

Grillet, Luc L.

Working Paper

Markets, hierarchies, and hybrids in corporate insurance

Diskussionsbeiträge - Serie II, No. 173

Provided in Cooperation with:

Department of Economics, University of Konstanz

Suggested Citation: Grillet, Luc L. (1992) : Markets, hierarchies, and hybrids in corporate insurance, Diskussionsbeiträge - Serie II, No. 173, Universität Konstanz, Sonderforschungsbereich 178 - Internationalisierung der Wirtschaft, Konstanz

This Version is available at:

<https://hdl.handle.net/10419/101631>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

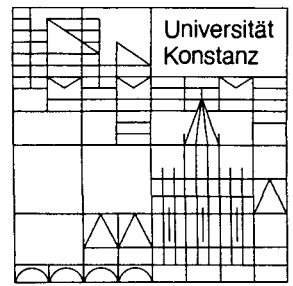
Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Sonderforschungsbereich 178
„Internationalisierung der Wirtschaft“

Diskussionsbeiträge



Juristische
Fakultät

Fakultät für Wirtschafts-
wissenschaften und Statistik

Luc|Grillet

**Markets, Hierarchies, and Hybrids
in Corporate Insurance**

Postfach 5560
D-7750 Konstanz

Serie II — Nr. 173
April 1992

15. JUNI 1992 Weltwirtschaft
Kiel

W 113-173.H

**MARKETS, HIERARCHIES, AND HYBRIDS
IN CORPORATE INSURANCE**

Luc Grillet

Serie II - Nr. 173

April 1992

ABSTRACT

The superior risk-bearing ability of commercial insurers is limited. Their comparative advantage depends on the calculability of property-liability loss distributions. Insurance contracts have their own transaction costs and these may outweigh the benefits of the commercial risk transfer. The violation of actuarial preconditions for insurability will augment these transaction costs. This increases incentives for insurance internalization and changes the organizational structures governing the market for corporate insurance. Residual risk bearing by captive and mutual forms may enhance further market exchange.

Markets, Hierarchies, and Hybrids in Corporate Insurance

by Luc Grillet

1. Introduction

This article focuses on the costs of limited shareholder liability in the theory of the firm. Market insurance may discourage the opportunistic externalization of those costs in a way that enhances optimal risk allocation for corporate stakeholders. The paper hypothesizes that insurance will enable the 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 (hierarchies) might enhance the credibility of the firm's organizational capital in a more cost-effective way than market insurance would do. Inefficient tort rules and extensive policy interpretation against insurers exacerbate insurance market dislocations and hamper economic stability. Insurance market externalities may induce industries to redesign contractual and organizational forms in order to reach a new, efficient equilibrium in which some liability is allocated to firms even though they are not the least-cost risk bearers.

2. Corporate Liability and Corporate Insurance

Limited shareholder liability enables the efficient separation and specialization of function (see Woodward [1985]), but

may also induce excessive risk taking and impose uncompensated risks on the firm's stakeholders. In the absence of appropriate incentive mechanisms, the costs of limited shareholder liability are externalized and stockholders shift the risk of default to their claimants.

2.1. Contract Creditors

The firm as a nexus of contracts generates a variety of monitoring and free riding problems which may be triggered or widened by property-liability losses. If no contract creditor has sufficient information about the 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 liability¹.

It should be stressed that the standard one-period paradigm can yield misleading results on the nature of monitoring and free riding problems in financial markets. The costs of limited liability can be greatly exaggerated in a one-period framework. In a dynamic, multiperiod context, the firm's incentives to

¹ The corporate 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 may improve the welfare of all its stakeholders.

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 the 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 the firm's organizational capital and its organizational liabilities is called net organizational capital. This approach is consistent with the concept of corporate reputation. Building and maintaining a high value of reputational capital can be seen as 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 the value of the firm 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 will drop, since corporate stakeholders expect reduced payouts on their implicit claims. They may even refuse to buy claims at all. Customers, suppliers and other business partners are no longer prepared to 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 indicate². The value of the firm's implicit claims will fall and the price of new explicit contracts will rise.

Highly levered firms and firms with volatile income streams are likely to benefit from insurance hedging of financial distress. Recognizing the uncertainty of implicit stakeholders about their future payouts, ex ante insurance of these casualty losses should maximize the firm's ex post value of net organizational capital. This paper hypothesizes that firms with high levels of net organizational capital should engage substantially more in insurance hedging, thereby signalling their commitment to make payments on implicit claims. Moreover, this paper 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.

2.2. Tort Creditors

Stakeholder theory should focus on the entire group of corporate claimants. Cornell and Shapiro [1987] point out that the firm's nexus of contracts includes all explicit and implicit first-party claims. The firm, however, has to 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

² A similar argument is made in the interesting papers of Marcus [1984] and Herring and Vankudre [1987], where growth opportunities of banks (charter value) are comparable with organizational capital. Regulatory and deregulatory measures should be taken carefully so as not to erode organizational assets and precipitate financial distress.

(noncontract) creditors enlarges the firm's set of opportunistic cost externalization possibilities. Since limited shareholder liability separates the private from the social costs of its risky activities, the firm might undertake projects for which marginal social costs exceed marginal social benefits. Hansmann and Kraakman [1991, 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 NPV of social costs and benefits is negative will be particularly strong, the longer it takes until tort costs materialize. A delayed risk of tort litigation enables the firm to spin-off risky activities without paying for future accident claims³. Schwartz [1985] argues that abolishing limited liability and imposing complete successor liability on the corporation that continues the risky activities will solve

³ The subsidiarization of risky activities as a liability evasion strategy is empirically studied in Ringleb and Wiggins [1990].

the cost externalization problem. In the event of expected liability for predecessors' torts, the successor will pay a lower price for the assets or won't buy at all. This should induce the firm to engage in the optimal amount of insurance hedging, since it cannot get rid of its tort liabilities by sale.

Liability should not be extended to remote risks, i.e. risks whose full extent a cost-justified research program would not have revealed and whose materialization could not have been prevented by an accurate warning (Cooter [1985] and Schwartz [1985]). The courts should investigate negligence on the basis of the reasonably available information at the time the firm started its risky activity. The level of risk control achieved through insurance and risk prevention would be more optimal if tort standards were enforced using ex ante measures of harm. Strict liability for uncertain events may decrease product quality through insurance premium averaging, weaken incentives for research into product safety or trigger the withdraw of products that are valuable for society. It is precisely the wrong practise of assessing negligence with ex post information together with extensive policy interpretation against insurers that reduced the firm's incentives to invest in safety research, stimulated liability evasion strategies and induced insurers to withdraw from unpredictable market segments. Capping liability on the basis of ex ante information⁴, however, will benefit both

⁴ Liability for risks that could not have been anticipated flaws the distinction between risk and uncertainty. See De Alessi and Staaf [1987, 16]: "[...] risk is insurable and spread in the market, whereas uncertainty, by definition, is uninsurable, unanticipated, and largely borne ex post by the owners of the firms."

the demand for and the supply of liability insurance. Strict liability for remote risks leads to deep-pocket results instead of risk spreading in the market.

3. Limits of Insurability and Markets versus Hierarchies

Shifting risk to an insurer is beneficial if the latter has a comparative advantage in risk bearing over other corporate claimants. A few scholars have advanced a positive and powerful framework for studying the insurance decision in the theory of the firm⁵. But their work overemphasizes the superior risk-bearing ability of commercial insurance intermediaries. At a critical level of insurability, internal coordination of the corporate insurance function by common or joint ownership will create more net organizational capital than market insurance would do.

3.1. Limits of Market Insurability

Increasing transaction costs within the firm's nexus of contracts raises the cost of joint production. Enlarging the set of corporate contracts with insurance policies should lower these costs by establishing a risk exchange with a more productive agent. Gains from trading insurable risks with a property-liability insurer arise when the latter can cope with the firm's casualties at lower cost than the insured. Insurance companies have a comparative advantage in claims administration services.

⁵ See the pioneering contributions of Mayers and Smith [1982] and Easterbrook and Fischel [1985].

Their real service efficiencies are due to their credibility, their diversification capabilities and their special skills in monitoring the insured's behavior, pricing risks and adjusting claims. Their specialization in writing and enforcing contracts on low probability events allows for economies of scale and learning, and their size is important for their credibility. Packaging credibility, claims adjustment and pricing of liabilities in an insurance contract reduces transaction costs.

The risk-bearing capacity of the suppliers of insurance services is limited, though. Their comparative advantage depends on the calculability of property and liability loss distributions. Predictability of insurable perils requires an explicit consideration of information costs. The insurance company is a nexus of contracts where teamwork should cut information costs at lower cost than a market-governance structure would do⁶. The insurance team produces reliable and long-lived information about property-liability loss distributions and uses its superior information production ability to monitor the insured's postcontractual behavior, enforce contracts and settle claims. Exogenous factors might lower the calculability of risks and raise information costs. This will not immediately induce the insurer to shrink insurance capacity, but will lead to an (increased) imposition of restrictive contractual provisions and to rising loading fees. This will raise the real cost of market insurance relative to self-insurance and increase incentives for

⁶ Restraining contracts and departures from repeated spot market transactions arise where information is costly; see Alchian and Woodward [1987, 111].

risk retention and alternative risk-sharing structures⁷. A better understanding of these governance mechanics requires a brief analysis of the economic properties of insurable risks. It is useful to distinguish between diversifiable and undiversifiable risks.

Risks are defined to be diversifiable when property-liability loss distributions can be calculated with accuracy. Accurate loss calculability requires efficient risk pooling, careful behavior on the part of the insured, ability of the insurer to differentiate between good and poor risks, predictability of loss probabilities, loss determinability and risk identifiability. Successful risk pooling requires insurable exposures to be numerous, homogeneous and relatively independent. The Law of Large Numbers can be readily applied. The average variance of the insurer's underwriting portfolio vanishes as his number of insurance policies tends to infinity.

Few risks exhibit all these ideal insurability criteria. This is not to say that one missing criterion should make particular exposures uninsurable. But the combined disappearance of several insurability conditions will make exposures difficult to insure for commercial risk carriers. The principal reason lies in the fact that the criteria are not independent of each other and their combined absence might exacerbate the calculability problem. The combined violation of several insurability conditions will lead to the mutualization of undiversifiable hazards.

⁷ The captive insurance phenomenon is incompatible with the stylized risk-aversion rationale. See Goldberg [1984, 566]: "[Increasing bonding costs of the insurer suggest] an explanation for an apparent anomaly - the increased use of self-insurance in the face of increased uncertainty."

Stock insurance companies can no longer achieve efficient risk pooling. With the benefits of the risk-pooling function disappearing, captive and mutual insurance forms will be a better way to spread and reduce risk⁸.

3.2. Insurance Market Externalities

Externalities reduce the superior risk-bearing ability of pure risk-transfer exchanges with commercial risk carriers. This will raise the cost of market insurance relatively to self-insurance and increase incentives for coordinating the insurance function by common or joint ownership. If the marginal cost of hiring and monitoring the inputs necessary for establishing house-made insurance is lower than the marginal cost of market insurance with an independent intermediary, then insurance internalization gives rise to a positive residual for the monitor-owners of the firm.

3.2.1. Moral Hazard

Many contracts written among the firm's resource owners are of the option type (see Franke [1987, 146]). An insurance policy provides the policyholder with an enlarged postcontractual opportunity set. This induces the insurance company to monitor the insured. This article stresses that some corporate risks do not allow for cost-effective monitoring. The enlarged postcontractu-

⁸ See also Marshall [1974], who discusses why the pure risk-transfer contract fails to provide ideal risk spreading for catastrophic hazards.

al opportunity set of the insurance buying firm can hardly be reduced and the insurer will charge a prohibitively high risk premium or he might even withdraw from that market segment.

Industries characterized by technological uncertainty, specific investments and continuous innovation do not have reliable loss experiences. The lack or outmoded nature of historical loss data obscure the insurer's superior role for undertaking inspection and safety research and triggering investments in risk prevention and loss reduction⁹. The sample of observations for catastrophic hazards will often be too small to allow the insurer to use experience rating for coping with moral hazard¹⁰. Cost-effective monitoring is nearly impossible and moral hazard remains unabated. Smaller mutual forms serve the purpose of mitigating the moral hazard problem. A small group of specialty manufacturers, for example, is better able to assess industry-specific risks, achieve cost-effective monitoring and induce safety measures that satisfy internal industry standards¹¹. The conflict of interest between insurer and insured will be internalized.

The moral hazard problem can be exacerbated by legislative

⁹ For an excellent discussion of the difficult calculability of loss distributions for chemical hazards and other insurability problems see Katzman [1987].

¹⁰ The infrequency of losses is one of the reasons why commercial risk carriers are inefficient risk bearers of satellite risks; see Butler and Doherty [1991].

¹¹ See Hansmann [1985, 148], who notes that mutual investments in risk prevention and loss reduction will be more effective since they will be returned to the mutual's policyholders-owners in the form of reduced insurance premiums. The incentives for a stock insurer under a pure risk-transfer contract to reward care are much weaker.

and judicial changes. In 1976, American Congress passed the Resource Conservation and Recovery Act (RCRA). RCRA regulates the treatment, storage and disposal of hazardous chemical substances. Handlers of these substances are required to show adequate financial responsibility (insurance coverage) for tort damages extending to 30 years after closure of the hazardous waste site. In 1980, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was passed in order to provide partial funding for hazardous waste cleanups and impose strict liability for cleanup costs on responsible parties. CERCLA has been amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, which imposed joint and several liability on responsible parties. The doctrine of joint and several liability in toxic torts reduces incentives of single waste handlers to invest in safety and care since damages might be shared with the other participants in the waste lifecycle¹². The insurance industry is a less efficient monitor of toxic risks. Mutualization of toxic damages within the industry will reverse perverse incentives.

3.2.2. Adverse Selection

Another reason for explaining the internal coordination of

¹² Joint and several liability may also reduce the efficacy of the Law of Large Numbers. For example, all generators of a particular chemical might become liable through the joinder of defendants; see Katzman [1988]. If a larger stake of an insurer's underwriting portfolio consists of environmental impairment liability risks of generators of the same chemical, the positive correlation due to joint and several liability might lead to disastrous diseconomies of risk pooling for the insurer.

the corporate insurance function by common or joint ownership is adverse selection undercutting the viability of the insurance market. Asymmetric information may provide a class of corporations with a clear incentive to single itself out of the crowd of insurance buyers as a means of getting more insurance for its money. This article argues that the difficulty of distinguishing between prospective insureds that differ in the risks they present is likely to increase with the policyholder's asset specificity. Captives and other mutual forms of insurance can be used as devices that signal the insurance market the true information about low-risk corporations and separate the latter from the riskier ones. The reinsurance market can act upon these signalling low-risk companies by serving them at a fairer rate than the direct commercial market would have done¹³. False signalling can be avoided through credible commitments, i.e. strong capitalization and a participating reinsurance policy with periodical adjustment.

The joint and several liability structures of RCRA and CERCLA will induce careful parties to self-insure, since adequate financial responsibility, and accurate and careful waste recording will not exclude them from the list of potentially

¹³ In the presence of symmetric information, there is no obvious rationale for an improved access of the captive insurer to the reinsurance market. Since the captive insurer and the direct underwriter are uniformly informed, one can reasonably expect the same contractual conditions to prevail in the reinsurance market. However, in the face of a fragmented buying structure of direct underwriters, large captives or risk retention groups might benefit from scale economies in purchasing reinsurance, due to their centralized bargaining position.

responsible parties¹⁴. Insurers face an adverse selection problem because they are doomed to underwrite mainly the worst toxic risks and increasing premiums will worsen the externality. The adverse selection and moral hazard problems due to joint and several liability could be mitigated if vertically integrated firms handled the treatment, storage and disposal of hazardous substances in house (see Doherty, Kleindorfer and Kunreuther [1990, 414-416]). Moreover, this article argues that, because of the huge transaction costs due to the indivisibility of toxic torts, joint and several liability can only be justified in a joint production industry, because only under joint production the ex post liability for tort damages will trigger the optimal ex ante risk management and insurance behavior.

3.3.3. Technology and Industry-Specific Uncertainty

Technological and industry-specific uncertainty¹⁵ can motivate the group internalization of corporate risk bearing. Buyers of mutual insurance against specific property and liability losses are less concerned with avoiding perils of the industry as a whole. No pool member will have a comparative advantage

¹⁴ This is consistent with Smith and Stutzer [1990], who prove that, in the presence of asymmetric information and aggregate uncertainty, low-risk firms will purchase participating policies (mutual insurance) but high-risk firms will not share risks with their insurers (pure risk transfer by means of nonparticipating policies).

¹⁵ Particularly for long-tail insurance lines, predictability of underwriting losses substantially decreased in the mid-80's, since a growing body of empirical evidence demonstrated the harmful effects of asbestos, pharmaceuticals and toxic waste; see U.S. Department of Justice [1986].

through mutual insurance since they are all exposed to the same concentrated losses (Hansmann [1985, 148]). If stock insurance companies insured those risks, they would be less cost-effective, for they would demand higher risk premiums for bearing the loss experience of the industry as a whole.

The withdraw of commercial risk carriers from particular liability insurance lines has been stimulated by extensive policy interpretation against insurers. Insurers try to cope with uncertainty by limiting coverage for certain events. Limiting coverage will make risks more predictable and priceable. The extensive policy interpretation of one court will result in an unanticipated and hence inadequately priced underwriting loss for the insurer (see Doherty [1991, 231]). The application of the rule of precedent through which a present court's interpretation may bind future court decisions can result in an undiversifiable portfolio of strongly correlated losses. Violation of both the Law of Large Numbers (correlation) and the condition of accurate loss identifiability causes these risks to be uninsurable under a pure risk-transfer contract.

3.3.4. Unstable Tort Rules

Uninsurability problems have primarily occurred in long-tail third-party liability lines (see Lai and Witt [1991] and Priest [1987]). Insurability problems might have been aggravated through cash flow underwriting practices, forecasting errors and the cyclical insurance underwriting cycle (Wade [1987]). Growing evidence suggests, however, that the primary cause of the insu-

rance crisis lies in the unanticipated increase in liability losses triggered by generous jury awards and by spectacular and unpredictable tort litigation¹⁶. This made traditional insurance coverage unviable since tort liability losses had lost their probabilistic character and disastrous correlation took away the risk-pooling ability from property-liability insurers¹⁷. The shift to organizational forms of insurance internalization was a natural response.

The Law of Large Numbers fails to work out in long-tail tort liability lines because there is a substantial time lag between the underwriting of contracts and the occurrence of tort losses. Insurers estimate loss distributions taking into account the liability rules and information prevailing at the time of policy issue. Substantial cumulative changes in the insurer's information base on which losses are calculated induce a movement from constant to random premium contracts (Doherty [1991]). The growing trend from occurrence to claims made policies and the rise of captive insurance reflect this movement.

3.3. Internal Coordination of the Insurance Function

Internal coordination of the insurance function by common or joint ownership may solve much of the moral hazard, adverse

¹⁶ For empirical evidence see Harrington and Litan [1988], Barker [1991], Cummins and Weiss [1991] and Litan [1991].

¹⁷ Unstable tort rules create undiversifiable, sociolegal risk. See Danzon [1984, 519]: "[...] sociolegal risk [...] is independent of the size of the risk pool and cannot be costlessly diversified through multiline insurance portfolios or stock markets."

selection and industry-specific uncertainty problems that plague particular insurance market segments. Residual and mutual risk bearing will enhance the credibility of the firm's organizational capital better than market insurance would do.

3.3.1. Residual Risk and Captive and Mutual Insurance Forms

For some corporate risks insurers are denied the usual tools to cope with insurability problems. The pure risk-transfer exchange with a commercial risk carrier becomes unproductive. The insurer charges skyrocketing loading fees, limits coverage or withdraws from the market. The insured has an incentive to purchase a random premium policy, i.e. he becomes a residual risk bearer. Residual bearing of specific property-liability risks, either through a stock, mutual or reciprocal form, should in essence guarantee the reduction of transactional opportunism in both goods and the insurance market by reciprocal transaction-specific investments. The members of a particular industry are better informed about some of their specific exposures than independent insurers. In the presence of technological uncertainty they are more able to cope with the time lag and inadequate loss data difficulties of third-party insurance lines. Their mutual knowledge will make them more cost-effective monitors of moral hazard and adverse selection problems.

This article stresses the fact that for particular industries where insurance is an important factor of production (e.g. hazardous waste management) group residual risk bearing may be Pareto-improving. This is the case since group residual risk

bearing introduces an aspect of joint production. Under the present system of joint and several liability, vertical integration of real activities or mutual risk bearing of the ex post tort liability losses of these activities will ensure the optimal amount of ex ante care.

In 1986, Congress stimulated the group residual risk bearing trend by enacting the Liability Risk Retention Act (LRRRA). LRRRA promotes the establishment of Risk Retention Groups to alleviate the problems of the product liability and other insurance market segments¹⁸.

3.3.2. Partial Risk Shifting and Hybrid Forms of Risk Bearing

In reality, the insurance market for catastrophic corporate hazards will be governed by more hybrid forms of risk bearing. Single and mutual captives, risk retention groups and reciprocal risk exchanges will cede particular layers of risk to the reinsurance market. Mutual risk-bearing forms might write third-party risks to achieve greater diversification. The market's answer is partial risk shifting. In essence, a substantial commitment of group residual risk bearing should guarantee cost-effective risk prevention and loss reduction and support further market exchange. The particular governance modes that coexist in the market are the result of a trade-off between transaction

¹⁸ LRRRA seems to be perceived by the insurance market as good news: Moore and Smith [1989] studied the average economic impact on the share values of large commercial insurers affected by the Act using the economic event methodology. They find marginally significant positive abnormal returns on equity for those commercial insurers with a significant stake in troubled commercial liability segments.

costs. They should restore or improve the optimal allocation of resources which, in the presence of perfect marketability, would have been achieved through market forces.

4. Concluding Remarks

This article focused on the costs of limited shareholder liability in the theory of the firm. The externalization of the social costs of the firm's activities will be reduced by the firm's incentives to insure. Incentives to insure will be triggered by contractual provisions that are imposed by rational stakeholders and by reputation mechanisms. In the presence of remote risks, the cost externalization problem may be properly dealt with by imposing complete successor liability on the corporation that continues the risky activity. This will restore incentives to insure and enable the firm to exploit more fully the quasi-rents associated with the profitable use of its organizational capital.

The superior risk-bearing ability of commercial risk carriers is limited. Their comparative advantage depends on the calculability of property-liability loss distributions. Insurance contracts have their own transaction costs and these may outweigh the benefits of the commercial risk transfer. The violation of actuarial preconditions for insurability will augment these transaction costs. This increases incentives for insurance internalization and changes the organizational structures governing the market for corporate insurance. Residual risk bearing by captive and mutual forms may enhance further market ex-

change.

Extensive policy interpretation against insurers and the doctrines of strict liability and joint and several liability exacerbate insurance market dislocations and do not trigger insurance buying corporations to engage in the optimal amount of ex ante care. Legal rules and judicial standards attempting to use insurance companies as a deep pocket are a waste of regulatory resources and a threat to economic stability. Regulatory policy should be designed such as to improve the economic viability of market forces in assuring the internalization of the social costs of the firm's activities. The tort liability system with its extremely expensive litigation should perform a strictly complementary role, i.e. enforcing compensation from firms that violated carefully set safety standards (see also Viscusi [1988]). To the extent that the market has responded to unstable tort rules by changing contractual and organizational design, the industries involved move to a new, efficient equilibrium in which some liability is allocated to firms even though they are not the least-cost risk bearers.

REFERENCES

- Alchian, Armen A., and Woodward, Susan E. [1987], "Reflections on the Theory of the Firm," *Journal of Institutional and Theoretical Economics*, 143, 110-136.
- Barker, Drucilla K. [1991], "An Empirical Analysis of the Effects of Product Liability Laws on Underwriting Risk," *Journal of Risk and Insurance*, 58, 63-79.
- Butler, Ann M., and Doherty, Neil A. [1991], "Torts and Orbits: The Allocation of the Costs of Accidents Involving Space-

- craft," *AEA Papers and Proceedings*, 81, 46-49.
- Coase, Ronald H. [1960], "The Problem of Social Cost," *Journal of Law and Economics*, 3, 1-44.
- Cooter, Robert D. [1985], "Defective Warnings, Remote Clauses, and Bankruptcy: Comment on Schwartz," *Journal of Legal Studies*, 14, 737-750.
- Cornell, Bradford, and Shapiro, Alan C. [1987], "Corporate Stakeholders and Corporate Finance," *Financial Management*, 16, 5-14.
- Cummins, J. David [1988], "Risk-Based Premiums for Insurance Guaranty Funds," *Journal of Finance*, 43, 823-839.
- Cummins, J. David, and Weiss, Mary A. [1991], *Structure, Conduct, and Regulation of the Property-Liability Insurance Industry*, Working Paper No.91-9, Philadelphia: Center for Risk and Insurance, The Wharton School of the University of Pennsylvania.
- Danzon, Patricia M. [1984], "Tort Reform and the Role of Government in Private Insurance Markets," *Journal of Legal Studies*, 18, 517-549.
- De Alessi, Louis, and Staaf, Robert S. [1987], "Liability, Control, and the Organization of Economic Activity," *International Review of Law and Economics*, 7, 5-20.
- Doherty, Neil A. [1991], "The Design of Insurance Contracts When Liability Rules are Unstable," *Journal of Risk and Insurance*, 58, 227-246.
- Doherty, Neil A., Kleindorfer, Paul, and Kunreuther, Howard [1990], "Insurance Perspectives on an Integrated Hazardous Waste Management Strategy," *The Geneva Papers on Risk and Insurance*, 15, 407-427.
- Easterbrook, Frank H., and Fischel, Donald R. [1985], "Limited Liability and the Corporation," *The University of Chicago Law Review*, 52, 89-117.
- Franke, Günter [1987], "Reflections on the Theory of the Firm: Comment," *Journal of Institutional and Theoretical Economics*, 143, 143-148.
- Goldberg, Victor P. [1984], "Tort Reform and the Role of Government in Private Insurance Markets: Comment on Danzon,"

Journal of Legal Studies, 13, 565-567.

Hansmann, Henry [1985], "The Organization of Insurance Companies: Mutual versus Stock," *Journal of Law, Economics, and Organization*, 1, 125-153.

Hansmann, Henry, and Kraakman, Reinier [1991], "Toward Unlimited Shareholder Liability for Corporate Torts," *The Yale Law Journal*, 100, 1-55.

Harrington, Scott, and Litan, Robert E. [1988], "Causes of the Liability Insurance Crisis," *Science*, 239, 737-741.

Herring, Richard J., and Vankudre, Prashant [1987], "Growth Opportunities and Risk-Taking by Financial Intermediaries," *Journal of Finance*, 42, 583-599.

Katzman, Martin T. [1987], "Environmental Risk Management through Insurance," *Cato Journal*, 6, 775-799.

Katzman, Martin T. [1988], "Pollution Liability Insurance and Catastrophic Environmental Risk," *Journal of Risk and Insurance*, 55, 75-100.

Klein, Benjamin, Crawford, Robert G., and Alchian, Armen A. [1978], "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law and Economics*, 21, 297-326.

Lai, Gene C., and Witt, Robert C. [1991], *A Microeconomic Theory of the Commercial Liability Insurance Crisis under Uncertainty*, Working Paper 90/91-2-18, Department of Finance, The University of Texas at Austin.

Litan, Robert E. [1991], "The Safety and Innovation Effects of U.S. Liability Law: The Evidence," *AEA Papers and Proceedings*, 81: 59-64.

Marcus, Alan J. [1984], "Deregulation and Bank Financial Policy," *Journal of Banking and Finance*, 8, 557-565.

Marshall, John M. [1974], "Insurance Theory: Reserves versus Mutuality," *Economic Inquiry*, 12, 476-492.

Mayers, David, and Smith, Clifford W. [1982], "On the Corporate Demand for Insurance," *Journal of Business*, 55, 281-296.

Moore, William T., and Smith, Joan T. [1989], "The Risk Retention Act of 1986: Effects on Insurance Firm Shareholders' Wealth," *Journal of Risk and Insurance*, 55, 137-145.

- Priest, George L. [1987], "The Current Insurance Crisis and Modern Tort Law," *The Yale Law Review*, 96, 1521-1590.
- Ringleb, Al H., and Wiggins, Steven [1990], "Liability and Large-Scale, Long-Term Hazards," *Journal of Political Economy*, 98, 574-595.
- Schwartz, Alan [1985], "Products Liability, Corporate Structure, and Bankruptcy: Toxic Substances and the Remote Risk Relationship," *Journal of Legal Studies*, 14, 689-726.
- Smith, Bruce D., and Stutzer, Michael J. [1990], "Adverse Selection, Aggregate Uncertainty, and the Role for Mutual Insurance Contracts," *Journal of Business*, 63, 493-510.
- U.S. Department of Justice [1986], *Report of the Tort Policy Working Group on the Causes, Extent and Policy Implications of the Current Crisis in Insurance Availability and Affordability*, Washington: U.S. Government Printing Office.
- Viscusi, W. Kip [1988], "Product Liability and Regulation: Establishing the Appropriate Institutional Division of Labor," *AEA Papers and Proceedings*, 78, 300-304.
- Wade, J.W. [1987], "An Evaluation of the "Insurance Crisis" and Modern Tort Law," *Houston Law Review*, 24, 81-96.
- Woodward, Susan E. [1985], "Limited Liability in the Theory of the Firm," *Journal of Institutional and Theoretical Economics*, 141, 601-611.

Luc Grillet

Sonderforschungsbereich 178

Internationalisierung der Wirtschaft

Universität Konstanz

Postfach 5560

D-7750 Konstanz