



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

(一)

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  
倫敦研究團隊

中華民國九十五年六月三十日

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## 研究報告中文摘要

英商信利保險經紀人股份有限公司於中華民國九十四年五月接受行政院金融監督管理委員會保險局委託進行「以財務再保險、限定再保險移轉災害風險之研究」。本研究計劃內容分為下列六大項目：

- 一、財務/限定再保險及其他新興風險移轉工具之沿革及性質
- 二、財務再保險/限定再保險的風險融通
- 三、財務再保險/限定再保險的監理
- 四、財務再保險/限定再保險的案例介紹
- 五、台灣運用財務再保險/限定再保險移轉巨災風險之可能性評估
- 六、結論與建議。

各項研究內容及成果摘述如下：

- 一、財務/限定再保險及其他新興風險移轉工具之沿革及性質：探討財務再保險/限定再保險在新興風險移轉市場的發展及所扮演的角色，說明財務再保險/限定再保險的型態及其他新興風險移轉工具與財務/限定再保險（ART/FFR）在一般公司、保險人與再保險人等不同對象上的應用，並對銀行金融衍生性商品之近況做簡要說明以及簡短評論保險業與銀行業至今整合有限之原因
- 二、財務再保險/限定再保險的風險融通：研究財務再保險及限定再保險的訂價、傳統保險商品及財務再保險商品價格比較、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、財務再保險/限定再保險的稅負與會計議題、10-10 經驗法則、財務再保險/限定再保險商品之現金流量表與財務再保險/限定再保險在巨災風險融通上扮演的角色
- 三、財務再保險、限定再保險的監理：除了分析財務再保險、限定再保險商品的保障與條款外，並對主要國家—英國、美國、澳洲、新加坡及日本等國之財務再保險、限定再保險之監理與法律規範做比較研究，期能獲得有用的結論以供委託單位參考；此外也探討財務再保險、限定再保險的風險基礎資本的要求，提出財務衡量法、百分位衡量法、超出衡量法及動差衡量法等風險衡量方法以供選擇，並探討 Scaled 配置法、Shapley 法、Ruhm-Mango-Kreps 法及共量法（Co-Measure, CM）等資本配置

方法之實例應用 四、財務再保險、限定再保險的案例介紹：在歐美方面本報告詳細介紹 HIH 保險股份有限公司、Brightpoint 公司、ROA 公司、Converium 公司、Renaissance 再保險公司、美國國際集團 (AIG)、Chiyoda 保險公司、USA 等案例；日本與亞太地區財務再保險、限定再保險案例則以 Fortress Re 為例，加以說明 五、台灣地區運用財務再保險／限定再保險以移轉巨災風險之可能性評估：本報告對現有住宅地震保險共保組織 (TREIP) 之危險承擔機制之結構及運作進行分析評論，提出建構 TREIP 模型之方法以及因應未來 TREIP 之危險承擔機制所可能面臨的情況的解決方案；對此，本公司 (英商信利保險經紀人股份有限公司) 也於中華民國九十五年五月十八日向台灣住宅地震保險共保組織 (TREIP) 進行簡報，並提出建議的可行方案供其研究參考 六、結論與建議：綜合應用前述研究之成果，在此提出財務再保險／限定再保險在台灣對天然災害風險移轉的應用、安排及整體策略的配套措施的建議，並分別從現行有關之法律規範及再保會計監理等方面，提出修訂建議以供主管機關參考。

## **Introduction**

We at Heath Lambert would like to thank the Taiwan Insurance Bureau for appointing our Company to write a report on Finite and Financial Reinsurance (FFR) for the Taiwanese Market. Our final report follows and we believe that this document fulfils both our original specification and the other areas where more detail was requested as the report progressed.

## **Report Summary**

### **FFR as a Class**

In the report we have traced the development of FFR products from their original conception through to the present day where we discuss the types of product currently available. We have then given examples of how these various products can be applied in specific situations with special attention to the analysis of the cost effectiveness of FFR.

### **Regulatory Issues Connected with FFR**

Our specification included reference to the accounting, regulation and taxation of FFR products – these topics are very much under scrutiny in the current “post-Spitzer” environment. Accounting and regulation have their own chapters, however the study of taxation proved to require only modest attention. This is not because taxation is unimportant, rather we found that FFR is treated no differently to other forms of reinsurance for tax purposes. The emphasis is on ensuring that FFR is accounted correctly within a sensible regulatory framework.

### **Major Pitfalls in FFR**

Included within our report are details of some of the cases where FFR has been found to have been used incorrectly. By necessity, and for legal reasons, these case studies are based on information in the public domain, however the exercise is no less useful with this restriction. The case studies give the background to the forces driving the development of the regulation of FFR in the current reinsurance market.

## The Possibilities for FFR in Taiwan

The final part of our report is a discussion of the possibilities for FFR in the Taiwanese Market, particularly in the area of earthquake reinsurance. Within this section we have identified areas where FFR could be applied within the TREIP programme.

## Key Points Arising from the Report

We have identified several key points from our study which will shall highlight under the four general sections summarised above.

### FFR as a Class

Despite the recent problems highlighted by the Spitzer investigation and the subsequent withdrawal of a number of players, FFR is still an important part of the reinsurance market place. Indeed, certain types of FFR such as catastrophe bonds and collateralised reinsurance are expected to increase in importance over the coming years as the schism between the banking and insurance markets continues to narrow. This convergence is driven by the insurance markets' appetite for new capital and the banking markets' appetite for uncorrelated investments.

### Regulatory Issues Connected with FFR

The current raft of regulation concerning FFR has in the main been aimed at eradicating "hidden" practices. "Side" letters and "handshake" agreements are now outlawed - the focus is on ensuring transparency in all dealings. Transparency eliminates many of the problems of the past.

The correct accounting of FFR transactions involves the use of deposit accounting for future assets and liabilities where appropriate. Such deposit transactions should be mirrored in the reinsurers balance sheet.

Once FFR transactions are transparent and correctly accounted, taxation follows the normal rules applying.

At present, in the wake of the Spitzer investigation, the regulation of FFR contracts is in a state of flux in many jurisdictions. In the UK the FSA is favouring a "principles"

approach on the basis that the more rules that are put in place, the more ways market practitioners will find around those rules. Other markets operate on a more “rules” based approach. In Europe the impending application of Solvency II will have a major influence on the potential benefits of certain types of FFR such as solvency quota shares. There is therefore no global standard for the regulation of FFR, and such a standard is unlikely to evolve in the foreseeable future.

### Major Pitfalls in FFR

Where the newer standards for the regulation of FFR are applied, many of the past abuses of FFR would be avoided.

### Possibilities for FFR in Taiwan

There are essentially 3 main areas for likely usage of Finite and Financial Reinsurance techniques in Taiwan. These are as follows:

1. The most likely buyers of Finite and Financial Reinsurance products are domestic Taiwanese insurance companies. Typically they will consider Finite Risk Policies at the bottom end of their Reinsurance Programmes - helping to reduce their net retentions per event, annually and over a period of years.

In addition, they are likely to increasingly consider the purchase of CAT Bonds at the very top end of their programmes – partly to increase available capacity (which is currently shrinking in world markets) but perhaps more importantly to guarantee the security of capacity at this level. Their interest in Catastrophe Bonds will be dependent on their own unique aggregation of catastrophe exposures and perils sought may extend from earthquake and typhoon to perhaps include more unusual exposures including bird flu.

2. Depending on the knowledge base of Risk Managers and Finance Directors of larger domestic Taiwan Corporations, it is possible that these entities might start looking to buy Finite Risk/Retention Financing Policies in order to help finance their retentions in their traditional insurance programmes. Policies bought at this level may apply as a reinsurance of captives or perhaps as an alternative to captive arrangements. It is unlikely that any Taiwanese corporations will consider Catastrophe Bond as they are unlikely to have

sufficient concentration of exposures to make the purchase of such bond a financially viable option for them. Other techniques ranging from contingent Capital to Credit Enhancement may start to appear in this market place however it will largely be dependent on their insurance broker's knowledge and ability to arrange and explain these quite complex transactions.

3. Government Level – we have outlined on our presentation certain strategies that the Government should consider as part of a co-ordinated and considered approach to the provision of funds to be made available in the event of a major catastrophe. The precise definition of “catastrophe” still needs to be established however given the magnitude of the exposure and the size of the limits required, we feel that a blend of a number of different Alternative Risk Transfer techniques will need to be utilised in order to design the most efficient long term strategy for dealing with this issue.



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# 第一章 財務/限定再保險及其他新興風險移轉工具之沿革及性質

## 第一節 財務再保險、限定再保險<sup>1</sup>在新興風險移轉市場的角色

### 第一項 新興風險移轉市場的歷史沿革

新興風險移轉市場(ART market : Alternative Risk Transfer market)的發展，已有四十年之歷史。這個市場的發展是漸進式的，雖然企業管理哲學、稅賦與監理扮演著重要的發展角色，但真正主導ART市場約四十年發展的是傳統保險市場的供需問題<sup>2</sup>。

大多數ART解決方法之發展，係因傳統保險市場對若干特殊問題缺乏承保能力或解決方法之結果。為解決若干無法解決之問題，今天在新興風險移轉(ART)市場已發展出各種不同之商品。市場繼續發展，毫無疑問地在未來新問題會浮現，而新的ART解決方案也會發展出來，以解決這些傳統保險市場不能解決之問題。

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<sup>1</sup> 財務再保 (Financial Reinsurance) 與限定(或譯限額，或譯有限，實因移轉風險是否顯著而得名)再保 (Finite Reinsurance) 兩種用語在目前再保市場中，應可交互使用。自美國財務會計準則委員會(FASB)公佈113公報後，“財務再保”一詞消匿，然壽險業仍沿用，亦有稱之BAT (Block Assumption Transactions)者。追根究底，這種有別於傳統再保方式的作法，實根源於英國Lloyd's的滾轉式(Rolling Over)再保費的會計處理方式。

<sup>2</sup> 傳統保險市場變成Hard Market時，對ART商品的需求較為殷切；傳統保險市場變成Soft Market時，對ART商品的需求較低。

ART 市場的歷史發展也是 ART 商品發展的歷史，受限於本報告的性質，提供今日市場及商品之背景以供討論，是最有效率的方式。或許卡崔娜(Katrina)颶風所造成的長期後續效應，將是導引新興風險移轉市場(ART)更加發展的動力，過去亦有這種例子。為了克服日趨頻繁與高成本的天然及人為巨災之經營環境，保險與再保險市場需要每一個可用的風險管理工具。

## 壹、專屬保險與再保險之發展

ART 市場中最早發展的是專屬保險與再保險，時約 1960 年代中期。專屬保險與再保險市場的發展至今已屆滿四十年，這個市場也可稱為最古老的新興風險移轉市場。

專屬保險可以定義為只承保股東風險的一種封閉型保險公司<sup>3</sup>，投資股東本身就是保險公司的所有者、被保險人，同時也是保險受益人。專屬保險公司之被保險人直接參與公司的經營並影響經營作業，包括：核保作業、理賠管理政策與投資作業等。

與其他 ART 解決方法一樣，專屬保險公司背後之最初動機，乃企圖將公司支付保險市場之保險費降至最低。例如：保險人/保險經紀人之傳統角色在提供可獲得之最低保險費及最小自負額之保險承保能量。當公司規模擴大時，對承保公司之風險暴露益形顯著，保險費因而增加。保費降至最低此項對外費用方法之一，就是客戶要自願自留更多風險(即增加其自負額)，如此，即可減少其對外保險費支出。由於這些自留額持續成長，專屬保險公司便採其他保險公司同樣之管理方式(如：核保程序、理賠管理、責任準備金提存實務等)管理自留業務，但同時又不致於將保險費外流至保險公司。

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<sup>3</sup> 該項定義是最原始的定義，此定義下的專屬保險類型是純專屬保險 (Pure Captive Insurance)。

因此，專屬保險公司之發展，主要受各大公司應用公司價值極大化之新興企業管理理念所驅動，而大公司使用此一途徑，使傳統保險市場之無效率更加顯著。就此觀念而言，專屬保險理念當時只是個雛形。

追求企業價值極大化以及運用相關風險管理工具的大型公司發現，傳統保險市場無法承受其想要轉嫁至保險市場的重大風險。它們也發現，保險費率反應的是整體產業的損失經驗，而不是反應個別公司的損失經驗，此種不合理的作法造成優質公司補貼劣質的競爭公司現象，因此，促使大型公司尋求更有效管理風險的變通方式。

專屬保險在風險管理上是項重大的投資，它提供大型企業所需要的保障範圍與風險的個別定價，專屬保險是相當吸引人的解決方案，在發展之初期，專屬保險大多是單一母公司之專屬保險(Single Parent Captive)，然後才陸續發展出集團專屬保險公司(Group Captive)。近年來，租用專屬保險公司(RACs: Rent-A-Captives)與專用專屬保險公司(PPCs: Protected Cell Captives)開始普及。

觀之整個 1970 年代，大型企業的經驗顯示，專屬保險符合風險管理上的基本要求，於是乎專屬保險理念更為盛行，而專屬保險公司之家數亦呈穩定的增加。直至 1980 年代，由於若干賦稅優惠被取消，專屬保險受到些許緊縮的影響，而保險市場同期也渡過一個疲軟階段。然而至 1990 年代，由於全方位風險管理<sup>4</sup> (ERM: Enterprise Risk Management) 概念的興起，且保險市場進入艱困階段，因此專屬保險又開始蓬勃發展。

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<sup>4</sup> 此種概念的風險管理有別於傳統零散式風險管理 (Segmented Risk Management) 的概念，它從總風險 (Total Risk) 下手，整合所有的風險與管理風險的所有工具，使管理風險的成本更具效率，是目前少數大型企業盛行的風險管理作法。

2000 年至 2001 年間專屬保險公司爆發經營失敗與醜聞事件，幾乎限制了專屬保險的發展，但所幸此事並未發生。今日專屬保險仍為 ART 市場最重要的部份。截至 2003 年為止，全世界已經有 5000 家專屬保險公司成立，這些專屬保險公司擁有美金 1,300 億之資產，佔有全球商業保險保險費 10% 的比例，相當於美金 250 億。

## 貳、財務再保險之興起

就歷史發展進程來看，新興風險移轉市場接下來的發展是批發保險市場（The Wholesale Insurance Market）與財務再保險的興起。財務再保險起源於 1960 年代，因當時傳統保險市場能量不足，無法承保石油探測與鑽油業風險之需求，迫使倫敦市場發展新興的解決方案。但直到 1980 年代，財務再保險才獲得突破成為功能完整的市場。突破的主要推手來自再保市場的強烈循環週期，理賠金額日益升高的美國社會文化，美國法院判決賠款金額及件數的增加所突顯的補償文化在美國日益高昇，以及整個保險市場核保利潤的下滑。

MGM Grand 大飯店<sup>5</sup>於 1980 年發生的大火是推動財務再保險發展的許多案例之一。在這些損失發生後，許多保險人與再保險人認為是提供被保險人追溯性保險<sup>6</sup>（Retroactive Insurance/Back-Dated Insurance）的有利時機。因為賠款支付具長尾模式，保險人與再保險人有自信，可使他們在應付賠款到期前，創造出獲利豐厚的投資收益之機會。不幸地，就市場所關注之層面而言，他們誤判了賠款期限，比他們的預期短得多，以致於他們必須吸收鉅額之損失。

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<sup>5</sup> 1980 年 11 月 21 日在 Las Vegas 的 MGM Grand Hotel (建於 1973 年的 24 層豪華大飯店) 發生火災，死者 85 名，傷者 700 多名，是美國飯店史上第二大事故。

<sup>6</sup> 所謂追溯性保險是於事故發生後，以事故發生基礎申請投保，保險公司承保時將責任開始時點追溯至事故發生前的一種責任保險，此種作法有違保險原理，引發爭議是必然。

此一痛苦的市場經驗，突顯出財務再保險的若干重要特性：有關賠款支付時程之時間價值，乃為所提供承保範圍之核心所在，被保險人也渴望購買具有賠款支付模式與賠款最終價值之保險，以保障其最終的財務風險。

這些保單並未將事故風險移轉至再保險人，而是將與賠款支付模式相關的時間風險移轉給再保險人，這便為本文所提「融資」(financial)之意義，它牽涉到時間上的風險(Timing Risks)，亦即損失發生或賠款支付期間較預期為快，以至於超過所交付之初期保險費及其後續的投資收益。

儘管有過 MGM Grand 大飯店火災的理賠經驗，保險人與再保險人看出此一新興風險管理工具所帶來的商機。商機即在風險的理財上，而非風險的移轉上。由於在此方面較缺乏會計制度規範，反倒成為激勵財務再保險市場發展的動力。尤其當時之會計制度容許保險人可報告其扣除再保險後之賠款準備金，分保人在如何說明財務再保險上，可憑主觀判斷說明，此舉自然導致對會計規範之積極解讀。

1980 年代保險人已廣泛使用財務再保險，管理追溯風險與預期風險 (retrospective and prospective exposures)。財務再保險儼然成為，保險人與再保險人風險管理工具的重要部份。

### 參、限定保險與再保險的浮現

過去十年間，經由 Gluckstern .S 與 Palm.M 兩位專家的研究，促成他們及蘇黎世保險公司建構了限定風險的觀念(the concept of finite risk)，蘇黎世保險公司並且在百慕達註冊設立專營限定再保業務的 Centre Re 子公司。Gluckstern 與 Palm 兩位專家係在美國一家保險經紀人公司安排再保險合約作業，擁有長達 20 年的經驗。

Gluckstern 與 Palm 兩位分析再保險合約的資料顯示，有超過 80% 之業務其財務結果是在合理的財務預期範圍內，而且再保險人通常是有利潤的，但其餘之業務，對再保險人之財務結果造成嚴重傷害。在這種不利的情況，使得部份再保險人破產，也使得分保人的財務前景受到威脅。再者，就全體而言，再保合約的結果是虧損的。儘管整體業務當中有 80% 以上的業務獲利，但仍然無法彌補其餘業務虧損所造成的財務缺口。這 20% 的再保合約績效不佳，其主要關鍵在於這些再保合約並未設定責任總限額，最終無法保障再保險人之財務實力。

從 Gluckstern 與 Palm 的分析中所得的結論，認為再保險人無法獲得足夠的補償，以承擔無上限的風險，實不足為奇。

Centre Re. 創辦人認為風險移轉的面向有兩個極端，一個是只承保可能發生嚴重災害的純核保風險，另一是逐漸盛行的財務再保險，完全不必承擔核保風險。他們事後發現有一個明顯的市場空隙，這項空隙可發展一種同時承保時間風險與限額核保風險的再保險來填補，根據他們的分析結果及當時風險移轉的市場狀況來看，這實在是極簡單且合乎邏輯的反應。

Centre Re. 於 1988 年開業後，經營十分成功，其他市場迅速跟進加入限定再保險市場，事實證明，市場上確實對限定再保險有強烈的需求。ART 市場發展下的另一個里程碑，就是財務再保險與限定再保險藉著傳統再保險市場的基礎與架構，獲取成功的結果。

#### 肆、資本市場與保險市場的融合

在這個時期，資本市場(銀行業務)與保險市場開始融合，而且在 ART 市場中有關鍵性的發展。兩者融合之理由很多，將另於衍生性金融商品章節中詳述。此處說明兩者融合之主要動力，來自整個金融市場對企業價值極大化的需求，與為了因應金融市場自由化。資本市場與保險市場持續融

合的動力，來自兩種市場採用類似之工具與技術，以及監理單位根據可適用於這兩個市場的風險基礎資本( RBC：Risk Based Capital )，發展出共同的監理架構。

適合新興風險移轉市場之各種資本市場商品甚多，可將其分為三個主要領域：證券化商品、或有資本商品、及保險衍生性金融商品。在所有商品交易案例中，均顯示一個共同的信念—即運用資本市場的工具，可以改善保險及再保險市場的風險管理。

此種融合在 ART 市場發展上，產生了重要的連結。迄今 ART 市場改造既有的保險/再保險技術，以創新 ART 商品。現階段 ART 的發展主要集中於資本市場工具的重整。

## 一、證券化商品

1970 年代晚期及 1980 年代初期，投資銀行一直發展證券化技術，證券化就是將公司資產負債表中的資產、負債或現金流量，轉為可由第三者投資的證券交易過程，證券化技術在使非流動性資產產生流動性方面，是相當成功的機制，證券化從住宅抵押貸款開始，至 80 年代中期前，已經被運用在很多不同的資產上。

90 年代初期，投資銀行與保險公司將保險風險證券化列入發展重點，Merrill Lynch 原訂於 1992 年代表 AIG 進行第一次保險證券化之發行，但此事因遇到安得魯 ( Andrew ) 颶風而延後。投資銀行察覺到，將證券化技術應用於日漸遭受巨災事件衝擊，致缺乏承保能量的保險及再保險市場，是另一種證券化獲利的來源。



1994 年美國 Northridge 地震為證券化的發展提供另一種動力，Northridge 地震後，保險公司退出加州住宅保險市場，州政府組成加州地震局(CEA: California Earthquake Authority)，提供消費者財產地震險保障。CEA 對再保市場之需求較傳統市場所能提供的大得多，CEA 似乎很有可能發行首次財產巨災債券。但由於 Berkshire Hathaway 稍後參與 CEA 之再保險計劃，打消了 CEA 實施證券化的需要。

這具有報紙頭條新聞的機會，目前雖然再次悄然流逝，但動能正在蘊釀，保險人、投資銀行及投資者，已經花費相當多的時間與精力在保險證券化之實務操作上，市場已出現幾個小型的實驗性交易。

市場於 1996 年完成了第一宗實質交易，當時美國 USAA 住宅再保公司(USAA's Residential Re)，發行面值 4.5 億美元之債券。此筆交易之規模，正好符合當時市場所需要之規模。若能成功地完成此種規模之交易，則會有許多投資人對這類業務的發展產生興趣。USAA 的這筆交易，使保險證券化在未來及邁入新的千禧年時，有了穩定業務量的開始。

證券化對保險市場最大的吸引力，在於有機會獲得資本市場的巨大能量。對資本市場而言，保險證券化可提供資本市場運用與其他種類風險資產不產生關聯的投資組合優勢，創造新種的商品資產。

正如前所述，再保險能量的供需是保險人利益的核心。90 年代初期與中期之天然災害巨災事件增加，使得再保承保能量大幅減少，並導致費率攀升。保險證券化對先前未開發之巨大能量提供出路。與資本市場超過 14 兆美元之資本相比，再保險市場大概有 250 億美元資本。

如上述發行數字顯示，當保險證券化穩定發展之際，市場並未如熱情支持者所預期的轟轟烈烈。我們無法確定其原因，但下面兩點值得注意。

第一、傳統市場比 90 年代晚期更為健全，在邁入新千禧年之際，市場相當疲軟，但當不可避免的巨災發生時，再保市場的承保能量將會急劇萎縮，在 911 事件後，再保市場相當艱困，再保承保能量的萎縮部份。被 911 之後出現的新再保人所填補。新舊再保險人維持住了傳統市場的優勢地位，誠然，新資金的流入與新再保人的加入，是為資本市場看好傳統市場的有力證明；第二、引進保險證券化之費用與傳統市場新興方法相比，仍然較高，現金取得條件、資源使用，與從交易初至執行所需之時間等成本均非小數目。儘管各界對保險證券化已經投入相當多智慧與精力，此等成本上的障礙並未顯著減少。

毫無疑問地保險證券化將會持續進行，許多支持證券化的正面因素依然存在，然而大型證券化市場的出現仍需假以時日。

## 二、或有資本商品

ART 市場裡的或有資本 (Contingent Capital) 商品，於 90 年代中期，也因再保市場供需困難而產生。或有資本商品在初期，僅應用於解決再保人遭受天然巨災後之財務困境，它似乎已成為精明的風險管理方法。再保市場很快把此種技術，運用於範圍較廣之非保險/再保險業界。

或有資本商品成為資本市場的特色之一已經有一段期間。或有資本商品是籌措資金的另類選項。它最簡單之形式是一家公司依其與銀行所簽訂合約的信用額度，此信用額度可支應其大部份業務的資金需求。一旦動用額度時，就成為公司的債務，商業銀行與投資銀行經常透過此信用狀與信用週轉機制提供此類產品。ART 市場利用此基本模式，邁入更複雜的操作工具。

以 ART 術語而言，或有資本商品允許一家公司，於發生預先約定之事故後，可增加資產淨值或負債。此種事故的啟動機制 (Trigger)，更增添了這些或有資本商品的複雜性。在保險/再保險市場中，天然巨災事故就是其啟動器。至於在非保險公司的領域中，選擇就更廣泛。若風險是可以衡量的，則可以作為形成事故啟動器之基礎。

於 90 年代中期與晚期，業界相當看好或有資本商品在 ART 市場的發展潛力，並且完成許多交易，對此，我們將於後面的章節中，作更仔細之探討，但整體來看或有資本商品並未如 90 年代當初的預期，發展成 ART 市場的特色之一。在 1995 到 2002 年期間，大約 60 億美元的交易安排成功，這些交易雖然不至於微不足道，但與自 1996 年以來保險證券化交易金額每年約 15 億美元到 20 億美元之交易額相比，算是偏低的。

保險業運用或有資本商品也許反應對資本市場的認知，那就是巨災事故增加，保險金額也因巨災事故發生而增加的情況下，對投資者言，保持觀望直到損失的發生是比較好的。因為在此時投資者能夠期望產生更好的投資報酬率。

### 三、保險衍生性商品

保險業運用資本市場機制的第三種方式就是衍生性商品。衍生性商品交易是一種雙邊契約，其價值衍生自一些基本資產 (Underlying Asset)、參考費率或指數 (Reference Rate or Index) 的價值。基本的參考 (Reference) 標的，明顯地，可包括企業損失之原因，衍生性商品經常用於這些損失的避險或謂“投保”。這種避險功能是，ART 市場中所採用的商品，融合 (Convergence) 現象的自然發展。

衍生性商品也可用於投機行為，這是與保險商品之間的基本差異。保險契約要求被保險人對保險標的必須要有保險利益，當保險利益受到損失時才可獲得賠償，而衍生性商品則非如此。衍生性商品之一項主要特性是，現金流量與事故啟動器均無需與被保險人損益掛勾。衍生性商品提供投資人賺取投機利潤之機會，因此監理官不允許衍生性商品被當作保險商品來處理。

衍生性商品可上市交易（Listed）也可上櫃交易(OTC)。某些上市交易的衍生性商品的歷史可回溯到幾百年前。但就其在金融市場內之廣泛運用而論，70年代的通貨膨脹與波動，導致衍生性商品更廣泛地被用在投機行為上。上市的衍生性商品於金融市場中，已成為最具流動性之風險管理工具。80年代上櫃交易的衍生性商品發展成功，由於具有彈性，它已主導金融工程之未來願景。

上市交易的衍生性商品是標準化的契約，因此，所有參與者均以相同的基本商品進行交易。標準化有助於提升衍生性商品在市場的流通性。流動性越大，叫價與出價的空間越小，如此一來，可以提供更具成本效率的風險管理解決方案。最具流動性的上市交易衍生性商品，主要奠基在主要金融指標之指數上，例如利率、外匯匯率、資產淨值及選擇性商品。

上市交易的保險衍生性商品契約，其條件與內容均相當審慎。已出現過之衍生性商品契約，主要是針對巨災的財產及意外 P&C( Property and Casualty ) 風險及非巨災之天氣風險。

美國芝加哥交易所（CBOT: The Chicago Board of Trade）對上市交易的巨災保險衍生性商品契約，曾經先後於 1992 年與 1995 年作過兩次嘗試。沒有一次上市成功並達成所需的經濟規模，於是 CBOT 於 2000 年退出上市並關閉市場。百慕達國會（Bermudian Parliament）於 1996 年授權成立百慕達商品交易所(Bermudian Commodities Exchange)，並作為上市

交易的巨災保險衍生性商品的交易平台。該平台致力於建立交易與清算機制，並有相當發展，但由於未獲得再保險公司如同 CBOT 一樣的支持，此項計畫最後被放棄。

上市交易巨災保險衍生性商品的嘗試之所以失敗，只有一個簡單的理由，亦就是參與不足。避險者與投機者均無法建立必要的信心，以創造足夠的市場活動。對避險者而言，參與不足是因為關注衍生性商品所存在的基差風險（Basis Risk），換言之，指數反映的是否為自我的損失經驗。就投機者而言，由於風險／報酬率缺乏充分的吸引力，而必須從事避險操作來協助創造資金必要的流通性，因而缺乏信心。由於初級市場不活絡，次級的上櫃市場及其他高度流動性市場，也無從發展，這些市場其實可強化初級市場的流動性。

根據溫度指數建立的上市交易天氣衍生性商品，倒是有較為成功的嘗試。另一個芝加哥商品交易平台，芝加哥商品交易所（Chicago Mercantile Exchange）於 1999 年依據美國 10 個城市之溫度指數，引進了現金結算期貨（Cash-Settled Futures）與期貨選擇權（Futures Options）。此項商品於開業前三年不如預期，直至 2002 年，由於上櫃市場的活絡，與一般對天氣風險管理的興趣增加，這項商品才活絡起來。然而，這個商品市場主要由能源業者與貿易業者所主導。保險與再保業者由於經驗過不利的後果，已經很少參與這個市場。

上櫃市場之主要特徵就是有彈性。所以無可避免的，上櫃市場成為保險衍生性創新商品最適合發展與交易的所在。巨災再保交換合約（Catastrophe Reinsurance Swaps），與純巨災交換合約（Pure Catastrophe Swaps）就是上櫃市場創新商品的最佳典範，關於這些商品的細節部份，請參閱後面的章節。

保險人/再保險人相當積極參與的另一上櫃市場是，信用衍生性商品市場。例如：遠期信用違約交換合約（Credit Forward Default Swaps），信用價差選擇權（Credit Spread Options）與總報酬交換合約（Total Return Swaps）。

#### 四、結論

ART 市場商品的發展史，就是 ART 的市場史。當然，在 ART 市場內，商品將持續發展，相對於我們已討論過之各項商品而言，新商品並不多見，唯有在商品創新者準備在市場上發表其新理念時才會出現。ART 產業保持著一定程度的不透明，是因為業者想要盡量長久持有其智慧財產權及商業機密上的利益。

90 年代 ART 商品之發展十分蓬勃，也可能是如此。90 年代出現了許多新的風險管理技術，市場上仍然在消化整理這創新時期的內容，是可理解的。

監理與會計之議題，使 ART 市場需要重估目前市場的現況及市場未來之走向。由於許多濫用 ART 商品之案例，使得市場更有理由暫時停頓，並且觀察反應與思考未來發展的方向。

#### 第二項 保險衍生性商品的性質

衍生性商品交易是一種雙邊契約，其價值衍生自一些基本資產、參考費率或指數的價值。它通常是財務風險的避險工具，在財務風險管理中扮演著重要角色。在本文中避險是指，無法經由標準的保險架構所承保的風險之管理工具。衍生性商品發揮類似像保險保障的避險功能，在資本市場與保險市場融合過程中，是相當自然的發展，為了擴張它們在保險市場的用途付出了相當多的努力。

衍生性商品市場的特點，也是年年成長且交易規模累積龐大快速發展的市場。至 2004 年底止，上市交易衍生性商品市場規模，在全球的利率、通貨、與權益衍生性商品市場中已達 1,144 兆美元。上櫃交易衍生性商品市場，從 1987 年底的 1 兆美元的規模，躍升至 2004 年底的 248 兆美元的規模。

1990 年代晚期，衍生性商品市場相當熱衷於利用很成功的技術，到新型而且有潛在獲利機會的保險業務中，而同樣地也因可保風險有重新包裝的潛力，以及市場承保能量新來源萎靡不振而引起保險市場的注意。

### 壹、建構衍生性商品的支柱

所有的衍生性商品，不是由兩項簡易的基本商品所構成，就是由其中之一所構成，這兩項簡易的基本商品，就是遠期合約與選擇權。遠期合約，就是一方有義務要買，另一方則依約定的執行價格，在未來的時點賣出特定的資產或等值現金的合約。選擇權合約，則在支付一定的權利金下，買方有權但沒有義務依約定的執行價格買賣特定的資產。這兩項基本合約是所有衍生性商品的基礎，就像是樂高(LEGO)積木一樣。

兩項基本合約可再進一步分成兩種不同的合約，一種是標準化的上市交易合約，另一種是量身訂作的上櫃交易合約。

期貨合約            標準化的上市交易合約，合約參與人可依約定的遠期價格買或賣基本資產。

選擇權合約           標準化的上市交易合約或量身訂作的上櫃交易合約，買方有權但沒義務依約定價格買或賣基本資產。

遠期合約            量身訂作的上櫃交易合約，合約參與人可依約定的遠期價格買或賣基本資產。

交換合約 量身訂作的上櫃交易合約，合約參與人在基本參考標的基礎下交換流量。

## 貳、衍生性商品與保險的基本差異

衍生性商品與保險存在著重大的差異。保險契約要有保險利益，分保人一旦有約定的事故發生時，要有遭受經濟損失的證明，衍生性商品則沒有這些條件上的限制。這使得衍生性商品時常被用來作為投機與避險的主要工具。

衍生性商品被用來作為投機與避險時，建立的是衍生性商品的實務操作，不是保險的實務操作。這種情形也表現在正式的監理上，紐約保險監理部門分別在 1998 年六月與 2000 年二月，針對巨災選擇權與天氣衍生性商品作出監理上的規定，那就是這兩種商品不能像保險一樣，在賠款支付或賠款事故上作出與購買者損益有任何關係的約定。

衍生性商品除作為投機工具外，也是非常重要的避險工具。衍生性商品可用在各種不同的風險管理情況，例如：個別風險損失面的處理，多樣化資產組合之風險暴露以減少整體資產組合風險，對從事波動性的新業務，衍生性商品可提供避險的機會。

衍生性商品不是補償契約，公司購入衍生性商品經常會面臨基差風險。某些財務風險，例如：匯率或利率風險，衍生性商品合約可搭配的相當精確，某些風險則不然，會有較大的基差風險。承受基差風險的買方其理論上的效益就是，存有基差風險的衍生性商品合約，會較無基差風險的衍生性商品合約，來得便宜。買方應適度評估價格與基差風險兩者間的得失。基差風險的承擔，一直是上市交易保險衍生性商品的重要議題。



## 一、上市交易的保險衍生性商品

上市交易的衍生性商品市場主要集中在美國及百慕達，而且是伴隨著錯誤的開始。

美國芝加哥交易所（CBOT）曾經根據巨災指數兩次推出上市交易的衍生性商品合約。1992年CBOT依據保險服務局（ISO: Insurance Services Office）編製的指數發行巨災期貨。保險服務局從一百家以上的保險公司收集了美國境內的巨災損失資料，以損失率為基礎運用這些資料建立了巨災指數。巨災期貨交易不理想，所以CBOT又發行巨災期貨選擇權，設法刺激買氣。但結果還是令人失望，CBOT於是在1994年取消兩種合約的發行。

CBOT仍不灰心，在1995年利用眾所認可的財產理賠服務公司（PCS: Property Claims Services）所提供的更透明的指數數據，重新嘗試發行現金結算之選擇權合約，PCS為CBOT建構與記錄九項個別的指數，包括全國性的、地區性的、與高風險區的參考指標。經由按日調查的結果，PCS指標遵循70家有巨災風險經驗的保險公司之記錄建立而成，對未受調查的保險公司，則調整該指數。據此，CBOT提供兩種不同的合約，一為損失在美元200億以下的小限額（Small Cap）選擇權，另一為損失在美元200億與500億間的大限額（Large Cap）選擇權。合約也提供二或四季的損失展延期間，類似傳統保險/再保險中的作法，損失超過某一數值時，依比例賠付指數價值。理論上來看，將小限額選擇權與大限額選擇權組合一起，就能構成一個綜合式的超額損失再保方案。這能當作傳統超額損失的替代方案，或當作一種投機策略。然而，市場仍不活絡，CBOT在2000年放棄上市這些商品。

這些上市交易之巨災衍生性商品合約的發行一再失敗，有兩個基本原因：一個就是基差風險的問題，另一個就是商品合約訂價的問題。將選擇權當作風險管理工具的購買者，一定要分析他們承擔的基差風險。購買者必需評估他們想要保障的資產組合與巨災指數間關聯性有多高。在購買時承擔基差風險之評估，總是很可能太大，意即購買者對保障的資產組合與巨災指數間有足夠的關聯，是不可能會有信心的。對尋求巨災風險管理的保險人言，可能的基差風險的大小是他們主要的商業風險。若購買巨災衍生性商品可替代傳統的再保方案，以致負擔因巨災指數未達啟動水準時而無法獲得補償的損失，其價值何在？假如基差風險數額沒有緩和，價格可能會降。整個 CBOT 的上市交易巨災衍生性商品存在期間，價格均一直維繫著高過傳統市場的水平。就此點來說，巨災衍生性商品並沒有遵循理論的分析，那就是基差風險增加可降低衍生性商品的價格。

缺乏交易量也讓投機者沮喪。缺乏流動性意即資金部位 (Position) 還是不變，對投機者而言正好相反，他們要的是交易量的流通，而不是資金部位被套牢。

百慕達國會於 1996 年立法通過成立百慕達商品交易所 (Bermudian Commodities Exchange)。這是巨災衍生性商品的上市與交易平台。該交易平台意圖致力於依據 The Guy Carpenter 巨災指數上市交易巨災選擇權。該指數由來自 39 家保險公司的資料建構而成，很像 CBOT 的 PCS 指數，但它是依郵遞區號為劃分基礎來計算損失與價值的比而成，而不是像 CBOT 的 PCS 指數係以各州 / 地區之總計現金損失為基礎。該選擇權也與 CBOT 上市的選擇權不同，它們是雙重的，不論指數高過執行價格 (Strike Price) 多少，均百分百賠付超過執行價格的部份。

但這些努力最終還是失敗，再保險業者對百慕達商品交易所 (BCE) 興趣缺缺。同樣地主要的問題還是來自指數的基差風險與訂價問題，外加它是雙重架構支付的選擇權。

在想成為有生機的市場這件事上面，顯然上市交易的衍生性商品是失敗的，這項失敗也與指數設計者在尋找另類與潛在購買者的巨災組合與最有關聯的合適替代指數時的無能為力密切相關。三種上市交易巨災衍生性商品合約的發行，都一直被購買者認定他們要承擔基差風險。而另類傳統再保險市場，提供的是無基差風險的保障。最成功的衍生性商品市場，是集中在一些大家普遍認同的特定市場，例如：匯率與利率市場。以避險術語而言，這些特定的市場與購買者的聯結相當清楚並且也沒有基差風險。對承擔基差風險的公司言，它要仔細計算基差風險可能產生的風險部位。對面臨巨災的保險公司言，承擔顯著的巨災基差風險在風險管理上會產生致命的缺失。

對大家普遍認同的特定市場之需要，意謂著上市交易巨災衍生性商品市場的榮景似乎遙遙無期。

## 二、上櫃交易的保險衍生性商品

與上市交易衍生性商品的標準化特徵相對照，上櫃交易衍生性商品市場的商標就是彈性化。這個彈性化提供，以交換合約之基礎的創新的保險衍生性商品持續發展的機會。這些創新的商品可被稱為風險交換合約 ( Risk Swaps ) 或巨災交換合約 ( Catastrophe Swaps )。

風險交換合約涉及到兩個或兩個以上不同的保險風險之交換。依照金融市場交換合約的實務操作，被交換的風險要很清楚的界定，且以名目價值 ( Notional Value ) 及損失機率加以量化。被交換的風險要能被完整與堅實地模型化，交易才可能成功。但對交換合約雙方的特定需求可以量身訂作，是風險交換合約的一大優點。量身訂作的彈性化擴大了以再保合約為基礎，而非以 ISDA 合約為基礎的交換合約之交換方式。( 原文註：金融市場中的交換合約量大量成長，為了降低執行成本與助長市場的成長，市場參與者積極發展標準的交換合約，ISDA 是此方面的佼佼者。)

風險交換合約，是風險資本管理與提供另類再保方式之非常有效率的工具。它也可降低進入交換合約交易時的高風險，交換合約的雙方也可藉由不相關風險的承擔，完成組合風險的多樣化，也可獲得他們個別所需風險資本降低的利益。

### 三、風險交換合約的範例

風險交換合約中，兩個最佳的案例分別是，2000 年的 Tokio Marine/State Farm 的交換合約，與 2001 年的 Swiss Re/Tokio Marine 的交換合約。前者是一對一的交換，後者是複數風險的交換。

在 Tokio Marine/State Farm 的交換合約裡，每家公司分別交換美元 2 億元的地震風險。該合約有期限或以五年為一期，Tokio 地震用來交換 New Madrid 地震。為了平衡兩個風險的損失機率，啟動參數 ( Parametric Trigger ) 被設計成兩個風險有同等的損失機率。為了在巨災損失發生時，確保交換合約的公平性，合約採用一組的梯型規則 ( Sliding Scales )，依地震損失規模決定賠付之標準。為了維持兩個風險暴露之公平性，這個梯型規則不是直線型的，而是嚴重偏斜型的，例如：東京發生七點七級以上規模的地震，Tokio Marine 可獲得 2 億美元的賠款，但地震規模如果是 7.2 至 7.6 級之間，則僅可獲得 2 億美元限額之某一比例的賠款。

2001 年的 Swiss Re/Tokio Marine 的交換合約，是複數風險巨災交換合約。雙方交換三組的巨災風險，每組合約值 1.5 億美元。這三組分別是：

- 日本地震交換加州地震
- 日本颱風交換佛羅里達颶風
- 日本颱風交換法國暴風

為了設定平衡的啟動點，每組交換合約均有其損失賠款的標準、參考組合與產業指數。交換合約是每年續約一次。

這些交換合約均含有一合理的架構，例如：為了達成一項平衡的交換合約，在 Tokio Marine/State Farm 的交換合約裡，就有啟動參數的約定。整體而言，風險交換合約相對上容易安排，主要得利於保險公司有強而有效的模型化工具。資本市場與保險市場的融合，引導了優質巨災模型的產生，與也引導資本管理上工具的廣泛應用，例如：動態財務分析(DFA)。像 Tokio Marine/State Farm 這麼複雜的市場，已快速有系統地運用這些工具，交換合約之交易就是運用這些更明智工具的明證。

公司透過交換合約交換風險，就像歷史悠久也極具特色的交換再保業務 ( Reciprocal Reinsurance )。但風險交換合約對利潤機會的尋求，比降低風險與資本管理更加重視。沒有現代模型化的技術提升風險分析能力的話，這些交換合約必定會經常變成非常不公平的風險交換。

與這些“純”風險交換合約稍為不同是， Swiss Re.與 Mitsui Marine 間的巨災再保交換合約。它是以約定的費用 ( Commitment Fee )，交換由巨災損失啟動的或有賠款 ( Contingent Payment )之一種綜合型財務交易合約。這種合約具備再保或證券化的大部份效益，但是卻可以避免這些風險管理工具之成本與架構的複雜性。Mitsui Marine 以倫敦銀行同業拆款利率 ( LIBOR ) 外加 375 基差點 ( Basis Points ) 的代價支付給 Swiss Re，換得 Swiss Re.在啟動參數的約定下，對東京地震承擔 3 千萬美元的或有風險。

### 第三項 專屬保險、專用專屬保險與租用專屬保險

#### 壹、專屬保險的背景

專屬保險領域是 ART 市場的核心部分，是迄今最常用的 ART 形式。專屬保險是公司管理自留風險常用且有效的一種方法，特別是針對可以合理預測的基層風險 ( Primary Layer Risk )。

如前“新興風險移轉市場的歷史沿革”中，對專屬保險的定義，所謂專屬保險是承保股東風險的一種封閉型保險公司，投資股東也就是保險公司的所有者，也是被保險人，也是保險受益人。專屬保險公司之被保險人直接參與公司的經營並影響經營作業，這包括核保作業、理賠管理政策與投資作業等。

如稍後之說明，一家專屬保險公司可能只有一位股東或數位股東。就專屬一語的語義來說，專屬保險公司的股東，通常是指專屬保險公司的發起人。股東/發起人提供專屬保險公司所需之前置資本與設立成本。當然，初期資本規模要看承保的業務而定，但通常是 25 萬美元。一般來說，股東/發起人在適當的時候都期望可以從專屬保險公司領到股利或利息。

專屬保險公司不是以保費交換承受風險移轉之方式直接承保股東/發起人之風險，就是間接地當作“前衛 (Fronting)”保險人之再保險人。後者因為是以專屬保險公司為再保險人，因此可以規避原保險市場保險人需適用的許多法規障礙，而參與批發再保險市場的法規就寬鬆得多。再保險市場也往往能提供比較好的條件與價格。

在營運方面，專屬保險公司之經營方式與任何其他保險或再保險公司並無二致，它也是透過分散風險及分保到再保險市場之方式，實際管理其保險業務。專屬保險公司會設立未滿期保費與賠款準備金，以最低的資本額及盈餘水準從事營運，並有一套積極的投資管理政策。

如前“新興風險移轉市場的歷史沿革”中所述，專屬保險公司最早是在六十年代中期開始發展，經過一段沉潛時期之後，於八十年代，其普遍性與數量均出現空前的成長。

## 貳、成功的專屬保險

專屬保險公司長期營運的成功要件在於其股東/發起人能維持一種長期有利的損失理賠經驗，這樣才能使股東/發起人內部從事積極的風險管理與損失控制，也才能使專屬保險公司內部從事健全的承保作業與專業管理，重要的是專屬保險公司需有足夠的保費收入與適當的財務資源，透過專屬保險機制，股東/發起人也需要有充足的承保能量足以承擔自我風險的主要部分。最後，營運成功的專屬保險公司需要股東/發起人積極投入管理。

## 參、租稅與註冊地

專屬保險公司的一項重要優點是節稅，絕大多數的專屬保險公司都在海外註冊，如百慕達、根西島與盧森堡等地，近年來，已有很多地區訂定對專屬保險公司友善的法律，顯示專屬保險公司的吸引力與普及性仍然強烈，專屬保險公司設立地點的選擇，不只要看該地的公司稅稅率，還要看其他因素，包括保險/再保險之管制、資本額與租稅要求、法規要求、準備金要求、保費稅、政治與法令的穩定性及基礎設施。

雖然大部分的專屬保險公司設立在對專屬保險公司訂定友善法律的海外地點，但通常也要接受某種法規監督，確保其能謹慎營運，而不損及流動性與清償能力，法規的管制方式各地不盡相同，但通常都會包括申報文件、資本額/盈餘水準及投資管制等方面的基本標準。

#### 肆、效益與成本

專屬保險公司之所以能長期受到歡迎，原因在於其營運所衍生的利益，包括：

- 為其可預測的基層風險，提供適當及更有效率的風險保障。
- 為其傳統保險市場不能接受或只有在“懲罰式”條件下才可接受之風險，提供合適之風險保障。
- 成本較低，免除了保費中所附加的經常費用支出、利潤及代理人與經紀人佣金。
- 在支付給專屬保險公司之保費、投資收益及已發生賠款方面，有可能的租稅利益（視專屬保險公司所在地與結構而定）。
- 不會再受保險市場景氣循環波動的影響、成本可測度提高及因此可降低盈餘波動性。
- 可直接進入批發再保險市場，且往往更具有價格競爭力。
- 可增加保留在專屬保險公司內的賠款準備金的投資收益，而不是交給第三者的保險人處理。



但也有成本及缺點，特別是：

- 設立專屬保險公司需要繳納先期開辦費用與資本。
- 設立專屬保險公司的資本會被“凍結”一陣期間，以致於降低其資本管理之彈性。
- 需遵守相關的法規環境。
- 不是都能獲得租稅利益，仍需視專屬保險公司所在的地點與結構而定。

但專屬保險公司受歡迎也並非沒有道理，通常其所獲效益會超過需付出的成本，專屬保險公司也已證明是管理自留風險的有效工具。

#### 伍、專屬保險的架構

專屬保險的架構可以有多種形式，一般來說，如何為公司選擇“最適合的架構”，是公司財務與風險管理的目標功能，廣義來說，專屬保險公司可有一位或數位股東/發起人，以及一位或數位與股東/發起人有關或無關之用戶，專屬保險公司的類型譜可以從只有一位股東/發起人與用戶的“純粹型”專屬保險公司，到有一位或數位股東/發起人與數位用戶無關的專用專屬保險公司。

#### 陸、“純粹型”專屬保險公司

“純粹型”專屬保險公司是持有執照的保險人或再保險人，只有一位股東/發起人，且其保險業務完全或主要來自該一位股東/發起人，實際上就是所謂的公司內部保險人。

此一類型為最普遍的專屬保險公司，約佔專屬保險公司家數的70%，股東/發起人可以用內部或外部資金提供專屬保險公司所需之資本，專屬保險公司則將這些資金投資於低風險證券，替股東/發起人獲取定期之收益；而隨著專屬保險公司承保業務的擴展所累積的資本，再用於支撐專屬保險公司，由於股東/發起人是專屬保險公司的唯一經營者，所以能直接控制專屬保險公司的經營活動；承保、理賠處理及投資控制等。

藉由保險單的簽發，專屬保險公司與股東/發起人之間的關係，與一般的保險關係並無不同，股東/發起人為了將風險移轉至專屬保險公司，也需支付保費給專屬保險公司，發生理賠時，股東/發起人也必須寄發正式通知給專屬保險公司並收取賠款（依據專屬保險公司簽發給股東/發起人之保險單）。

“純粹型”專屬保險公司也可以設立多家分公司，分設於不同的地點或地區，以反映其股東/發起人個別子公司之需要，若使用前衛保險人時，則股東/發起人會指示其在當地的子公司，找前衛保險人當地分公司投保，該前衛保險人再將所接受之所有風險，透過分公司分保給專屬保險公司。

“純粹型”專屬保險公司還有一種有趣的轉型，就是發展成高級專屬保險公司（Senior Captive），在此一類型的結構中，其股東/發起人獨資設立的子公司型專屬保險公司不只一個，並指定其中承保比較大額的外部或非相關業務，而成為“高級”專屬保險公司，為更優惠的租稅待遇創造條件。

“純粹型”專屬保險公司再轉型下去，就是姊妹型專屬保險公司（Sister Captive）。它也是只有一位股東/發起人，但可以承接的保險業務卻及於這家股東/發起人之企業集團內的其他公司，換句話說：是同一“經濟家族”內的相關實體，因此風險可以分散到廣大的經濟集團，但業務仍在單一集團的保護傘內。

## 柒、集團專屬保險公司與相互保險公司

集團專屬保險公司是持有執照的保險人或再保險人，由多家公司所共同擁有，其保險業務來自所有該股東/發起人公司，此種結構與相互保險公司之結構很類似，與相互保險公司一樣，集團專屬保險公司通常也是由工商協會代其會員設立，美國的能源與相互保險有限公司（Energy Insurance and Mutual Limited）就是一個很好的例子，它是一家集團專屬保險公司，它代表許多家美國的能源與瓦斯公用事業公司。

集團專屬保險公司可以提供分散單一經濟集團組合風險的機會，但分散的範圍也只限於單一產業之風險，例如能源公用事業，集團專屬保險公司內損失保障依個別股東/發起人所繳入的保費比例而定，此種方式可以減少費用與現金流量風險，與“純粹型”專屬保險公司的結構比較，無可避免地，參加的公司必須放棄對集團專屬保險公司的大部分（雖非全部）控制權，但一般說來，股東/發起人可以獲得較低成本及更優惠的租稅待遇之利益。

## 捌、租用專屬保險公司

租用專屬保險公司則是捨棄專屬股東/發起人，它與專用專屬保險公司構成專屬保險的“出租專屬保險”市場。

租用專屬保險公司通常由一方或多方擁有，而由獨立的代理人管理，並透過獨特的結構機制承保很多非相關團體之保險，租用專屬保險公司讓公司可以不需要擁有專屬保險公司或負擔初期的籌設成本，即享受專屬保險公司風險管理的利益。

租用專屬保險公司通常是由一家再保險公司籌設與營運，其典型的交易是由一家企業向一家前衛保險人買保單，再由該前衛保險人將所承保的全部風險向租用專屬保險公司投保再保險，在租用專屬保險公司內，會建立個別客戶帳戶以處理保費與理賠，承保的各客戶之帳戶風險是以契約及股東合約分開，但資產卻可能混在一起，所以至少在理論上，若有一位客戶發生重大理賠事故，則可能導致租用專屬保險公司其他客戶的損失或保障範圍減少，但租用專屬保險公司經理人總會小心評估及平衡租用專屬保險公司所承保之風險，所以到目前一直運作順利，沒有出現過此類的問題，在專屬保險市場中，租用專屬保險公司可提供比較快速及方便的風險自留機制。

## 玖、專用專屬保險公司 (PCCs)

租用專屬保險公司內資產可能混在一起，不管從理論或其他方面來說，很清楚的是項缺點，專用專屬保險公司則是直接為解決此一問題應運而生，每一個“分管帳戶”(Cell)都是為了完全保護個別客戶資產而構成的“環節”，租用專屬保險公司的個別帳戶是由契約及股東合約分開，以避免“交叉污染”，但專用專屬保險公司的“分管帳戶”卻依據法律強制分離，所以其分開之結構更為穩固，依據特別立法之規定，需將個別“分管帳戶”之資產與負債彼此完全分開，不可能混在一起。某一“分管帳戶”之債權人只可以就該“分管帳戶”之資產求償，法律明文禁止債權人之求償及於其他“分管帳戶”之資產。

典型的專用專屬保險公司結構有兩個基本部分：核心部分與分管帳戶。與租用專屬保險公司一樣，專用專屬保險公司的核心部分通常也是由獨立的第三者，例如再保險人或銀行，所擁有及管理，專用專屬保險公司的客戶與核心部分簽約使用一個或多個“分管帳戶”，參與成本則是包括分管帳戶之“開戶”費用及支付核心部分提供之權益持分；分管帳戶用戶因此只支付其實際使用部分之權益的費用，分管帳戶之持有人通常會將分管帳

戶內的風險擔保化，而核心部分則依實際需要。

動用該擔保專用專屬保險公司的額外安全性是其受歡迎的重要原因之一，其他因素還包括機動彈性及相對容易進入，特別是法律禁止設立完全的專屬保險機制，例如為短期合資事業提供保險、為個別保險公司之子公司提供巨災保險及個別的風險管理計畫時，專用專屬保險公司特別有其功能，專用專屬保險公司也會隨著特殊用途調整，如為了處理衍生性商品與結構型債券的發行。

## 第二節 財務再保險/限定再保險的型態

就限定與財務再保險（ FFR: Finite and Financial Reinsurance ）的本質而言，有許多量身訂做的客製化商品，同時也有許多其他正在持續發展中的商品或方案。因此若試圖將 FFR 加以分類，可能會因為過於簡化而產生誤導之現象。即便如此，FFR 也有一些共同而明顯的特質：

- 它係一種數年期的專案
- 它有累積的責任限額
- 它係一種利潤分享的專案功能
- 它將在經驗帳戶中表達出來結果

FFR 基本上可明確劃分為兩種，一為管理已經發生損失的合約，稱為追溯式的 FFR，另一為管理尚未發生損失的合約，稱為預期式的 FFR。追溯式的 FFR 與預期式的 FFR 還可各自細分為兩個類別，追溯式的 FFR 可細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 FFR 則可細分為限額比率合約（ FQSSs: Finite Quota Shares ）與分散損失合約（ SLTs: Spread Loss Treaty ）。

### 第一項 賠款責任移轉合約（ LPTs ）

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來賠款責任，轉讓給再保險人的合約，所轉讓之業務可能是分保公司之全部業務或部分業務。LPTs 的賠款限額，通常等於所轉讓的賠款準備金，再保險人承受未來賠款責任，其取得的對價約等於已提存的賠款準備金外加反映時間風險的承保風險保費以及任何認知到的提存不足的準備金之淨現值。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，例如保險業務組合的分析成本。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，承擔賠款責任的結案可能比預期的還快，當然，在簽訂交易時，再保險人的期望是最終賠款模式應該如同分保公司的估計時程或者更慢一些，若是比較慢的賠款模式，則再保險人所獲得之投資收益就可能比預期多，能為再保險人之預期結果創造淨利，該淨利之利益通常是與分保公司分享，並且會在契約中約定。

分保公司也能獲得許多利益，免除不確定性就是重大的效益，但 LPTs 的真正價值在於改善交易當年度資產負債表中的重要數據表現，第一：是降低綜合成本率，因為未來可能的投資收益可回饋到當期的承保收益；第二：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險保費，所以賠款準備金隱含的折現值，可強化分保公司的保單持有人盈餘，進而強化公司的清償能力。

LPTs 也可能是原保險交易，對非保險公司來說，在結束某一產品線或賣掉一個部門時，循 LPTs 模式轉讓自我保險的未決賠款，並且得以因為快速結案而增加的收入才是真正的利益所在。

## 第二項 LPTs 範例

下列是安固保險公司（Solid Insurance Company）簡化後的財務報表：

### 【LPTs 範例.xls – LPTs 購買前】

於本範例中，假設簽單保費 = 滿期保費，從財報數據中所顯示之重要比率如下：

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。

在購買 LPTs 後，安固保險公司之財務報表如下：

**【LPTs 財務 – 在 LPTs 購買後，摘自 LPT 範例.xls】**

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。

### 第三項 回溯累積合約 ( ADCs )

與 LPTs 一樣，回溯累積合約 ( ADCs ) 也是追溯式的 FFR，但在所提供的保障方面，它們卻是一個獨特的商品群，在 ADCs 結構中，沒有賠款準備的移轉。ADCs 之所以應運而生，是因為被再保險人擔心最終發生的賠款會大於已提存的賠款準備金，所以 ADCs 之風險主要在於核保風險 - 準備金不足 - 其次才是業務組合內與 ADCs 本身的時間風險。

雖然不是主要的風險考量，但時間風險在 ADCs 的價格計算中，的確扮演一個重要的角色，再保險人要計算最終發生的賠款超過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重就越大，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。

ADCs 看起來與傳統的超額賠款合約十分類似，也是設有責任限度以及當已決賠款超過特定的起賠點或超額時，即需依據 ADCs 支付賠款，此一標準係依照未決賠款準備的水準而定，應付保費則依再保險人對於承保風險與時間風險之認知而定，凡屬限定風險契約者，都會在契約中規定如何分享最後的交易利潤。

ADCs 的優點在於能處理保險公司對老債務比未決賠款準備更關心的問題，很清楚的，ADCs 在提高既有的賠款準備水準上是項吸引人的方案，同時也衝擊到年度總承保損益。

#### 第四項 限額比率合約 ( FQSs)

在傳統的比例式再保合約中，再保險人同意支付因某種保險業務引起之賠款及其理賠費用中的某一固定或變動的比例，以交換同一比例之保險費，一般來說，分保公司向再保險人收取分保佣金，以反映所分保業務之獲取與承保成本及利潤。在這種傳統的比例式安排方式中，再保險人暴露的風險只限於相關保單所訂之責任限額。

反之，FQSs 則明訂再保險人之責任總額上限，所以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，兩者之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，則分保公司可承受大部份的結果，若損率不佳時，則分保公司之佣金支付下降，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的期間，但總是每年續約一次。

FQSs 的主要用途是為了符合相關的法律規定而釋出盈餘。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，對於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並收取分保佣金。在分保人的財務報表中，分保佣金被認為是當期收入，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。

### 第五項 FQSs 範例

下列範例說明 FQSs 如何幫助原保險人提高法定的清償能力、增加承保能量及降低承保損益的波動性。

司馬特保險公司 (Smart Insurance) 需要 1000 萬英鎊的支援，才不至於在當年度(2002 年)的財報中被認為是虧損，該公司因此與舒普特再保公司 (Support Re) 簽訂一項 FQSs 合約，為了滿足司馬特保險公司追求費用率穩定及無虧損目標的要求，FQSs 合約簽訂三年，預期損失率為 70%，因此以 2 億英鎊的毛保費計算，預期賠款金額為 1 億 4000 萬英鎊，在第一個年度 (2002 年)，費用預計會高達 7000 萬英鎊，因此費用率為 35%，在往後年度，費用預計會降為 5000 萬英鎊，2002 年度，司馬特保險公司出現 1000 萬英鎊的虧損，為消除該筆虧損，司馬特保險公司透過 FQSs 合約，將其保險業務之 25% 投保舒普特再保公司的再保險，這合約要求需轉讓毛保費計 5000 萬英鎊及價值 3500 萬英鎊之相關賠案，舒普特再保公司則分年支付司馬特保險公司的分保佣金，2002 年為 2500 萬英鎊，而 2003 年與 2004 年則分別為 1000 萬英鎊。

FQSs 之效應是讓司馬特保險公司可以宣佈 2002 年度損益平衡，但必須接受 2003 年與 2004 年損益結果較差的結果，換句話說，舒普特再保公司已預付司馬特保險公司 1000 萬英鎊，將在 2003 年與 2004 年收回 500 萬英鎊，為允許與預期結果有差異，FQSs 會有一個經驗帳戶，紀錄司馬特保險公司與舒普特再保公司之間的現金流量及依實際損益結果，雙方分享盈餘或虧損。

## 第六項 分散損失合約(SLTs)

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，合約中也會有條款關係到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% )。

所有 FFR 都有一項特點，即再保險人的責任不只訂有年度限額，也訂有契約期間的限額，更設有以年度和/或全期為基礎的起賠點。

保費可分躉繳或年繳，並在扣除再保險人之邊際利潤後轉到經驗帳戶，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，要求分保人有義務，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。

SLTs 的另一項特徵是訂有契約條款，在合約期滿時，再保險人之契約義務將做一次總結算，這一點明顯有別於傳統的再保合約。

SLTs 的特徵是保費按照整個合約期累積，而發生的賠款則分散到各年度，再保險人猶如短中期的放款人，但不同的是還要承保風險 ( 不論風險之大小 )。

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，就專屬保險公司來說，SLTs 能降低專屬保險公司盈餘的波動性，因此有助於降低母公司的資金成本。

## 第三節 ART/FFR 在一般公司、保險人與再保險人的應用

### 第一項 ART/FFR 在一般公司、保險人與再保險人的應用

實施風險管理計畫的公司均可應用 ART，如前“新興風險移轉市場的歷史沿革”中所述，在 ART 市場成長中一項重要的發展是以全方位整合性的觀點分析風險與資本管理，增加了公司風險管理的複雜性。這個方式在非保險公司與保險公司間並無不同，同樣適用相同的原則與技術，不論是否為保險公司，都可以考慮採用 ART 技術管理風險。

#### 壹、公司處理風險的方法

公司在追求利益機會的同時，也承擔各種風險，公司的風險管理不外乎四種方法：規避風險、降低風險、移轉風險或自留風險，前兩種方法－規避風險與降低風險－可統稱為風險控制，而後兩種－移轉風險與自留風險－則統稱為風險理財，風險理財是風險控制的後續動作，目的是針對風險控制後，仍可能發生的損失，尋求彌補損失的資金並確保無虞。

#### 貳、傳統的公司風險管理

傳統上，針對各種風險的管理都是以個別部門的方式處理，例如：財務風險是財務部門的責任，而財產風險則是保險採購單位或風險管理經理的責任。對大多數公司來說，此一方法已行之有年且成效良好，但是隨著風險管理與資本管理理論基礎的發展，有必要重新評估公司為求更有效的資本管理，所應採取的風險管理方法。

### 參、風險管理與企業價值的最大化

目前主要的資本與風險管理理論重新強調企業存續的基本原則。基本上，投資人追求的是其投資於風險之下的資本的最大報酬，被投資公司對其投資人負有一項基本義務，即“企業價值”的最大化，以提供投資人可能的最高投資報酬。為達到公司價值的最大化，管理階層必須從整體全方位的觀點分析，看待公司所面對的機會與風險。因此傳統各部門個別式的風險管理方式必須改變，為求公司資本的有效管理，風險管理上應採取集中掌控，協調與發展的方式。

這是追求公司“企業價值”最大化的動態風險與資本管理模式，而ART之應用必需關注。

#### 第二項 ART 的定義及其與傳統保險的關係

ART 市場是創新的保險與資本市場方案結合一起的風險管理市場，用以支援風險管理之核心技術：風險控制與風險理財，ART 不只在風險理財方面有效，在風險控制方面也非常有用，不論是風險控制、風險理財或兩者，風險管理都能支援公司的資本管理，並追求公司“企業價值”最大化的目標。

在風險管理上，ART 不應被視為可完全替代傳統的保險或風險管理衍生性商品，而應將其視為執行有效的風險管理計畫時另一項配置的工具。應用ART時，我們考慮透過上述四種風險管理方法，將其中的規避風險與降低風險歸類為風險控制，並將移轉風險與自留風險歸類為為風險理財。

### 第三項 ART 在風險控制上的應用

#### 壹、風險規避

依定義 ART 在公司規避風險決策中並無其角色存在，此一決策過程是公司風險管理過程的“第一個基礎”，可依公司判斷在所涉風險過大時，決定不投資或撤回投資，此過程中沒有理由需要 ART 解決方案，因為公司一開始就已經“不想要”承擔風險，在風險規避下並沒有剩餘的風險可言，像 ART 這種可能是最佳的風險管理方案也無用武之地。

#### 貳、風險降低

想要降低風險需採取損害防阻、損害控管與風險分散等手段。損害防阻旨在減少特定種類損失發生的可能性，損害防阻具有清楚的實質作為，例如在倉庫或工廠中安裝煙霧偵測器，政府方面也會為了公共利益，實際介入訂定相關規定，以預防發生意外事故，例如要求車內所有乘客都必須繫上安全帶。當然，任何損害防阻技術也都有其限制，以政府立法進行損害防阻來說，政府與公眾所作的各項措施，到目前為止已到臨界點，若再強化損害防阻措施，所增加的成本可能超過所獲得之利益。與風險規避一樣，ART 在此無用武之地。

損害控管技術性質上也需實質的作為，雖然煙霧偵測器是減少損失的審慎手段，但安裝消防灑水系統也不失為審慎的手段。因此若煙霧警報器失靈，也還可以用消防灑水系統作為損害控管的手段。相對於實質面，損害控管的手段也有財務面，例如：在資本市場，股票投資人可以下停損單，可以在股票跌到某一門檻以下時自動啟動賣單。於本例中，我們可看到 ART 解決方案在損害控管技術中應用的可能性，“價外”停損就是 ART 的一個範例，例如將客戶的保險人之損失率上限加以限制到 105%，同損害防阻措施一樣，損害控管措施也並非完全安全無慮。雖有消防灑水系統，但若火勢過於猛烈，可能也於事無補，此外，資本市場停損單在市場失去流動性時也會失靈。ART 在設有限制的前提下，其停損機制也能提供風險的控制，



但一旦用罄，停損雖已達到降低風險之作用，即無法提供損害控管之功能。

風險分散是降低風險的第三隻腳，西方有一句諺語“不要將所有的蛋都放在同一個籃子裡”，這句諺語被諾貝爾獎得主 Markowitz 的組合理論所證實，組合理論提供如何建構有效率組合的新技術，為古老的諺語增加了現代的投資智慧。若一家能源公司具有多個獨立的危險單位（油井設備、煉油廠、油罐車車隊及零售店），則該公司可合理精確的預估意外事故在特定期間發生的可能性，由於獨立的危險單位相當分散，所以公司可達成內部的風險分散。ART 的各項工具，例如交換合約，即可直接應用在風險分散上。

#### 第四項 ART 在風險理財上的應用

##### 壹、風險移轉

風險移轉是將風險從一方移轉至更能或更願意承擔損失之另一方，這通常透過保險或避險即可完成。風險移轉多多少少也能透過 ART 達成，傳統保險之風險移轉的品質很清楚，也證實是風險管理的主要工具。保險提供資金與盈餘的穩定性，也是很多經濟活動的關鍵所在，但是保險可能非常昂貴，供應也受限，且某些風險無法承保，這對公司的風險與資本管理來說，就存在著很大的風險。當傳統保險市場無法提供有效的商品時，ART 在動態風險管理過程中就扮演了重要的角色，以完全的風險移轉來說，證券化與交換合約都能提供有效率的機制與商品，例如分散損失合約，雖然風險移轉有限制，但這些機制將風險移轉與風險自留混合一起，仍能提供有效率的風險管理機制。

如前所述，避險具有保險的很多特徵，而就現代經濟而言，其在移轉財務風險中也扮演著關鍵的角色，例如匯率與利率風險，在商品交易中避險也扮演比較傳統的角色。雖然避險對沖是動態風險管理計畫中非常重要的一部，但在本文中 ART 並不應用於避險，反而是避險技術在 ART 市場有可觀的發展，例如交換合約與天氣型衍生性商品。

## 貳、風險自留

風險自留有些是自願性的，有些則是非自願性，當公司沒有認知到其所暴露之風險時，該公司只好非自願地自留風險，顯然，為了處理該風險所能做的並不多。另一方面，當公司明智地決定保留某一風險的全部或部分時，即為主動之風險自留，亦即公司已經決定，自留風險才是最有成本效率的風險管理解決方案。願意自留風險可能的原因是移轉風險成本太高或沒有人願意承保風險，或其損失可充分預測，並且在最壞的狀況下其財力仍足以因應。這時候可以應用 ART 機制支援這些風險自留所需的基金，這是 ART 技術應用的主要領域，例如運用專屬保險、賠款責任移轉合約、分散損失合約等，對風險自留所需的基金均很有助益。

ART 技術在不同公司之間不會有差別待遇，應用於非保險公司與保險公司都有相同的效益。最明顯的例子就是專屬保險市場，全世界目前約有 5,000 家專屬保險公司，其中絕大部分是非保險公司所擁有，如專屬保險章節中所述，ART 技術提供高效率之風險與資本管理之解決方案。

ART 技術應用的關鍵在於公司對特定風險所採行的風險管理模式，在總體公司風險與資本管理的計畫中，幾乎可以確定的是 ART 是個能處理風險問題的一個選項。

在追求企業價值最大化而實施的動態風險管理計畫中，所有的公司都應考慮將 ART 技術做為風險與資本管理計畫的一部分。然而並不是所有的風險管理都能使用 ART，例如風險規避，但是公司還是應該在適當的範圍內，盡量考慮可能的 ART 方案，才能掌握公司可用的風險管理技術的全部知識，進而做出最明智的決定。

## 第四節 銀行金融衍生性商品

過去五年，關於保險業與銀行業整合之市場評論曾經引起許多討論。事實上，直到今天為止保險業與銀行業之整合仍然有限，茲簡短評論一下他們至今整合有限之原因。

廣義而言，銀行各種產品，如信用狀(LOC)、衍生性金融商品等等是清晰且明確之金融工具(instruments)。當信用狀被提示付款時，毫無爭議地必須立即履行付款之義務，沒有例外之情事。然而，就保險單而言，如承保的事故發生，則依承保條件、特約條款及除外事項來賠償客戶之損失。因此，當保險事故發生時，對於發生之事故是否在保險單之承保範圍內，與實際應賠金額，雙方往往有所爭議。此為保險單項下賠款義務之「灰色地帶」顯示，保險商品與作為標準化典型之金融工具之銀行商品間存有一顯著之差異。許多銀行商品之此種標準化，後來促成許多附屬商品之發展及交易。這的確因保險業缺此種標準化之所致，例如保險業尚未發展期貨市場，使保險商品未來價格能避險。請留意本報告描述之每一項商品與技術均為「工具」，用以減輕採購客戶之風險。某種風險需要某種技術，而其他風險則需利用其他形式之風險移轉/風險減輕。

然而，這些普通原則也有例外。在現行市場環境下，找一家保險公司或一個政府機構或一家大型公司，混合使用傳統保險、限定風險與巨災債券，也並非不尋常。決定用那一種技術處理某特殊風險，毫無疑問地，是一項主觀決定且視個案而不同，視客戶之特殊環境而定。這種決定多多少少也會受到購買保險當時之傳統保險市場狀況之影響。於市場價格上揚週期(即保險費率高)中，客戶傾向於替代產品以減輕其風險，反之，當保險費率疲軟時，而客戶覺得能以低廉成本來移轉風險，則傳統保險市場往往為優先之選擇。

以下為以美國之巨災債券替代傳統保險市場解決方案之範例：一家在美國有多個據點之主要汽車製造商，於過去多年期間，出租其汽車給買車客戶日日增多，而非僅以單一價格出售汽車。當汽車出租增加了該製造商之營業額，在租期終了時(一般是 36 月租期)其汽車殘值之潛在未來變動性，導致增加該汽車製造商資產負債表上之變動性。該製造商之汽車重要大眾產品之失敗，可能導致整個出租汽車之殘值劇降。

該汽車製造商希望在其資產負債表上，提高正在累積增加之負債，並在傳統市場上尋找殘值保險。保險公司樂意報價，但由於若干因素促使該客戶就此風險購買巨災債券，以利購買保險單。首先，超過傳統保險市場殘值保險具有之承保能量，客戶尚面臨多少風險數量甚為重要。因此，當客戶可能已買到夠之保險，以承保殘值較小之波動時，卻無足夠之承保能量能完全承保一次巨災來臨時之未來價值。此外，客戶關切保險公司支付此一大型理賠賠款之能力與意願，因而選擇巨災債券之途徑。此項選擇不但提供所需之承保能量，而且給予最後付款之保證因為投資人已把現金存入巨災債券。毫無疑問地，客戶選擇購買巨災債券是一條更貴之途徑(情形往往如此)，可是它畢竟提供了所需之最終安全。

我們檢視巨災方案時，將傳統保險、限定風險與巨災債券合併採用並非不尋常。通常，就架構而言，在各最低層保障使用限定風險保險，巨災方案之頂層使用典型之巨災債券，以提供最終再保安全並減少因重要需求在保險價格上之向上壓力。

同樣地，在用信用危險方面，有一系列保險及銀行產品可用於減輕客戶之風險。典型地，投保人可投保信用險，以承保其客戶不履行義務之危險(通常售貨後，30 到 90 天之期間內，其客戶應支付貨款)。承包商可投保確實保證保險，保證依約對其客戶行義務。信用提高保險單被試買過並用於改進客戶之負債比率或改進被保險人因其客戶不履約而破產對貸款銀行之理賠方案。所有這些均為「特別交易」保險單，不過客

戶可選擇購買一項名為「信用不履約交換」之銀行商品，以便於在對方不履約時，可以保障自己。信用不履約交換這項商品不需連接任何交易，購買人僅於交易對方無清償能力時足以保障自己，其保障額度達到交換 (SWAP) 之金額。

總結傳統保險，限定風險與 ART 商品，以及銀行商品應視為客戶可使用之一系列工具，針對某些種類之風險來，保障自己。每一個客戶之風險情況與每一個其他客戶之風險狀況均會不同，因此取決於客戶與其顧問從許多現有之解決方案中，選擇最恰當之風險管理/風險移轉技術。然而，關鍵在於每一客戶要明確地確認本身存在些什麼風險，這些風險發生時對該客戶在財務上會有什麼衝擊，然後與其可信賴而精幹之顧問對移轉或減輕其希望避免之風險作最佳之決定。

## Chapter One: The Nature of Financial Reinsurance/Finite Reinsurance

### The Role of FFR in the ART Market

### A History of Alternative Risk Transfer

#### Introduction

As a timeline, the history of the Alternative Risk Transfer (ART) marketplace covers the last forty years. It has been characterised by incremental development and although areas such as business management philosophy, taxation and regulation have played important development roles it has been the supply and demand of the insurance market cycle that has driven the ART marketplace over that forty year period.

It is essential to note that the vast majority of ART solutions developed as a result of a lack of traditional insurance market capacity or solutions to particular issues. The different products which exist today in the ART market place, have all developed over time as a reaction to otherwise insoluble problems. The market place continues to develop and undoubtedly in the years to come new problems will arise and new ART solutions will be developed to resolve these problems where the traditional insurance market is unable to respond.

This history follows the product developments of the ART market chronologically. Given the nature of this report this is the most effective way to provide the background for a discussion of the products and marketplace of today. Perhaps a long-term consequence of Hurricane Katrina will be to trigger further development of the ART market. This has certainly been the case in the past. The insurance and reinsurance markets need every risk management tool available to them in order to navigate through a world of man-made and natural catastrophes more frequent and more costly.

#### Captive insurance and reinsurance

The first ART area to develop was Captive insurance and reinsurance, which emerged in the mid 60's. As this sector celebrates – approximately - its 40<sup>th</sup> birthday it can correctly be described as the oldest part of the Alternative Risk Transfer marketplace.

A Captive insurance company is defined as a closely held insurance company whose insurance business is primarily supplied and controlled by its owners, and in which the original insureds are the principal beneficiaries. A captive insurance company's insureds have direct involvement and influence over the company's major operations, including underwriting, claims management policy and investment.[\*Towers Perrin definition]

In common with other ART solutions, the initial motivation behind Captive insurance companies was to attempt to minimise external premiums paid by corporations to the insurance market. By way of example, the traditional role of Insurers/Insurance brokers was to provide and acquire insurance

capacity at the lowest premium with the smallest deductible. As corporations grew larger, the exposure to underwriters became more significant and accordingly premiums were increased. One method of minimising this external expense is for clients to voluntarily retain more of their risk (i.e. increase their deductibles) which leads to reduced external premium expense. As these retentions grew and grew, Captive insurance companies performed the management of these retentions in the same fashion as any other insurance company (i.e. underwriting procedures, claims management, reserving practices etc) but without losing the premium to an external insurer.

Accordingly, the development of captives was principally driven by large corporations applying the emerging business management concept of maximising corporate value[\*] and traditional insurance market inefficiencies which were highlighted by corporations using this approach. In this sense, the captive concept was very much a child of its time.

Corporations using the concept of **enterprise value maximisation?** and the associated risk management techniques found that traditional insurance markets would not or could not assume significant risks that corporations were now able to identify and which they sought to transfer to the insurance marketplace. Corporations also found that they were trapped within a pricing structure which reflected the loss history of their industry sector rather than individual corporate loss experience, in effect, an indirect subsidy from corporates with a good risk portfolio to competitors with poor risk portfolios. This situation pushed corporations to look for an alternative way of more efficiently managing these risks.

The captive concept, allied with strong investment in risk management, provided the corporations with the coverages required and the individual pricing they were seeking. The captive concept presented a highly attractive solution. The concept that has developed over time, was initially composed of single parent captives. Then, group captives were developed where several companies within an industrial sector got together to form a collective captive. More recently 'alternative' rent-a-captives' and 'protected cell captives' have become popular.

Throughout the 1970's, as the experience of large corporations proved the fundamental quality of the captive concept, there was a rise in the popularity of the concept and a steady increase in the number of captives being formed [check numbers]. The 1980's saw some contraction in the sector as certain tax benefits were removed and the insurance market cycle went through a "soft" phase. The sector surged during the 1990's with the rise of **enterprise risk management** within the corporate world and a "hardening" insurance market.

Despite the concern that the corporate failures and scandals of 2000 and 2001 would inhibit further development of the sector, this has not occurred. Today, the captive sector is by far the most substantial part of the ART marketplace. By 2003, the number of captives established worldwide was 5,000. These companies held assets of US\$130 billion and accounted for nearly 10% commercial insurance premiums globally, US\$25 billion.

## Financial Reinsurance

Chronologically, the next development in the ART marketplace moves to the wholesale insurance market and the advent of financial reinsurance. It has been suggested that financial reinsurance has its origins in the 60's, when a dearth of traditional capacity to cover oil exploration and drilling led the London market to develop alternative solutions [Shimpi – Integrating Corp. Risk Mang.] However, it was not until the 1980's that financial reinsurance broke through as a fully functioning marketplace. The primary drivers of this breakthrough were the intensifying cycles within the reinsurance market, the rise and rise of the compensation culture in the US highlighted by the increased value and number of court awards and a market-wide downturn in the underwriting results of insurers.

One of the losses which heralded the development of financial reinsurance has been identified as the MGM Grand Hotel fire in 1980 [Phifer – Reinsurance Fundamentals]. Following the loss, a number of insurers and reinsurers saw what they thought was an attractive opportunity to provide retroactive covers. They were confident that the loss pay-out would have a very long-tail pattern which would create the opportunity for considerable investment income to be earned before the claims became due for settlement. Unfortunately for the markets concerned, they misjudged the claims settlement pattern, which was much shorter than they had expected, and they had to absorb substantial losses.

While this was a bruising experience for the markets involved it served to highlight several key characteristics of financial reinsurance; the time-value of money related to the pace of the loss payments was the core of the coverage provided and the buyers desire to cap their ultimate financial exposure by purchasing coverage which reflected both the pattern of payment and the payment's ultimate value.

These covers did not transfer the event risk to reinsurers but instead the timing risk associated with the payout pattern of the loss. This is the meaning of 'financial' in this context, it refers to the Timing Risk, being losses or loss payments which occur faster than expected and thus accrue at a rate which exceeds the initial premium paid and the consequent investment income earned.

Despite their experience in the MGM Grand Hotel loss, both insurers and reinsurers saw considerable opportunity with this new risk management tool. Risk financing rather than risk transfer. The relative lack of accounting guidance in this area was an important stimulus to the development of the financial reinsurance market. In particular, the accounting regime at that time allowed insurers to report their loss reserves net of reinsurance, ceding insurers were able to make subjective judgements on how to account for financial reinsurance, and this led naturally to aggressive interpretation of the available guidance.

Through the 1980's, financial reinsurance became widely used by insurers to manage both retrospective and prospective exposures. Financial reinsurance became a key part of the insurer / reinsurer risk management tool kit.



## The emergence of Finite insurance and reinsurance

In the middle of the decade, Steven Gluckstern and Michael Palm undertook research which would lead them and Zurich Insurance [check] to establish Centre Re and the concept of finite risk [Tymon – Alternative Risk Strategies]. Gluckstern and Palm were given access to 20 years reinsurance treaty experience handled by a major US broker.

The analysis of this portfolio showed that in over 80% of cases the financial outcome was within the boundaries of reasonable financial expectation, and was generally profitable for the reinsurer. However, for the remaining cases the outcome was financially disastrous. So disastrous in fact, that in some cases the reinsurer was bankrupted and the financial future of the reinsured was threatened. Further, the overall result of the portfolio was negative. Despite the profitable business being 80%, of the overall portfolio it could not outweigh the unprofitable business. The key to the poor performing 20% of treaties was that the treaties contained no overall limit of liability, save ultimately, the financial strength of the reinsurer.

Gluckstern and Palm's conclusion from the analysis was, unsurprisingly, that reinsurers were not sufficiently compensated to assume unlimited or infinite risk.

The risk transfer spectrum that the Centre Re founders considered had pure underwriting risk with disastrous results at one extreme, and at the other extreme, increasingly popular financial reinsurance arrangements which assumed no underwriting risk at all. They saw, what is with hindsight, an obvious gap in the marketplace a need to develop a reinsurance concept which combined timing risk with a limited amount of underwriting risk. It was a stunningly simple and logical response to the results of their analysis and the risk transfer marketplace at that time.

The success enjoyed by Centre Re, after it opened for business in 1988, and other markets which quickly followed it into the finite arena was conclusive evidence that there was considerable demand for finite reinsurance. Indeed, the next milestone in the development of the ART marketplace was as a direct result of the success which both financial and finite reinsurance enjoyed at the expense of traditional reinsurance structures.

## Convergence of the capital markets and the insurance sector

This period also saw the beginning of the convergence of the capital markets (banking) and insurance sectors, and a key development within the ART market. The reasons for convergence are numerous and discussed in more detail in the section on derivatives etc, but for the requirement of this section the drivers of convergence can be defined as the continuing demand across the financial marketplace to maximise corporate value and financial market deregulation. The momentum of convergence continues as the sectors adopt the similar tools and techniques and as regulators develop a common regulatory framework based on risk based capital which can be applied to both sectors.

The variety of capital markets products adapted for the ART market is considerable and can be reasonably broken down into three main areas; securitization, contingent capital structures and insurance derivatives. In all cases the belief was that the application of capital markets tools would improve the management of risk within the insurance / reinsurance sector.

This convergence marks a critical juncture in the development of the ART market. Until now the marketplace had adapted existing insurance/reinsurance techniques to create ART products. Now ART development centred on the reworking of capital markets techniques.

### Securitisation

Through the late 70's and early 80's, the investment banks had been developing the techniques of securitization, such as the process of removing assets, liabilities or cashflows from the balance sheet of the originating corporation and conveying them to third parties through tradable securities. It has been a hugely successful mechanism to create liquidity in previously illiquid assets. Securitization began with residential mortgages but by the mid 80's was being applied to an enormous variety of assets.

By the early 90's the securitization of insurance risk was firmly on the agenda of the investment banks and the major insurers. Indeed, the first insurance linked securitization would have been issued in 1992 by Merrill Lynch on behalf of AIG but it was postponed following Hurricane Andrew. The investment banks perceived that another profitable securitisation income stream could be developed from the application of securitization techniques to an insurance/ reinsurance market suffering from an increasing incidence of natural catastrophes and a lack of reinsurance market capacity for catastrophe cover.

The Northridge earthquake in 1994 was another spur to securitization activity. Following Northridge, insurance companies withdrew from the California homeowners market and the state authorities formed the California Earthquake Authority to provide consumers with property cover for earthquake. The CEA demand for capacity from the reinsurance market was much larger than the traditional market was thought to be able to provide and it seemed very likely that the CEA would attempt take the ground-breaking step of issuing the first property catastrophe bond. However, Berkshire Hathaway's late offer to participate in the CEA's reinsurance programme extinguished the CEA's need to securitize.

For the moment, the opportunity for the headline catching transaction had again slipped away, but the momentum was building and insurers, investment bankers and investors, spent considerable time and effort on the practical mechanics of insurance linked securitization, and several small, experimental, transactions were brought to the market.

The market's first really substantive transaction was in 1996, with USAA's Residential Re issuing bonds with a face value of USD 450 million. This was a deal of the scale that the market needed. If a deal of this size could be successfully completed, then there was sufficient investor appetite for the market to develop. The USAA deal marked the beginning of a steady flow of insurance securitizations during the rest of decade and into the new millennium.

The great attraction of securitization for the insurance market lay in the opportunity to access the enormous capacity of the capital markets. For the capital markets, insurance linked securitization provided the opportunity to establish a new asset class which had the great advantage of not being correlated to any other risk asset class in their portfolio.

As noted above the supply of and demand for reinsurance capacity lay at the heart of insurers interest. The increased incidence of natural catastrophes of the early and mid 90's had substantially reduced the capacity available with a consequent hardening of rates. Securitization offered access to previously untapped capacity of enormous size. A reinsurance sector of approximately USD 25 billion in capital compared to USD 14 trillion or more of the capital markets.

As the issuance figures above indicate, while there has been a steady stream of insurance linked securitisations this has not, as its enthusiastic proponents believed it would, become a flood. We cannot be certain of the reasons for this but two points are worthy of note.

First, the traditional market has proven to be more robust than appeared likely in the late 90's. The very soft market at the turn of the millennium suggested that there would be a sharp capacity contraction when the inevitable major catastrophe occurred, but following the 9/11 tragedy there was a substantial hardening of the reinsurance market and any contraction in capacity was neutralised by the arrival of a clutch of new post 9/11 reinsurers. The old and new reinsurers have maintained the predominant position of the traditional marketplace. Indeed, the flow of new capital into existing reinsurers and new entities is strong evidence that the capital markets have a very positive view of the traditional marketplace. Second, the costs of bringing an insurance linked securitisation to the market are still high relative to the traditional alternative. The cost, in cash terms, resource use and time from transaction initiation to execution are still substantial. Despite the considerable intellectual and practical energy focussed on insurance linked securitisation, these cost hurdles have not been sufficiently reduced.

No doubt issuance will continue as there are strong positives in favour of the securitisation approach, but a big securitisation marketplace does appear to be some time away.

### Contingent Capital

Contingent capital structures in an ART context also sprang from the reinsurance markets supply and demand difficulties of the mid 90's. Initially contingent capital was seen as an effective way to remove the possibility of financial distress from reinsurers following a major natural catastrophe - it seemed like smart risk management. The technique was quickly adapted by the reinsurance market for application to the wider non-insurance / reinsurance corporate community.

Contingent capital had been a feature of the capital markets for a considerable time. A contingent capital instrument is an option to raise capital. In its simplest form, it is a bank line of credit that a firm can draw on for most of its business needs, as specified in an agreement with the firm's bank. Once

drawn the funds are treated as corporate debt. Commercial and investment banks routinely offer this product through letters of credit and revolving credit facilities. The ART market adapted this basic model into a more complex instrument.

In ART terms, a contingent capital instrument allows a corporation to raise equity or debt upon the occurrence of a pre-agreed event. It is this event trigger which adds a further level of complexity to these instruments. Within the insurance/reinsurance market, it was identified to use natural catastrophes as their event trigger. For non-insurance corporates, of course, the choice is far broader. If the risk can be measured, then it can form the basis of an event trigger.

During the mid and late 90's, there was considerable enthusiasm for the potential of contingent capital as an ART mechanism, and a number of transactions were completed (which we shall look at in more detail in section X) but overall, contingent capital has not developed as a feature of the ART market as was envisaged in the 90's. Between 1995 and 2002, some USD 6 billion in deals were arranged, not insignificant, but a low value compared to insurance linked securitization, running at approximately USD 1.5 billion to USD 2 billion per year since 1996.

For contingent capital instruments related to the insurance industry, this may reflect capital market perception that given an increased incidence of natural catastrophes and increased insured values arising from those catastrophes, it is better for investors to keep their 'powder dry' until the loss has occurred. At this time, they can expect to generate a much better return on capital provided.

### Insurance derivatives

The third area of capital markets activity which has been adapted for the insurance sector is derivatives. A derivatives transaction is a bilateral contract whose value is derived from the value of some underlying asset, reference rate or index. The underlying reference can, obviously, include a cause of corporate loss and derivatives are heavily used to hedge or 'insure against' such losses. Given this hedging function, it was a natural development of convergence that these instruments would be adapted for use in ART.

Derivatives are also used to speculate and this marks a fundamental difference with insurance. Where insurance requires the buyer to have an insurable interest and loss to be sustained from that insurable interest in order for the buyer to receive a payment, derivatives do not. It is a key characteristic of derivatives that neither cash-flow nor the trigger event need bear any relationship to the buyer's gain or loss. Derivatives provide investors with access to the opportunity to earn a speculative profit. For this reason regulators will not allow derivatives to be treated as insurance.

Derivatives are categorised as either exchange-traded (Listed) or Over the Counter (OTC). Some exchange-traded derivative products have a history going back over several hundred years, but in terms of broad application within the financial markets, it was the inflation and volatility of the 70's that led to derivatives wider speculative use. Listed derivatives have become some of the most liquid risk management instruments in the financial system. OTC derivatives were developed during the 80's

and have come to dominate the landscape of financial engineering because of their flexibility.

Exchange traded derivatives are characterised by standard contract terms, so that all participants trade the same underlying instrument. This standardisation helps to create the critical mass of liquidity (market activity) in the market. In turn, the greater the liquidity, the tighter the spread between bid and offer prices and this provides more cost effective risk management solutions. The most liquid listed contracts are based on indexes of key financial indicators such as interest rates, exchange rates, equities and select commodities.

In terms of insurance related listed contracts, the offered contracts and activity in them have been very modest. The instruments that have appeared have concentrated on catastrophic Property and Casualty and non-catastrophic weather risk.

The Chicago Board of Trade (CBOT) has had two attempts at launching exchange-traded catastrophe insurance derivative contracts, initially in 1992 and then in 1995. Neither listing was successful in achieving the necessary critical mass in market activity and the CBOT withdrew the listing and closed the market in 2000. The Bermudian Parliament authorised the development of the Bermudian Commodities Exchange in 1996 as a forum for listing and trading catastrophe insurance derivatives. Considerable development was undertaken to establish the exchange and clearing structure but it was unable to gain the support of reinsurers and, like the CBOT initiative, the project was abandoned.

These experiments in establishing exchange-traded catastrophe insurance derivatives failed for one simple reason, lack of participation. Neither hedgers nor speculators could establish the necessary level of confidence to create sufficient market activity. For hedgers, the lack of participation resulted from concern over the amount of basis risk in the instruments, i.e. would the index reflect their own loss experience. For speculators the risk / reward ratio of the instruments was not sufficiently attractive and they needed hedging activity to help create the necessary liquidity. Without sufficient activity in the initial market there was no development of a secondary OTC market, a characteristic of other highly liquid markets, which would provide substantially enhanced liquidity to the initial market.

There has been a somewhat more successful attempt to establish exchange-traded weather derivatives, based on temperature. Another Chicago trading forum, the Chicago Mercantile Exchange introduced cash-settled futures and futures options on temperature indexes for 10 US cities in 1999. Relatively inactive in its first three years, activity increased in 2002 as market activity increased in the OTC market and general interest in weather risk management grew. However, this marketplace is dominated by energy companies and traders. There is now very little participation by insurers/reinsurers, perhaps due to some the adverse results they have experienced'.

The key characteristic of the the OTC market is flexibility. So, inevitably, this is where the most innovative insurance derivatives are developed and traded. Catastrophe reinsurance swaps and Pure Catastrophe swaps are good examples of innovation in the OTC market and we look at these instruments in more detail in section X.

Another area of the OTC derivative market where insurers and reinsurers have become active, is credit derivatives. Credit forward default swaps, credit spread options and total return swaps.

### In conclusion

In terms of the history of product development in ART, this brings us to the present day. Of course, within the ART community, development of products continues but as with the products we have discussed in this history, new products are rarely seen until the developers are ready to launch their new idea in the marketplace. There is a certain opaqueness to the ART world, an understandable desire to maintain intellectual ownership for as long as possible and commercial confidentiality as well.

It may also be the case that the 90's saw a high watermark in the development of ART products. Given the number of new risk management techniques that emerged in the 90's, it is perhaps understandable that the market is still 'digesting' this remarkably creative period.

Issues surrounding regulation and accounting have led the ART market to take stock of where the market is now and where it goes next. A number of high profile cases of abuse of ART products have given the market further reason to pause for reflection and to consider how it should move on.

Recent developments in the ART marketplace are dealt with in a separate section. **Which one???**

## **Insurance Derivatives**

### **Introduction**

A derivatives transaction is a bilateral contract whose value is derived from the value of some underlying asset, reference rate or index. Derivatives are commonly used to hedge financial risks and play an important role in financial risk management. Hedging in this context is the management of risks which are not insurable through a standard insurance framework. Given that when derivatives are used as a hedge they perform an 'insurance like' function it was a very natural development of the capital market / insurance market convergence that there would be considerable effort to broaden their use into the insurance marketplace.

The derivatives marketplace is also characterised by extremes of aggregate notional size and year on year growth. At the end of 2004 the exchange traded derivatives marketplace had USD 1,144 trillion outstanding in global interest rate, currency and equity products. The over-the-counter market has grown from around USD1 trillion outstanding at the end of 1987 to USD 248 trillion outstanding at the end of 2004.

In the late 1990s the derivatives market was keen to apply its highly successful technology to a new and potentially lucrative business area of insurance risk and the insurance market was equally attracted by the potential to repackage insurance risk and by the sheer size of this new source of capacity.

## **The Building Blocks of Derivatives**

All derivatives are either constructed with or are one of two simple and fundamental financial building blocks: forwards and options. A forward contract obligates one party to buy and the counterparty to sell a specified asset or its cash equivalent in the future for a predetermined price. Under an option contract in return for the payment of a premium the buyer has the right but not the obligation to buy or sell a specified asset in the future at a pre-determined price. These two building blocks have been referred to as the LEGO bricks with which all derivatives contracts are built.

Beyond the two basic building blocks derivatives split into two distinct groupings, standardised contracts that are exchange traded and customised contracts that form the over-the-counter market.

Futures	Standardised exchange-traded contracts that enable participants to buy or sell an underlying asset at a predetermined forward price.
Options	Standardised exchange-traded or over-the-counter customised contracts that give the buyer the right, but not the obligation, to buy or sell an underlying asset at a predetermined price.
Forwards	Customised over-the-counter contracts that enable participants to buy or sell an underlying asset at a predetermined forward price.
Swaps	Customised over-the-counter contracts that enable participants to exchange periodic flows based on a underlying reference.

## **Derivatives and Insurance – a fundamental difference**

A critical difference exists between a insurance and a derivative. While insurance requires an insurable interest, proof that the cedant has suffered an economic loss once a defined event occurs, derivatives do not require any such qualification. This allows a derivative to be used as an instrument of speculation as well as the principal vehicle for hedging.

As a derivative can be used for speculation as well as hedging it is established practice that a derivative is not insurance. This position has a formal manifestation, the New York Insurance Department has ruled that both catastrophe options (in June 1998) and weather derivatives (in February 2000) are not insurance as neither payments or triggering events bear any relationship to the purchaser's loss or gain.

Putting aside the use of derivatives as a speculative instruments, as hedging instruments derivatives are extremely important [\* ISDA story FT 29/30.9]. Derivatives can be used in a variety of risk management situations, such as; negation of the downside effects of a single risk, diversifying a portfolio of exposures to reduce overall portfolio risk and providing the capacity to engage in a new volatile business opportunity.

As derivatives are not contracts of indemnity a company purchasing a derivative is often exposed to basis risk. While some financial risks can be matched precisely, for example exchange or interest rates, others cannot. The theoretic off-setting benefit of assuming basis risk is that the instrument with an imperfect match will be cheaper than an instrument which is a perfect match. So the purchaser is required to assess price vs basis risk. The assumption of basis risk has been a major issue for exchange-traded insurance derivatives.

### Exchange traded Insurance Derivatives

Exchange traded activity in derivatives has concentrated exclusively in the US and, with a false start, Bermuda.

The Chicago board of Trade (CBOT) has twice launched exchange traded contracts based on catastrophe indexes. In 1992 CBOT developed a catastrophe future based on an index created by Insurance Services Office (ISO). ISO collected data on US catastrophe losses from 100 or more insurance companies and used the data to build a catastrophe index based on loss ratios. Active trading of this future was slight, so CBOT tried to encourage activity by the introduction of an options contract on futures. But trading volumes remained disappointingly low and the CBOT withdrew both contracts in 1994.

CBOT tried again in 1995, introducing a cashed settled options contract with an more transparent index provided by the widely recognised loss assessors Property Claims Services. PCS built and tracked nine separate indexes for CBOT, including national, regional sector and high-risk state references. The PCS index followed 70 participant insurers involved in catastrophe risk via a daily survey, the index was then adjusted for non-survey catastrophe insurers. Two contracts were offered, a small cap option covering original losses below USD 20 billion and a large cap option for original losses between USD 20 and 50 billion. The contracts also allowed for a loss development period of either two or four quarters and like traditional insurance / reinsurance contracts would pay-out proportionate to the value of the index above the strike. In theory by assembling the small and large cap options together one could build a synthetic excess of loss reinsurance programme. This could be used as a substitute for traditional excess of loss programme or as a speculative strategy. Again, however, market activity was extremely low and CBOT abandoned the listing of these instruments in 2000.

The failure of these exchange based catastrophe derivatives rests on two fundamental issues, basis risk and pricing. Any potential purchaser of these options as a form of risk management had to analysis the basis risk they were assuming. The purchaser had to assess how closely the portfolio they wished to protect correlated with the catastrophe index. The assessment was invariably that the basis risk assumed in purchase was likely to be too great, i.e. the purchaser could not be confident that the purchaser's portfolio and the cat index were sufficiently correlated. For an insurer seeking a risk management solution to catastrophe exposure the amount of basis risk possible represented a major commercial risk. What value could there be in purchasing a package of catastrophe derivatives to replace a traditional reinsurance programme and then sustaining a loss which may not recovered



because the catastrophe index had not triggered the derivative. If the amount of basis risk did not deter then price probably would. Throughout the lifetime of CBOT's exchange traded catastrophe derivatives the offer price was well above the traditional marketplace until very remote levels of loss were reached. In this respect the catastrophe derivative did not seem to follow the theoretic analysis that increased basis risk would lower the price of the derivative.

The lack of trading volume also discouraged speculators. The lack of liquidity meant a position assumed was a position held, antithesis to the speculator requiring flexibility to trade in and out rather than to be trapped in a position.

In 1996 the Bermudian Parliament passed legislation authorising the development of the Bermuda Commodities Exchange (BCE). This was to be a forum for the listing and trading of catastrophe derivatives. It was intended that the exchange would list catastrophe options based on an index built and supported by Guy Carpenter, the Guy Carpenter Catastrophe Index. The index was to comprise data received from 39 insurance companies, very like the CBOT indexes but with a loss-to-value ratio calculated to post code level rather than the PCS index for CBOT based on the total dollar loss metric at the state / regional level. The options were also differentiated from the CBOT listing in that they were to be binary, 100% pay-out above the strike regardless of where the index was above the strike.

But the effort was doomed to failure, the reinsurance industry showed little inclination to become involved in the BCE. The key issues again being basis risk assumed from the index and pricing, plus the binary structure to the pay-out under the option.

The failure of exchange based derivatives to emerge as a viable marketplace revolves around the inability of the index designers to find a suitable index proxy which will closely correlate with a potential purchasers catastrophe portfolio. In all three attempts to launch exchange based catastrophe derivatives there was always considerable basis risk to be assumed by the purchaser. When the alternative - traditional reinsurance - offered the coverage without the basis risk. The most successful derivatives focus on specific market references which are universally recognised, such as interest rates and exchange rates. In hedging terms, the linkage to the purchaser is clear and free of basis risk. For a company to assume basis risk there must be a careful calculation of the risk position this creates. For a catastrophe exposed insurer to assume significant basis risk on catastrophe losses would create a fatal flaw in the insurer's risk management programme.

For want of a universally recognised specific market reference there seems to be no prospect of the emergence of a successful marketplace in exchange traded catastrophe derivatives.

### Over-the-Counter Insurance Derivatives

In contrast to the necessary standardisation which characterises exchange traded derivatives the trademark of over-the-counter market is its flexibility. This flexibility has allowed the development of an innovative insurance derivatives based on a swap contract. These are described as either risk swaps or catastrophe swaps.

A risk swap involves two or more different insurance risks being exchanged. Following the practices developed for a financial market swap the risks to be swapped are clearly defined and quantified to be equal in terms of notional value and probability of loss. Extensive and robust modelling of the subject risks to be swapped is a precondition of a successful transaction. But the ability to customise to the specific requirements of the swapping parties is a great advantage. This customisation extends all the way to swap contracts being based on reinsurance contracts rather than the contract forms provided by the International Swaps and Derivatives Association (ISDA)\*. [Given the very large growth in the volumes of swaps transactions in the financial markets, market participants were keen to develop basic swap documentation in order to facilitate the market's growth and to reduce the execution costs. ISDA has been extremely successful in establishing standard documentation]

Risk swaps are very effective tools for dealing with risk capital management as well as providing an alternative to reinsurance. As well as achieving a reduction in peak exposure by entering a swap transaction the swap parties also achieve portfolio diversification by the assumption of uncorrelated risk, gaining a reduction in their respective required risk capital calculations.

#### Examples of Risk Swaps

Two excellent examples of risk swaps are the Tokio Marine / State Farm swap of 2000 and the Swiss Re / Tokio Marine swap transaction of 2001. The first deal is a one for one risk swap and the second a multi-risk swap.

In the Tokio Marine / State Farm transaction the companies swapped earthquake risk of USD 200 million each. The swap had a period or tenure of five years, and Tokyo quake was exchanged for New Madrid quake. In order to balance the probabilities of loss for the two exposures, parametric triggers were designed for each exposure to provide an equal probability of loss. To ensure that the swap remained equitable in the event of a large catastrophe loss a pair of sliding scales were also included in the transaction calibrating recovery ratio to magnitude. To maintain equitable risk exposure the sliding scale was not a 'straight line' but heavily skewed, for example in the event of a Tokyo earthquake of 7.7 plus magnitude Tokio Marine would recover a full USD 200 million, but for a quake of 7.2 – 7.6 magnitude the recovery would only be a fraction of the USD 200 million limit.

In 2001 Swiss Re and Tokio Marine arranged a multi-risk catastrophe swap. The companies would exchange three pairs of catastrophe risk each individual tranche with a USD value of 150 million. The paired swaps were;

- Japanese earthquake for California earthquake
- Japan typhoon for Florida hurricane
- Japan typhoon for French storm

Each pairing was allocated indemnity loss levels, reference portfolios and industrial indices in order to set balanced trigger points. The swap was subject to annual renewal.

These swaps contain a reasonable level of structuring, such as the parametric trigger in the Tokio Marine / State Farm transaction, in order to achieve a balanced swap. But overall the transactions were relatively easy to arrange, largely thanks to the development of stronger and more effective modelling tools for insurers. Capital market and insurance market convergence led to the introduction of better catastrophe modelling and more widespread use of capital management tools such as Dynamic Financial Analysis (DFA). Sophisticated markets like Tokio Marine and State Farm were quick to use these tools in a systematic way, and the swap transactions are evidence of this more enlightened approach.

Companies swapping risk in this way looks rather like reciprocal reinsurance arrangements which have been a feature of the reinsurance landscape for a very long time. But these arrangements were more orientated to seeking out profit opportunities than to exposure reduction and capital management. Without the risk analysis ability provided by modern modelling techniques inevitably the arrangements often turned out to be very uneven exchanges of risk.

A variation on these 'pure' risk swaps is the catastrophe reinsurance swap transacted between Swiss Re and Mitsui Marine. This was a synthetic financial transaction exchanging a commitment fee for a contingent payment triggered by a catastrophic loss. This structure has many of the same benefits as reinsurance or securitisation but arguably avoids some of the costs and structural complexities of these risk management tools. Mitsui paid Swiss Re Libor plus 375 basis points and in return Swiss Re assumed USD 30 million of contingent exposure, subject to a parametric trigger, to Tokyo earthquake.

## Captives, Protected Cells and 'Rent-a-Captives'

### **Setting the captive scene**

The captive arena is the core sector of the ART marketplace, it is by far the most actively used form of ART. Captives are a popular and effective way for companies to manage risk retention, in particular primary layer risks which have reasonably predictable results.

To repeat the definition of a captive set out in the History section, a Captive insurance company is defined as a closely held insurance company whose insurance business is primarily supplied and controlled by its owners, and in which the original insureds are the principal beneficiaries. A captive insurance company's insureds have direct involvement and influence over the company's major operations, including underwriting, claims management policy and investment. [\*Towers Perrin definition]

As we shall see later in this section, ownership of a captive can be by a single owner or multiple owners. In the language of captives, owners of captives are usually referred to as the sponsors of the captive. The owner/sponsor will provide the upfront capital of the captive and the set-up costs. Of course,

initial capital levels will vary dependent on the business to be written but in general US\$ 250,000 is a common initial level. Typically, the owner/sponsor will expect to receive, in due course, dividends or interest from the captive.

The captive will either insure the owner/sponsor directly by accepting a transfer of risk in exchange for premium or indirectly as a reinsurer of a 'fronting' insurer. This latter structure, with the captive acting as a reinsurer, allows the captive to avoid many of the regulatory hurdles that are applied to primary market insurers and participate in the wholesale reinsurance market where the regulatory touch is generally lighter. There are often better terms and pricing to be obtained in the reinsurance market.

At an operational level, a captive manages its activities in the same way as any other insurance or reinsurance company. There will be active management of its underwriting portfolio through diversification and cessions to the reinsurance market. It will establish unearned premium and loss reserves, gear its operations to minimum capital and surplus levels and will conduct an active investment management policy.

As was noted in the history section, captives were originally developed in the mid 60's and, allowing for a growth stall during the 80's, they have grown in popularity and number ever since.

#### A successful captive

The critical requirement for the successful long-term operation of a captive is that its owner/sponsor is able to maintain a positive loss experience over time. This puts a premium on active risk management and loss control within the owner/sponsor and sound underwriting practices and professional management within the captive. It is important that the captive has sufficient premium volume and that it is provided with adequate financial resources. The owner/sponsor also needs to have sufficient capacity to be able to retain a significant proportion of its own risk exposure via the captive. Finally, the management of the owner/sponsor needs to be committed to the successful operation of the captive.

#### **Tax and domicile**

An important benefit of a captive structure is the tax treatment it receives and the majority of captives are set up in off-shore domiciles such as Bermuda, Guernsey and Luxembourg. Captive-friendly legislation has appeared in a number of locations [\*Footnote locations] in recent years suggesting that the attraction and popularity of captives remains strong. The selection of a suitable location for the establishment of a captive is not only dependent on the expected corporate tax treatment but on other factors, including insurance/reinsurance restrictions, capital and tax requirements, regulatory requirements, reserve requirements, premium taxes, political and regulatory stability and infrastructure.

While most captives are set up in captive friendly off-shore locations, they are generally subject to some kind of regulatory oversight ensuring prudent operation in respect of liquidity and solvency. Regulatory requirements will vary but typically include minimum levels of reporting, capital/surplus levels, and investment restrictions.

## **Benefits and costs**

The enduring popularity of captives is due to the benefits derived from their operation, these include;

- Providing appropriate and more efficient risk coverage for those primary risks with a predictable loss profile.
- Providing appropriate risk coverage for those risks which the traditional insurance market will not accept, or will only accept on 'punitive' terms.
- Lower costs, avoiding insurance market premium loadings for overhead and profit and agency and broker commissions.
- Possible tax advantages (dependent on captive location and structure) on premiums paid to the captive, investment income and incurred losses.
- No longer subject to the volatility of the insurance market cycle, increased predictability of costs and consequent reduction in earnings
- Direct access to the wholesale reinsurance market, often more competitive in pricing.
- Increased investment income from loss reserve fund, which retained in captive rather than handed over to third party insurer.

There are costs and there can be disadvantages as well, in particular;

- Payment of upfront fees and capital to establish the captive
- 'Locking up' capital in the captive for an extended period of time, so reducing capital management flexibility.
- Adherence to relevant regulatory environment
- Not always tax advantage is depending on location and structure.

But given the popularity of captives, it is fair to say that the benefits generally outweigh the costs, and captives have proved to be an efficient tool for the management of retained risk.

## Captive structures

Captives can be structured in a variety of forms, selecting the 'best fit structure' for a company is generally a function of the company's financial and risk management objectives. In broad terms, captives have a single or multiple owner/sponsor and single or multiple users that are either related or unrelated to the owner(s)/sponsor(s). The captive spectrum runs from the 'pure' captive with a single owner/sponsor and user to the protected cell company with unrelated single or multiple owner(s)/sponsor(s) and multiple users.

### Pure Captive

A pure captive is a licensed insurer or reinsurer that is wholly owned by a single owner/sponsor and the insurance business written by the captive is solely or primarily for that owner/ sponsor. In effect an in-house insurer.

This is the most popular form of captive and is currently approximately 70% of the captive population. The owner/sponsor can capitalise the captive with internal or external funds which are then invested in low-risk securities on behalf of the owner/sponsor and generate periodic returns; as the business underwritten by the captive expands so must the capital supporting the captive. As the owner/sponsor is sole controller of the captive, it has direct operational control over the captive's activities; underwriting, claims handling, investment controls etc.

In terms of the insurance policy issued, the relationship between the captive and the owner/sponsor is the same as a regular insurance relationship. The owner/sponsor pays a premium to the captive in order to transfer risk to the captive. In the event of loss, the owner/sponsor sends a formal advice to the captive and receives a compensating payment (as provided by the terms of the insurance policy issued by the captive to the owner/sponsor).

A pure captive can also be set up with multiple branches in different locations or regulatory regimes to reflect the needs of the the owner/sponsor's individual subsidiaries. When a **fronting** insurer is used, the owner/sponsor directs its local subsidiaries to the local branch of the **fronting insurer**, the **fronting insurer** then cedes all risks accepted through the branches to the captive.

An interesting twist to the pure captive is the development of the senior captive. In this structure, the owner/sponsor has more than one wholly owned subsidiary captive, and designates one of the captives to underwrite a greater amount of external or unrelated business, thus becoming the 'senior' captive, and this can create the conditions for more favourable tax treatment.

A further variant on the pure captive is the sister captive. Again, solely owned by a single owner/sponsor, the captive underwrites for other companies within the owner/sponsor's corporate group, in other words related entities forming a single 'economic family'. This can provide diversification of risk across a broader economic group but the portfolio is still within a single umbrella grouping.

## Group Captives and Mutuals

1. A group captive or Mutual is a licensed insurer or reinsurer owned by a number of companies which underwrites risk for all the owner/ sponsor companies. They are often set up by industry trade associations on behalf of their members.

A group captive offers the opportunity for portfolio diversification away from a single economic unit, but this diversification is limited to the extent that the portfolio is made up of risks from a single industry, e.g. energy utilities. Loss coverage within group captives is often set in proportion to the premiums paid in by the individual owner/sponsor, reducing expenses and cash flow risks. Participating companies inevitably give up substantial, if not all, operational control of the group captive compared to a pure captive structure but generally owners/sponsors benefit from a lower cost base and more favourable tax treatment.

## Rent-a-captive

The rent-a-captive structure breaks away from the dedicated owner/sponsor, and with protected cell companies forms the 'captive for hire' section of the captive marketplace.

Rent-a-captive entities are usually owned by one or more parties, are managed by independent agents and underwrite business with a large number of unrelated parties through unique structural mechanisms. They allow companies to access the advantages of captive risk management without having either to own a captive or to bear the initial set-up costs.

Typically, a rent-a-captive is set-up and operated by a reinsurer. In a typical transaction, a company will purchase an insurance policy from a **fronting insurer** who will, in turn, reinsure the whole of the assumed risk with the rent-a-captive. Within the rent-a-captive, individual customer accounts are established to manage premiums and claims. Risks are segregated across customer accounts by contract and shareholder agreements, but assets can be co-mingled, so at least, at a theoretic level, a severe loss for one customer could lead to a loss or coverage reduction for other customers of the rent-a-captive. However, rent-a-captive managers carefully assess and balance the exposures assumed by the rent-a-captive and to date they have been used successfully and without such a problem arising. Within the captive marketplace they provide a relatively quick and convenient risk retention mechanism.

## Protected Cell Companies (PCCs)

Co-mingling of assets within a rent-a-captive is clearly a disadvantage, theoretic or otherwise. PCCs provide a direct response to this issue, each cell is 'ring fenced' to fully protect the assets of individual customers. The individual cells of a rent-a-captive are separated by contract and a shareholders agreement to avoid 'cross-contamination'. By contrast the cells of a PCC are separated by statute, providing a far more robust segregation structure. Through specific legislation, the assets and

liabilities of the individual cells are wholly isolated from each other and no co-mingling can take place. Creditors of a cell may only have access to the assets of that cell, the legislation specifically prohibiting creditors from accessing the assets of other cells.

The typical PCC structure has two basic components: the core and the cells. As with rent-a-captives, the PCC core is usually owned and managed by an independent third party such as a reinsurer or a bank. Clients of the PCC will contract with the core to use one or more of the cells. The costs involved will be those related to 'starting-up' the cell and paying for the share of the equity provided by the core; the cell user therefore only paying for the equity they actually use. Typically cell owners are expected to collateralise the risk in the cell, and the core has access to the collateral on an 'as required' basis.

The additional security of PCCs has contributed substantially to their popularity, along with their flexibility and relative easy access. They have proved particularly useful in situations where setting up a full captive structure would be prohibitive, such as, providing insurance cover for joint ventures, providing catastrophe cover and segregated risk management programmes for individual client subsidiaries. They have also been adapted for use as special purpose vehicles dealing with derivative transformers and structured note issues.



## **The nature and the future of FFR**

### **Introduction to FFR**

The bespoke nature of finite and financial reinsurance (FFR) solutions means there is an enormous variety of customised products available and many other products/solutions which are constantly being developed. Consequently, attempts at classification can create misleading simplification.

However, Finite risk solutions do generally share some distinct characteristics;

- solutions are usually multi-year, explicit or implicit
- have a limit of aggregate liability assumed
- a profit-sharing mechanism
- an experience account, explicit or implicit.

A clear basic distinction can also be drawn between contracts to manage losses which have already been incurred, retrospective FFR and contracts to manage losses yet to be incurred, prospective FFR. Within retrospective and prospective FFR we can identify two sub-groups within each. Retrospective contracts can be separated into, Loss Portfolio Transfers (LPTs) and Adverse Development Covers (ADCs). Prospective covers can be separated into, Financial or Finite Quota Shares and Spread Loss Treaties.

### **Loss Portfolio Transfers (LPTs)**

A Loss Portfolio Transfer is the transfer of a company's future payment obligations resulting from past underwriting years to a reinsurer. The business transferred may be part of or the whole of the ceding company's portfolio. The LPT will have a limit of indemnity which will be equal to the transferred loss reserves. In turn, for assuming the future payment obligations, the reinsurer receives a premium which will be approximately equivalent to the net present value of the established loss reserves plus an underwriting risk premium to reflect timing risk and any perceived under-reserving. The reinsurer will also receive a fee composed of the reinsurer's margin (profit) and incurred transaction costs, e.g. the cost related to the analysis of the portfolio. There may be a pre-contract agreement addressing the allocation of underwriting costs between the parties depending on whether the transaction is executed or not.

The principle risk being assumed by the reinsurer in an LPT is the timing risk, that being, the settlement of the assumed losses being more rapid than expected. Of course in entering into the transaction the reinsurer expects that the payment pattern to ultimate extinction of liability will be as the reinsured's analysis estimates or slower. A slower settlement pattern will allow the reinsurer to generate more investment income than anticipated, creating a net gain on the reinsurer's expected result. The benefit of such a net gain is often shared with the ceding company, and is addressed in the contract.

For the ceding company there can be a number of benefits. The removal of uncertainty is certainly a substantial benefit. However the real value of an LPT lies in the improvements it delivers to important balance sheet numbers in the year the transaction is concluded. First, a reduction in the combined ratio, as possible future investment income feeds through to current underwriting income. Second, increased solvency as the liabilities ceded to the reinsurer are greater than the reinsurance premium paid, so the implicit discounting of the loss reserves strengthens the ceding company's policyholder's surplus, and therefore the company's solvency.

LPT's can also be insurance transactions. For a non-insurance company the transfer of self-insured outstanding claims via an LPT and the consequent boost to income from the accelerated settlement can be a real benefit in closing a product line or selling a division.

### A Reinsurance LPT example

The following is a simplified financial statement for the Solid Insurance company.

[LPT example.xls – before LPT purchased]

For the purposes of example written premiums = earned premiums. The key ratios flowing from these numbers are as follows;

Premium to Surplus: 3.33 to 1  
500,000 / 150,000

Loss Ratio: 80%  
400,000 / 500,000

Expense Ratio: 30%  
150,000 / 500,000

Combined Ratio: 110%  
550,000 / 500,000

The LPT agreement will be effective from 1<sup>st</sup> January, so it will only cover business written with an inception date prior to 1<sup>st</sup> January and in respect of outstanding losses on such business settled after 1<sup>st</sup> January.

The Solid Ins. Co. wishes to transfer 100,000 of its total outstanding loss reserve of 400,000. The reinsurer has calculated that to assume this 100,000 of estimated ultimate loss it will need to charge Solid Ins. Co. a premium of 60,000, payable immediately in cash.

The reinsurer has calculated that the investment income on the 60,000 will grow faster than the projected loss settlement pattern of the transferred outstanding loss reserve. If the settlement pattern

is faster than projected the investment income earned plus the 60,000 will be inadequate to cover the ultimate loss – Timing Risk - and the reinsurer will make a loss on the LPT. So, the accuracy of the projected settlement pattern is crucial to the reinsurer's underwriting analysis. The basic pricing of an LPT will depend on the reinsurer's analysis of the projected settlement pattern, the faster the projected settlement the higher the premium charged will need to be.

After purchasing the LPT Solid Ins. Co. financial statement is as follows;

[LPT example financials – after LPT purchase, extract from LPT example.xls]

On the Asset side of the balance sheet, the LPT reduces Cash from 100 to 40, as 60 flows to the reinsurer. On the Liability side Outstanding Losses are reduced by 100 to 300, and overall liabilities is correspondingly reduced to 750. Solid Ins. Co. may therefore book a 'profit' of 40. Although Assets have reduced Policyholder Surplus has increased from 150 to 190. The Income statement also shows an operating result profit of 40.

Solid's key ratios are now;

Premium to Surplus: 2.32 to 1 (3.33 to 1)  
440 / 190

Premium volume has been reduced while increasing Surplus.

Loss Ratio: 68.2% (80%)

Although premium volume has dropped by 60 outstanding loss reserves have been reduced by 100, so the overall loss ratio falls to 68.2%

Expense Ratio: 34.1% (30%)

Premium volume has reduced so expense ratio has increased.

Combined Ratio: 102.3% (110%)

The reduction in outstanding loss reserves reduces the combined ratio from 110%.

### A Direct LPT Example

Over the course of a number of years, ABC Company had sought to reduce its external insurance premium expenses by retaining more risk. Specifically, during a hard market cycle, ABC Company had retained the first £250 of its own Employers Liability exposure. This achieved a significant reduction in ABC's premium expense, however as the years progressed, claims occurred and liabilities built up on ABC's balance sheet. The claims incurred were within the expected range and undoubtedly ABC had reduced its costs utilising this technique. As the traditional insurance market softened in year 8

and subsequent years, ABC Company elected to revert to the traditional insurance market and effectively offload its EL risk by buying traditional insurance capacity. ABC's intention was merely to runoff the 7 years of retained liabilities however some 2 years after the decision to revert to the traditional market, ABC's directors elected to sell the business of one of its subsidiaries to a third party.

During the course of negotiations with the prospective buyer of the subsidiary, it became apparent that the prospective buyer was attempting to over inflate ABC's subsidiaries retained exposure in order to reduce the purchase price of the subsidiary. In order to take the negotiating tactic away from the prospective buyer, ABC approached its insurance brokers to seek terms to transfer the retained liability risk to a third party insurance company. The terms of the LPT transaction placed where as follows:

Limit - review Bass Brewer LPT

Period

Premium

Experience Capped Contribution

The specific benefits to ABC of this transaction were as follows:

1. The placement of the Loss Portfolio Transfer took away a strong negotiating feature from the prospective buyers. This enabled ABC Insurance Company to secure the maximum price from the prospective buyer for its subsidiary without having to compromise that price due to the uncertainty of the liabilities that were retained within ABC subsidiary.
2. Due to the large experience account calculation, if ABC continue to negotiate hard on each individual claim settlement, and claims finally settled out as expected in future years, ABC was entitled to a very significant share of the premium it has paid for the Loss Portfolio Transfer to be returned to it. A traditional insurance market solution would merely have been a flat premium for the exposure which would have left ABC with no incentive to continue strong claims management and thereby share the profits with the Insurer.

### **Adverse Development Covers**

Like LPT's Adverse Development Covers (ADCs) are retrospective, but in the coverage that they provide they are quite distinct as a product group. No loss reserves are transferred in an ADC structure. The driver for an ADC is the reinsured's concern that ultimately incurred losses will be greater than the loss reserves it has already formed. So the risk focus in an ADC is primarily on underwriting risk – inadequate reserving – and then considering the timing risk within the subject portfolio and within the ADC itself.

Although it is not the primary risk consideration timing risk does have an important role to play in the price calculation of an ADC. The reinsurer will be calculating how long it will be, if at all, before the current reserves are exceeded by settled claims. The longer this period, the greater the investment income component will be in the reinsurer's overall price calculation. Thus the time value of money is utilized in ADC structures to achieve more cost-effective cover.

An ADC looks very like a traditional excess of loss contract, it carries a limit of indemnity and claims become payable under the ADC when settled losses breach a specified attachment point or excess. This will be set at the level of the outstanding loss reserves. The premium payable will address the reinsurer's perception of underwriting risk and timing risk. As with all finite contracts there will be provision within the contract to share any ultimate profit arising from the transaction.

The advantage of an ADC is in the ability to manage the concern that old liabilities will settle for more than the set outstanding loss reserves. Clearly this can be an attractive alternative to increasing the level of existing loss reserves, with the resulting impact on the overall underwriting result for the year.

## **Financial or Finite Quota Shares (FQSs)**

In a traditional quota share the reinsurer agrees to pay a fixed or variable proportion of the claims and loss adjustment expenses arising from a defined portfolio of business in return for the same proportion of the premium. Typically the cedant receives a ceding commission from the reinsurer to reflect acquisition and underwriting costs and the profitability of the ceded portfolio. The exposure of the reinsurer in such a traditional quota share arrangement is only limited by any limitation of liability occurring in the underlying policies.

In contrast a FQS is structured with an explicit limit to the overall liability of the reinsurer. So whether the underlying policies carry policy limits or not the reinsurer's contractual liability is fixed. This is the key difference between the traditional and the finite quota share. The other marked differential between the two is that the ceding commission in a FQS will often be on a sliding scale. This scale will vary with the loss ratio, for example for every 1% reduction in the loss ratio the commission paid will increase by 1% and vice versa, subject to set minimums and maximums. This mechanism creates more sensitivity to the performance of the underlying business. If the results are good the reinsured can retain a larger share of the result. Conversely if the experience is poor then the reinsured's commission payment falls and the reinsurer retains a greater proportion of the premium in compensation.

Another differentiating characteristic of FQSs is that they usually run for a fixed and specified period, typically between three and five years. In a traditional quota share arrangement while the expectation of the parties may be for the quota share to be in force for a considerable period of time it will almost always be subject to annual renewal.

The primary use of FQSs is to provide surplus relief for regulatory purposes. It has been a popular tool for smaller primary insurers in the US market. In the US when an insurer is adding new business (creating premium growth) it is required to immediately recognise the acquisition costs as expenses, even though profit from the new business will emerge and be recognised over a number of years. For insurers with relatively small policyholders surpluses FQS provide a highly efficient way for the insurer to finance premium volume growth.

FQSs can, of course, provide the same benefits as traditional quota share arrangements, increasing underwriting capacity and reducing the volatility of the reinsured's underwriting result.

Typically a cedant transfers a proportion of unearned premium to the reinsurer and receives, in return, a ceding commission. The ceding commission is treated in the financial statement of the cedant as current income and so serves to increase the insurer's statutory surplus. The intent within the transaction is that the premium transferred to the reinsurer will be sufficient, including investment income, to cover the expected claims allowing a significant margin for error. If claims are greater than estimated then the reinsurer will be able to recover these excess losses over the term of the agreement.

### A Financial or Finite Quota Share Example

Solid Insurance Company (SIC) is a fast growing insurer operating in a niche market. Their niche focus has enabled them to achieve excellent profits (they currently operate at a combined ratio of 85%) however their premium income growth is outstripping their capital – thus their solvency ratio is falling. Management do not wish to pass over new business given that the opportunity for increased profit is good, however they also do not wish to raise further capital from the investment market since this would dilute the holdings of the current shareholders. For these reasons, SIC's management has decided to investigate a financial or finite quota share (FFQS).

The FFQS proposal they obtain is as follows:

- SIC to cede a 50% quota share to the reinsurer
- Sliding scale commission minimum 0% at 92.5% ceded loss ratio rising to a maximum of 32.5% at 60% ceded loss ratio
- A loss corridor (the cedant pays the claims) from 92.5% ceded loss ratio to 100% ceded loss ratio
- A loss ratio cap at 125% ceded loss ratio.

On this basis SIC can achieve a higher commission than would be available from the traditional market over the range of likely loss ratios. SIC also have the benefit of risk transfer should the unexpected happen and the loss ratio deteriorate beyond 100%. The 125% loss ratio cap is high enough that SIC cannot envisage a scenario where this cap would be breached, since they (and their competitors) would already have become insolvent if their portfolios ran at these loss ratios. The 50% quota share provides SIC with immediate solvency relief, since in their market the minimum solvency requirement is based on a fixed percentage of net premium.

### Another FQS example

In the following example shows how a FQS can help a primary insurer to improve regulatory solvency, boost underwriting capacity and reduce the volatility of underwriting results.

Smart Insurance needs £10 million of support so that it will not need to show a loss in the current year, 2002. It enters into a FQS with Support Re. The FQS is structured as a three year contract that meets Smart Ins requirements for a stable expense ratio and no negative results. The expected loss ratio is 70% so that on gross premiums of £200 million, £140 million is expected in claims. In the first year 2002 expenses are expected to be high at £70 million giving an expense ratio of 35%. In the following years, the expenses are expected to be lower at £50 million. For the 2002 year Smart Ins. shows a negative result of £10 million. To eliminate this loss Smart Ins. reinsures 25% of its portfolio through the FQS with Support Re. This requires the transfer of £50 million of gross premium and

corresponding claims with a value of £35 million. Support Re pays Smart Ins a ceding commission of £25 million in 2002 and £10 million in 2003 and 2004.

The impact of the FQS is to allow Smart Ins. to declare a 'breakeven' result in 2002 but in exchange to accept lower results in 2003 and 2004. In other words Support Re have advanced Smart Ins. £10 million and will receive £5 million in 2003 and 2004. In order to allow for variation in the expected results the FQS has been structured with an experience account which records the cashflows and provides for the allocation of profit or loss shares to Smart Ins. and Support Re., depending upon actual result.

### **Spread Loss Treaties**

A Spread Loss Treaty (SLT) is a multi-year transaction either explicitly or implicitly. If this feature is implicit the contract will contain contractual provision so that it will be in the cedant's economic interest to renew the contract, i.e. if the cedant does not renew it may lose the profit sharing mechanism or the limit of liability may be 'collapsed' to a small percentage of its original size. [footnote, typically 10% of the premium paid]

As is characteristic in all FFR the reinsurer's liability will be limited both on an annual basis and over the full contract term. There will also be an excess on an annual and/or overall basis.

Premium is payable either in a single payment or on an annual basis, and will be transferred, less the reinsurer's margin, to an experience account. The funds in the experience account will earn interest at a contractually agreed rate.

In the event of loss, loss payments will first come from the funds in the experience account, but if these funds are insufficient the reinsurer will settle the claim amounts in excess of the experience account funds.

In the event of the experience account having a negative balance the SLT will almost certainly contain contractual provision obliging the cedant to settle the whole or part of the negative balance. Equally there will be contractual provision for the cedant to share in any positive experience account balance.

It is also characteristic of SLTs to have contractual provision for full and final commutation of the reinsurer's contractual obligations at the expiry of the agreement. A marked distinction from a traditional cover.

The characterisation of SLTs is of premium accumulated over the entire term and of incurred losses being distributed over a multi-year period. The reinsurer looks like a short to medium term lender but with a crucial additional element, underwriting risk (large or small!).

The key benefit to the cedant of an SLT is the ability of the SLT to smooth over time the variation in annual incurred losses. It is also an effective way to provide an off-balance sheet flexible equalisation



reserve and a tax efficient tool to build up a fund to finance deductibles or catastrophe losses over the medium term. It is a very useful tool for the management of those uninsurable risks which the traditional market will not cover. For captives SLTs help to reduce the capital cost of the parent company by reducing the volatility of the captive's earnings.

## **Application of ART/FFR to Direct Companies, Insurers and Reinsurers**

### **ART techniques apply equally to companies**

The application of ART applies equally to all companies who operate with an active risk management programme. As noted in the history section, one of the important developments for the growth of ART market has been the increased sophistication of corporate risk management allied to a more holistic view of risk and capital management. This approach does not change between non-insurance companies and insurance companies, the same principles and techniques are applied, and following from, this ART techniques for managing risk can be considered by any company whether an insurance company or not.

### The Company's approach to dealing with risk

The company has always been exposed to a wide and diverse variety of risks, the flip-side of the opportunities it seeks to benefit from. To manage risk, the company has only four approaches it can take; avoid risk, reduce risk, transfer risk or retain risk. The first two approaches – risk avoidance and risk reduction can be summarised as risk control and the latter two – risk transfer and risk retention - as risk financing. Risk financing follows on from risk control in that the aim of risk financing is to fund the losses that remain for the company after the application of risk control techniques.

### Traditional Company Risk Management

Traditionally, the risk spectrum tends to have been dealt with in a compartmentalised way. For example, financial risks would be the responsibility of the finance department and property risks the responsibility of the insurance buyer or risk manager. For a considerable period of time and for a very wide variety of companies this approach worked well enough. However the development of the theoretic basis of risk management and capital management has led to a fundamental re-appraisal of the way that a company should manage risk in order to better manage capital.

### Risk management and the maximisation of enterprise value

Prevailing capital and risk management theory re-emphasises fundamental principles of corporate existence. In essence, investors always seek to maximise the return on the capital they invest and which is therefore at risk. The companies invested in have, in turn, a basic obligation to their investors to maximise 'enterprise value' in order to provide investors with the best possible return on the capital they have invested in the company. In order to achieve the maximisation of the company's value the management must take a holistic view of the company in terms of both opportunities and risks facing it. Therefore the traditional compartmentalisation of risk management must be broken down and the company's risk management programme centrally co-ordinated and developed in the context of the impact of the programme on the capital management of the company.

This is the model, dynamic risk and capital management seeking to maximise the 'enterprise value' of a company, through which the application of ART should be viewed.

### **ART definition and its relationship to traditional insurance**

To restate the definition of the ART market, it is the combined risk management marketplace for innovative insurance and capital market solutions and it supports the core techniques of risk management; risk control and risk financing. Although most effective in the risk financing arena it can also prove useful in risk control situations. This risk management activity, whether risk control, risk financing or both, in turn supports the capital management of the company and the overall aim of maximising the enterprise value of the company.

It is also important that ART should not be seen as a wholesale replacement for traditional insurance or derivatives within the risk management universe, but another tool to be deployed in execution of an active risk management programme. We can consider the application of ART through the four methods of risk management outlined above; risk avoidance and risk reduction, grouped as risk control and risk transfer and risk retention, grouped as risk financing.

### **ART application to Risk Control techniques.**

#### *Risk Avoidance*

By definition ART will not have a role to play in a company avoiding risk. This decision making process is the 'first base' of the company's risk management process, deciding to abstain or withdraw from an investment where the company's judgement is that the risk involved is too great. There will be no reason in this process to look for an ART solution, as the company is 'stepping away' from the assumption of risk in the first place. By definition there will be no residual risks for which the best risk management solution may be an ART mechanism.

#### *Risk reduction*

Risk reduction occurs through loss prevention, loss control and diversification. Loss prevention seeks to reduce the likelihood of a given type of loss occurring. There is clearly a physical element to loss prevention, for example, the installation in a warehouse or factory of smoke detectors. There will also be significant intervention from government related to loss prevention measures considered to be in the public good, for example, requiring all passengers in cars to wear seat belts. But, of course, any loss prevention technique will have limits. Taking legislative loss prevention as an example, seeking to legislate risk away can only be carried so far by government and public, there comes a point at which an enhancing measure will incur incremental costs which are greater than the benefits derived. As with risk avoidance this is an area where the ART techniques cannot make a contribution.

Loss control techniques can also be physical in nature, while smoke detectors are clearly prudent as a loss reduction measure, it would be equally prudent to install a sprinkler system to the facility. So if the smoke alarm fails to avert the fire then the sprinkler system will provide a measure of loss control. A loss control measure may also be financial as opposed to physical. For example, in the capital markets an equity investor may place a stop-loss order that automatically triggers a sell order once the value of a stock falls below a certain threshold. In this example we can see the possibility for the application of ART solutions in loss control techniques. An ART example would be an 'out of the money' stop loss which limits the client insurer's technical loss ratio to 105%. In the same way as loss prevention measures, loss control measures cannot be foolproof. A sprinkler system can be overwhelmed by a fierce enough fire, capital market stop-loss orders have been ineffective when the market is illiquid, and the ART stop loss will provide risk control as long as it has limit available, but once this is exhausted the stop loss has provided risk reduction but can no longer be said to offer loss control.

Diversification is the third leg of risk reduction. Don't put all your eggs in one basket is the colloquial saying. In the financial world this advice has been formalised by the Nobel prize-winning work of Markowitz on portfolio theory. Portfolio theory offers a new technology for constructing 'efficient' portfolios adding an intellectual rigour to the age old saying. An energy company with a large number of independent loss units (oil rigs, refinery facilities, road tanker fleet, retail outlets) can estimate with reasonable accuracy the accidental losses which will occur in a given year. With this spread of independent loss units the company has an internal diversification of risk. ART instruments such as swaps can have a direct application to support diversification, [see the Tokio Marine / State Farm swap in the derivatives section]

#### ART applications to Risk Financing techniques

This is the ART market's major application.

#### *Risk Transfer*

The transfer of risk from one party to another better able or more willing to bear the loss. This is usually achieved through insurance or hedging. Risk transfer can also be achieved in greater and lesser degrees through ART. The risk transfer qualities of traditional insurance are clear and it is also evidently a prime tool for risk management. Insurance provides funding and earnings stability and is crucial to many types of economic activity. But insurance can become very expensive, supply can be restricted and certain risks may be uninsurable. This can present a significant risk to the company in terms of its risk and capital management programme. In these circumstances when the traditional insurance market cannot offer an efficient product ART has an important application to the dynamic risk management process. In terms of full risk transfer securitisations and swaps can provide efficient mechanisms and through products like spread loss treaties, while risk transfer is more limited, the mechanisms can still provide an efficient risk management mechanism blending risk transfer and risk retention

Hedging, as has been noted has many of the characteristics of insurance, and in modern economies also plays a key role in transferring financial sector risks, such as exchange rates and interest rates as well as its more traditional role in commodities. While hedging is a crucial part of a dynamic risk management programme, in the context of this paper ART does not have an application to hedging. Rather hedging techniques have informed the more recent developments in the ART marketplace, swaps and weather derivatives for example.

### *Risk Retention*

Risk retention may be voluntary or involuntary. A company is involuntarily retaining a risk when it does not recognise that it is exposed to a risk, clearly by definition there is not a great deal that can be done to manage such a risk. On the other hand active risk retention is where the company makes a conscious decision to retain all or part of a given risk, that is, the company has decided that retention is the most cost-effective risk management solution available. Possibly the costs of transferring the risk are too great or the risk is uninsurable, or the losses are sufficiently predictable and the worst case scenarios financially manageable. In these circumstances ART mechanisms can be applied to support in the self-funding of these risks. This is a prime area for the deployment of ART techniques for example, Captives, Loss Portfolio Transfers, Spread Loss Treaties can be of great benefit.

ART techniques do not discriminate between companies, ART may be applied with as much efficiency to a non-insurance company as to an insurance company. The most visible example of this is the captive market. Of the 5,000 or so captives currently operating around the globe the vast majority are owned by non-insurance companies. As we have seen from the captive section they are providing a highly efficient risk and capital management solution.

Within an overall company risk and capital management programme there will, almost certainly, be risk issues where an ART solution is an option.

Within the context of a dynamic risk management programme aimed at maximising enterprise value all companies should consider ART techniques as a component part of their risk and capital management programmes. We have seen that ART cannot be used with all the basic approaches to risk management, e.g. risk avoidance. However companies should always consider possible ART solutions where they are applicable so that they have the most complete knowledge of the risk management techniques available to the company and can make the best informed decisions.

Whilst there are no clear rules governing which ART techniques apply to Direct Companies, which apply to Insurers and which apply to Reinsurers, the general use of these techniques can be demonstrated using the following flow chart and its following narrative:

## **Direct Company**

Various different business have a vast array of different risks they face. Most business compile a risk register which attempts to identify each significant risk the company faces and further more attempts to quantify the financial impact of each of those risks occurring.

Some of those risk are easily identifiable and comparatively easily transferable. For example one of the major risks to an oil refinery business is fire or explosion. This is a comparatively known exposure and the insurance market (subject to its fluctuations in pricing and capacity) it readily able to accept the transfer of these risks in return for the charge of a premium.

The value of a branded food manufacturing company however will be far more at risk from an event that causes damage to its brand (e.g contamination of one of its products). In this case, the insurance market is not as established to accept such risks - particularly in the broadest meaning of brand damage (some negative press speculation may cause significant brand damage). In a case such this, ART techniques can be used to transform the original risk into one that is more easily to asses by the ART Insurer. One of the techniques available may be the use of Contingent Capital whereby a brand damage event is defined and listed as one of the triggers under a Contingent Capital Arrangement. In the event an occurrence happens, the Contingent Capital provider may provide cash to the buyer who uses it to either record products, launch an advertising campaign or what ever other loss mitigation techniques the buyer feels would assist in protection of his brand. The buyer then repays the cash/debt to the Contingent Capital provider over the next 5 years at pre-agreed interest rates. In this example, the risk is transformed from brand damage to credit - i.e the Contingent Capital providers to exposure to risk is based on the buyers ability to make future repayments of the debt. From the buyers prospective, it is worth paying a premium / option price in order to maintain the facility of access to cash when it most needs it at a point in time when a brand damage event might otherwise bring the company to its knees.

To continue the same example, with the use of a different ART technique, the company, having identified brand damage as a major risk to its business, could buy a Finite Risk Policy from an insurance company. Again the policy trigger would need to be identified and the amount of indemnity required by the company would need to be determined. Whilst the likelihood of an event occurring is remote, the severity of such an event could be catastrophic for the company. In such case the company might elect to make provision for such an event using the following policy structure:

TRIGGER : Brand damage event as defined.

Limit: £10,000,000 (being the amount of money the company determines it requires to recover its brand of value).

Period: 5 years.

Premium: £1.8m per annum.

Experience CAT

Contribution: 95%

In this way the company is making active provision against the unlikely event of a brand damage occurrence but should no such occurrence occur 95% of its premium plus interest are returned to it.

In broad terms, it is interesting to note that the majority of the ART techniques used by companies are bought either because there is not traditional market product available for the risk that the company wishes to transfer or because the traditional markets capacity or pricing for the risk is excessive. In the case of the latter circumstance (market pricing) it is usually beneficial for a buyer to review ART techniques and the pricing for a particular layer of cover exceeds 25% rate on line (i.e when the premium is 25% or greater of the limit of the indemnity provided by the insurer).

### **Insurance Company**

By nature of their business, insurance companies tend to accumulate a large amount of "traditional" risk. Traditional risks include fire, lightning etc and catastrophe perils such as flood, earthquake, windstorm etc. It is these catastrophe risks, which pose the greatest aggregation of exposure to an insurance company, and in common with a direct company, the Insurer will compile a "risk register" to try to asses all of the risks to its own business.

The Insurer then goes through the same process as a direct company in assessing which risks to retain and which to transfer. If traditional reinsurance can be sought at commercial prices, then the Insurer will transfer the risk to a Reinsurer. It is important to note that due to the concentration particularly of catastrophe exposures to Insurers, the rate online they have to pay for their reinsurance protection is typically significant higher than that of a direct company. In order to mitigate these significant costs insurance companies look at a wider variety of alternative techniques to spread or transfer its risks.

It is also interesting to note that an insurance company is also significantly at risk from financial default of its reinsurance capacity. Immediately post any major catastrophe, Insurers will asses their nett retention and expected reinsurance recoveries in order to asses its ongoing financial strength. Due to the ever-increasing concentration of exposure through the chain from companies to Insurers to Reinsurers, one of the major risk an insurance company faces is default by one or more of its Reinsurers.

In order to counter this risk, some Insurers have elected to pursue Catastrophe Bonds to not only transfer their catastrophe risk exposure but also to eliminate the credit risk exposure they face from their Reinsurers. It has been noted previously in this report, under a Catastrophe Bond arrangement the capital markets place cash to the extent of the limit required by the buyer in a vehicle in return for a premium over and above the normal investment return rates. This premium is the extra cost for allowing their money to be exposed to a defined event (Caribbean windstorm, Californian earthquake etc). By using this method, the Insurer guarantees that it has cash available to meet its obligations without the risk of Reinsurer default/ bankruptcy.

## **Reinsurers**

Traditionally major Reinsurers have been the ultimate financial in the insurance industry. By nature they have very large concentrations of traditional risk such as flood, windstorm, quake etc, their Shareholders have invested in them expecting a good return in years of low catastrophe occurrence and poor returns/losses in the years where there are frequent catastrophe occurrences.

Again Reinsurers will assess the entirety of risk that they face and similarly seek to avoid/mitigate their risk where they can.



## **Linking with Banks and Banking Type Products including Cat Bonds, Interest Rate / Exchange Rate Swaps and Derivative products**

Over the last five years there has been a great deal of discussion and market commentary about the **convergence** of the insurance and banking industries. In reality, little convergence has actually occurred to date and it is worth commenting briefly on the reason for this lack of convergence to date.

In broad terms banking products such as LOC's, Derivatives etc are clear and unequivocal instruments. In the event of an LOC being triggered, there is not debate as to the payment obligation - the payment is made without delay or exception. Insurance policies however are merely agreements to reimburse clients for their loss in the event of an insured peril occurring but subject to a list of conditions, warranties and/or exclusions. Accordingly when an insured event occurs, there is often debate about not only whether the event is covered under the policy or not but also the actual quantum of claim payment due. This "greyness" over the obligation to pay under an insurance policy marks a significant difference between banking products which are typically standardised instruments. It is this standardisation of many banking products which has allowed secondary and ? products to be subsequently developed and traded. It is exactly due to this lack of standardisation that the insurance industry has not developed for example a futures market for hedging against the future price of the insurance commodity. It is essential to remember that each of the products and techniques described within this document are all "tools" to use in the mitigation of risk to the buying customer. Certain exposures require that a use of certain techniques whilst other risks will limb themselves to other forms of risk transfer/risk mitigation.

There are however exceptions to these general principles and it is not uncommon in the current market environment to find an insurance company or a government entity, or indeed a very large single corporate combining the use of traditional insurance, Finite Risk and CAT Bonds. The decision over which technique to use to fulfil a particular exposure is undoubtedly a subjective decision and varies on a case by case basis depending on that client's own particular circumstances. The decision is also somewhat dependent upon the state of the traditional insurance market at the time of purchase. During a hard market cycle (i.e. when insurance rates are high) clients tend to lean towards alternative products to mitigate their risk - conversely when insurance rates are soft, and clients feel they can transfer risk cheaply, then traditional insurance market capacity is often the preferred route.

### Example of a US Based CAT Bond alternative to the Traditional Insurance Market Solution

A major car manufacturer with locations in the US had, over a period of years, increasingly leased cars to buyers rather than merely sold the cars at a flat price. Whilst the leasing of vehicles increased turnover for the manufacturer the potential future volatility of the residual value of the car at the end of the lease term (typically 36 months) led to increasing volatility on the manufacturers balance sheet. A significant and public products failure of that manufactures car could lead to a dramatic fall in the residual value of its entire leased portfolio.

The car manufacturer wished to elevate its balance sheet of the liability that is was accruing and explored residual value insurance in the traditional market place. Insurers were happy to quote for the risk however a number of factors led the client to purchase a CAT Bond for this exposure in favour of an insurance policy. Firstly the amount of exposure the client faced was significantly in excess of the amount of capacity available in the insurance market for residual value insurance. Accordingly whilst the client could have bought sufficient cover for minor fluctuations in its residual values, there was insufficient capacity to fully cover a major catastrophe drop in the future value. Furthermore, the client was concerned at the Insurers ability and willingness to pay such a large claim and accordingly the CAT Bond route was selected. This provided not only the required capacity but gave the ultimate guarantee of payment as cash had been deposited by investors into the CAT Bond. Undoubtedly the CAT Bond option was a more expensive route for the client to buy (which is often the case) however it did provide the ultimate security that was required.

When looking at catastrophe programmes, it is not unusual to see a combination of traditional insurance, Finite Risk and CAT Bonds, usually structured using Finite risk insurance at the lowest layers of cover, the traditional market above a Finite programme and typically a CAT Bond at the top of the programme to provide the ultimate security and to reduce the upward pressure on insurance pricing due to demand of significant limits.

Similarly in the area of Credit Risk, there are array of both insurance and banking products available for clients to mitigate risk. Typically a client might buy credit insurance against the risk of a customer defaulting on his trade credit obligations to the client within the normal period of say 30 to 90 days of sale. Surety Bonds maybe taken up by contractors to guarantee the fulfilment of their obligations to perform under contract to their customers. Credit Enhancement policies have been explored and used to improve the debt rating of a customer or a project by indemnifying lenders against defaulted bankruptcy of the client. All of these are "deal specific" insurance policies however a client could elect to buy a Credit Default Swap - a banking market product - to protect itself against the bankruptcy of a counterparty. The Credit Default Swap would not need to be linked to any transaction - the buyer is merely protecting itself to the amount of the swap against the insolvency of the counterparty.

In summary traditional insurance, Finite Risk and ART products, and banking products should all be viewed as a range of tools a client can use to protect itself against certain types of risks. Every clients risk profile will be different from every other client and therefore it is down to that client and its advisors to select the most appropriate risks management /risk transfer techniques from all of the vast array of solutions available. They key for every client however is to clearly establish what risks exist, what the financial impact of these risk occurring is that client and then collaborate with trusted and proven advisors to determine the best matter of transferring or mitigating those risks that the client wishes to avoid.