© The Journal of Risk and Insurance, 1992 Vol. LIX, No 3, 462-469

SHORTER ARTICLES

Organizational Capital and Corporate Insurance Hedging

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ABSTRACT

Insurance may discourage the opportunistic externalization of the social costs of a firm's activities in a way that enhances optimal risk allocation for the firm's explicit, implicit, and tort claimants. Insurance enables a firm to exploit more fully the quasi rents associated with the profitable use of its organizational capital. At a critical level of insurability, internal coordination of the insurance function by common or joint ownership will create more net organizational capital than market insurance would.

The Corporate Demand for Insurance

Risk aversion as the traditional explanation for corporate insurance buying is unsatisfactory. Consider the insurance decision of a corporation with widely dispersed ownership within the frictionless markets framework. Insurance of unsystematic risks will not improve the welfare of the individual security holder, because any of these specific exposures can be eliminated by holding a well-diversified portfolio without paying an insurance premium. Insurance of systematic risks will lower the covariance between a firm's return and the market return, but the potential increase in firm value will be absorbed by the insurer as an insurance premium exceeding the actuarially fair odds by a mark-up sufficient to justify holding undiversifiable risk. On the surface, an insurance contract with huge loading fees would appear to be a negative net present value project.

However, corporate insurance decisions must be understood in a framework of market imperfections and transaction costs, where the insurer is an intermediary counteracting these imperfections. Corporate insurance may increase a firm's expected cash flows by decreasing its tax liabilities, increasing efficiency in the allocation of risk bearing among the firm's

* Luc Grillet is a doctoral student in economics at the University of Constance, Germany. The valuable help of the editor, an associate editor, the referees, Werner Ebke, and Günter Franke is gratefully acknowledged. The research reported in this article is supported by the Deutsche Forschungsgemeinschaft.

claimholders,[1] reducing expected bankruptcy costs, providing the firm with cost-effective service and claims administration services, monitoring the compliance of investments in prevention and loss control, bonding the firm's real investment decisions, and maintaining an optimal capital structure (see, for example, Cummins, 1976; Easterbrook and Fischel, 1985; Main, 1982; Mayers and Smith, 1982, 1987; Staking and Bernier, 1989).

The objective of this article is to increase our understanding of insurance hedging by drawing on the theory of the firm. The following section studies the corporate insurance decision in an incomplete capital market framework. The discussion then turns to the use of insurance to increase the firm's quasi rents. The final section of the article explains the phenomenon of insurance internalization.

Insurance and Incomplete Capital Markets

Woodward (1985) argues that the benefits of alienability of equity shares conferred by limited liability allows the exploitation of large investment opportunities by separating consumption, risk bearing, and production decisions. Limited liability eliminates the dependence of firm credit on shareholder wealth and reduces the transaction and information costs for risky investment projects with numerous stakeholders. But if financial distress depresses firm value, then limited liability will protect shareholders from being held personally liable for corporate debts when income or existing reserves are insufficient to cover those claims.

The benefits of limited liability must be weighed against the costs. In times of financial distress, the interests of stockholders and other stakeholders may be in conflict. Leonard and Zeckhauser (1985) point out that corporate liability produces an asymmetry in payoffs around the point of bankruptcy as limited shareholder liability separates the private and social costs of the firm's activities. Acting on behalf of shareholders, management may increase firm risk, even if it entails a reduction in expected returns. This article examines the impact of insurance on a firm's costs of limited liability assuming that there is a positive probability of insolvency.

Value Additivity

Assuming value additivity, the value of a leveraged uninsured firm can be written in an Arrow-Debreu framework as follows:

$$V_L^U = \Sigma_S P(i)V(i) + \Sigma_{S-B_L^U} P(i)\tau D - \Sigma_{B_L^U} P(i)c(i) \; . \qquad (1)$$

where S = set of a finite number of all states of nature i,
B_L^U = insolvency set of a leveraged uninsured firm,

[1] The optimal sharing rule between corporate claimants cannot be supported solely by stocks, bonds, and their hybrids (see Williams, 1987).

B_L^I = insolvency set of a leveraged insured firm,
$V(i)$ = after-tax value of an unleveraged firm in state i,
D = fixed coupon payment of a firm's perpetual debt,
$c(i)$ = cost of insolvency in state i,[2]
$P(i)$ = present value of a monetary unit in state i,
τ = tax rate for which the additional tax paid by lenders on an extra dollar of interest equals the expected corporate tax shield on an extra dollar of interest,
V_L^U = market value of an uninsured leveraged firm,
V_L^I = market value of an insured leveraged firm,
$L(i)$ = loading costs of the insurance contract in state i, $B_L^I \subset B_L^U \subset S$,
$P^U(i)$ = state price before insuring, and
$P^I(i)$ = state price after insuring.

The first term in equation (1) is the present value of the uninsured firm in the absence of leverage and insolvency costs, the second term equals the present value of the tax shield of debt financing, and the last term is the present value of insolvency costs.

Similarly, the value of an insured leveraged firm is

$$V_L^I = \Sigma_S P(i)V(i) + \Sigma_{S-B_L^I} P(i)\tau D - \Sigma_{B_L^I} P(i)c(i) - \Sigma_S P(i)L(i), \qquad (2)$$

where the loading costs are paid in every state (the premium is paid prior to occurence in standard insurance contracts). As a result, the change in firm value attributable to insurance can be written as

$$V_L^I - V_L^U = \Sigma_{B_L^U - B_L^I} P(i)\tau D + \Sigma_{B_L^U - B_L^I} P(i)c(i) - \Sigma_S P(i)L(i). \qquad (3)$$

Equation (3) shows that optimal insurance requires the marginal cost of insurance to equal the marginal present value of both the additional tax shield differential and the reduction in expected insolvency costs. Insurance reduces the set of states in which property-liability losses would trigger or inflate transaction costs. This effectively ensures reinvestment at a fixed a priori cost when the cost of reconstruction might be stochastic and unknown (and cannot be credibly communicated) to market participants at times when variance is very high.[3]

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[2] It is assumed that insolvency costs are paid only by the firm in states of insolvency. However, deadweight losses due to financial distress may also occur in some of the solvent states, and insurance will also limit these costs and the set of states where they occur. This slightly softens the overstatement of the value of insurance in equation (3).

[3] Insurance will flatten the optimal capital structure curve (see Staking and Bernier, 1989, pp. 15-23). A substantial uninsured loss will have both a liquidity and a replenishment effect: Restoration of productive capacity will raise the cost of short-term credit, and the lost equity will have to be replaced at higher cost.

Incomplete Capital Market

Equation (3) is generally not correct for at least three reasons. First, the Modigliani and Miller (1963) results apply to two firms in the same risk class, not necessarily to a given firm before and after leverage. In a perfect but incomplete market, repackaging by a firm will generally upset the equilibrium. Shifting a risk to an insurer generally cannot be undone by the investor in an incomplete market so that state prices will change. Second, when insurance reduces the deadweight losses of financial distress to the economy as a whole, state prices will change even in complete markets because the output in the economy will be affected. The Modigliani-Miller assumption of a fixed investment policy, which implies that aggregate output is not affected by a firm's financing decision, is untenable with deadweight losses. State prices may change, but, for a small risk in a large capital market, this effect might be of second order. Third, insurance purchases are not riskless; for example, commercial insurance lines are not fully covered by state guarantee funds (see Cummins, 1988). Other factors being equal, equation (3) overstates the value of insurance.

Relaxing the complete markets assumption may enrich the theory of financial intermediation and therefore deserves special attention. Gains are realized from trading insurable risks with a property-liability insurer, because the latter can cope with the firm's casualties at lower cost than the insured. Like any firm, the insurer is a nexus of contracts where teamwork should cut information costs more than a market structure would.[4] The insurance team produces reliable and long-lived information about property-liability loss distributions and uses its superior information to monitor the insured's postcontractual behavior, enforce contracts, and settle claims. Packaging together credibility, claims adjustment, and pricing of these liabilities in an insurance contract will change state prices; that is, state prices will be higher after insurance or in the previous model $P^I(i) > P^U(i)$. Investors lack the insurer's specialization and risk-bearing ability and hence are not able to duplicate this risk transfer in securities markets.

Insurance and Corporate Quasi Rents

The static framework with taxes and bankruptcy costs is too narrow for explaining the corporate demand for insurance. A more complete picture can be drawn from the theory of the firm. Limited liability enables the efficient separation and specialization of function but may also induce excessive risk-taking and impose uncompensated risks upon a firm's nonshareholder stakeholders. In the absence of appropriate incentive mechanisms, the costs of limited liability are externalized, and stockholders shift the risk of default to their claimants.

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[4] Restraining contracts and departures from repeated spot market transactions arise in markets where information is costly (see Alchian and Woodward, 1987, p. 111).

The firm as a nexus of contracts generates a variety of monitoring and free-riding problems that may be triggered or widened by property-liability losses. If no contract creditor has sufficient information about a firm's risky activities, then the market will elicit an appropriate price reaction by charging an explicit and prohibitively high risk premium, and the increased uncertainty will adversely affect the firm's reputational capital. Insurance will enable the firm to economize on these transaction costs. The insurer becomes one of the firm's contract creditors and reduces the externality under limited liability.[5]

The standard one-period paradigm may yield misleading results on the nature of monitoring and free-riding problems in financial markets, because the costs of limited liability can be greatly exaggerated. In a dynamic, multiperiod context, a firm's incentives to insure will be structured by the ex ante contracted provisions of rational creditors and by reputation mechanisms. Following Cornell and Shapiro (1987), the market value of all future implicit claims that a firm expects to sell equals its organizational capital, and the expected costs of honoring both current and future implicit claims equal its organizational liabilities. The difference between a firm's organizational capital and its organizational liabilities is called net organizational capital. This approach is consistent with the concept of corporate reputation, whereby building and maintaining a high value of reputational capital is an ongoing capital budgeting decision. Net organizational capital—the net proceeds of the investments in reputation—accrues to the shareholders.

Cornell and Shapiro (1987) argue that to the extent that a firm's value depends on its ability to sell implicit claims, financial distress is likely to be particularly costly, even in the absence of bankruptcy. In times of financial distress the prices of implicit claims drop, because the stakeholders expect reduced payouts on their implicit claims. They may refuse to buy any claims at all. Customers, suppliers, and other business partners can no longer do business on the same terms. Explicit contracts might have to be written at highly inflated cost to convince stakeholders to stay in business with the firm. Shocks, such as product recalls, litigations, and environmental difficulties, will seriously jeopardize the value of the firm, more than the direct cash drain would indicate.[6] The value of the firm's implicit claims will fall, and the price of new explicit contracts will rise.

Highly leveraged firms and firms with volatile incomes are likely to benefit from insurance hedging of financial distress. Recognizing implicit

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[5] The insurance decision is an application of the Coase (1960) Theorem with transaction costs. By adding insurance contracts to the firm's nexus of contracts in a way that internalizes the social costs of the firm's activities, a widely-held corporation might improve the welfare of all its stakeholders.

[6] Marcus (1984) and Herring and Vankudre (1987) note, interestingly, that growth opportunities of banks (charter value) are comparable with organizational capital. Regulators should take account of the incentives toward risk taking that are imbedded in the decision to erode value.

stakeholders' uncertainty about their future payouts, ex ante insurance of these casualty losses should maximize the firm's ex post value of net organizational capital. This article hypothesizes that firms with high levels of net organizational capital should engage in substantially more insurance hedging, thereby signaling their commitment to make payments on implicit claims. Moreover, this article suggests that insuring large casualty losses will enable the firm to exploit more fully the quasi rents associated with the profitable use of its organizational capital.

Stakeholder theory should focus on the entire group of corporate claimants. Cornell and Shapiro (1987) point out that a firm's nexus of contracts includes all explicit and implicit first-party claims. A firm, however, must tap the private interests of its activities to serve the public interest. The menu of corporate claimants also includes its tort or involuntary creditors. Limited liability and the existence of third-party (noncontract) creditors enlarges a firm's set of opportunistic cost externalization possibilities. Because limited liability separates the private from the social costs of its risky activities, a firm might undertake projects for which marginal social costs exceed marginal social benefits. Hansmann and Kraakman (1991, pp. 5-6) stress that a higher degree of financial leverage will exacerbate the externality, since the priority rule in bankruptcy includes secured but not tort creditors.

Contract creditors will anticipate the adverse impact of tort liability losses on the value of their investment stakes in firm-specific assets. Insurance enables shareholders to economize on the premiums paid to these claimants as compensation for bearing an increased probability of financial distress and hence of personal wealth expropriation in the event of mass tort litigation. Insurance will lower the opportunity cost of funds for high payouts on these claims.

The incentives to insure are, however, much weaker when the firm expects tort claims to be filed after many years of profitable and excessive risk-taking. The incentives for entering risky projects for which the net present value of social costs and benefits is negative will be particularly strong, the longer it takes tort costs to materialize. A delayed risk of tort litigation enables a firm to spin off risky activities without paying for future accident claims.[7] Schwartz (1985) argues that abolishing limited liability and imposing complete successor liability on a corporation that continues risky activities will solve the cost externalization problem. In the event of expected liability for predecessors' torts, the successor will pay a lower price for the assets or will not buy at all. This should induce the firm to engage in the optimal amount of insurance hedging, because it cannot dispose of its tort liabilities by sale.

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[7] See Ringleb and Wiggins (1990) for an empirical study of the segregation of risky activities to smaller subsidiary firms as a liability evasion strategy.

Insurance Internalization

By analogy to Klein, Crawford, and Alchian (1978), at a critical level of insurability, the insurer's comparative risk-bearing advantage will disappear, and the firm will have an incentive to vertically integrate into the corporate insurance function. Decreasing predictability of the insured's risks will raise the insurer's information costs. This will raise the real cost of market insurance relative to self-insurance and increase incentives for the internal coordination of the insurance function by common or joint ownership (captives, mutuals, and risk retention groups).

With decreasing predictability of risks and rising monitoring costs, the insurer faces an increased probability of being deprived of the quasi rents associated with the profitable use of his or her specific information-producing resources. This will induce the insurer to charge higher premiums and impose restrictive contractual provisions or, in the worst case, to withdraw from the market. The pure risk transfer exchange with a commercial risk carrier becomes unproductive. The insured has an incentive to purchase a random premium policy; that is, he or she becomes a residual risk bearer. Residual bearing of specific property-liability risks should in essence guarantee the reduction of transactional opportunism in the market by reciprocal transaction-specific investments. Firms in some industries are better informed than insurers about their specific exposures. In the presence of technological uncertainty and unstable tort rules, they are more able to cope with the difficulties of time lags and inadequate loss data inherent in third-party insurance lines. Their mutual knowledge enables them to be more cost-effective monitors of moral hazard and adverse selection problems.

In essence, a substantial commitment of group residual risk bearing should guarantee optimal risk prevention and loss reduction and support further market exchange. The particular governance structures that coexist in the insurance market are the result of a trade-off between transaction costs. They should improve the optimal allocation of resources, which, in the case of perfect marketability, would have been achieved through market forces.

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