

Research and Findings on Insurance Insolvency

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This study focuses on insolvency of insurance companies. Three related issues are explored. The first study analyzes the effects of insolvency risk on consumers' demand for insurance, and it evaluates guaranty funds and solvency regulation in terms of consumers' welfare. The basic idea is that insurance premiums adjust to an insurer's capability to indemnify policy-holders' claims as well as to other factors. In other words, the higher the insolvency risk of the insurer, the lower the insurance premium. This relation has some surprising consequences. Specifically, because the effects of solvency regulation are fully priced to consumers, solvency regulation is not a particularly desirable activity. Guaranty funds are much more germane to consumer interests.

The second one studies the proper rate of return and thus the insurance premium when an insurer has a risk of insolvency. The underlying ideas are those of the Capital Asset Pricing Model, but with explicit inclusion of insolvency risk. The Capital Asset Pricing Model has long been used in this way by researchers from Fairley (1979) to Brown and Hoyt (1995). The outcomes derived from the adjusted Capital Asset Pricing Model form a basis of calculating competitive rates and incidentally confirm the prediction of chapter one that when investors have the valuable option of taking bankruptcy, they require a lower rate of return.

The third one focuses on reinsurance purchases by an insurer as a signal of higher risk of insolvency. Such signals are important because they give regulators advance warning about financial troubles insurers are facing. Using such information, regulators are able to watch these firms closely and take precautions to avoid or limit losses from their insolvencies. Previous studies on surveillance for insurance insolvency have demonstrated that financial ratios are good indicators of the insurer's solvency. This paper focuses on the use of reinsurance by a primary insurer. Two mechanisms are potentially at work. First, a less solvent insurer will use more reinsurance than others because of the difficulty of raising needed capital in the financial market. Alternatively, a firm that makes excessive use of reinsurance may fail because its reinsurer fails. Data from property-liability insurers confirm the predictive power of the reinsurance variable and give some clues to the dominant mechanism.

Main Findings

Guaranty Funds and Solvency Regulation

In this study, the consumer is a risk averse expected-utility maximizer. Insurers are risk neutral but experience some transactions costs. In case of insolvency, the clients receive a “default indemnity” equal to a fraction of what would otherwise be owed them. Competition among insurers assures that premiums are lower when an insurer has a higher probability of insolvency or a lower default indemnity. In this environment, the consumer's demand for insurance has some unexpected properties. For instance, a consumer who has a higher risk of loss purchases less insurance coverage than one with a lower risk. Insolvency hardly matters to the low-risk consumer because he is unlikely to make a claim, but to the high-risk consumer an insolvency is more likely to be relevant. The analysis shows that an increase in the default indemnity always benefits consumers, even though they pay a fair price for it through higher premiums. On the other hand, an increase in the probability of solvency may hurt some consumers and is, in general, less beneficial than a comparable increase in default indemnity. The value of solvency regulation, then, is indirect. It protects guaranty funds and ameliorates the disincentives they create. The results hold up when the analysis includes regulatory costs.

This study has important policy implications. Because of the dramatic increase in insolvencies of insurance firms in recent years, the effectiveness of guaranty funds and solvency regulation has been questioned (Stewart 1988, Jackson 1990, U. S. House 1990, Power, et. al 1991, Schacht and Gallanis 1993). Federal intervention has been suggested as a way to improve solvency of the insurance industry. This study indicates that such an effort might be unnecessary or even harmful because reducing the probability of insolvency is not very beneficial. In particular, when such federal intervention causes higher regulatory costs, consumers are hurt. On the other hand, forming an interstate compact of guaranty funds or a national guaranty fund is attractive because it enables states to raise the default indemnities received by clients of failed insurers.

This study can also be viewed as an extension of the studies of regulatory effects on quality of products and on consumers. Economists have long been interested in such studies. Spence (1975) finds that when firms have the monopoly power to set both the price and quality of products, they tend to set quality too low. He further concludes that under certain conditions, rate of return regulation will force the firms to raise quality and thereby benefit consumers. Here, the quality of insurance products is the firm's probability of solvency and its default indemnity. Previous studies have focused on regulation and the quality of insurance services (for instance, Frech and Samprone 1980, and Pauly, Kunreuther and Kleindorfer 1986). Insolvency of insurance firms provides a unique environment under which one is able to analyze the effects of insurance regulation on quality of insurance and consumers. This study adds to understanding of the subject.

Capital Asset Pricing Models with Default Risk: Theory and Applications in Insurance

This study concentrates on the derivation of the competitive rate of return and the competitive premium for insurance when an insurer has a default risk. The result verifies in a new context the one

derived in the previous chapter, i. e., that the competitive rate of return and premium should be lower when an insurer has a higher risk of insolvency. The derivations take the point of views of investors who make portfolio decisions based on the expected return and variance of the investments. Such an assumption is weaker than one in the previous chapter, where it is assumed that insurers are risk neutral.

Researchers have long remarked that lack of insolvency risk is an important main weakness of the traditional Capital Asset Pricing Model (Fairley 1979, Doherty and Garven 1986, and Brown and Hoyt 1995). A major feature of the chapter is to remedy this defect by bringing in features of the Option Pricing Model in insurance and combining them with the Capital Asset Pricing Model. The derivation from this chapter shows that the competitive rate of return in insurance with insolvency risk will differ from the competitive rate of return without including the insolvency risk by the rate of return on the option of insolvency. Such a return exists and reduces the return required by investors because they have the limited liability when the firm becomes insolvent.

In evaluating the quantitative impact of the bankruptcy option, this paper uses data of property-liability stock insurance firms from 1943 to 1991. Functional forms for option value are based on the general theory of options. The chapter estimates the underwriting beta and the effects of the insolvency risk on the rate of underwriting profit. The existence of the insolvency reduces the required rate of return of underwriting by a small but significant amount. Although the estimated coefficient is small and the total effect on the profit rate is only about .14 percent, the effect on the insurance industry's total profits could be large because the total volume of premiums of the industry is so large. During 1943 to 1991, the average volume of the premiums for the property-liability stock insurance firms was \$ 39.5 billion per year. So, the total profit was reduced by \$55.3 million each year associated with the existence of the insolvency.

The Effects of Ceded Reinsurance on Solvency of Primary Insurers

In the previous studies, a less solvent insurer should charge less, assuming that consumers and investors are aware of the situation. In practice, the latter rely in part on state insurance regulators. In order for regulators to apply the results, they need to know which insurers are less solvent, and that requires looking at the financial status and underwriting activities of individual insurers. The Insurance Regulatory Information System (IRIS) was developed for this purpose by the National Association of Insurance Commissioners (NAIC) in the early 1970s. Recently it has been criticized for its failure to consider interdependence among the 11 ratios it includes, and modified to meet the criticisms. The modifications have not been completely successful. Researchers have found that relatively few companies that later failed had displayed the early warning signs that were anticipated (Grace, Harrington and Klein 1993 and Cummins, Harrington and Klein 1994).

It seems natural to look at the academic literature for ways of forecasting insolvency. Previous academic studies have examined many financial factors that may affect insurers' insolvency. One main result is that an insurer's premium to surplus ratio (the inverse of the policy-holder's surplus ratio) is a good indicator of an insurer's solvency (Harrington and Nelson 1986), and numerous other measures have roles to play. This paper seeks to add to the list of predictors. The idea is that the insurers have information about their probability of insolvency, which their decisions to cede reinsurance will partly reveal. Presumably the less solvent insurer uses more reinsurance. Especially in developing new business, the less solvent insurer has difficulty raising needed capital and relies on reinsurance to develop new business. Investors are not willing to put money on the primary insurer that has a high risk of insolvency because invested capital will be defaulted not only because of the risk of new business but also because of the old business. Investors are willing to put money in a reinsurer that assumes premiums from the new business of the primary insurer because investors can escape risk associated with the old business of the primary insurer. In the literature on costs of financial distress, the problem being solved by the insurer is the failure of financial markets to contribute to projects having positive market value.

Using data for property and liability insurers, the paper estimates the effects of ceded reinsurance on the probability of insolvency of the primary insurers. The results show that an insurer that has a higher cost to raise needed capital or an insurer that is involved in riskier lines of business uses more reinsurance than others. In particular, use of reinsurance signals a significant increase of an insurer's probability of insolvency. Thus excessive use of reinsurance could signal that the insurer is nearing insolvency.

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