Contact:

For general ART enquiries:

Peter Allen
Head of Alternative Risk Transfer
peter.allen@lloyds.com
++ 44 (0) 20 7327 5040

Editor:

Simon Johnson
Business Development Executive
simon.johnson@lloyds.com
++ 44 (0) 20 7327 5908

Lloyd's,
One Lime Street
London EC3M 7HA
Tel: 020 7327 1000
Fax: 020 7327 5599

www.lloyds.com

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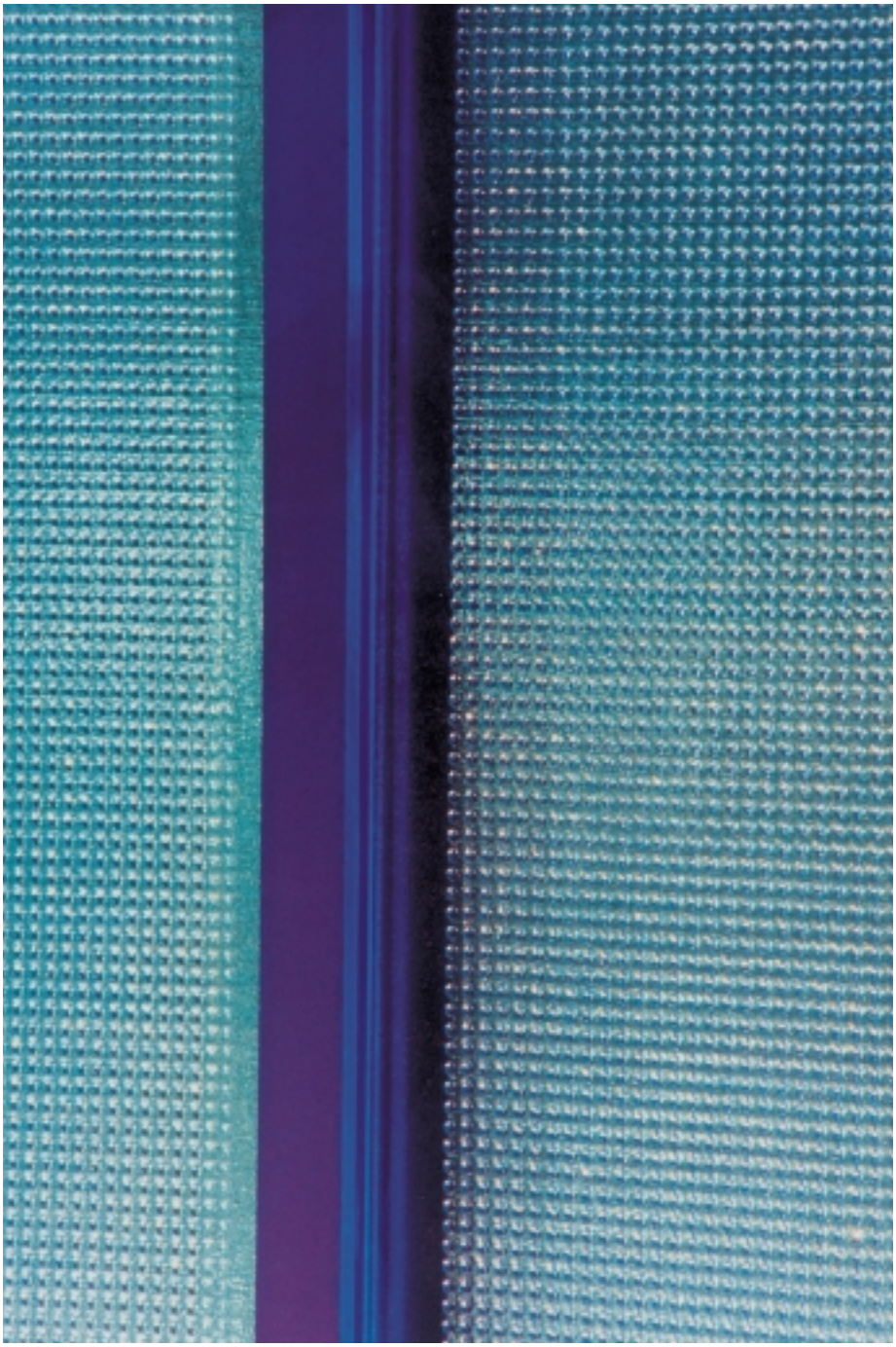

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Welcome to the fourth edition of *ARTwork*. We hope that you have enjoyed the previous editions and found the content interesting and useful.

As you may be aware, we released details last September of the new regime for the regulation of financial guarantee insurance within Lloyd's. This edition contains two articles, one which sets out the structure of the new financial guarantee regime and one which explains the modelling used to support the capitalisation structure. If you have any questions regarding financial guarantee, please feel free to contact us.

In addition, we are looking at the placing of finite risks within Lloyd's and continuing our work on securitisation techniques.

Again, if you would like to comment on any of the articles in this edition, or make suggestions for future editions, please contact me or the editor, Simon Johnson.

Peter Allen
Head of Alternative Risk Transfer

Financial Guarantee Insurance at Lloyd's

by Simon Johnson, Lloyd's

Lloyd's response to convergence

Most ART products import techniques, attitudes or language from the capital markets and investment banking into insurance and reinsurance. Although ART first gained prominence in the early 1990s as a result of cat bonds, a significant growth in the reverse phenomenon, namely property/casualty insurers assuming business, credit and banking risk has been observed over the last year.

The insurance cycle has partially been the cause for this growth. As a consequence of the softest market for a generation, underwriters have been exploring more innovative ways to risk their money. Bankers have noticed that there is regulatory arbitrage between the BIS banking capital adequacy provisions and the capital demands made on insurers. The events of 1998 illustrated to banks their high level of exposure to spikes in their credit book. Other reasons reflect more secular trends. The insurance market habitually seeks to expand the universe of insurable risk to cover the previously uninsurable. So, if one expands the boundaries of operational risk, it follows that more business and credit risk will be assumed by an insurer.

Over the past eighteen months these trends have resulted in a dramatic drive by major reinsurers and investment banks to transfer credit and business risk from the banking and capital markets into the insurance markets. Lloyd's has naturally been keen to take advantage of this development.

The background to the changes

The underwriting of credit and financial guarantee business has been variously prohibited or restricted at Lloyd's since 1924 following a scandal in which Stanley Harrison, the underwriter of a five-Name syndicate, lost £367,787 by guaranteeing the value of used cars in dealers' lots.

In 1997 the Council of Lloyd's took the decision to review the existing financial guarantee regime, as detailed below. In addition to the structural changes to the industry outlined above, the main reasons for the review were that the regulatory apparatus was not furnished with the necessary tools to make sound judgements about systemic risk; it discouraged or prevented innovation; and the casework approach was cumbersome and might result in the loss of business. In its strategic planning document, Priorities for Growth 2000-2003, the Lloyd's Market Board made a commitment to "complete the implementation of the Council's decision to change the basis of regulation of financial guarantee insurance". It was decided early on that the risk assessed capital framework provided a sound and prudent basis for such regulation.

The old regime

The regulation currently applicable is the Lloyd's Financial Guarantee Insurance Regulation. This defines financial guarantee insurance as a range of financial and

economic risks including default and insolvency, asset values, revenues, currency and commodity risks (See Table 1.). It provides that such insurance be written only with the prior written approval of the Council, which acts through the War, Civil War and Financial Guarantee Committee. Over the years the committee has given case by case approval to a regular flow of applications, but more significantly has given block approval, subject to certain conditions, to the writing of a number of classes of business: contract frustration; trade credit; surety bonds; mortgage indemnity; and collision, salvage and general average guarantees.

TABLE 1.

Extraction of Lloyd's Financial Guarantee Insurance Regulation outlining the definition of financial guarantee within Lloyd's.

The events referred to in paragraph 3 of the regulation are any of the following:

(a)	the financial failure, default, insolvency, bankruptcy, liquidation or winding up of any person whether or not a party to the contract of insurance;
(b)	the financial failure of any venture;
(c)	the lack of or insufficient receipts, sales or profits of any venture;
(d)	the lack of or inadequate response or support by sponsors or financial supporters;
(e)	a change in levels of interest rates;
(f)	a change in rates of exchange of currency;
(g)	a change in the value or price of land, buildings, securities or commodities;
(h)	a change in levels of financial or commodity indices;
(i)	any liability or obligation under an accommodation bill or similar instrument.

The underlying riskiness of financial guarantee

Three aspects of financial guarantee insurance business make it potentially riskier than the business traditionally underwritten at Lloyd's:

- Lloyd's underwriters are relatively **unfamiliar** with it. Lloyd's has not traded in many areas of financial guarantee for 80 years; those classes currently exempted from the prohibition tend to be evolutionary developments from existing business – such as the development of trade credit written off a book of cargo business or mortgage indemnity written off a book of term life.
- It is more vulnerable to **moral hazard**. Some forms of financial guarantee create an asset which can be used to support further transactions. Most are in some respects a commercial alternative to other financial instruments which make use of different capital and pricing methods. Buyers can therefore weigh up insurance against other forms of finance (whereas in conventional insurance they usually just weigh up insurance against no insurance) and underwriters may find themselves being bet against by assureds.
- It is more exposed to **correlation**. The result of a macro-economic catastrophe may be that such business – for example a mixed book of residual value, credit, contract frustration and mortgage indemnity business in a number of countries – responds adversely and simultaneously to one crisis.

During late 1999 and 2000 work continued to investigate and determine how this business might prudently be supervised. Work in particular focused on reaching a landing in three areas: capitalisation, competence, and legal and regulatory issues.

The new capitalisation structure

During 2000 Lloyd's developed and agreed a bespoke capitalisation structure for financial guarantee insurance. The principal motivation for devising a structure different from the conventional risk based capital system is that the higher levels of correlation found in these classes, combined with the possibility that syndicates will write relatively few and relatively large risks, means that

premium (as used by the mainstream risk based capital system) is not the only and necessarily best proxy for risk.

In this issue of *ARTwork*, Derek Bain of E&Y examines in more detail the underlying justification and performance of the capitalisation structure. However, in summary, syndicates set aside capital (known technically as "Funds at Lloyd's") equal to the maximum of three terms: an exposure term, which relates to the aggregate liability incurred by the syndicate; a premium term, which relates to the volume of business being underwritten; and a term derived from the impact of the most damaging of a number of realistic disaster scenarios on these risks.

The reason for choosing this three-pronged method is to account for the effect of correlation and for the inaccuracy of premium alone as a proxy for risk.

Allowance is made in the structure for credit facultative and financial guarantee-specific reinsurances placed with markets rated A+ and above, up to a maximum of £25m or 5% of syndicate stamp for each exposure. The credit factor is arrived at by applying S&P charge factors to the relevant tranches of the potential reinsurance recoveries used in the above calculation. The premium multiple of 230% was initially derived from comparable figures displayed in the US financial guaranty industry but has been examined and validated in the exercise undertaken by E&Y. To allow for the effect of multi-year policies, syndicates will be required to recalculate the additional FAL for all valid policies in every year.

Lloyd's has emphasised to interested parties that this capitalisation structure is a "first stab" at a prudent underpinning for Lloyd's syndicates wanting to enter this business. Informed comments on how it may be improved are welcome.

The new pre-authorisation process

There is consensus in the Lloyd's market that this business should only be transacted by a limited number of agents, syndicates and underwriters who have passed through a pre-authorisation process.

The pre-authorisation process for each syndicate is designed to evaluate the agency's skills, controls and resources in the specific areas of financial guarantee business to be underwritten. A syndicate writing the currently permitted classes of financial guarantee which wants to move into the new classes will have to obtain specific permission to do so. This approach accords with the role Lloyd's will have under the new FSA regime, in that the authorisation of each syndicate is a matter reserved solely for Lloyd's.

The agent managing the syndicate is required to submit a plan outlining the proposed underwriting in the currently prohibited classes, and to show that it has:

- access to information and intelligence about the risks, the country of risk, and the buyers of such insurance;
- the skills to use that information to price risk independently of the judgement of those buyers, including where necessary technical modelling skills;
- adequate resources to support the underwriting (actuarial, legal etc) and a team-based underwriting approach that ensures that this input is sensibly used;
- a good understanding of the potential motivations for purchase among buyers, and an awareness of the enhanced risk of moral hazard;
- effective control of underwriting in this area and an understanding of potential difficulties in respect of claims recovery;
- the ability to monitor aggregate exposures adequately, and in particular the ability to calculate realistic disaster scenarios which are set centrally and also to identify and calculate realistic disaster scenarios set at syndicate level;
- an adequate reinsurance programme;
- an effective process of independent expert review of risks;
- knowledge of the licensing requirements in all relevant territories and of the limits of insurability under UK law;
- an awareness of the enhanced possibility of fraud in these classes and adequate procedures for advising Lloyd's and other authorities of suspected fraud; and
- the ability to produce information and reports to the managing agent.

The above criteria are to be applied in a manner appropriate to the business the syndicate proposes to write. For example, if a syndicate wishes to write only a book of aviation residual value insurance, the agent will

have to show only that it meets the above criteria in that area. The pre-authorisation process will be undertaken by Lloyd's, advised by a Financial Guarantee Panel of internal and external experts.

Legal and regulatory issues

The type of product that Lloyd's underwriters may offer is limited to insurance and guarantee business by statute, EU directive and agency agreement. When the current general prohibition on financial guarantee insurance is removed, syndicates should naturally ensure that all contracts are legal. For example, even without the financial guarantee restrictions, contracts for differences and gambling agreements cannot be issued as Lloyd's policies. The definition of insurance in UK law is not statutory and is therefore somewhat imprecise. Provided that a contract can be legally formulated as insurance, even in circumstances (such as types of hedging against currency or commodity risk) where it is more conventional to use another form of financial instrument, it will be insurable at Lloyd's.

To assist pre-authorised syndicates Lloyd's will shortly issue guidance on the legal limits of insurability in the UK, to be summarised in ARTwork V. The final responsibility for ensuring that policies are legally insurance or reinsurance contracts lies with the underwriting agent. The guidance will deal only with the UK and EU position. The general legal position and our licensing position in other territories are, not surprisingly, diverse. Agents will be required to consult with Lloyd's Worldwide Markets before attempting to issue a policy outside the EU.

At some stage in the future, when the new regime has "bedded down", it is proposed to change or remove the Financial Guarantee Insurance Regulation. Lloyd's syndicates writing business in the currently exempted financial guarantee classes only (including trade credit, surety bond reinsurance, contract frustration, mortgage indemnity and trade finance) will not require pre-authorisation and will not be required to provide additional FAL.

Next steps

At the time of writing Lloyd's has received two expressions of interest from syndicates wanting to write this business in 2001, and a further three for 2002. Because of the time required to create and develop the necessary investment in this complex and demanding field, a large market is unlikely to develop quickly at Lloyd's. However, the ability of underwriters to consider assuming contracts with greater elements of business and operational risk will be an increasingly important aspect of Lloyd's competitive positioning as this market develops.

Simon Johnson works on the ART team at Lloyd's and can be contact by email at *simon.johnson@lloyds.com* or on *+44 207 327 5908*

Unwrapping Credit Enhancement Modelling

by Derek Bain and Tony Jones, Ernst & Young

Derek Bain and Tony Jones describe the work recently undertaken with Lloyd's to investigate the resilience of the Lloyd's financial guarantee capitalisation requirements. This brings to insurance, pricing and risk analysis methods used in the capital markets.

Recent years have seen an increase in the demand for financial guarantee products to be provided by the insurance markets. This convergence with the capital markets has led to the increasing use of sophisticated mathematical models in the underwriting of such risks. While such models undoubtedly add to an underwriter's armoury they are not a substitute for sound risk management practices and experienced underwriting judgement. In our experience it is the whole risk management framework that protects a company or syndicate from adverse experience, and mathematical modelling is only one piece of such a framework. However, one area where such models can add significant value is the investigation of capital requirements.

From 2001 it will be possible for a Lloyd's syndicate to underwrite financial guarantee business. One of the central changes to the regulatory regime has been the introduction of a new capitalisation requirement for syndicates writing such business.

Many financial guarantee risks have at their heart some form of credit enhancement or credit default risk. Models for pricing and managing these have been developed by the banking and capital market industries. We have applied these techniques to model the loss experience of a syndicate writing a portfolio of credit enhancement business in order to investigate the resilience of the financial guarantee capitalisation requirements.

The proposed capital requirements

Lloyd's proposed capital requirements are based upon a syndicate being required to set aside as Funds at Lloyd's (FAL) the maximum of:

1. The "exposure" method, which is defined as

   Capital Required = $\sqrt{\sum_{i=1}^{n} k_i^2} + C$

   Where n is the total number of risks, k_i is the net nominal value of the i^{th} risk and C is a reinsurance credit risk factor.

2. The "premium" method, which is defined as 230% of gross premium written on the portfolio of risks.

3. The "RDS" method, which requires syndicates to assess the impact of a number of realistic disaster scenarios.

Modelling a bond portfolio and its capital requirements

In order to assess the adequacy of any proposed capitalisation regime it is necessary to define a measure by which the adequacy will be judged. The measure we have adopted is the Expected Syndicate Loss ("ESL") (where a syndicate loss is defined as the excess of portfolio losses over the capital plus premium) over the lifetime of a portfolio of credit enhancement business. The steps below summarise how this expected loss is calculated within our model (the approach follows that of CreditMetrics™, full details of which can be found in [1]).

Step 1 – Generate a portfolio of loans and its associated capital

Step 1A – Generate a portfolio of loans

A portfolio of loans with an average nominal value of £35 million was generated. The nominal value of each loan is generated by randomly sampling from a loan size distribution with a mean of £500,000 (the distribution chosen was a beta (10,10) defined over the range [250,000:750,000]). In practice an individual syndicate's portfolio will depend on its specific circumstances, these assumptions are based on the information presently available on what might be written in 2001.

Step 1B – Calculate the associated capital requirement

The "exposure" capital requirement was calculated directly from the gross policy exposures (i.e. the loan nominal values). No reinsurance was assumed.

The "premium" capital requirement was estimated from the expected portfolio loss cost produced by the simulation model. This is based on the assumption that actual premium would be based on accurate modelling work. In practice this would be a source of additional uncertainty.

The "RDS" capital requirement was ignored in this model. Thus the capital available to syndicates could be more than is included in this analysis.

Step 2 – Generate a correlated list of defaulting loans

Central to any estimate of the aggregate portfolio loss distribution is a treatment of the correlations between bonds within the portfolio, because ignoring such correlations will understate the potential syndicate loss. However before tackling this we first address the simpler issue of calculating independent default rates.

Step 2A – Independent default rates

Independent default probabilities can be assigned to individual loans via a credit rating system. Credit rating systems are generally qualitative systems whereby an alphabetic label is assigned to a loan. These labels define an ordinal ranking of the probability of default. In order to develop a quantitative model it is necessary to associate a default probability with each rating category. These mappings between rating category and default probability have been developed by credit rating houses (such as Moody's and Standard & Poor's) by observing the historic default experience of loans within each rating category.

The methodology we have used relies on assigning a credit rating to each loan and using these ratings to determine the loan default probability.

Step 2B – Correlating the default rates

When modelling correlations we have followed the CreditMetrics™ approach. This approach can be described as an asset value approach and follows Merton's option theoretic approach to pricing corporate debt (see [2]).

Essentially, the method is built on the key assertion that the correlation between the asset returns of obligators can be used to estimate their default correlation.

Merton's option theoretic model implies that the (log) normalised assets returns, R, are standard normally distributed. Using this model for asset returns we can establish a connection between asset value default thresholds (i.e. the level of assets below which a firm will no longer be able meet its debts) and loan default probabilities.

In order for the asset value to dip below the default threshold the asset returns must be below some asset return default threshold. The probability of this occurring can be expressed as:

$$Pr\{Default\}=P_{def} = Pr\{R<Z_{def}\} = \Phi(Z_{def}) ,$$

where Z_{def} is the asset return default threshold and Φ denotes the distribution function for the standard normal distribution. As the probability of default is known (assuming that a credit rating has been assigned to the loan) the default threshold may be calculated by inverting the standard normal cumulative distribution function.

$$Z_{def} = \Phi^{-1}(P_{def})$$

In order to demonstrate how the introduction of correlations is achieved we consider the case of a

portfolio comprising only two loans. Firstly we look at the correlation between the asset returns of our obligators. Once we have estimated this correlation, ρ, we can express the joint probability of default as

$$Pr\{Obligator\ 1\ defaults\ and\ Obligator\ 2\ defaults\} = P(R_1 < Z_{def1}, R_2 < Z_{def2}\}$$

$$P(R_1 < Z_{def1}, R2 < Z_{def2}\} = \Phi(\ Z_{def1}\ , Z_{def2}, \rho)$$

where $R_{1,2}$ are the normalised asset returns of obligators *1* and *2* respectively, $Z_{def1,2}$ are the asset return default thresholds and $\Phi(Z_{def1}\ , Z_{def2}, \rho)$ is the cumulative distribution function of the bivariate normal distribution with correlation ρ (see figure 1).

Therefore, in order to determine which of our loans has defaulted we need only generate two correlated normal random variables. Each of the correlated normal random variables is then attributed to a loan and compared to a default threshold to determine if the loan has defaulted.

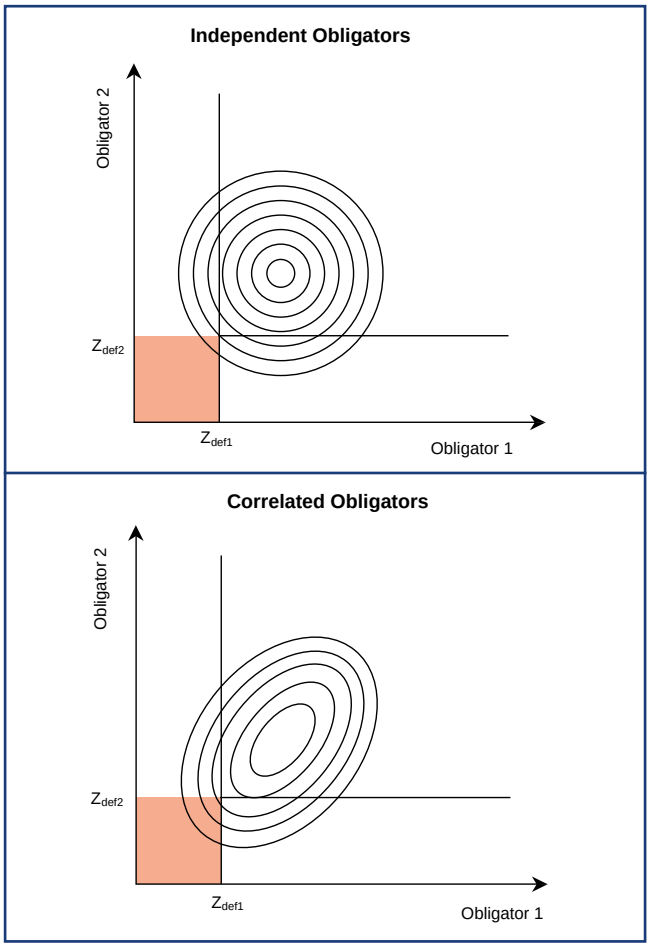

Figure 1: Contour plots of independent and correlated bivariate normal density showing joint default probability (shaded area) and individual default probabilities (see [3])

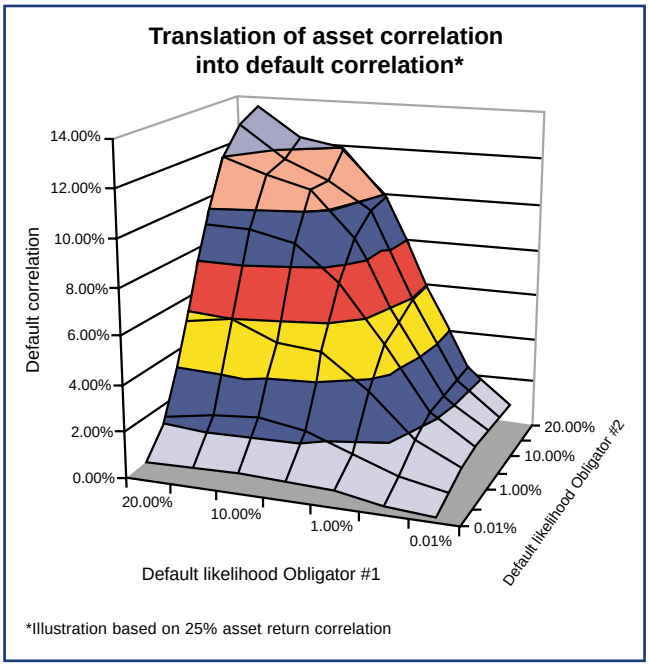

Figure 2: The use of a multivariate normal distribution imposes a correlation structure on the default rates whereby lower rated obligators are more correlated than higher rated ones (see [1]).

This method of generating correlated defaults is easily extended to arbitrarily large portfolios by replacing the bivariate normal density with correlation ρ with the multivariate normal density with covariance matrix Σ.

Before moving on to examine the estimation of recovery rate it is worth examining the implication of the above approach. The use of the multivariate normal distribution imposes a correlation structure on the bond default rates with the effect that lower rated debt becomes more heavily correlated than higher rated debt (figure 2), an effect which has been observed in practice. (see [3]).

Step 3 – For each defaulted loan generate the size of the loss

The main determinate of the size of loss is the level of seniority of the debt. Average loss rates can range from 50% of the nominal value for senior secured debt up to 85% for junior subordinated debt. Additionally, as pointed out in [1], loss rates generally exhibit high levels of volatility.

Our loss rates are randomly generated from a beta distribution (see [1] for a more detailed discussion).

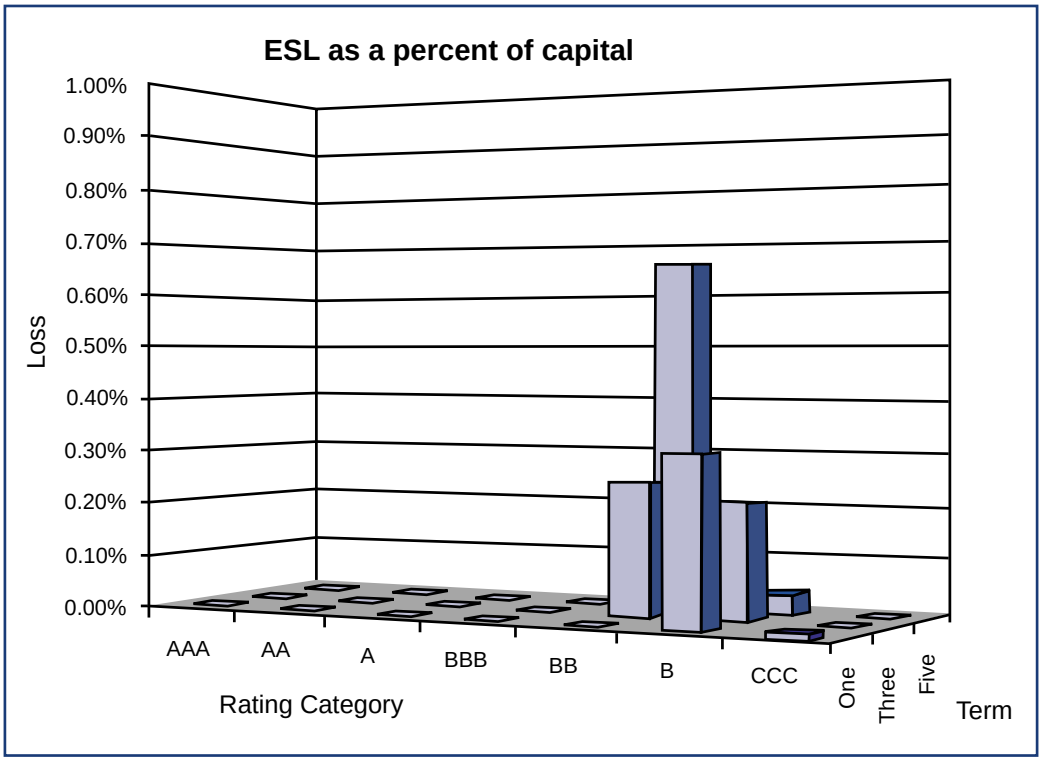

Figure 3: Graph of the ESL as a percentage of the capital required to commence underwriting for a number of portfolios ranging from 100% AAA one year term to 100% CCC five year term.

Estimated Syndicate Losses

Steps one to three above summarise the approach to calculating the portfolio loss for one simulation. It is then possible, using Monte Carlo simulation, to estimate a portfolio loss distribution from which an average portfolio loss can be calculated.

To determine the ESL it is first necessary to calculate the syndicate loss arising during each simulation. To do this the capital (as calculated in step 1B) plus premium is compared with the estimated portfolio loss. These syndicate losses are then averaged over all simulations to estimate the ESL (see figure 3).

Whether the "exposure" or "premium" method is triggered depends primarily on the probability of default. When this is low (i.e. high rated debt or very short term loans) the exposure method dominates. As the probability of default increases (i.e. low grade debt and longer loan terms) the premium method becomes progressively more important. The area where the ESL is highest tends to be around the cross over points between the two methods. However, even at these points the ESL remains very low.

References

[1] Gupton G., Finger C. and Bhatia M. (1997), "CreditMetricsTM – Technical Document" J P Morgan.

[2] Merton, R.C.(1990), "Continuous- Time Finance", Blackwell.

[3] Pawlowski J., Malhotra N. and Manning J (2000), "Credit Models: the next generation", Cedit Magazine May 2000 Volume 1/Issue 4.

Tony Jones is the lead partner in Ernst & Young's P&C Actuarial practice and can be contacted by e-mail at *tjones@cc.ernsty.co.uk* or by telephone on *++ 44 7951 1474*

Derek Bain is a senior actuary in Ernst & Young's P&C practice with specific responsibility for ART. He can be contacted by e-mail at *dbain1@cc.ernsty.co.uk* or telephone on *++ 44 7951 1542*

Alternative Risk Transfer: A Market Research Perspective

by Chris Mundy, Marsh Risk Finance

What do buyers really want?

In the insurance industry, almost everyone has a view about alternative risk transfer. The general consensus appears to be that it is 'a good thing', although demand is not as high as had been expected. There is a large minority which thinks that it is all a waste of time, that it is a product of the soft insurance market and will disappear over the next couple of years as insurance companies focus back on their core business of conventional risk transfer. I believe that this would be a tragedy for the insurance sector. New ideas and new products which combine insurance and capital market techniques are here, now, and can only become more relevant. In a period of consolidation in every industry sector, when growth is being achieved as much by merger and acquisition as it is by real market growth, and M&A activity is ripping through the medium-to-large enterprises, conventional risk transfer is becoming less and less attractive for the major corporations.

Marsh has been surveying major corporations for three years, and it's most recent review – published over the summer – gives some clear messages to buyers and providers alike. When it started, this survey was unique in asking actual and potential buyers of ART products what they wanted from the insurance and capital markets, rather than focusing on the providers and what they would like to provide.

In this article, some of the key findings from the latest review have been summarised, with the aim of highlighting what the buyers have been telling us, the industry. It shows that if we ask, our clients will tell us clearly what they need or want. If we now fail to take heed of that advice, then it will be our own fault if the buyers move on to other providers. This article will illustrate the findings of the research and point out issues for consideration – you must decide how relevant they are to your business and what they mean for you.

Risk retention capabilities

Demonstrating that the survey is concerned with corporations with very differing risk appetite or aversion, the self-defined retention capability of a representative sample of the audience ranges from US$1.5Bn to US$1.4M, and the cost of risk (defined as the cost of insurance, self-insurance and risk management) from US$60M to US$0.5M.

Table 1 – Retention / Cost of risk profile (US$)*

Retention capability	Cost of risk
$1,500,000,000	$13,000,000
$250,000,000	$18,500,000
$150,000,000	$60,000,000
$100,000,000	$20,000,000
$100,000,000	$26,000,000
$50,000,000	$24,000,000
$50,000,000	$5,100,000
$40,000,000	$50,000,000
$32,000,000	$6,400,000
$26,000,000	$6,896,550
$25,000,000	$28,000,000
$24,000,000	$16,000,000
$20,000,000	$500,000
$16,000,000	$590,000
$16,000,000	$20,000,000
$10,000,000	$1,500,000
$5,000,000	$14,000,000
$1,600,000	$3,200,000
$1,400,000	$1,812,500

It must be stressed that these figures are the respondents' own calculations, and therefore reflect their own perceptions and appetites for risk.

There continues to be wide variation in the ratio of cost of risk to retention capability. One would normally expect to see the cost of risk as a fraction of the total retention capability, but in six of the current sample the cost of risk exceeds retention capability. This is at odds with the concept of a soft insurance market and is indicative of a gradual hardening of conventional insurance rates over the three years of the survey.

Perhaps more interestingly, when we put declared revenues together with the retention capability and cost of risk, we have the following ratios:

Table 2 – Revenue ratios*

Retention capability: revenue	Cost of risk: revenue
34.04%	2.05%
21.64%	1.67%
7.82%	1.26%
5.71%	1.17%
4.17%	0.78%
2.86%	0.77%
1.58%	0.77%
1.18%	0.58%
1.10%	0.52%
1.00%	0.47%
0.77%	0.29%
0.62%	0.27%
0.62%	0.24%
0.48%	0.19%
0.45%	0.17%
0.42%	0.14%
0.42%	0.12%
0.38%	0.10%
0.20%	0.10%

Unlike the first chart, where the retention and cost of risk are related, these ratios are ranked separately from highest to lowest. Although the calculation must take into account a wide range of factors, the make-up of which will differ substantially from company to company, one might assume that the norm for risk retention capability would be around 5% of revenues and the cost of risk range between 0.5% and 1%.

Alternative Risk Transfer

Turning to the types of ART products used, the next chart shows the respondents' views of the products most likely to interest them and also what products are actually in use. Whilst it is obvious that only those interested in ART are likely to respond to a market survey on the topic, it is clear that there are users of these products. The challenge for the ART providers will be to align the products with buyers' needs.

Table 3 – Use of ART mechanisms*

	Never	Unlikely	Maybe	Likely	Definitely	Using
Finite risk insurance	4%	42%	23%	12%	0%	19%
Loss portfolio transfers	4%	58%	19%	12%	4%	4%
Insurance derivatives	8%	54%	19%	12%	4%	4%
Dual trigger policies	12%	46%	27%	15%	0%	0%
Risk securitisation	8%	54%	27%	12%	0%	0%
Catastrophe bonds	12%	54%	27%	8%	0%	0%
Structured notes	12%	54%	31%	0%	4%	0%

One difference between last year and now is the percentage of 'Maybe' answers. The reduction from 37% to 25% perhaps reflects greater clarity the relevance of ART products to risk transfer needs.

The questionnaire asked for which key exposures respondents would like to see products developed. 62% came up with a number of product suggestions, from corporate image and brand risk protection through failure to supply penalties to commodity pricing risks and contingent capital. They can be categorised as follows:

Table 4 – Key exposures for product development*

	2000	1999	1998
Operational risks	44%	41%	9%
Financial risks	32%	21%	51%
Hazard risks	24%	38%	40%

The big switch over the past two years is from financial risks to operational risks, and the largest determinant of this switch has been the change in the makeup of the sample from a large majority of oil and gas companies with extensive on and off balance sheet exposures (particularly long term environmental liabilities which we have classified in this exercise as financial risks) to a more general industrial base.

Risk integration

In any assessment of the role of alternative risk transfer, a key question is how far the two conventional markets – insurance and capital markets – are seen to have come together. We asked respondents the degree of integration they saw in their company between insurance risks and financial risks.

Table 5 – Degree of integration of risk management (in %)*

% of Respondents	0	10	20	30	40	50	60	70	80	90	100
2000	23%	15%	15%	19%	8%	12%	0%	0%	4%	0%	4%
1999	13%	18%	13%	21%	8%	10%	5%	5%	3%	0%	5%

Discussions with risk managers and treasurers indicates that integration, whilst a goal for most, appears more difficult to achieve than originally anticipated. This appears to be reflected in the views expressed about future integration.

Table 6 – Are you intending to increase this level of integration over the next 3 years?*

Year	Yes	No	Don't Know
2000	38%	27%	35%
1999	51%	23%	26%

Read together with the table on the degree of actual integration, this would appear to be bad news for those who have advocated convergence. It is fascinating,

though, to see that there is an even higher expectation of convergence than before.

Table 7 – Do you believe that the insurance and the capital markets are converging?*

Year	Yes	No	Don't Know
2000	85%	15%	0%
1999	69%	21%	10%

This is a very strong response. Even on a small sample, it is clear that respondents overwhelmingly view convergence to be inevitable. As mentioned last year, if the buyers expect integration, then it will follow, whether or not people think it is a good or bad development. Fortunately, it appears to be seen as a good thing.

Table 8 – Do you believe convergence to be good or bad for your company's risk management strategy?*

Year	Good	Bad	Don't Know
2000	81%	0%	19%
1999	64%	10%	26%

Anecdotal evidence indicates that, to the buyers, convergence is a good thing because it will make the market even more competitive, probably to the detriment of insurers. The view appears to be that as and when the capital markets make their move, the size and scale of their operations will dwarf the insurance markets. As one respondent said:

In the convergence between the insurance and the financial worlds I doubt very much that the leading role will be taken by insurance. It seems to me that everything will happen once the financiers discover the business opportunity within insurance.

Hedging and insuring

Whilst protection against catastrophes still receives the highest rating with around 90%, the importance of reducing firm specific risk has risen from 5th place in 1998 to 2nd.

Table 9 – Reasons companies Hedge or Insure*

	0	1	2	3	4	5
To protect the firm financially against catastrophe	4%	0%	0%	8%	12%	77%
To reduce firm-specific risk	8%	4%	15%	35%	31%	8%
To signal good financial management	8%	4%	19%	27%	42%	0%
To reduce costs of financial distress	8%	8%	23%	19%	31%	12%
To protect the firm's ability to pay dividends	15%	15%	15%	12%	42%	0%
To increase the firm's rate of return	12%	27%	12%	12%	35%	4%
To reduce the "worry factor" for senior management	8%	19%	19%	35%	15%	4%
To smooth operating cash flow	15%	15%	15%	31%	23%	0%
To stabilise the firm's borrowing cost	19%	23%	23%	15%	15%	4%
To reduce the firm's borrowing cost	15%	35%	15%	23%	12%	0%
To reduce expected tax liabilities	23%	8%	38%	27%	4%	0%

Whilst there is no doubt that the emphasis of hedging and risk transfer is still defensive, value enhancement objectives such as the ability to pay dividends has gone up from 7th to 5th and increasing the rate of return has gone up from 8th to 6th. Whilst stabilising or reducing borrowing costs or tax liabilities have not altered their position over the past three years, this is evidence that the framework for convergence is being built in buyers' minds.

Table 10 – Reasons companies did not hedge or insure*

	2000	1999	1998
Too expensive	33%	37%	31%
No Cover	27%	31%	26%
Management reluctance	12%	10%	14%
No experience	11%	7%	15%
Others	9%	6%	9%
Accounting or legal issues	8%	9%	5%

Where insurance or hedging instruments were not purchased, the two clear reasons were either the cost of the cover available or the lack of suitable transfer instruments. As cover exists for many of the risks mentioned, the reasons appear to be cost.

This year there is a wider diversity of types of exposure. Whilst some solutions are easier to envisage than others, how these hazards are transferred to insurers may well prove to be the differentiating point between the providers.

Table 11 – Most significant uninsured / uninsurable risk*

Operational risks	21%
Credit/political risks	17%
Environmental risks	17%
Strategic risks	13%
Forex/financialrisks	8%
Brand risks	8%
Catastrophe	8%
Business Interruption	8%

Conclusion

There appear to be some clear trends emerging. For a start, the model for insurance is changing. Customers see a need for risk transfer and risk mitigation services, but probably not the old model of insurance. This has implications for the skill bases of most insurance companies and brokers. The skills needed will be in the areas of predictive risk assessment, repackaging and restructuring risk and corporate finance and, most importantly, in prioritising risk.

It also affects the number and type of players in this field. There is tremendous opportunity for niche players to develop highly focused skill sets and exploit certain sectors. Major service providers and

intermediaries should maintain their dominant position because they have the resources to invest. However, related service providers- the large accountancy practices, risk consultancies and the investment banks – also have the resources to invest. As convergence finally arrives and destroys the artificial boundaries between financial, legal, strategic, operational and insurance risk so customers will look for advisers who can provide the efficiency of combining and controlling a range of risk.

Against that background, the work that companies are doing on enterprise risk management and on alternative risk transfer should be seen as investment in the future of their organisations. Interestingly, there is as much work being done on enterprise risk by the buyers as there is by the providers, which raises the possibility that the buyers could chose to dis-intermediate the insurance and consulting markets, not least because – in an efficient capital market – if investors are made aware of the risks involved in an investment, then risk control becomes less attractive. Fortunately for all of the providers of risk management products and services, the capital markets are not that efficient. For now.

* Source: Marsh Risk Finance

Copies of the research can be obtained from:
Chris Mundy, Marsh Risk Finance
No1., The Marsh Centre,
London E1 8DX
chris.mundy@marsh.com

Recent examples of worldwide ART deals

Cedant	Placement agent	Capacity	Coverage outline	Date
Triarc Companies, Inc. SPV: Arby's Franchise Trust	Structured by Swiss Re New Markets. Morgan Stanley Dean Witter were lead underwriter with ING Barings co-managing the transaction.	$290m	This innovative transaction securitises intellectual property in the form of franchise royalties and fees from current and future owners of Triarc Companies Arby's chain of fast-food restaurants. It was a private placement of $290m of non-recourse fixed rate insured notes. The deal is based on an insurance and reinsurance platform where a Swiss Re Group company takes the first loss position and Ambac Assurance Corporation takes the excess risk position. In this deal Swiss Re New Markets is transferring capital markets risk to the insurance market.	December 2000
Munich Re	Lehman Re, Goldman Sachs and American Re.	$500m	The deal securitises U.S. hurricane and earthquake risk and European-based windstorm risk. The deal will be split into two $250m tranches, one for hurricane risk and the other for earthquake and windstorm risk. The deal will be linked to a parametric measure ie. payout will be triggered by windspeed etc. This deal has not yet come to market, but is expected to by the end of the year.	December 2000
AGF SPV: Mediterranean Re	Goldman Sachs was sole manager of the issue. EQECAT provided CAT modelling.	$129m	These notes represent the first entry of AGF into the CAT bond market. They provide 5 year, fully collateralised indexed cover against windstorms in France and earthquakes within 200km of Monaco. This transfers a portion of AGF's earthquake and wind exposures to the holders of the notes through a excess-of-loss reinsurance agreement with Mediterranean Re, an SPV domiciled in Ireland. The notes are structured in two tranches: $41m of Class A notes rated BBB+ and $88m of Class B notes rated BB+. All ratings from Standard & Poor's. This is the first European earthquake risk securitisation.	November 2000

The above is derived from a fuller list which can be found on the ARTEMIS portal, accessible at www.artemis.bm

Launched at the Bermuda Insurance Summit in May 1999, ARTEMIS provides underwriters, brokers, risk managers, CFO's and traders with information and greater transparency to help them understand how ART techniques can be used and who is there to help them. It receives some 60,000 hits per month.