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A Strategic Approach To Operational Risk Financing For Financial Institutions

A Willis White Paper

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What is the Value of Insurance to a Financial Institution?

All financial institutions buy insurance against some of their operational risks. The premise of the discussion that follows is that financial institutions can implement more effective insurance programs if program design and implementation take place within the framework of a sound operational risk quantification process that is consistent with other risk management and financial decision-making disciplines at the financial institution.

It is fitting for a financial institution to question the value of its insurance program and to be uneasy about the decisions made regarding how much insurance to purchase and how much insurable risk to retain. Without a foundation that is consistent with other risk-related decision-making processes, the basis for these decisions may be limited to budgeted premiums, benchmarks against other firms and rules of thumb.

Most financial institutions are no strangers to the measurement of risk as embodied in concepts like value at risk (VaR) and risk-adjusted return of capital (RAROC), which take into account not only expected cost but also the effect of potential volatility. Financial institutions can use these tools from their core business activities to improve decisions about their insurance programs. Our proposal is simple: use these metrics to evaluate the financial institution's operational risks and the effectiveness of insurance alternatives to address those operational risks. A consistent decision-making process is not just theoretically appropriate but can be valuable in several ways that will improve the strategic deployment of capital.

The reason this approach is not usually taken by financial institutions is that, despite the theoretical advantages, there are substantial practical challenges in implementing these quantitative techniques and in designing insurance programs that maximize the financial institution's return on capital. Nevertheless, financial institutions that use these tools carefully, with an understanding of their underlying limitations, can leverage their operational risk data, improve the accuracy of their performance measurement and lower their cost of capital through more effective insurance.

Operational Risk and Insurance

Virtually all insurance (other than Employee Benefits) addresses operational risks, but insurance typically addresses only a portion of the operational risks shown in Figure 1. As a result, most financial institutions have found that fully integrating insurance and operational risk is very challenging. In fact, in the context of an operational risk-based analysis, insurance often appears to address only a small fraction of the institution's operational risk exposure.

Figure 1



What is Special about Operational Risk?

The language and the thought processes used in the operational risk and insurance disciplines are fundamentally different. Many operational risk professionals have backgrounds in credit risk, market risk, internal audit or operations. Insurance backgrounds on the other hand are typically in underwriting, claims or actuarial practice.

The repercussions from these differences can be complex and subtle. For example, operational risk measurement categories, when derived from internal audit and the international banking protocols of Basel II, do not match one-to-one with insurance coverages, making it difficult to measure the effectiveness or value of the insurance in an operational risk context.

Equally important are the differences in the nature of the risks themselves. Operational risks are not homogenous in that each loss event is somewhat different and the same loss event may have very different economic consequences to different institutions. Some core risks of financial institutions – particularly credit and market risks – are homogenous and often easily transferred through vehicles such as derivatives and securitizations. Except in the case of some credit risk securitizations, payment is normally triggered by external indices that are beyond the control of the buyer of the protection. In some cases, this may result in basis risk to the buyer, meaning that the buyer's own losses could be materially different from the payment that results from application of the index. However, because the index is usually objective and external to the protection buyer, there is little moral hazard. In other words, there is little chance for the buyer to "game the system" through inside information.

Traditional insurance, on the other hand, relies on the principle of indemnification of a particular organization's specific loss. Insurance policies therefore are designed to pay, subject to limits and deductibles and other terms, exactly what the insured has lost. There is very little basis risk to the buyer but substantial moral hazard to the seller. Although the buyer of protection is required to be truthful and disclose certain material facts about the risk, normally the insurers assume that, even when the buyer does not intentionally misstate the facts, the buyers' understanding of their own risks creates a natural advantage. The insurers also often suspect that the insured will not necessarily minimize its loss to the extent that the insured perceives the insurer's money to be at stake. The question of the exactly appropriate amount to indemnify the insured and the potential conflicts of interest in handling claims can lead to disputes between the insurer and the insured.

Insurance typically addresses only a fraction of a financial institution's operational risks. There are many reasons for this, but one primary reason is that insurance typically covers exposures that are external or at least largely beyond the control of the insured. Operational risks, on the other hand, include risks that are so fundamentally within an organization's own control that they represent a substantial moral hazard to an insurer and so are very difficult to underwrite. One solution to this circumstance is a policy in which original loss is not covered but certain types of ensuing litigation may be covered. Two such operational risks where this occurs are improper business practices and processing errors. Another area of operational risks that is difficult to underwrite is technology hazard because technology evolves so rapidly that insurers struggle to understand and evaluate the nature of the inherent risks.



How is the Integration of Insurance and Operational Risk Changing?

For some time, a goal of many enterprise risk management efforts has been to apply consistent identification and measurement of risk across the organization. At financial institutions, such focus was first applied to core activities such as credit, market and underwriting (or insurance company product) risks where there are discrete exposures in the form of credit positions, investments or insurance policies. Operational risk, which lacks discrete exposures, has often been left out of this equation as too difficult to measure. Some financial institutions still believe that operational risk cannot be effectively measured using existing tools, but, under the influence of regulatory initiatives such as Basel II, Solvency II and Sarbanes-Oxley, the tools are improving along with the methodologies for the oversight, identification and measurement of operational risk.

Operational risk measurement may also include the valuation of the mitigating effect of insurance. Because of the differences in the way operational risks and insurance are typically analyzed, organizations face many complexities in accomplishing accurate measurement.

Unlike an insurance company's book of policies, a bank's credit loan portfolio and an asset manager's investment portfolio, operational risks do not fall into discrete categories with homogenous units of exposure, each of which has a defined maximum loss cost or size. In some cases, such as in litigation, the theoretical cost is unlimited. Furthermore, there are substantial limitations on the value of loss history in measuring operational risk. Internal loss history typically does not include enough data to model the likelihood of very adverse events (which statisticians call the "extreme tail" of the loss distribution). External data from similar businesses is also frequently sparse, incomplete or irrelevant. So the financial institution must rely also on approximations and judgment in determining its exposure to operational risk and evaluation of the benefit of insurance. Despite the fact that the science is imperfect, insight and consistency are possible through an objective and systematic approach to the integration of operational risk and insurance.

Comprehensive Cost of Risk and Capital Efficiency

Traditionally, expected cost of risk is the primary criterion in risk management decisions. Why? The answer lies in the way most financial institutions think about the cost of risk when dealing with their insurance. Many focus on minimizing the premium plus expected retained losses, but this approach provides an oversimplified and incomplete picture of the cost of risk. For example, many organizations view hedging activities for some risks (e.g., insurance risks) as a cost center rather than as a means to manage risk capital. In this context, performance is rewarded only by reducing costs as defined in the traditional sense. This view often discourages the purchase of additional insurance, hedges or other risk management expenses that could reduce the overall cost of risk capital. On the other hand, dropping capital-inefficient insurance may seem undesirable if the insurance helps in budgeting.

The traditional definition of cost of risk has three or more basic components:

- The cost of hedging, insurance or other protection
- The expected cost of retained losses, including claim handling expenses
- The cost of administration of the program

Sometimes the analysis includes additional factors:

- The time value of money for retained losses and hedging costs that are paid by the financial institution over future periods
- The cash flow impact arising from the appropriate tax treatment of the various costs

Even this enhanced traditional definition ignores a fundamental element of the cost of risk – the cost of capital associated with volatility. Capital must be available to respond to the organization's aggregate risk exposure in instances where the manifestation of this exposure turns out to be greater than expected. This capital¹ is a portion of the financial institution's assets that must be maintained in high quality, very liquid investments to be immediately available to deal with unexpected costs. In statistical parlance, this capital should be available to respond to an appropriately determined percentile of the loss distribution over a specified time period (referred to as "Value at Risk" or VaR).

Despite the fact that the science is imperfect, insight and consistency are possible through an objective and systematic approach to the integration of operational risk and insurance.

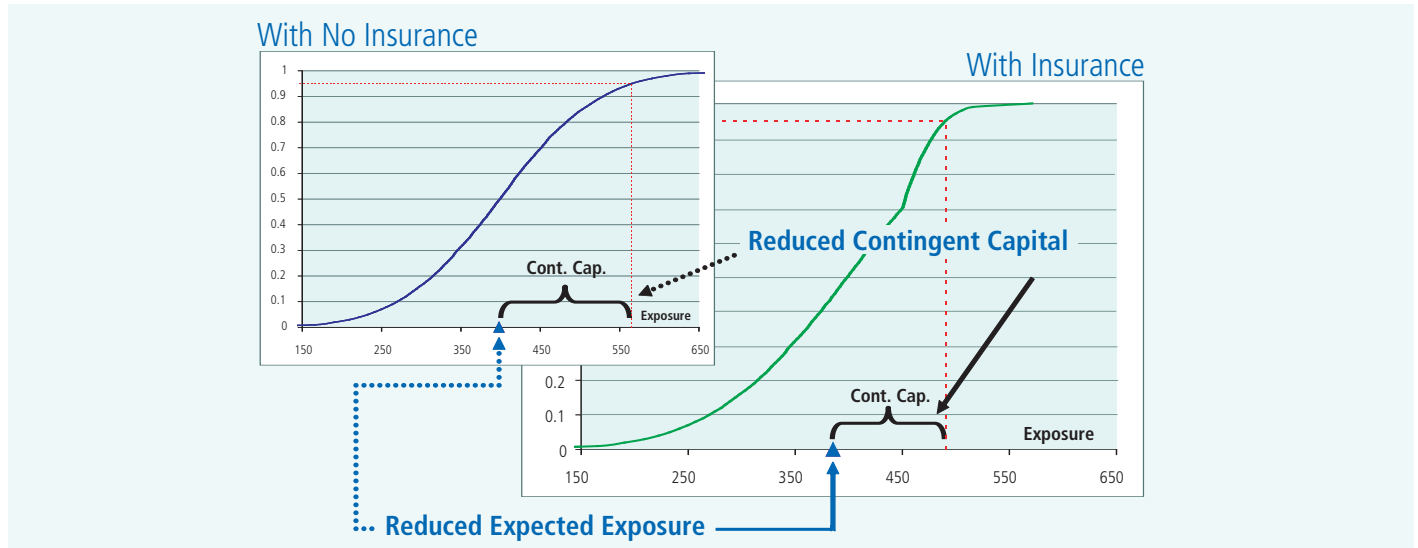
For financial institutions with fiduciary responsibilities to depositors, policyholders or investors, this capital should be available to absorb these unexpected losses even in extreme cases². When volatility is addressed at all in a traditional analysis, it is typically through an analysis of the loss costs at a higher than expected confidence level, such as 90 percent confidence or 95 percent confidence for one year. While this may be an improvement over an expected loss analysis, there is rarely an analysis of what constitutes an appropriate level of capital adequacy for the retained portion of insured losses, i.e., the confidence level to provide an insurance VaR that is appropriate, much less an effort to integrate into the cost of risk the actual cost of this additional capital to the organization. Such an effort, however, can yield a risk-adjusted return on capital (RAROC) for the financial institution's investment in its insurance program.

¹ Economic capital, risk capital, contingent capital, regulatory capital, invested capital and other terminology concern the nature of capital, how much capital is enough for various purposes and what are appropriate investment vehicles for capital. This is in itself an area of interest and conflict among various financial institutions, their regulators and their investors.

² Under Basel II, the confidence level or VaR point for operational risk capital is 99.9 percent for a one-year period, i.e. a one-in-1000 year event, and under Solvency II, the target for risk-based capital is a risk of ruin of less than 0.5 percent or 99.5 percent for one year but "ruin" still entails positive net worth.

A simplified example (ignoring the administrative cost and tax treatment) of how risk financing impacts expected losses and the cost of capital at risk is shown in Figure 2.

Figure 2



The hypothetical analysis below assumes a 12.4 percent (over a risk-free rate of 2.6 percent) cost of capital.

The use of VaR can show that an insured or hedged risk can create savings that exceed hedging costs. Note that in the example, if the reduction in cost associated with a reduction of capital at risk is not considered in the analysis, the decision to purchase coverage (and reduce overall cost of risk) would not have been made.

On the other hand, if the financial institution uses an arbitrary confidence level in lieu of the expected loss (such as that underlying the VaR) rather than the additional capital cost, they will tend to over-insure. In the example, they would theoretically be willing to pay as much as \$74.9 million for this insurance!

Thus, the key problems with the traditional cost of risk based upon expected loss cost or cost at an arbitrary confidence level (rather than the capital cost of VaR) are:

- Depending on the confidence level selected, the approach creates an inappropriate bias towards increased retention or toward too much insurance
- Such an approach often leads to crude rules of thumb for determining retention
- The approach ignores the true tradeoff between capital and insurance

Summary of Changes in Cost of Risk

- (12.8) Expected Losses
- (9.3) Capital Charge
- 16.0 Hedge Premium
- (6.1) Net Decrease through Hedging

Taking potential volatility into consideration facilitates capital efficiency and reduction of cost of risk; failure to do so produces sub-optimal and ultimately more costly decisions.

| | <u>Expected</u> | <u>VaR</u> | <u>Capital Charge</u> | <u>Premium</u> |
|----------|-----------------|------------|-----------------------|----------------|
| Unhedged | \$398.0 | \$565.2 | \$25.1 | - |
| Hedged | \$385.2 | \$490.3 | \$15.8 | \$16.0 |

| | | | |
|----------|----------|---------|--------|
| (\$12.8) | (\$74.9) | (\$9.3) | \$16.0 |
| (\$22.1) | | | |

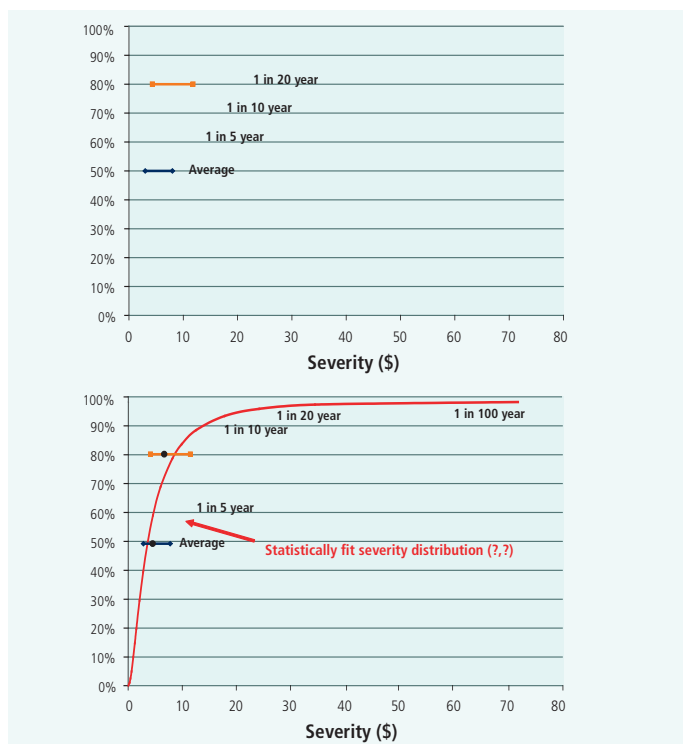
We recommend that financial institutions consider bringing risk-based capital measurement more solidly into the insurance decision process, not because there is an exact science that will allow perfect decisions but because a systematic approach to these difficult issues is likely to lead to a sounder analysis than more traditional benchmarking and rule-of-thumb approaches. In addition, as insurance and enterprise risk practice grows closer, there will be opportunities to provide new and enhanced product offerings in the insurance marketplace.

The use of VaR is commonplace in financial risk management. The ability to apply VaR to insurance risks depends on the availability of data to create a robust model. Nonetheless, even with risks for which there is little or no data, there are various techniques that can be utilized to calculate VaR.

For risks where historical loss data is insufficient to generate acceptably reliable loss distributions, one methodology employs self-assessment and scenario work. This method involves the selection of respondents with expertise in the risk under analysis. Through a series of interviews and questionnaires, respondents give their best guess as to the expected severity and the magnitudes of several, less frequent, events (such as one in five years, one in 10 years, one in 100 years). Extracting information from the qualitative assessments and statistically fitting a curve can create usable frequency and severity distributions. The following two graphs (Figure 3) depict this process. Other factors that bear on the analysis include the following, each of which could have a significant effect on the risk decisions:

- Choice of loss distributions, parameter selection and uncertainty, especially when taking into account the challenging nature of operational risk quantification
- Timeliness and certainty of payment of insurance proceeds, not only the credit risk of the insurer but also the contract performance risk
- Correlation of insurable losses to other losses within the portfolio³

Figure 3



³ It is possible that corporate insurance purchases and hedging strategy could, if uncoordinated, increase rather than decrease the volatility of an organization's results.

Comprehensive cost of risk includes ALL of the above. However, a detailed analysis of these last three areas is beyond the scope of this discussion.

We believe it is likely that a large financial institution can significantly improve its risk management decision-making by incorporating a version of this strategic approach into risk financing.

Capital Allocation

Effective allocation of operational risk capital to lines of business and even specific products of the institution should improve accountability for risk management decisions in the field and provide more accurate costing of product offerings.

While it is also appropriate to integrate the valuation of insurance into the allocation of operational risk capital to specific operations or products, such integration should proceed with caution because of the volatility of the Property/Casualty insurance markets and the possibility of creating moral hazards. It is certainly reasonable to take the reduction of capital cost through insurance into account, but before relying on insurance for product pricing, the financial institution should take into account the volatility in availability and pricing of the insurance markets and the possibility that a product put into the market today which entails several years of potential risk of loss may have a different insurance program applying at the time of loss. Also, it is important to keep in mind that the existence of insurance can influence behavior. If managers see that insurance reduces their accountability for losses, they may be less diligent in managing their insured risks.

Benefits of the Process

Beyond the potential benefits of improved rigor in decision-making, cost accounting and performance measurement, considering the insurance program in the context of the organization's operational risks provides an opportunity to improve insurance programs themselves.

Basel II will require the largest banks to calculate their capital based on internal loss event data, external loss events, self-assessments and scenario analysis and their control environment⁴. The operational risk management process as envisioned by Basel II can provide the basis for improving the terms offered by the insurance market. As financial institutions develop improved understanding of their processes and controls around their operational risks, they will have the opportunity to re-use the information they develop in placing their risks. For example, as the institution improves its understanding of and

⁴ Basel II has other specific requirements for crediting insurance against its regulatory capital requirement including an overall 20 percent cap and requirements relating to credit quality of the insurer, timeliness and certainty of payment, duration of the insurance, certain exclusionary language and mapping the coverage to the operational risks.

controls over internal fraud, relevant operational risk data and analysis can be distilled to improve the underwriting placement process for the institution's crime insurance.

Improved processes offer the opportunity to leverage information not only in traditional product placement, but also in the search for customized insurance products that lower the cost of capital. This is particularly applicable where the internal data is especially rich but the insurance market is thin. For example, the organization may face exposures due to processing errors from a particular line of business in a particular geography. Insurers are usually reluctant to insure against internal errors. However, if the organization has amassed substantial data on this risk in its effort to analyze the capital required to respond to the volatility, the data may well hold the key to transferring the risk to insurers for less than the cost of capital required to hold the risk in house.

Future Considerations

Developments in operational risk management have the potential to revolutionize risk financing. As financial institutions develop sophisticated analytics, they will make decisions differently. They may buy more or less insurance than they have in the past and may implement insurance in ways that differentiate them from their peers. They may be more likely to find efficient and effective alternatives to traditional insurance.

One area ripe for improvement in the traditional insurance system is the timeliness and certainty of payment. Especially in the case of sensitive insurance coverages such as Directors & Officers and Professional Liability insurance, the insurer often disputes the amount of the claim or even whether the claim is covered at all. These disputes often stem from the fact that, unlike the derivatives market, the insurance market is not at all standardized in terms of underwriting data or policy terms so that neither the insured nor the insurer has clear data or precedents on which to rely. Furthermore, in placing their insurance, diverse, multinational insureds often seek to 1) minimize the burden of data they must gather to place the business and 2) broaden the insurance policy to deal with unknown locations, products and services, acquisitions and the like. While this approach makes sense from the insured's point of view, it results in uncertainty that can bring unpleasant surprises to the insurer.

It is possible that at some point common policy terms and sets of data will be required for certain lines of insurance, as in the case of derivatives and securitizations. If this can be achieved, there will be far fewer disputes.

KRIs

Many financial institutions are developing key risk indicators (KRIs). These are directly measurable variables related to operations that tend to be associated with loss costs. For example, litigation may require years to measure but the number of customer complaints may be an indication of loss due to litigation. If so, the customer complaint level can be used as a KRI for the cost of litigation.

An effective KRI or series of KRIs can serve as proxy data for an underlying risk that is difficult to measure directly. The best KRIs bear a logical connection with the underlying risk, are in fact highly correlated with incidence of loss from that risk, and can be measured precisely and contemporaneously. KRIs can be useful in capital calculations and performance measures.

Derivatives and Securitization

While trading operational risk through risk derivatives and securitization appears to be a desirable way to spread risk and to protect a financial institution, the challenges are significant. As mentioned above, derivatives typically require an index that is objectively measurable and cannot be substantially affected by the actions of one of the parties to the derivative transaction. From the perspective of the sellers of operational risk derivatives or the agencies who must rate securitizations, it is important that the risk not be subject to manipulation by the buyer and must be objectively measurable. Operational risks, other than industry-wide loss from external events such as storms and earthquakes, rarely meet these criteria. In fact, most operational risks are either directly or indirectly affected by how the organization manages the risk (e.g., processing error loss) or are not precisely measurable (e.g., the cost of business disruption caused by a power outage).

KRIs, if aggregated across multiple financial institutions, could provide an answer to the question of objectivity, as they would largely be outside any particular protection buyer's control. That does not necessarily mean there will be a market for industry-wide operational risk derivatives because such an approach could entail too much basis risk for the buyer. Let us suppose that there is a quarterly index of all operational risk losses from all financial institutions with over \$5 billion in assets and that put options against that index are available. Operational losses are sometimes systemic, affecting a large range of financial institutions and, unlike credit and market risk or even hazard catastrophe risk, are sometimes highly idiosyncratic, affecting only one or a few institutions. An operational risk could be either systemic or idiosyncratic, depending on circumstances.

Derivatives might help a financial institution with its systemic risks, as the indexes follow the experience of many of its component institutions. For idiosyncratic or individual risk, the appropriateness of derivatives has to be questioned. Purchasing puts against an index might not protect a financial institution's capital if that institution sustains a large share of the industry's losses but the overall index is no higher than normal.

Given the challenges in the creation and use of operational risk derivatives and securitizations, whether based on a particular institution's risks or on industry-wide KRIs, this approach may ultimately be a cost-effective way to finance some but not all operational risks.

Conclusion

Improving the science behind the analysis and design of a large financial institution's insurance program and integrating these efforts with overall enterprise risk management may generate the following benefits:

1. **More consistent decisions about insurance** – As the tools and metrics improve, decisions about what and how much insurance to buy can be made in a manner that is consistent with other risk-related decisions.
2. **Reuse of the enterprise risk data and analysis to obtain better terms** – Relevant information developed by the enterprise risk management process can be helpful in improving the information given to insurance underwriters, and this in turn will often result in more favorable placements.

3. **Redesign of insurance to improve the risk-adjusted return on capital (RAROC) of the financial institution's insurance program** – Insurance companies hope to offer their customers insurance products that produce the highest return on capital to the insurer. However, the financial institution can turn the situation to its advantage by developing specifications for insurance products that produce a reasonable return to the insurer and also a favorable return on capital to the insured.
4. **Development of customized programs to address specific risks** – There is the potential to use the data produced in the enterprise risk management process not only to improve conventional insurance but also to develop custom products that address those enterprise risks where the financial institution must earmark substantial capital.
5. **Allocation of cost and measuring performance** – An appropriate allocation of operational risk capital costs to product lines and business segments with a careful consideration of the effect of insurance can improve accuracy in the pricing of products and also provide incentives to management to control the cost and volatility of operational risks.

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