

## ADVANCED RISK FINANCE

James P. Greenhill

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Résumé de l'article

Cet article fait un tour d'horizon des derniers développements dans le domaine de Financement Avancé du Risque (FAR). Il examine l'évolution des produits FAR en partant des premières techniques, où le but était de trouver de nouvelles manières pour subventionner des expositions à des risques traditionnels, et en allant jusqu'aux derniers produits plus sophistiqués, où le but est de rendre le financement plus complet tout en diminuant les coûts (quelques exemples illustrant des concepts principaux sont inclus). Des lignes directrices sur l'application de ces nouvelles techniques de FAR sont présentées à la fin.

## **ADVANCED RISK FINANCE**

**by James P. Greenhill**

### **ABSTRACT**

In this paper we will look at a number of typical cases in order to introduce some Advanced Risk Financing (ARF) concepts. This includes a review of the evolution of ARF products from early techniques, where ARF practitioners are interested in alternative ways of funding traditional risk exposures, to the latest more sophisticated products, where corporations seek to achieve efficiencies through holistic risk financing approaches. We will discuss how, within the past few years, insurance and other financial techniques have converged, allowing insurance markets to assume risks that are normally laid off in the derivative or capital markets. Finally, we will discuss when and where these advanced applications make sense.

### **RÉSUMÉ**

*Cet article fait un tour d'horizon des derniers développements dans le domaine de Financement Avancé du Risque (FAR). Il examine l'évolution des produits FAR en partant des premières techniques, où le but était de trouver de nouvelles manières pour subventionner des expositions à des risques traditionnels, et en allant jusqu'aux derniers produits plus sophistiqués, où le but est de rendre le financement plus complet tout en diminuant les coûts (quelques exemples illustrant des concepts principaux sont inclus). Des lignes directrices sur l'application de ces nouvelles techniques de FAR sont présentées à la fin.*

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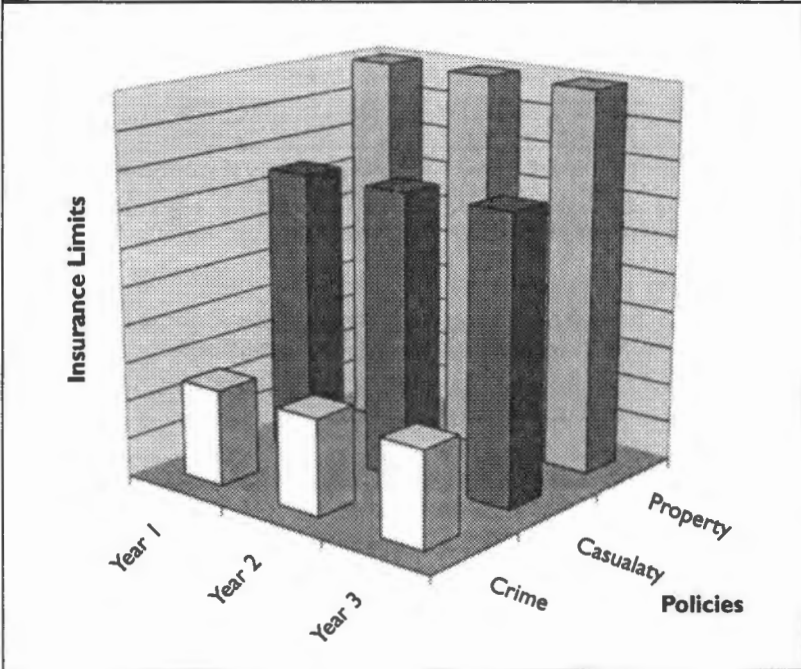
#### **The author :**

James P. Greenhill is partner with Marsh Canada Inc.

## ■ THE EVOLUTION OF RISK TRANSFER

Traditionally, corporations transfer risk to the insurance markets through a series of policies that are renewed on an annual basis. Each policy is negotiated separately to cover specific lines of risk (Figure 1).

**FIGURE 1**  
**MONO-LINE, MONO-YEAR PROGRAM**

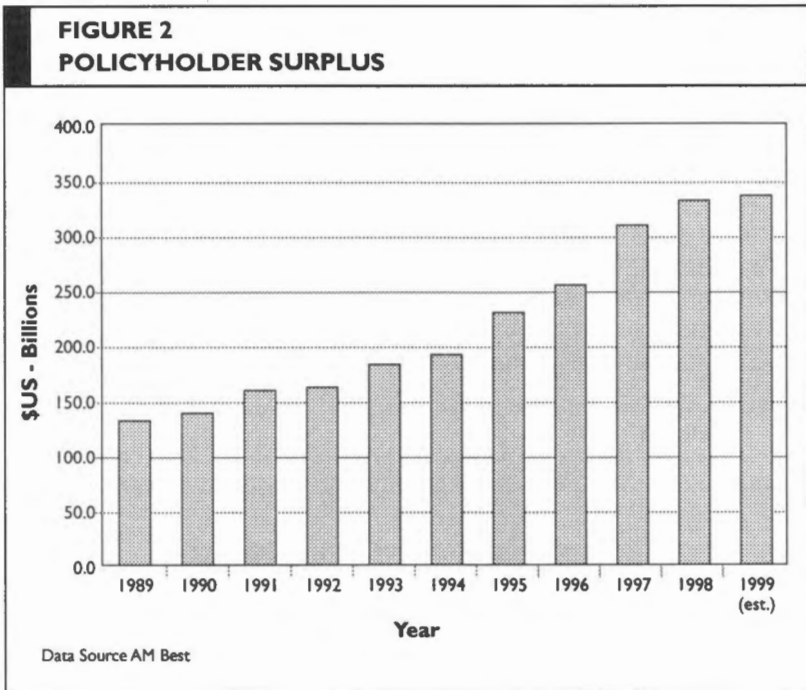


Within the last two decades changes in the risk financing landscape have created new opportunities:

- Corporations have become more sophisticated in terms of the risks they want to transfer and the ways they are willing to do it,
- Risk management industry personnel have developed increasing financial sophistication, breaking out of their traditional silo of transacting conventional insurance,
- Insurance capacity has concentrated in the hands of a few powerful insurers, creating underwriting flexibility through less dependence on reinsurers,

– Insurers have moved to expand their traditional skill sets to underwrite additional, previously non-insurable risks, because of excess capacity in the conventional property and casualty lines (Figure 2),

– Capital markets have entered the ARF field as a means to diversify their investment income.



The evolution of ARF products has occurred in three basic steps. The earlier products, which we will refer to as “traditional” ARF products, are essentially a variation on traditional insurance. They primarily aim to transfer lines of traditional risk more effectively through the use of some alternative form, including loss-sensitive rating plans, application of captive insurance, finite risk structures or loss portfolio transfers.

The more sophisticated recent products, often referred to as “integrated” programs, aim at finding alternative financing for multiple lines of risk, allowing for greater price efficiencies. They include multi-year programs, multi-year multi-line programs, and integrated programs “fused” with risks conventionally not covered in the insurance markets.

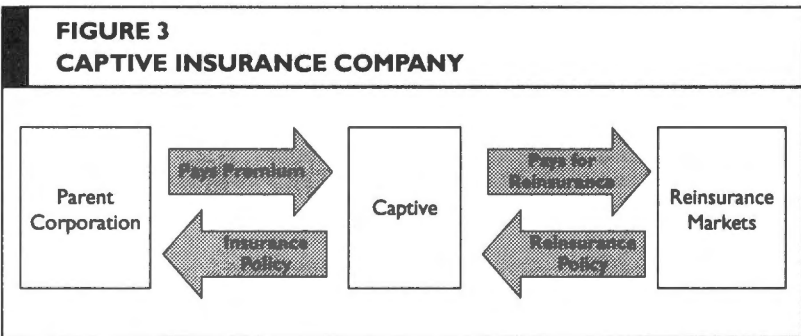
Finally, the convergence of insurance and financial markets has created a number of new applications for ARF, including for example catastrophe bonds, credit enhancement, revenue guarantees and contingent capital.

The following sections will elaborate on each of these stages of ARF development.

□ **“Traditional” ARF Products**

*Loss Sensitive Programs*

Loss sensitive programs come in many forms. Their purpose is to have the insured share in the fortunes of the insurer through some plan by which premiums are adjusted either upwards, downwards or both ways to reflect the insured’s own loss experience. This includes the captive insurers that first appeared in the 1970s, where an in-house insurer is created in a suitable tax and regulatory environment and is used to fund for the cost swings arising from a basic self-insurance approach (Figure 3).



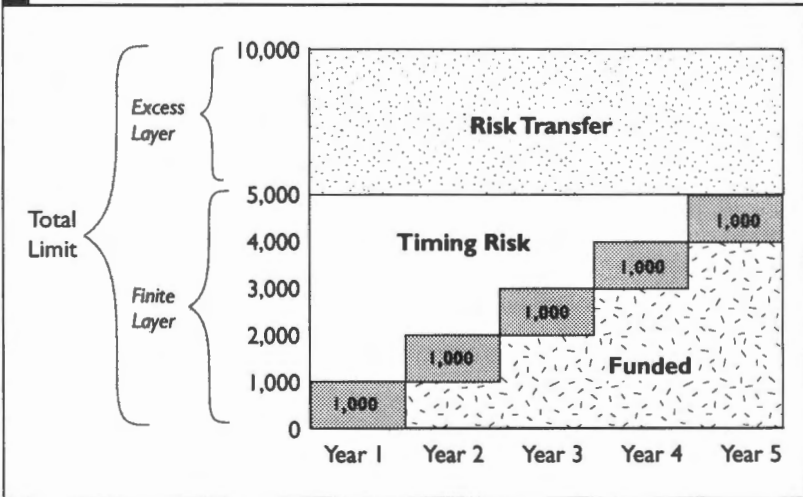
Excess risks of the parent corporation are transferred by the captive insurer to the reinsurance market. Assuming a favorable tax treatment, the parent corporation enjoys the tax deductibility associated with insurance premium paid to the captive, and is able to arrange for insurance coverages that may not be available via conventional markets. If the corporation has a favorable loss experience then the captive reaps a profit for the parent.

*Finite Risk Structure*

Finite risk structures are used by corporations that want to fund against risks that occur infrequently, but with noticeable severity. Payments are made each year into the structure until the

finite layer is fully funded (Figure 4). At the same time the insurer “fronting” the program provides risk transfer capacity over top of the “finite” layer to guard against greater than expected losses in the catastrophic level, thus providing true risk transfer. Should a risk event exhaust the finite limit before the finite layer is fully funded, the insurer either lends the difference to the insured and charges interest, or accepts the “timing risk” and allows the corporation to continue to input funds at the agreed upon rate. At the end of the program period, any funds remaining after paying out for losses are either commuted back to the corporation or rolled over into a new policy. In addition to smoothing costs, the corporation achieves the possibility of paying for the funding as an insurance premium, which could provide some accelerated tax benefits and the opportunity of preventing an unwanted liability from appearing on the balance sheet.

**FIGURE 4**  
**FINITE RISK STRUCTURE**



### *Loss Portfolio Transfer*

A corporation may have to establish a reserve fund for incurred losses that have to be paid out over a long period of time and it may be unclear what the total loss will be, as for example in the cases of asbestos and environmental liability exposures. This adversely affects the balance sheet while no tax benefits are realized until the losses are paid out as an expense.

An ARF solution is to have an insurance company take over the obligation. While this can represent a large one-time cost for the corporation, it must be weighed against the benefit of removing the obligation from the balance sheet and the immediate tax benefit from converting the balance sheet reserves to an insurance premium paid to the insurer.

As demonstrated, even though these methods are advanced in the way they finance risk, they still tend to deal with insurable risks on the traditional line by line basis.

#### □ **“Integrated” ARF**

Another way in which risk can be financed more efficiently is to blend independent risks together. Within risk financing, the “portfolio effect” is where the overall volatility of a portfolio of risks is less than the sum of the volatilities of the individual risks. The result is that the amount required to finance or transfer the total portfolio is less than the total cost of transferring the risks on an individual or “silo” basis.

#### *Multi-Year Programs*

In recent years, companies have looked to take further advantage of this concept by moving from mono-line programs with annual renewals to mono-line with multi-year life spans (Figure 5), on the basis that loss history is independent from one year to another. Additional advantages for the insured are:

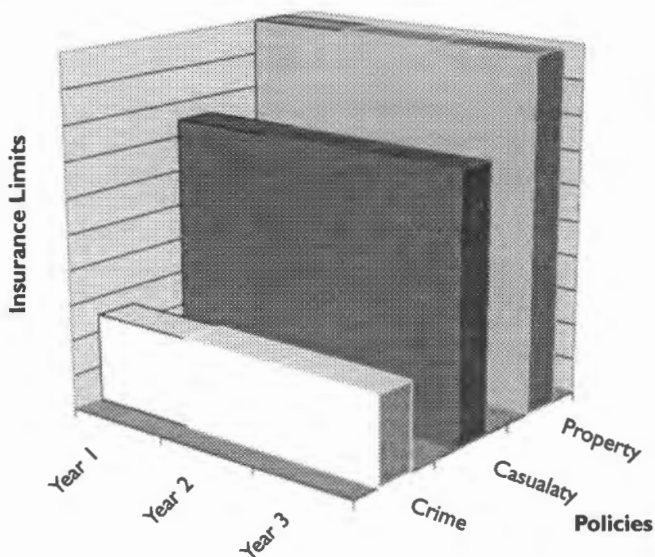
- Guaranteed prices that, over time, could counter an adverse or “hardening” insurance market,
- Simpler administration due to fewer renewals,
- Possible lower prices due to economy of scale effects from the amount of premium being placed in the program.

#### *Multi-Year, Multi-Line (Integrated) Programs*

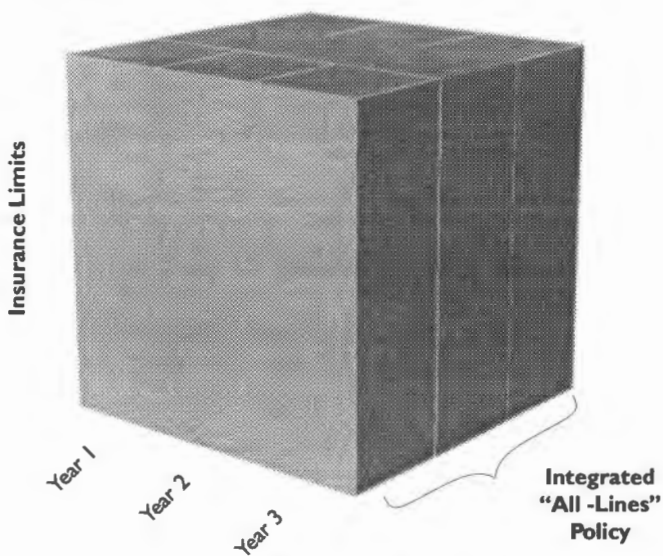
The next stage involves multi-line as well as multi-year programs (Figure 6). An advantage over a multi-year program is the coverage of “gaps” that might occur between individual lines of insurance.

When placing integrated programs, corporations have to be aware of the following possible disadvantages:

**FIGURE 5**  
**MONO-LINE, MULTI-YEAR PROGRAM**



**FIGURE 6**  
**MULTI-LINE, MULTI-YEAR (INTEGRATED) PROGRAM**





- Such programs would be placed with a limited number of insurers, which may force the corporation into breaking some long-term relationships.

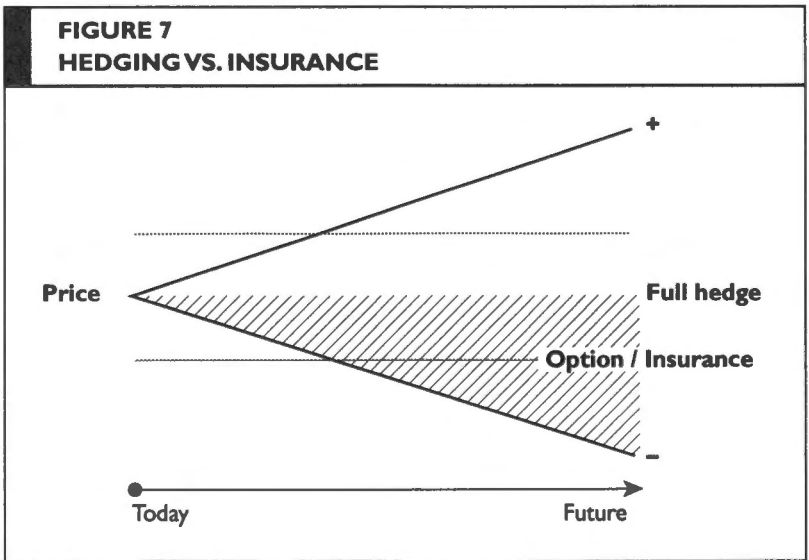
- The corporation would have to consider if it wants to leave control of its risk financing in the hands of one or two providers.

- Limits from several unassociated events may erode the level of protection (limit) that the program provides. To guard against this an insurer could allow for the reinstatement of limits for additional premium.

***Multi-Year, Multi-Line Programs with Non-Conventional Risks (RiskFusion)***

A critical mass of premium may encourage insurers to consider lines of risk they would not normally take on. For example a multi-year, multi-line program has been placed in the US that fuses foreign exchange risk with traditional property and casualty lines. Other possible non-traditional risks exposures that could be included in a fusion program are interest rate (fixed or floating), commodities (tradable or non-tradable) and weather.

Part of the process is realizing how similar an insurance program is to the purchase of an option. As the diagram below indicates (Figure 7), the drop in value of an underlying asset can be offset by the purchase of a put option. Similarly the purchase of an insurance policy prevents the complete loss in value of a company



asset (for example a property policy indemnifying a corporation for a factory fire). A corporation reduces the cost of the put option by moving it further “out of the money”. The same method is used to reduce the cost of insurance, except it is referred to as “raising deductibles”.

To reduce costs, a variation of this program is the “dual trigger” where the insurer does not pay for losses unless multiple events occur, either internally or externally. For example a program not paying unless there are losses in both the non-conventional and “traditional” lines of risk.

The advantages and disadvantages of multi-year, multi-line products listed in the previous section also apply to these programs

#### **Hybridization of Insurance and Other Financial Products**

The fusion of a foreign exchange risk with conventional insurance represented one of the first times insurance markets looked at risks that are normally transferred in the capital or derivatives markets.

Hybridization has continued with other forms of ARF that are neither pure insurance, nor a pure capital market solution nor a derivative product.

#### ***Catastrophe Bond***

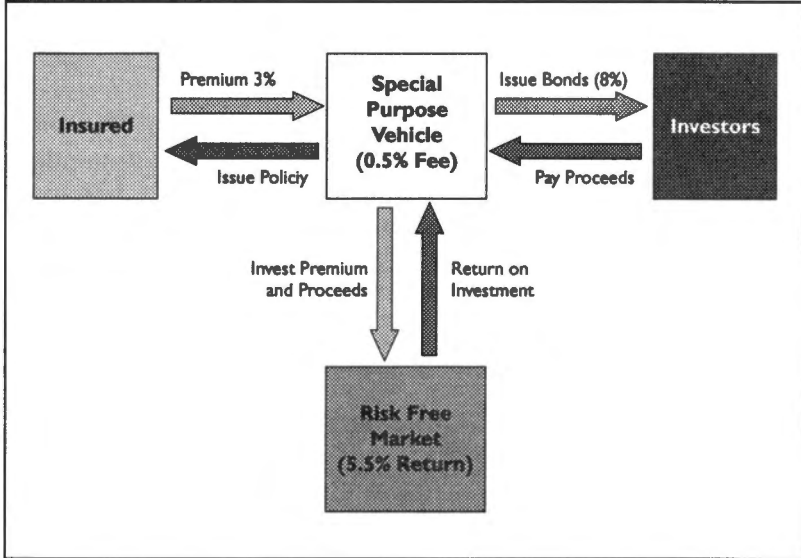
In a conventional bond issue, the bond (and its associated rate) reflect the risk that the issuers will not pay out on their obligations.

Catastrophe bonds (Figure 8) operate accordingly to provide a capital response to risk financing. Often arranged through a special purpose vehicle, the bond payments are linked to predetermined risk events such as an earthquake with a minimum intensity or a hurricane with a certain force. The measurement of the triggering risk is through the use of an impartial and external source, such as meteorological services. If the risk event occurs, the issuer would not be obliged to repay the debt, but would use the funds to indemnify the purchaser of the policy.

#### ***Credit Enhancement***

With both the insurance and finance world sharing views on risk, insurance has started to move into other areas of finance, such as credit enhancement.

**FIGURE 8**  
**CATASTROPHE BOND**



For example, a European aircraft manufacturer secured an insurance program to cover potential shortfalls in revenue streams from a portfolio of leased aircraft. The broker modeled the risk of a drop in income due to various factors (such as customer default, recession, etc.) and took the results to the insurance markets. In exchange for a premium payment, the syndicate of insurers guaranteed to pay out, if required, to keep the revenue stream above a certain level for a 15-year period. In effect, with the transaction of the policy, the manufacturer was wrapping this pool of leased assets with the A-level credit rating of the insurers.

***Revenue Guarantees, Bottom Line Protection***

With these advances in thinking on risk, its measurement and the ability to market it, we can drill down further, past the assets that generate the revenue stream and look at the underlying factors that affect them. For example, insurers have looked at covering the loss of revenues due to:

- Reduced attendance levels – for example the number of people attending amusement parks, or the ridership for a railway line,
- Adverse weather effects – for example an insurer covering a manufacturer of winter recreation products for losses in revenues because of unusually warm weather,

– Volatile supply prices – for example collaring the cost of non-tradable commodities.

### ***Contingent Capital, Hedging Programs***

Insurance could be used in capital planning or hedging strategies, for example an insurance policy to:

– Guarantee the availability of lines of credit in the event of a predetermined loss. This form of contingent capital has the advantage of not straining the credit lines of the insured and at the same time the insurance premium is tax deductible,

– Be used for hedging commodity and foreign exchange risks instead of participating in the forward and futures markets. While these latter markets are very efficient, insurance might still hold the advantages of:

– Covering all lines of a company's exposure with a single program,

– The possibility of lower costs when combined within a portfolio of risks.

### **Is ARF Suitable For You?**

To maintain its competitive advantage in the future, a corporation has to prevent or transfer the volatility that major risk events bring. Advanced Risk Financing has the increasing potential to transfer these risks efficiently, effectively and economically. There are a number of considerations when looking at ARF as an appropriate and cost-effective solution.

First, significant loss exposures that could materially effect the company's performance are ideal candidates for a search for a suitable ARF product, especially if there is no viable traditional insurance or conventional capital market solution.

Second, corporate financial resources have to be commensurate with the size and the complexity of the problem.

Thirdly, senior management has to be concerned enough about risk coverage to devote time and resources to solving the problem. ARF requires management to break out of the mold of traditional risk transfer and consider whether:

1) Risks are currently transferred at an acceptable coverage level,

2) There are risks that are not currently covered, but could potentially be covered via ARF products,

3) Risk coverage is reassessed on a regular basis to determine if any new ARF products in this rapidly expanding market could be suitable for the corporation.

The successful implementation of ARF helps to protect corporate value and shows stakeholders that management has taken steps to guard against adverse risk in keeping with the progress of the risk management field.