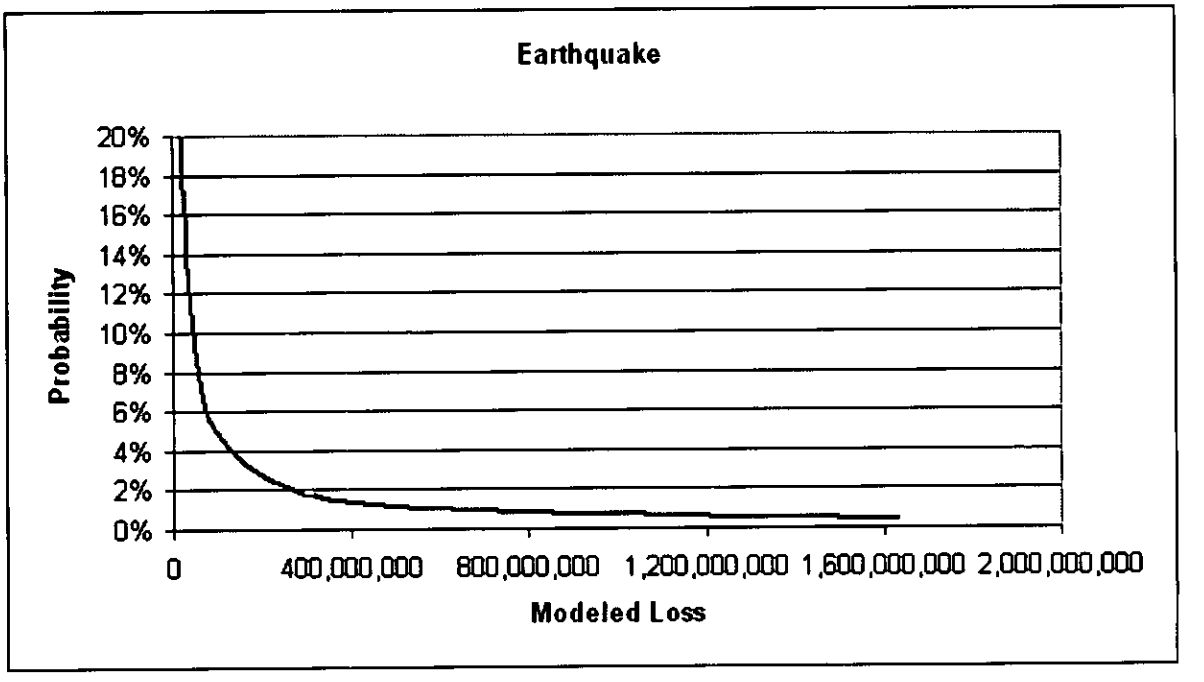


Exhibit 2 - Traditional Reinsurance Quotations for ICA

Hurricane

Limit	Excess	Pure Rate on Line	Quoted Rate on Line	Monetary Cost
25,000,000	25,000,000	14.97%	26.58%	6,644,436
50,000,000	50,000,000	6.85%	16.78%	8,387,989
100,000,000	100,000,000	3.14%	10.33%	10,332,026
300,000,000	200,000,000	1.27%	5.80%	17,397,628
475,000,000	25,000,000		9.00%	42,762,080

Earthquake

Limit	Excess	Pure Rate on Line	Quoted Rate on Line	Monetary Cost
25,000,000	25,000,000	12.09%	23.52%	5,879,703
50,000,000	50,000,000	6.53%	16.28%	8,140,989
100,000,000	100,000,000	3.52%	11.11%	11,109,564
300,000,000	200,000,000	1.72%	7.06%	21,167,325
500,000,000	500,000,000	0.84%	4.46%	22,277,240
500,000,000	1,000,000,000	0.52%	3.25%	16,248,531
1,475,000,000	25,000,000		5.75%	84,823,352

Combined Quotations

Limit	Excess	Pure Rate on Line	Quoted Rate on Line	Monetary Cost
50,000,000	50,000,000	13.38%	24.93%	12,466,691
100,000,000	100,000,000	6.66%	16.49%	16,486,310
300,000,000	200,000,000	2.99%	10.02%	30,054,936

All Layers with 1 reinstatement at 100%

Exhibit 3 - Spread Loss Cover Quotation for ICA

Combined Coverage for Hurricane and Earthquake

Limit	Excess	Monetary Limit	Pure Rate on Line	Pure Monetary Cost
25,000,000	25,000,000	25,000,000	27.06%	6,765,741

Reinstatement Premium Protection - Hurricane

Limit	Excess	Monetary Limit	Pure Rate on Line	Pure Monetary Cost
50,000,000	50,000,000	8,387,989	6.85%	574,996

Reinstatement Premium Protection - Earthquake

Limit	Excess	Monetary Limit	Pure Rate on Line	Pure Monetary Cost
50,000,000	50,000,000	8,140,989	6.53%	531,347

Overall Coverage Requirements

Monetary Limit	Pure Rate on Line	Pure Monetary Cost
41,528,978	18.96%	7,872,083

Spread Loss Cover Quotation

Annual Risk Premium	9,500,000
Section A	25,000,000 xs 25,000,000 hurricane and earthquake combined, 1 Free Reinstatement
Section B	8,387,989 in respect of reinstatment premiums to hurricane layer 50m xs 50m
Section C	8,140,989 in respect of reinstatment premiums to earthquake layer 50m xs 50m
Maximum Annual Limit	63,289,828
Annual Reinsurer Margin	1,000,000
Overall Annual Cost	10,500,000
Basis of Accounting	Reinsurer margin only. Premiums and claims accounted to a Funds Witheld Experience Account.
Risk Transfer	In the event of a deficit to the FWEA at cancellation, cedant to pay back 90% of the deficit.

Exhibit 4 - Camelot Re

Layer Probabilities

Limit	Excess	
350,000,000	1,000,000,000	
Annual Attachment Probability		0.62%
Annual Expected Loss		0.54%
Annual Exhaustion Probability		0.47%

Exhibit 5 - Traditional Reinsurance Structure for Insurance Corporation of Avalon

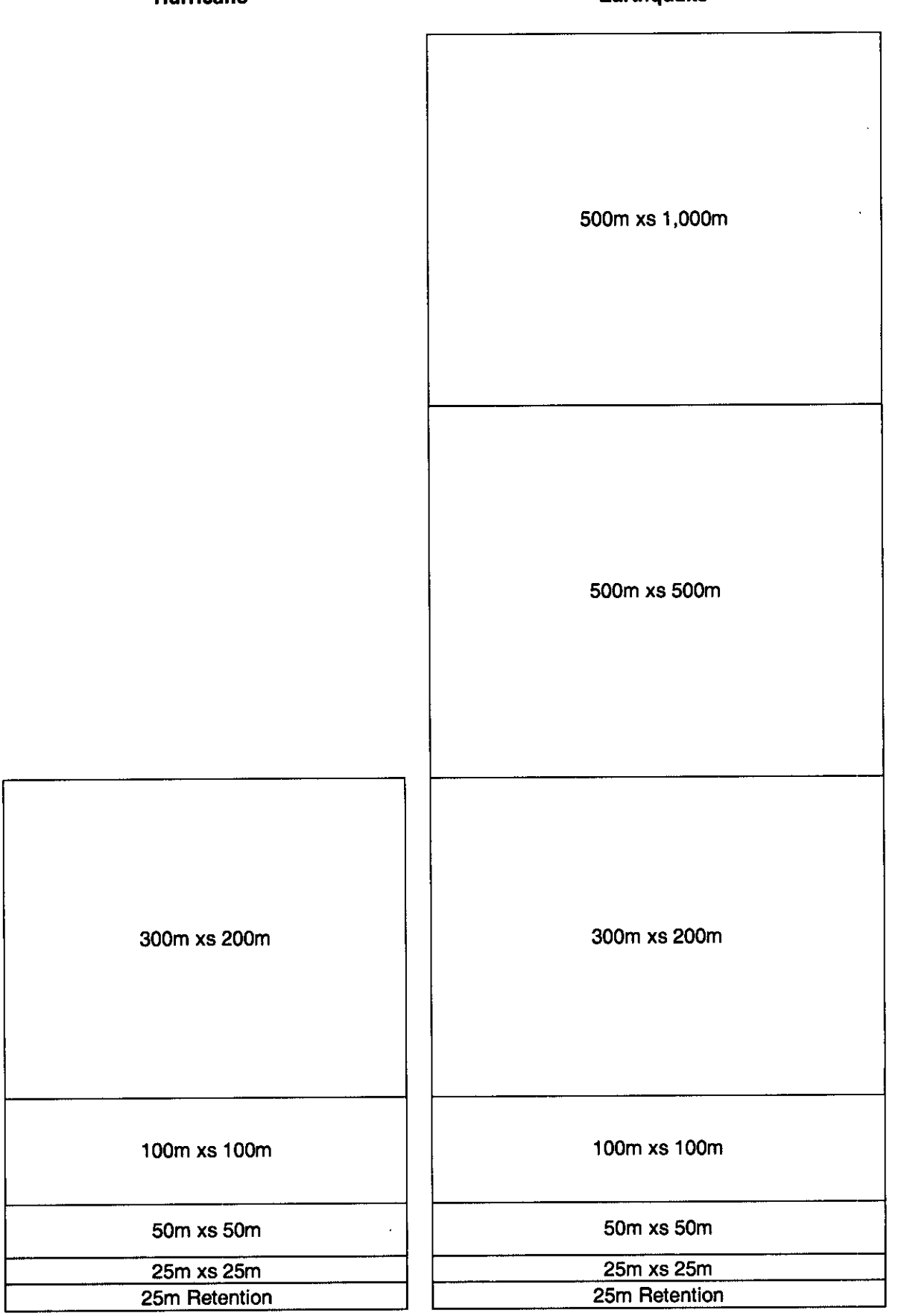


Exhibit 6 - Alternative Reinsurance Structure for Insurance Corporation of Avalon

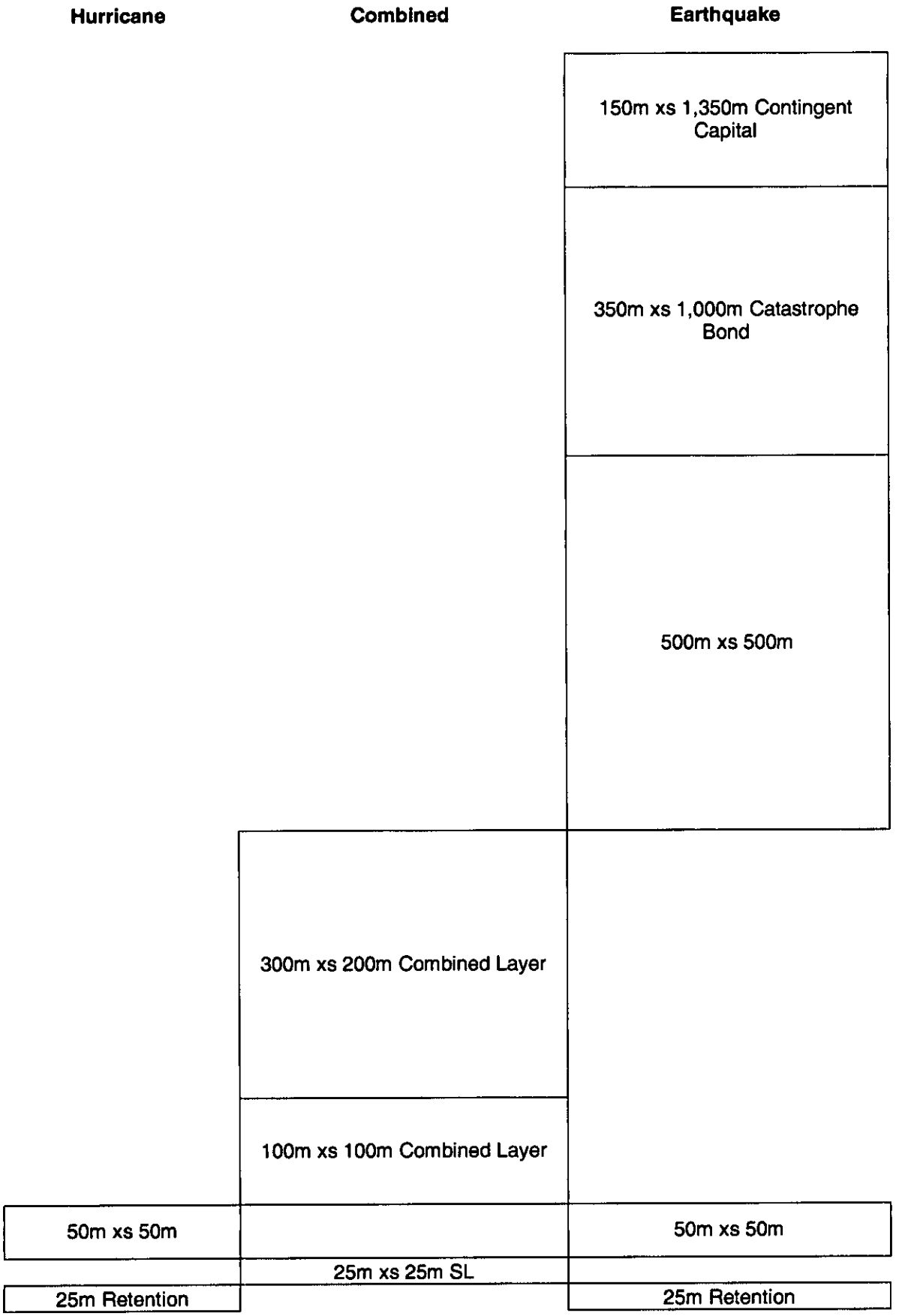


Exhibit 7 - Cost Effectiveness Comparison between Traditional and Alternative Reinsurance for ICA

Traditional	Premium	Average Benefit
Hurricane 25m xs 25m	6,644,436	-4,091,290
Earthquake 25m xs 25m	5,879,703	-3,790,131
Hurricane 50m xs 50m	8,387,989	-5,840,336
Earthquake 50m xs 50m	8,140,989	-5,691,482
Hurricane 100m xs 100m	10,332,026	-7,933,370
Earthquake 100m xs 100m	11,109,564	-8,426,219
Hurricane 300m xs 200m	17,397,628	-14,446,471
Earthquake 300m xs 200m	21,167,325	-17,227,863
Earthquake 500m xs 500m	22,277,240	-18,785,587
Earthquake 500m xs 1000m	16,248,531	-14,016,394
Overall		-100,249,143

Alternative	Premium	Average Benefit
Spread Loss 25m xs 25m	10,500,000	-3,022,172
Hurricane 50m xs 50m	8,387,989	-5,840,336
Earthquake 50m xs 50m	8,140,989	-5,691,482
Combined 100m xs 100m	16,486,310	-11,413,255
Combined 300m xs 200m	30,054,936	-22,911,766
Earthquake 500m xs 500m	22,277,240	-18,785,587
Cat Bond 350m xs 1000m	12,250,000	-10,542,888
Contingent Capital 150m xs 1350m	750,000	-946,000
Overall		-79,153,486

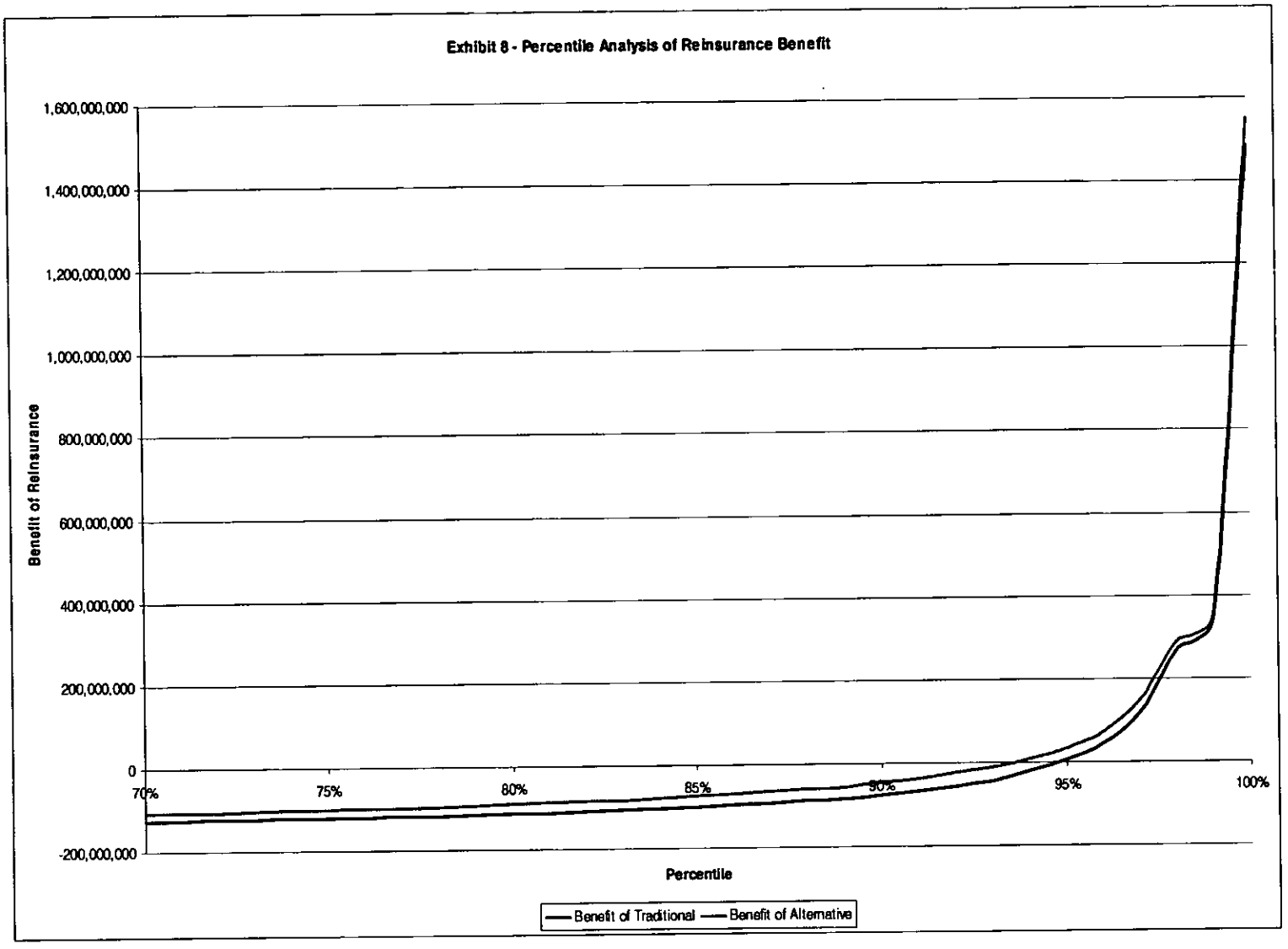


Exhibit 8 - Percentile Analysis of Reinsurance Benefit
1,600,000,000
1,400,000,000
1,200,000,000
1,000,000,000
800,000,000
600,000,000
400,000,000
200,000,000
0
-200,000,000
Benefit of Reinsurance
70%
75%
80%
85%
90%
95%
100%
Percentile
Benefit of Traditional
Benefit of Alternative