



BARBON INSTITUTE

THE ROLE OF INSURANCE AND MANAGEMENT OF RISK IN THE 21ST CENTURY

**INSTITUTE OUTLOOK:
INSURING THE UNINSURABLE II**

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INSURING THE UNINSURABLE II

By

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Several years ago, I was visited by the worried CEO and CIO of a prominent specialty property/casualty insurer. The insurer was under severe financial distress due to an onslaught of claims. Only a short while earlier, the company had received a top rating for its financial strength. Suspecting an asset/liability mismatch problem, I inquired first about their asset portfolio. The officers said that they had a low tolerance for risk and that consequently, the company's assets were comprised almost entirely of U.S. Treasury notes of short and intermediate term. They had not experienced a bond default in many years.

I next inquired about the nature of their insurance policies. The company insured farms, farm structures, and farm equipment throughout western New York, Pennsylvania, and the Midwest, and had been hit with an unprecedented rate of insurance claims. Farmhouses were burning down, silos were exploding, and farm equipment was breaking down or being stolen. The rate of claims was so high that the insurer had insufficient manpower to verify the claims and was doing its best simply to process the claims payments. The officers said that if the pace of claims continued for another month or two, it would force the insurer into receivership.

I noted that the farms in their service area were dominated by soybean and corn producers and asked them (rhetorically) if their company had short positions in soybean and corn

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futures, or had synthetically created any put options for those commodities. They had not, but even if they had they wanted to, the insurance regulators probably would have prohibited such unorthodox investments as being “too risky.”

I then downloaded a chart of soybean and corn prices, which revealed a steep decline over the previous two years. I explained that the farmers who they were insuring were undoubtedly in severe financial straits themselves, and likely unable to pay their creditors for farm equipment and mortgages. Rather than lose their farms, these farmers had decided to “sell to the insurer” their other assets at pre-specified prices by exercising their own “put options” (i.e., filing insurance claims).

The problem was not that the severity of losses per claim was higher than anticipated, but that the frequency of claims was enormous, and that this unexpected frequency was undoubtedly occasioned by morale hazard (i.e., the lack of maintenance due to reduced farm income) and moral hazard (i.e., taking direct actions to influence the incidence of claims). This observation resonated with the two company officers, who disclosed that their internal investigation revealed that for those clients who were bachelors or recently divorced males, the incidence of claims was almost 100 percent.

A New Paradigm for Assessing Risk

This anecdote illustrates elements of the new paradigm of insurance that has arrived. For regulators, their traditional assessment of asset risk has essentially viewed assets in isolation from the insurance liabilities they back, and an unhealthy fixation on credit risk. A reassessment of the risk level of insurer assets should be in light of the needs of the liabilities that they back. For insurers, their traditional focus has been on distinguishing between risks that are insurable and those that are not. In assessing the insurability of risks, the primary guideline has been the

degree to which risk pooling could be employed to reduce risks to manageable levels. Eight criteria have been established for insurability, six of which measure a risk exposure's pooling properties.¹ While few risks meet all of these ideals, insurable risks tend to fall within acceptable ranges.

Back in 1984, I first wrote about a new approach to the insurability of risks.² I suggested that meeting the eight criteria of insurability was *sufficient* to allow the risk pooling mechanism of insurance to operate, but that this was not *necessary*. The criteria become necessary only to the extent that risk pooling is relied on as the primary risk managing mechanism. What *is a necessary and sufficient criterion* for a viable insurance contract is simply that *the insurer have sufficient assets available to honor claims as they arise*. While an insurer can achieve this by pooling independent risks meeting the aforementioned criteria of insurability, it could also achieve this by investing in assets whose payoffs are contingent on the occurrence of events that are related to the incidence of claims. Where risks are uncorrelated and aggregate loss distributions are stable or otherwise predictable, the pooling concept is fine. But in other cases, insurers either must rely on the risk-hedging mechanism in their investment policy, or else must have already accumulated sufficient reserves and surplus to cover any claims that may arise.

Hedging Strategies: A New Look

From the perspective of financial economics, when an insurer underwrites a policy, it has effectively sold a put option that is exercised when the value decline of the insured asset is greater than the deductible (i.e., the put option exercise price). An insurer with a block of policies essentially has sold a portfolio of put options. Would it not be natural, then, for the insurer to

¹ See Baruch Berliner (1982).

² My 1984 working paper dealt with insuring against default on third-world debt, and was sent for review to the World Bank, who apparently deposited it in its "round file." A more narrowly focused article was published in 1989 on the insurability of systematic bank credit risk, and the earlier paper was resurrected and published by the World Bank in 1996, with the strong endorsement of its new treasurer. See Babbel (1984), (1989), and (1996).

also own a portfolio of put options, at least on its unpoolable risks, to hedge against the clustering of those risks?

One type of put option is reinsurance. A reinsurance policy will pay the primary carrier directly based on the loss experience of the reinsured policy or group of policies.³ The problem with reinsurance as a hedge is that it is often unavailable, or unattractively priced. Moreover, with the eroding credit quality among traditional reinsurers in recent years, many companies today are looking for alternatives. A spate of new financial instruments has allowed insurers to hedge their unpoolable risks by investing in various derivative-like securities, such as catastrophe bonds, sidecars, Cat-E-Puts, contingent surplus notes, and so forth.⁴

There are three main problems with these derivative instruments:

- (1) they may not be available in sufficient quantity⁵;
- (2) they may not cover the kinds of risk to which an insurer is exposed; and
- (3) they often are priced so high that insurers could expect to earn more by issuing these securities than owning them and issuing insurance policies.

Back to Basics

This leads us back to some fundamentals. As discussed in Babbel (1989) and (1996), there is always the alternative of synthesizing your own hedges by using the fundamental building blocks available. Recall that option pricing formulae were originally developed based on the observation that the payoffs of an option could be exactly replicated through a portfolio of the underlying security and debt, where the weights are adjusted dynamically over time based on changes in the value of the underlying. In the case of an uninsurable event, it can become

³ For a discussion of reinsurance from an options perspective, *see* McIsaac & Babbel (1995).

⁴ For an analysis of the alternative strategies, *see* Doherty (2000).

⁵ Although the market appears to be growing, the aggregate capacity remains small. In 2005, many of the insurance-linked securities featured indemnity triggers. This trend may be short lived as investors digest the expected full loss of principal on the indemnity-triggered KAMP Re transaction.

insurable if the insurer obtains or synthesizes an asset portfolio that will payoff when the peril is realized. Unlike reinsurance, these hedges are imperfect, and a lot of risk may remain. But if done well, the remaining risk should be uncorrelated to the precipitating event and, therefore, amenable to the usual pooling techniques, supplemented by adequate capital.

In Babbel (1989), I described how to insure a portfolio of loans subject to clustered default risk. The study in Babbel (1996) described how to insure against default on sovereign debt. At the time, these two types of undiversifiable risk were considered uninsurable by the usual pooling mechanism, yet they were hedgeable and, therefore, insurable. Since that time, an active market has emerged for synthetic CDOs (collateralized debt obligations) and credit derivatives that obviates or supplements the suggestions made in those papers for insuring credit risk. However, there remain many areas where the techniques described in those papers may be profitably used. Robert Merton (1998) has discussed pricing issues and tracking error in such hedges.

Finding Profits in Uninsurable Risks

In today's insurance market, many products have become so commoditized that profit margins have been squeezed razor thin. It seems to me that there remains a lot of profit to be earned in areas that have heretofore been considered uninsurable. But the profit will have to be *earned* by an insurer undertaking the homework necessary to study the available hedging instruments, and synthesizing those that are not yet available. For example, in the case of terrorism risk, some natural hedge instruments come to mind. An insurer with exposure to this risk would want to own assets whose values would increase if an event were to occur, and have a short position in those assets whose values would likely decline. This essay is not the place to treat the mathematics of proper hedge ratios, but the new paradigm of insurable risks suggests

the direction that insurers will need to go to profitably operate in areas of risk that, until now, have been underserved.

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References

- Babbel, David F. (Jun. 1996). "Insuring Sovereign Debt Against Default." *World Bank Discussion Paper*, Financial Sector Development Department.
- Babbel, David F. (Dec. 1989). "Insuring Banks against Systematic Credit Risk." *Journal of Futures Markets*.
- Babbel, David F. (1984). "Insuring the Uninsurable." Working Paper, University of California at Berkeley.
- Berliner, Baruch (1982). *Limits of Insurability of Risks*, Englewood Cliffs, N.J: Prentice-Hall.
- Doherty, Neil A. (2000). *Integrated Risk Management: Techniques and Strategies for Managing Corporate Risk*, McGraw-Hill.
- McIsaac, Donald A. & David F. Babbel (1995). *The World Bank Primer on Reinsurance*, World Bank Monograph.
- Merton, Robert C. (Jun. 1988). "Application of Option-Pricing Theory: Twenty-Five Years Later." *American Economic Review*, Vol. 88:3, 323-349.