JOHN A. MAJOR, GARY G. VENTER[1]

Guy Carpenter & Co., Inc.
Two World Trade Center
New York, NY 10048
(212) 323-1605
john.major@guycarp.com

Financing Risk & Reinsurance

WHY TRANSFER RISK?

Ever since Modigliani and Miller (1958), finance theorists have grappled with the question of why firms engage in various forms of risk transfer, including insurance and hedging with financial derivatives. This article summarizes recent findings on that question and draws attention to certain consequences for risk transfer professionals.

The Capital Asset Pricing Model (CAPM) approach to valuing a firm states that systematic risk – covariance between the fortunes of a firm and the rest of the market as measured by "beta" – and only systematic risk, requires compensation in a competitive investment environment. Random shocks to earnings or cash flow, as long as they are uncorrelated with stock market movements, are of no consequence to an investor whose portfolio is well diversified. Consequently, any actions taken by the firm to reduce the volatility of earnings or cash flow (with no improvement in the

[1] John Major, ASA, is a member of the board of contributors of FR&R. Gary Venter, FCAS, is a Managing Director of Guy Carpenter & Co., Inc.

~ MORE ~

expected levels of earnings) will not result in a change in investors' demands for return on investment. So why bother?

Finance theorists have hypothesized a number of reasons that firms might rationally hedge their risks to earnings or cash flow. Other researchers have examined the behavior of large numbers of firms to see if the data support the theories. Several conclusions have emerged.

Most of the theories revolve around market imperfections that make the logic of CAPM not (fully) applicable. These include the corporate income tax, costs incurred in going bankrupt, financing costs, incomplete diversification, and other features of an imperfect world.

That the corporate income tax constitutes a market imperfection should come as no surprise. One theory here is that after-tax earnings are a nonlinear function of gross earnings. Therefore, reducing volatility in earnings takes advantage of a "convexity effect" in boosting expected net results. Unfortunately, Graham and Rogers (1999), in studying corporate hedging of interest rate and currency risk, found that the "convexity effect" was too small to influence hedging. Instead, they found that reducing volatility increased debt capacity, and therefore the value of tax advantages associated with debt.

If going bankrupt brings additional expenses (legal fees, business interruption, etc.) then reducing the probability of ruin

decreases the expected cost. A more interesting line of inquiry is to consider whose shoulders the burden of bankruptcy falls upon. Bondholders, after all, do not view the firm in the same way that shareholders do. They demand a premium for the risk that they will not be repaid that is greater than the expected value of the shortfall. In Froot et. al. (1993), reduction in volatility is seen as decreasing the cost of external financing.

However, bondholders do get first call on residual assets, before shareholders. It may be rational for shareholders to consider that too large a portion of an increase in earnings actually benefits the bondholders more than the shareholders. This can lead to a situation where the firm does not take sufficient advantage of its own growth and investment opportunities. This is the so-called "underinvestment problem."

Insurers cannot use debt directly to increase surplus, because the assets and liabilities would increase by the same amount, thus leaving surplus unchanged. A holding company, however, can use debt to increase the surplus of an insurance subsidiary. The holding company assets and liabilities increase by the same amount, but the insurer only gets the asset. An insurer with surplus infusions financed by debt can help reduce borrowing costs for its parent by engaging in an appropriate amount of risk transfer.

Beyond equity and debt investors, there are other stakeholders that value certainty. Suppliers are often looking for long term

customers, and may offer less favorable terms if the buyer's financial condition appears vulnerable. Employees (who are, after all, not fully diversified in terms of their sources of wages) also could be expected to require higher pay in compensation for the possibility that the firm could go out of business due to an unhedged risk. In the specific case of insurance companies, and, by extension, any business with long-term customer relations, another class of interested parties must be considered: the customers (insureds). Mayers and Smith (1990) highlight the fact that probability of bankruptcy is an integral element of product quality. These "stakeholder premiums" can be significant drains on earnings. Garven and Lamm-Tennant (1997) include an explicit term for this, the default cost function, in their theoretical model of the value of an insurance firm.

The risk of insurer bankruptcy is the key concern of rating agencies. The market relies upon them to quantify risk; both the bond rating and the claims paying rating look to stability as an issue. Clearly, higher bond ratings increase expected earnings by reducing debt costs. Similarly, one should be able to detect a price advantage from the claims paying rating.

Reinsurance is a factor that rating agencies consider. Some insurers say they would not buy reinsurance if it were not for Best's ratings. The protection only achieves value when it becomes recognized in the marketplace, e.g., through a better rating and

improved prices and access to markets. Ratings agencies are the key mechanism by which policyholders and other stakeholders can assess the riskiness of the firm as one element of product quality.

Insurance is also seen as more than a risk-transfer mechanism; it provides "real services," e.g., in loss control or benefits and claims administration. Reinsurance similarly provides "real services" to an insurer expanding into a geographical area or line of business with which it has little experience or expertise.

Also, as a confirmation of financial theory expectations, Mayers and Smith find that the less diversified the owners of an insurance company (e.g., Lloyd's companies versus widely-held stock companies), the more likely the company is to reinsure.

Reinsurance in particular, and substitute risk transfer mechanisms in general, can be alternative forms of financing by allowing an insurer to write as if it had more surplus. If the servicing costs of debt exceed the loading elements of the reinsurance, risk transfer can increase the overall profitability. For mutual companies without access to either debt or equity markets, reinsurance can become the only viable financing arrangement. Mayers and Smith found that mutual companies do indeed buy more reinsurance than similarly situated stock companies.

Hoyt and Khang (1999) also study the corporate insurance purchase decision. They find evidence that tax effects, as outlined in Mayers and Smith (1982) are important. Specifically,

insurance provides a faster adjustment of the depreciable basis of replacement property than does self-insurance. It also allows the firm to protect other tax benefits (investment tax credits, loss carry-forwards, etc.) Insuring depreciated assets can be profitable after tax. If the premium is a deductible expense, after tax it could be less than expected losses. At the same time if the recovery of a loss is not taxable income, after tax the expected recovery then exceeds the premium, with no offsetting book loss as the lost asset was depreciated. Hoyt and Khang found that insurance purchases increased significantly with increases in the ratio of cumulative depreciation to the historical cost of fixed assets.

Minton and Schrand (1998) dig deeper into the nature of volatility and find a distinction between reducing the volatility of earnings and that of cash flow. Cash flow volatility is found to be associated with decreased levels of discretionary investment (the "underinvestment problem") and increased costs of external financing. Bond rating agencies and analysts appear to attend to cash flow volatility and not earnings volatility. On the other hand, stock analysts attend to earnings volatility. Finally, they find that a risk management strategy is only effective if it is expected to provide benefits extending into the future; one-shot fixes are of little help. A related problem is that of distinguishing a fluctuation from a trend. If earnings go down one quarter, is that a sign of a problem or just a one-time blip?

Accounting and regulatory issues provide another dimension of motivation for risk transfer. Statutory accounting for insurance companies requires proportional earning of policy expenses, such as commissions, even if these are paid up front. Thus an insurer receives a fraction of the premium at inception but books a reserve of 100%. This surplus strain creates additional financing needs.

Another area of regulatory intervention is capital requirements. While arguably an appropriate province of regulation, there is no agreed upon objective method for the determination of necessary capital for an insurer. Erring on the conservative side, regulators are likely to increase the need for risk transfer beyond the levels dictated by financial theory.

What are the implications of this for those of us engaged in the business of risk transfer? First, reducing earnings or cash flow volatility, or pushing back the probability of ruin, are generally not of value in and of themselves. They usually acquire value only through specific mechanisms that allow the client to reduce expenses, increase earnings, or engage in profitable activities that would otherwise not be possible. How well diversified are the owners? If not very well, then perhaps they do value stability per se. But even so, one should attend to those value-enhancing mechanisms.

What is the tax situation of the client? Is there a convexity effect? Are there tax advantages that aren’t being adequately

utilized? What is their inventory of depreciable assets? Examine the balance sheet. Is the client taking sufficient advantage of debt? What is the cost of external financing and can it be lowered?

Consider the various stakeholders: customers, suppliers, and employees. How does the client's situation compare with successful peers? Is the client paying a premium in terms of higher costs or lower revenues because of an inferior risk position? This analysis starts (but shouldn't end) with ratings concerns.

Are there "real services" advantages to be gained? An insurance solution may look expensive from a risk-financing viewpoint, but it may provide operational value in terms of services that are not being offered by an alternative. These need to be priced out accordingly.

Are there accounting and regulatory issues that stand in the way of positive net present value projects? The intricacies involved here often dominate the analysis. So-called "regulatory arbitrage" between insurance and other sectors of the economy can result in substantial value to the firm undreamed of in finance theory.

The possibilities for risk management in general and risk transfer in particular have grown dramatically in recent decades. In addition to insurance and reinsurance, there has been a growth in the use of financial derivatives as well as a convergence and blending with insurance derivatives ("securitization") and

financial insurance ("insuratization"). These tools are being used in a more integrated fashion as firms look to "enterprise risk management" to foster a whole-firm, strategic approach.

Finance theory and empirical research reveal that the goal of risk management for the firm is neither as monolithic nor as obvious as it might appear. There are numerous specific mechanisms by which risk reduction manifests itself in increased firm value, and these mechanisms translate into opportunities for the profitable application of risk transfer tools. But in order to take advantage of these opportunities, we must attend to the details.

References:

Froot, K. A., D. S. Scharfstein and J. C. Stein (1993) Risk management: coordinating corporate investment and financial policies, Journal of Finance 48, 1629-1658.

Garven, J. R., and J. Lamm-Tennant (1997) The demand for reinsurance: theory and empirical tests, 5th International Conference on Insurance Solvency and Finance; to appear in Journal of Business.

Graham, J. R. and D. A. Rogers (1999) Is corporate hedging consistent with value maximization? An empirical analysis, Duke University.

Hoyt, R. E. and H. Khang (1999) On the demand for corporate property insurance, (being revised for resubmission to the Journal of Risk and Insurance).

Mayers, D. and C. W. Smith (1982) On the corporate demand for insurance, Journal of Business 55, 281-296.

Mayers, D. and C. W. Smith (1990) On the corporate demand for insurance: evidence from the reinsurance market, Journal of Business 63, 19-40.

Minton, B. A. and C. Schrand (1998) Does cash flow volatility affect firm value: its impact on discretionary investment and the costs of debt and equity financing, Journal of Financial Economics 54, 432-460.

Modigliani, F. and M. H. Miller (1958) The cost of capital, corporation finance and the theory of investment, American Economic Review 48, 261-297.

-End-