WPS 1155

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Financial Sector Development

Financial Sector Development Department
The World Bank
July 1993
WPS 1155

The Regulation and Structure of Nonlife Insurance in the United States

Martin F. Grace
and
Michael M. Barth

Restrictive regulations on the U.S. nonlife insurance industry have affected its efficiency and profitability, especially for such mandatory lines as automobile insurance. Prudential regulation that emphasizes solvency monitoring is preferable to price, product, and entry controls.

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This paper — a product of the Financial Sector Development Department — is part of a larger effort in the department to study the development of the insurance industry. Copies of the paper are available from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Priscilla Infante, room N9-003, extension 37664 (July 1993, 64 pages).

The insurance industry is underdeveloped in most developing countries because of low levels of income and wealth and because restrictive regulations inhibit the supply of insurance services. But several countries have begun to reform their insurance industries.

To help those countries, Grace and Barth offer an overview of insurance regulation in the United States—and discuss the economics and market structure of nonlife insurance in entry and exit barriers, economies of scale, and conduct and performance studies.

They conclude that the U.S. nonlife insurance industry exhibits low concentration at both national and state market levels. Concentration is low even on a line-by-line basis.

The primary concern of regulators has been to protect policyholders from insolvency, but regulation has also often been used to protect the market position of local insurance companies against the entry of out-of-state competitors. Regulation has worked best when based on solvency monitoring, with limited restrictions on entry. It has been more harmful when it involved controls on premiums and products and on the industry's level of profitability.

Over the years the industry has shown a remarkable degree of innovation, although it has also faced many serious and persistent problems. The problems include the widespread crisis in liability (including product liability and medical malpractice), the crisis in automobile insurance, the volatility of investment income, the effects of market-driven pricing and underwriting cycles, and the difficulty of measuring insurance solvency.

The "long-tailed" lines of insurance — those that entail long delays in final settlements — are exposed to the vagaries of inflation and rising costs.

Two mandatory lines — third party automobile insurance and workers' compensation (for work accidents) — account for nearly 55 percent of premiums. These two lines — plus medical malpractice, other liability, and aircraft insurance — had combined ratios well over 125 percent in 1989.

The industry has some ability to collude and to set prices, but seems to be competitive and to earn profits below similarly situated financial firms. Insurance profitability is not consistently above or below normal returns, although earnings for mandatory and strictly regulated lines of automobile insurance and workers' compensation appear to be below-adequate for long-term viability.

Produced by the Policy Research Dissemination Center

Financial Sector Development Department
The World Bank

The Regulation and Structure of Non-Life Insurance in the United States

Martin F. Grace & Michael M. Barth

PREFACE

The state of development of the insurance industries in many developing countries reflects the low level of income and especially the low level of insurable wealth of their residents. But the insurance industries, for both life and nonlife purposes, have also suffered in most developing countries from restrictive regulations and domination by state-owned companies. Competition and innovation have been stifled by controls on premiums and products; consumer protection has been inadequate; too many risks have been retained in the domestic markets through restrictions on reinsurance with international companies; and the financial position of most domestic companies has been weakened by operating inefficiencies, inadequate premiums, exposure to excessive risks, and compulsory investments in low-yielding assets, especially government securities.

Recent years have witnessed a recognition of the damaging effects of restrictive regulations and several countries have undertaken, or have been willing to undertake, fundamental reforms of their insurance sectors. In the case of life insurance, these initiatives have often been linked with social security and pension reforms. In nonlife insurance, they have often emphasized the benefits from opening domestic markets to foreign entry. These benefits have taken the form not only of increased competition but also of transfer of financial technology, both in terms of new products and in terms of better management and higher operating efficiency.

One of the issues facing policymakers contemplating fundamental insurance reform is what would be the structure of a competitive insurance industry and what kind of regulations would be required to ensure the financial soundness of insurance companies and to protect the interests of policy holders. The present paper, commissioned from Messrs Martin Grace and Michael Barth, of the Center for Risk Management and Insurance Research of Georgia State University, provides an overview of the regulation, structure, and economic performance of the US nonlife insurance industry. The paper complements the research conducted by Mr Kenneth M. Wright on the US life insurance industry (Wright, 1992). The US market is, of course, highly complex and sophisticated and is faced with many problems that would not be relevant for the majority of developing countries. However, it is hoped that the analysis and findings of the paper, and especially its emphasis on competition within a framework of sound prudential controls, would be useful to policy makers and others dealing with insurance issues in developing countries.

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I. Introduction and Summary

A. Introduction

The U.S. non-life insurance industry suffered a liability crisis, a malpractice crisis, a worker's compensation crisis, an auto insurance crisis, and a solvency crisis during the 1980s and early 1990s. As a result, the non-life insurance industry is under more rigorous scrutiny than at any time in its past. Academics, policy makers and consumer advocates have examined parts of the industry and made proposals for reform. States have reacted by passing new laws that enhance regulatory powers, reform tort laws, or set prices.

The non-life insurance industry is generally considered competitive and, under current economic thinking, not a proper subject for increased government regulation. Current government concern arises from the size of the industry and its impact on consumers. There are approximately 2,000 non-life insurance companies in the United States employing over 1 million people. Non-life companies wrote over $205 billion in premiums and paid over $1 billion in state and federal taxes during 1988. Non-life premiums account for 2% of a typical consumer's budget and 4% of GNP. Table 1.1 provides additional data on the size and growth of the non-life insurance industry.

Table 1.1 *Size and Growth of Non-Life Industry in Terms of Assets and Surplus (000,000 omitted)*

	ADMITTED ASSETS	CHANGE	SURPLUS	CHANGE	NET WRITTEN PREMIUMS	CHANGE
1986	$393,188	NA	$110,019	NA	$165,289	NA
1987	$446,157	13.47%	$119,932	9.01%	$181,144	9.59%
1988	$497,969	11.61%	$136,081	13.47%	$189,520	4.62%
1989	$545,751	9.60%	$153,046	12.47%	$195,133	2.96%

Source: *National Underwriter's Profiles -- Property/Liability* (1990).

Although there are approximately 2,000 non-life companies, the industry is not monolithic. Numerous market segments based on lines of business (e.g., auto, home-owners, fire) and large differences in the types of customers served (i.e., private or commercial) exist. These differences are not readily apparent to the typical consumer as he or she deals with a small number of companies for non-life insurance purposes.

95% of home-owners carry property insurance, most auto-owners have some amount of coverage, and practically all employers carry workers compensation insurance for their employees. Thus, even though most Americans have private insurance coverage for some of their activities, it is provided by numerous companies each with different interests.

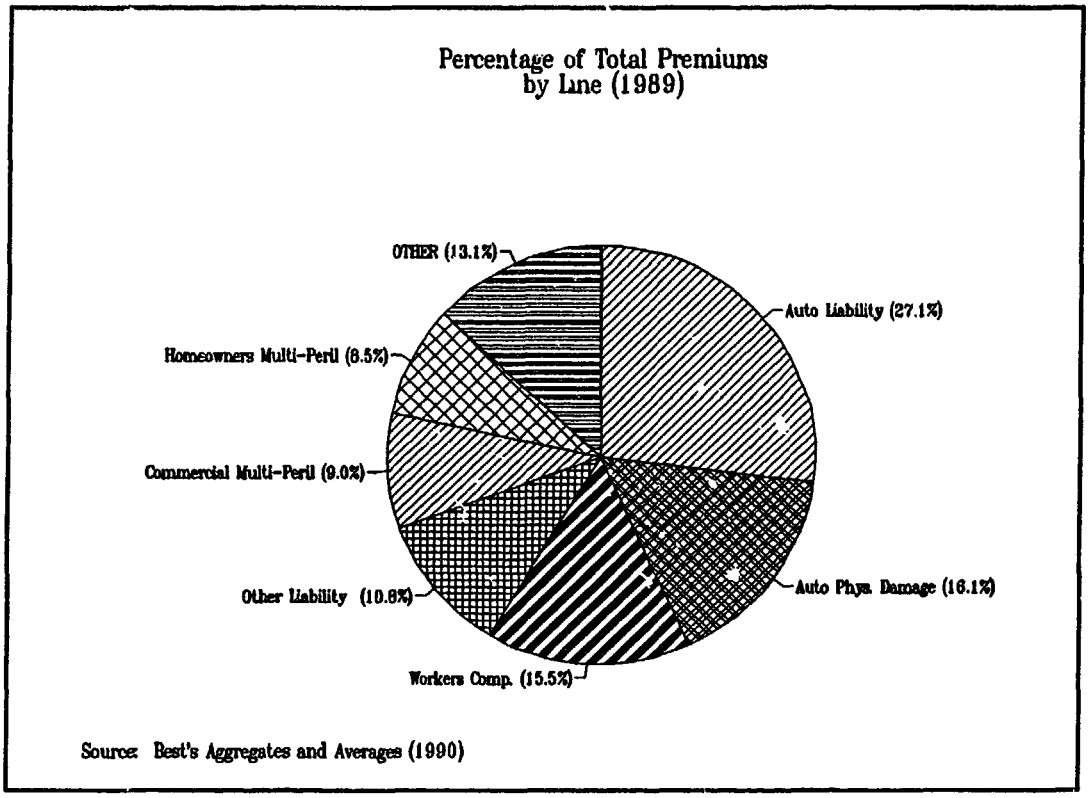

Figure 1.1 *Distribution of Non-Life Premiums*

Figure 1.1 provides a description of various sectors of the property liability industry. For example, auto insurance (commercial and private passenger liability and physical damage) accounts for the largest percentage part of the industry (41% of premiums written). In contrast, glass coverage accounts for the smallest proportion (0.01%). Tables 1.2 and 1.3 show the state activity of the non-life insurance industry. A large number (45.8%) of the U.S. companies are small companies, writing business in only one state. The largest companies tend to do business in most states. However, they represent a small percentage of the total number of companies (15.2%) in the non-life insurance industry.

States proposed to spend approximately $440 million in 1991 to regulate the insurance industry [NAIC (1990)]. Since non-life premiums account for one-half of all insurance premiums, states should spend about that percentage of their resources regulating non-life companies. In most cases, however, the percentage is higher since non-life insurance regulators have broader authority than life regulators. Life insurance regulation covers solvency regulation while non-life insurance regulation concerns both solvency and price.

Table 1.2 *Distribution of Licensed Companies Across States*

NO. OF STATE LICENSES	NO. OF COMPANIES	PERCENT	CUMULATIVE PERCENT
1	1,189	45.8%	45.8%
2-5	407	15.7%	61.5%
6-10	179	6.9%	68.3%
11-24	241	9.3%	77.6%
25-39	186	7.2%	84.8%
40 +	395	15.2%	100.0%
TOTAL	2,597	100.0%	100.0%

B. Summary

This paper describes the history of the regulation of the U.S. non-life insurance industry and the current economics of the industry. The U.S. non-life insurance industry is a very broad group of sub-industries each with its own particular product or geographical market fragmented by regulation and economic dictates. Historical regulation has led to many inefficiencies. For example, states adopted policies through their taxation system that encouraged potentially nonviable firms to enter a market. Other regulations restricted the companies' pricing ability, while other policies enforced collusion among potential competitors. Not only has regulation caused inefficiencies, but it has often been applied inconsistently. The history of regulation shows swings from solvency regulation to profit regulation back to solvency regulation.

One might argue that the insurance industry does not fit the traditional model of public utility/natural monopoly regulation. This is because the sub-industries subject to the most public scrutiny and regulation have no barriers to entry, have low concentration ratios, and relatively low profits. The traditional reason for insurance regulation was protection from insolvencies. Today this is a small portion of regulation in many states. Given the problems many states are experiencing, there should be a return to solvency regulation. Recently, Litan (1992) called for a return to the traditional model as profit regulation and solvency regulation conflict: Restrictive regulation of profits leads to an increase in default risk for the firm.

It should be noted that even with the swing back to more restrictive regulation, there have been numerous benefits from increased competition in those lines that are subject to the most public scrutiny. Competition has forced a reevaluation of inefficient marketing and distribution mechanisms and it has forced firms to adopt cost saving technologies. There are enough benefits derived from competition to suggest that restrictive price regulation is antithetical to the consumer's interest. In addition, there is evidence that strict regulation increases the production inefficiencies of the typical insurance firm. Very few state insurance statutes, however, are written from this

Table 1.3 *Distribution of Premiums among Companies and States*

NO. OF STATES ACTIVE	NO. OF COMPANIES	PERCENT	CUMULATIVE PERCENT
1	959	42.5%	42.5%
2-5	415	18.4%	60.9%
6-10	174	7.7%	68.6%
11-24	223	9.9%	78.5%
25-39	140	6.2%	84.7%
40 +	346	15.3%	100.0%

NO. OF STATES ACTIVE	NO. OF COMPANIES	MILLIONS OF DOLLARS OF PREMIUM	PERCENT OF TOTAL
1	959	$24,060	10.8%
2-5	415	$13,452	6.1%
6-10	174	$8,105	3.6%
11-24	223	14,163	6.3%
25-39	140	11,570	5.1%
40 +	336	$154,634	68.4%
TOTAL	2,257	$221,084	100.0%

Source: National Association of Insurance Commissioners, Annual Statement Compilation Tapes 1989.

perspective. Thus, for the immediate future, there is little hope for improvement in the regulatory environment.

The existing problems are potentially a result of historic social and regulatory policies specific to the industry or a result of exogenous influences. The industry specific policies are aimed at the state's control of the market. However, the state really is no longer in control of a multi-state and multi-product company. Even if in the past, the state could control a large foreign multi-state company, this is no longer true today. In addition, as regulation becomes more severe, there should be supply restrictions as firms quit markets. This has already occurred in Massachusetts and California, which are two relatively large states in terms of population.

Two external factors affect the industry. First, insurance rate setting has become a political decision in many states due to seemingly large price increases during the last twenty years. The political decision to set rates is a popular decision, but if the high market rates are not the result of abuse of market power, then regulation serves no purpose and

may be damaging to the health of the industry. High prices resulting from competition infer scarcity and a regulatory reduction of prices does not solve the scarcity problem.

The second exogenous influence is the effect of the change in the legal environment over the last two or three decades. This change in legal liability has led to allegations of insurer collusion to reduce coverage for certain types of policies to limit insurer liability. This change in the liability regime may not affect the structure of the market, but may reduce the market's incentives to provide insurance. The liability crisis is exogenous to the insurance industry, but the industry is regulated more strictly as a result. It is easier to regulate in the short run than solve the real problems.

The U.S. system has allowed a very strong industry to evolve over the last 200 years. However, political control of prices has tended to overshadow the traditional regulatory approach of protecting society against insolvency. This has created more problems and has encouraged even further regulation. Structural changes in regulation are necessary. This may require a federal regulatory authority and less local political control over prices and regulatory policies. However, this is not likely soon as the states view a federal preemption of insurance regulation as a loss of sovereignty. Policymakers and Congress are beginning to see a necessity for a different regulatory scenario, but it will take a major overhaul of existing federal and state legislation. However, without such a change the long-run viability of certain portions of the non-life insurance industry are at stake.

This paper provides an overview of the economics and regulation of the U.S. non-life insurance industry. Chapter 2 describes the evolution of regulation and contains a discussion of modern regulatory issues confronting the industry. Chapter 3 describes and analyzes the current non-life insurance market focusing on the traditional industrial organization economic concerns of conduct, structure and performance. Although regulatory institutions affect market development and vice versa, the chapters are self contained and can be read independently. Together, they complement each other and provide a comprehensive picture of the economics and regulation of the U.S. market.

II. A Brief History and Overview of the Regulation of the U.S. Non-Life Insurance Industry

A. History of Regulation

There are a number of potential rationales for regulation of the insurance industry and it is not surprising that these reasons were recognized at an early date. Issues of solvency, consumer protection, and corporate power abuse, for example, existed at the beginning of the development of the U.S. non-life insurance industry. Since little insurance was available in Colonial and post-Colonial America, the need for regulation was non-existent. As soon as domestic firms came into existence, the need for some form of regulation became apparent. With the formation of two Pennsylvanian insurance companies in the late 1700s, the state of Pennsylvania commenced regulating the industry.

Corporations were not very common during the late Eighteenth century and early Nineteenth century and they were a creature of the state legislature and thus could be regulated by placing limitations in the companies' corporate charters. The modern administrative commission did not yet exist when insurers first began doing business. Thus, alternate means of restricting the activities of firms in the industry were necessary. According to Patterson (1927) the growth of the use of the corporate form was the impetus behind the demand for increased insurance regulation as the corporate form permitted larger-scale insurance operations. In addition, it was possible to accumulate large amounts of capital from small investors and the corporate form permitted an indefinite existence allowing wealth accumulation over a long period.

Early restrictions placed in the corporate charter related to investment restrictions [Kimball (1960)]. For example, there were restrictions on the ownership of real estate as it was thought to be too illiquid to allow for proper or useful reserving. Solvency concerns were not the entire reason for investment restrictions, however. Orren (1974) accounts for a number of different stages of state legislative restrictions, the first stage commencing with the development of the industry in the late Eighteenth Century. The concern at this time was that insurance companies might be used as a vehicle for the concentration of wealth and power. The early colonial experience with British Crown corporations was very unsatisfactory and thus the early restrictions were to keep the size and power of the corporations in check. A second concern was the outflow of capital to out-of-state, and predominantly eastern, companies. States imposed requirements that an out-of-state company invest assets in the host state as a condition of doing business. Some of these restrictions remained until modern times.[1]

Other early regulation was based on taxation. Massachusetts enacted its first tax in 1785 that was, ironically, a stamp tax [Kimball: (1960): 251], while New York put in place the first premium tax in 1824 [Patterson (1927): 524], and Illinois taxed out-of-state companies total premiums in 1844 [Grace and Skipper (1990)]. As can be seen by the Illinois tax, taxation was also used as a way of putting up barriers to entry to keep out foreign insurers. Some states that attempted to develop their own industry while erecting tax barriers to entry of foreign insurers saw this policy backfire. For

example, New York's premium tax was 10% for alien insurers (and zero for New York domiciled companies), but after a major fire in 1835 bankrupted 23 of 26 fire companies, New York lowered the rate to 2% in order to attract foreign insurers [Lilly (1976)]. During the early years of insurance regulation in the U.S. most of the regulation was very haphazard and tended to be relatively simple as the corporate charter restrictions could not be as broad as might be made by the modern administrative review and regulatory process.

B. State Regulation and *Paul v. Virginia*

From the founding of the nation, the states regulated the business of insurance. There was no real thought concerning a federal role in the regulatory process for almost seventy years. However, in 1865 the first suggestions for a federal role were made when the insurance industry lobbied Congress for a National Incorporation Act that would allow for federally franchised insurance corporations and immunity from state regulation. Banks had previously obtained a federal incorporation act, but the insurance industry act did not pass. Thus, states were left in control of the insurance industry [Day (1970)].

A second attempt to obtain federal oversight of the insurance industry was made through the judicial system. The State of Virginia required that all agents of out-of-state insurance companies register and that the out-of-state companies register. The agent of a New York company was prosecuted for violating the state's registration requirements. This case, *Paul v. Virginia*,[2] set the tone for federal-state insurance relations to the present day. The issue of the case was whether states could regulate businesses involved in interstate commerce since the U.S. Constitution grants this power solely to Congress.[3] If the Constitution's commerce power granted to Congress prohibited the states from regulating interstate insurance sales, then most state insurance regulation would be voided as most sales were of an interstate nature. The Supreme Court held in *Paul v. Virginia* that Congress did have power over interstate commerce and that the commerce clause would preclude regulation of interstate business, but it also held that insurance was not commerce under the commerce clause because it was local in nature. The insurance contract was a "local" contract because the contract was executed in the same state that the insured resided. This case put the control of the insurance industry firmly into the hands of the states.

C. Early Insolvency Regulation

Another major dimension to early insurance regulation was insolvency protection regulation. The idea is that disclosure of certain company information would provide consumers with information that could be used to judge whether the company was sound. Patterson states that Massachusetts first required this type of information to be made public in 1799 and New York did so in 1828 [Patterson (1927) 525-526].

Even with disclosure regulation, however, insolvencies still occurred. Most states did not really attempt to regulate and those that did, tended to have very weak regulations. The typical insolvency scenario involved the fire line. Numerous fire companies existed in the market. Some offered low prices (with little or no reserving), while others offered higher prices for similar coverage (with adequate reserving). Consumers purchased the inexpensive insurance. If a conflagration occurred, the insured's company (and many others) went bankrupt as entire sections of cities were destroyed. The insured was left without coverage. After the bankruptcies, new firms entered the market and again offered inexpensive insurance. One can argue that the consumer was buying insurance for damage caused if only his property was destroyed by fire. The insurance consumer was not purchasing insurance for the case in which an entire section of the town was destroyed.

However, calls to stop this boom-and-bust were common.

Other structural problems related to failures existed in the fire line. Agents who did not bear any risk provided clients to companies without proper screening. Thus, improper reserving in cases of major catastrophes and poor underwriting caused a major bankruptcy problem [Stewart, Stewart, and Roodis (1991)].

This bankruptcy problem provoked two responses: one by the industry and the other by the states. The industry's effort focused on colluding to set rates and to restrict competition between companies and agents. The National Board of Fire Underwriters was formed to set rates and agent commissions in 1866. Because the National Board had no real enforcement powers nor did the organization have the economic ability to punish violators for deviating from the set rates, many companies did so. So, after two major fires in Chicago and Boston in 1871 and 1872 respectively, 3,000 of the country's 4,000 fire insurance companies went bankrupt, allegedly due to improper reserving and inadequate pricing. Other regional and state boards were set up to set rates and these boards developed into regional rating bureaus by the 1880s. These boards, too, were fairly ineffective because there were no barriers to entry and there was no ability to detect, much less, punish cheaters [Joskow (1973)].

The states' response was to impose regulation in a more systematic way. State insurance commissions were created, policy forms were standardized so that consumers could compare policy contracts, reserve requirements were imposed, and restrictions on the types of assets that were allowed to be used for investment purposes were implemented [Day (1970].

D. Twentieth Century Regulation

The late Nineteenth Century and the beginning of the Twentieth Century saw the rise of the populist movement in the United States. This movement was responsible for the first great wave of regulation in the United States. Congress set up the Interstate Commerce Commission, the Food and Drug Administration, the Federal Trade Commission, and states set up administrative commission to regulate telephones, electricity, water, and other utilities. In addition, the Congress passed the Sherman Antitrust Act that prohibited contracts, combinations, or conspiracies in restraints of trade. Many states also passed anti-collusion (or anti-compact) laws prohibiting insurance companies from entering into compacts to set terms or restrict competition. With increased government supervision came increased press scrutiny. This scrutiny had an effect on the insurance business in general even though the primary focus was on the life insurance industry.

Many of the largest life insurance companies were mutual companies, companies owned not by shareholders but by policyholders. Because of certain practices that are described more fully in Meier (1987), mutual companies were immune from oversight by the policy holders. Thus, there were great excesses in salaries paid to management and great amounts of money spent on perquisites. In fact, the public became aware of these abuses only when the Chairman of The Equitable Insurance Company died, leaving control of the company to his son. The son was not popular with the other company directors and they made his abuses public. As a result, in 1906 the State of New York commenced an investigation of the practices of insurance companies known as the Armstrong Committee investigation. In the aftermath of the Armstrong investigation, New York enacted the first comprehensive state insurance code to reduce the likelihood of management abuses [Meier (1987)].

A second major investigation known as the Merrit Committee investigation resulted from the large number of insurer bankruptcies and subsequent insurance price increases after the 1906 San Francisco earthquake. The companies blamed the resulting failures on excessive or destructive competition [Hanson, Dinneen, and Johnson, (1974)]. The Committee concluded that anti-compact laws had hurt the industry because no one company had enough data to make accurate loss forecasts. Only by colluding on information sharing and rate setting could companies compete "fairly." New York passed a law in 1911 allowing mandated bureau rates to prevent the so-called destructive competition. These bureau rates would, in many states, be the only rates allowed to be charged by the industry. This time the enforcement worked because the bureau had the police power of the state to enforce the rates. One should note that the regulators were concerned, not with monopoly pricing, but with insolvencies [Joskow and McLaughlin (1991)].

Insurers were also subject to organized regulation of investment decisions for the first time. This is what Orren (1974) terms the second stage of investment restriction/regulation. As a result of the concerns raised by the Armstrong Committee the industry was restricted to owning very conservative investments, such as bonds. States attempted to encourage insurers to invest in state securities, prohibited them from investing in the equities of other corporations, and prohibited them from investing in other high risk securities. Common belief suggests that the restriction on the ability to invest in the common stock of other corporations reduced the impact of the Great Depression on the insurance industry. One could argue that it also prevented insurers from obtaining security and profits in the market during the time preceding the depression. However, after the start of the Depression, the states allowed more types of assets to be owned. Other government securities were added, like Federal Home Administration bonds, common stock, and certain states even permitted companies to invest up to 2% of funds in non-approved assets.

E. *Southeastern Underwriters* and the McCarran-Ferguson Act

In 1944, the U.S. Department of Justice brought suit against one of the regional rate setting bureaus, Southeastern Underwriters Association, for engaging in practices that allegedly violated the Sherman Antitrust Act[4]. It is interesting to note that the suit was originally started by the Attorney General for the State of Missouri. In 1922 Missouri felt that certain fire insurance rates were too high and attempted to rescind the regional rating bureau's rates in Missouri. However, the industry brought over 100 lawsuits seeking to enjoin the state from rescinding the rates. Over the next fifteen years the state and the industry negotiated and came up with a plan finalized in the late 1930s. However, the settlement involved pay-offs to government officials. After discovering the bribes, the Missouri attorney general filed suit against all the companies that contributed money to the bribe fund. Since the attempt to restrict prices actually occurred across state lines, Missouri asked the Department of Justice for assistance [Meier (1987)].

The Department investigated and filed a suit alleging that Southeastern Underwriters was price fixing and engaging in other conduct that violated antitrust laws. Because of *Paul v. Virginia* and at least eight other cases, the industry relied upon the fact that insurance was not subject to the federal commerce power or legislation based upon the federal commerce power, e.g., the Sherman Act [Day (1970)].

The Supreme Court in *Southeastern Underwriters v. U.S* held that insurance was subject to the commerce power as insurance could constitute interstate commerce. In addition, the Court held that the Sherman Act could be applied to the Southeastern Underwriters (and other rating bureaus) and then

found Southeastern Underwriters guilty of violating the law. By overturning *Paul v. Virginia*, the Supreme Court voided most state regulation of insurance and threw the regulators and the industry into chaos.

This chaos was relatively short lived as Congress was intensively lobbied to overturn the Court's decision. The resulting legislation, known as the McCarran-Ferguson Act,[5] returned to the states the power to regulate and tax the insurance industry free from federal control and regulation. The major exemptions were that the antitrust laws would still apply to an insurer who engages in anti-competitive practices outside the "business of insurance". In addition, there was no exemption for boycotts or intimidation. This exemption was designed to allow the insurers to share information and engage in other practices that may violate the Sherman Act, but to prevent insurers from colluding to keep competitors out of the business. However, as Joskow and McLaughlin (1991) point out, it seems pointless to prohibit this type of behavior when the industry is allowed to accomplish the same thing through other anti-competitive practices.

F. Removal of Bureau Rates and the Move to Competition

The NAIC proposed model legislation to the states and by 1951 it was adopted in almost original form in all states. Some of the provisions of this model law allowed states to regulate and license regional rating bureaus, to set rates, to regulate policy forms, and to license agents. One major deviation from the law regarded how rates were actually set. Three approaches were adopted: (1) bureaus set rates that were then applied uniformly for all insurers within a state; (2) the state allowed the insurer to propose rates with the commissioner who then could reject them if they were held to be unreasonable; and (3) insurers could set any rate they pleased [NAIC Model Laws (1990) and Day (1970)].

During the 1960s and 1970s many states changed their statutes to make their rating laws more in line with the competitive market. For example, states allowed companies to use rates prior to filing with the commissioner. The commissioner could presumably reject the rates if they were inadequate, but this was not a frequent occurrence. In addition, some states removed, almost completely, the rate-setting or approval powers of the insurance commissioner. These changes increased after a study by the New York Insurance Department found that rates in so-called competitive states were lower than in states where rates were determined in a non-competitive manner [See Harrington (1984a) and (1984b)]. Thus, state regulation entered a weakly pro-competitive era that lasted, with notable exceptions, until the mid to late 1980s.

G. Overview of Current Issues

The current industry issues are not necessarily new, and often appear periodically over the years in response to some stimuli. However, the responses of the regulatory community to these issues often change from period to period, and some of the most important pieces of insurance legislation, such as the introduction of insurance guaranty funds or the introduction of automobile personal injury protection coverage, are direct responses to these stimuli. While the future regulatory response to these particular issues is unknown at this time, these are areas requiring attention in the near term.

The Liability Crisis. The crisis in liability insurance is not actually a current crisis but a seemingly continuing crisis, periodically erupting in one or more of the liability lines of insurance. For instance, the Medical Malpractice line of insurance has experienced two crises in the last twenty years, generally tied to the upswings of the insurance cycle for that line. The general

liability line experienced a crisis in recent years as the cycle turned and prices increased while availability declined. The current crisis gaining the most attention is the crisis in the workers compensation line, a highly politicized issue in the various states. Indeed, budgetary impasses in Connecticut, Maine and California were partially the result of proposals to reform those states' workers compensation systems, and workers compensation problems abound in other states as well. Crisis is a much over-worked term in the insurance industry, and various crises in insurance availability and/or affordability have been around for a number of years, and should continue into the foreseeable future.[6]

General liability insurance has become much more volatile in recent years. The long "tail" on the coverage leaves an insurance company liable for losses long after the last of the premium is earned and the books are closed. Often, judicial interpretation of contracts renders insurance coverage where none was originally intended by the insurance company. Additionally, unexpected loss occurrences appear that were not contemplated when the contract was designed, such as the asbestos hazard, liability for the side effects of patent drugs, or intentional toxic waste dumping.

A partial solution to the problem on the insurance industry's part was the introduction of the claims-made policy in 1986, which was intended to place a limit on the time during which an obligation could be presented.[7] Therefore, the insurance company would not have to worry over having unexpected claims arise years and even decades after the expiration of the policy. The full impact of the claims-made policy will not be known for years, but it may be expected to lessen some, but certainly not all, of the variability and thus enhance the predictability of liability losses.

However, the removal of insurance coverage does not accomplish the extinguishment of the loss. Property-liability insurance is indemnity insurance, which is designed to make a person whole again following a loss. The removal of the insurance does not remove the loss that occurred, it only shifts the obligation to pay for the loss from the insurer back to the policyholder. The underlying problems that have caused the explosive growth in insurance costs have not been addressed except on a superficial basis in most states.

Some of these underlying costs relate to lawyers, litigation, and the tort system. According to the Bush Administration, the United States currently has 70% of the world's lawyers. A recent study by Tillinghast (1989) estimated that the United States spends about 2.5% of its Gross National Product on tort costs, substantially more than other industrialized nations. Additionally, a recent closed claims study of automobile personal injury claims conducted by the All Industry Research Advisory Council [AIRAC (1988)] reveals that there has been a significant increase in the frequency and severity of claims involving simple sprains and strains, especially when a lawyer is involved in the claims process. All of these factors point towards increases in insurance costs in the future.

The trends in the future costs are only a small factor in the availability crises. As long as the loss costs are relatively predictable, the insurance industry is able to establish a price. When the loss costs become unpredictable or less predictable, insurers are likely to avoid that business or raise prices to account for greater uncertainty, thus, the availability or affordability of that insurance coverage is reduced. When uncertainty regarding the expected losses increases insurers will require higher relative prices in order to provide the coverage or else they will simply cease to provide the coverage and shift capital and other resources into more predictable ventures more closely matching their risk/return temperament.

A further source of instability is the rate approval process at the state level. While in principle insurers pass along all loss costs and administrative costs to their customers, in practice the state regulators often restrict pricing decisions. These restrictions are often politically motivated and fail to address the practical issues involved. For instance, current trends in the workers compensation line are to restrict rate increases, even when justified. The medical portion of the workers compensation claims is rising at a much higher rate than general inflation, and has been for the last twenty years. Increasing health care costs are a current concern with state and federal regulators, but efforts to curb increases have not proven effective. These medical loss costs that are driving up the cost of health care are also affecting the workers compensation line of insurance as well as the automobile liability line, which together account for over forty percent of the property-liability insurance industry's written premiums.

Automobile Insurance Crisis. Regulators across the country have come under criticism in recent years for allowing automobile insurance companies to reap exorbitant profits and for allowing premiums to spiral upwards out of control. In California, a voter initiative, Proposition 103,[8] passed in 1989 mandating automobile insurance rate rollbacks and imposing severe restrictions on the operations of automobile insurers. In the wake of the passage of Proposition 103, over forty states attempted to enact similar legislation, although to varying degrees of success. In some states, the measures were rejected in the legislature and in others they were overturned by the courts.

The status of the rate rollbacks and premium rebates mandated under California's controversial law are unclear. The across the board rollbacks have been held to be unconstitutional so far, although California's newly elected insurance commissioner has renewed efforts to see that they are implemented.[9] Automobile liability insurance is the largest single line of insurance, and therefore the final resolution of this issue is of great importance to the industry as well as the public at large. The growing uncertainty in this line of insurance has caused some large insurance companies to pull out of the personal lines markets and to concentrate on other, more lucrative lines. One result of the pullout of underpriced companies is to raise the overall average premiums. Automobile liability insurance premiums cover a very wide range for identical policyholders, and when underpriced companies withdraw from a market or otherwise restrict themselves, their customers are forced to seek insurance from other, often higher-priced competitor insurance companies. The end result is often that the average premiums rise following regulatory actions of this nature, and in the first year following the implementation of Proposition 103 in California this is indeed what occurred as the average premiums in that state actually rose in the period following implementation.

Banks in Insurance. Currently, federally chartered banks are prohibited from underwriting insurance products and are generally prohibited from acting as insurance agents by the states. However, these prohibitions are gradually changing. For instance, California's Proposition 103 opened the door for banks to act as insurance agents and to sell insurance products. Delaware passed legislation allowing state chartered institutions to underwrite as well as sell insurance products. Federal banking legislation proposed by the Bush Administration in 1991 called for removal of the historical barriers forbidding banks to underwrite insurance.[10] Additionally, many states have relaxed their regulatory prohibitions as well, and a combination of banking and insurance should become a reality in time.

In Europe, banking and insurance are already partners. Arguably, there are economies of both scale and scope to be realized by combining all financial services into one entity. Of course, there are dangers as well, and most proposals for incorporating insurance

underwriting into banking entail the erection of "fire walls" to completely separate the activities of the bank from the activities of the insurer.

With regard to banking institutions performing the services of an insurance agent (versus actually underwriting the business), this represents a natural extension of current services. Competition has narrowed interest rate spreads for banking organizations, and more and more banks are beginning to rely on fee-for-service income to supplement their traditional sources of revenue. The bank's customer base represents a natural market for insurance products that may generate commission income for the bank for relatively little incremental effort, while at the same time offering insurers a marketing opportunity.

Currently, integration of banking and insurance is opposed by many regulators as well as by insurance agents, who would face stiff competition from a non-traditional source. The original prohibitions against banks engaging in non-banking activities were implemented during the Great Depression of the 1930s, when it was believed that these activities had contributed to the banking system collapse. Those beliefs have been largely discounted, and bank deregulation during the last decade has moved at a brisk pace.

On the other hand, prohibitions against insurers engaging in non-insurance (i.e., "banking") activities are generally codified at the state level. In Florida, for instance, the law reads "No domestic insurer shall engage directly or indirectly in any business other than the insurance business and business activities reasonably and necessarily incidental to such insurance business."[11] Additionally, most states limit the investments allowed in the common stock of non-insurance companies, effectively blocking off conglomeration. These restrictions notwithstanding, there are numerous instances of insurance companies owning banking institutions: John Hancock Mutual Life, The Travelers Corporation, Hartford Insurance Group, USAA Group, and The Prudential Insurance Company of America all include banking organizations in their overall corporate holdings [Toivonen (1990)].

Federal Solvency Regulation. Recently, proposals for a federal role in insurance company solvency regulation have emerged from a twenty year dormancy, following a spate of large-scale insurance company insolvencies during the 1980s. Additionally, worries about the potential of the insurance industry becoming the "S & L Crisis" of the 1990s, with its concomitant federal bailout, have stirred renewed interest in some form of national insolvency guaranty mechanism. The federal government relinquished the role of insurance regulation to the various states with the passage of the McCarran-Ferguson Act in 1945. Since that time, there have been periodic calls for the federal government to reassume responsibility in this area. The implementation of the states' property-liability insurance guaranty funds in the early 1970s was a direct response to Congressional proposals to establish a federal regulatory authority to administer insurer solvency measures. In the last three years, Congress has again turned its attention to the insurance industry and especially to the adequacy of continued state-by-state regulation.

A major concern with the implementation of federal regulation of insurance solvency is the problem of a dual set of regulatory authorities, both at the federal and at the state level. Additionally, it has been suggested that regulation at the federal level would be no more effective than that currently in place at the state level.

In an effort to implement some measure of uniformity in the regulatory system by state, the NAIC has implemented a new accreditation program for each state's insurance commissioner's office [NAIC (1991)]. As originally proposed, this program would have severely limited the ability of insurers domiciled in a non-accredited state to do business in other

states. Recent modifications to the accreditation program have lessened some of the impact, but it is a concrete step towards fostering formal cooperation among state regulators in lieu of federal regulation.

Current State Insolvency Guaranty System. Currently, each of the states and territories administers its own guaranty mechanism, technically independent of the other state jurisdictions although there is cooperation through the NAIC and the National Conference of Insurance Guaranty Funds (NCIGF). This latter organization is made up of and funded by 47 post-assessment guaranty funds, and its purpose is to assist the individual guaranty funds in fulfilling their statutory obligations as well as to facilitate interfund cooperation and communication [NCIGF (1990)].

History and Trends in Insolvency Guaranty Funds. Most state insurance guaranty funds were created during the early 1970s, mainly in response to federal moves to enact a federal insolvency system.[12] These state guaranty funds were as a rule modeled after the NAIC Model Bill, which called for a post-assessment guaranty system for all licensed property-casualty insurance companies doing business within a state. Another response to the insolvency problem at that time was the expansion of uninsured motorist coverage in many states to include policyholders of insolvent companies within the definition of an "uninsured motorist".[13]

Recent trends in insurer insolvencies have reflected fundamental changes in the risks guaranteed by the insolvency funds. Beginning in the latter part of the 1980s, several multi-state, multi-line insolvencies have occurred resulting in large assessments across many states. While insurance insolvencies represent a small fraction of insurance companies, they are becoming a sizable drain. Note that the cost of insolvencies is theoretically spread among policyholders of solvent companies because the cost of assessments is added to the price of insurance. However, in many cases the various states allow a premium tax offset, which in effect passes the cost of insurer insolvencies to the citizens in that state.[14] Annual assessments are based on prior year written premiums and are not adjusted for risk.

Insurer insolvencies are cyclical in nature, and have been circumstantially linked with insurance cycles [Gottheimer (1989)]. Rappaport (1989) attributes the large number of insolvencies in 1975 to the recessionary pressures and stagflation of the early 1970s. He also identified declining interest rates and a strong dollar as contributing factors for the high number of insolvencies in 1985. Obviously, both internal industry economic factors as well as external national economic factors have a strong impact on the solvency of insurers. Insurance companies are increasingly susceptible to the macroeconomic environment because of increasing reliance on investment income, coupled with deteriorating underwriting returns.

In 1989, there were a record 43 involuntary corporate retirements, twice as many as in 1988.[15] These involuntary retirements were concentrated in only a few domiciliary states, and included some rather large companies. The NCIGF reported assessments of $246,317,885 on fourteen insolvent companies during 1989. Additionally, insolvencies from prior years and from non-specified company insolvencies required over $570,000,000 in assessments, for a grand total of $819,998,036 in insurer assessments during 1989 [NCIGF (1990)].[16]

These figures represent the latest in a trend that has seen multi-state insolvencies of major proportions occurring during the last several years. Historically, insolvencies were concentrated in regional companies specializing in nonstandard automobile risks. The 1980s produced a rash of insolvencies concentrated in worker's compensation, general liability, and automobile liability lines in multi-state, multi-line companies. However, the insolvencies

were not distributed systematically. Over sixty percent of the assessment dollars during the period 1969-1989 were assessed on multi-state companies *during the last five years*. These companies represented just eleven percent of the total number of insolvencies during the period [NCIGF (1990)]. This translates to twenty insolvencies causing assessments of over $2 billion, and this only represents a portion of the final assessments to solvent insurers.

However, these do not represent the total costs. As companies are liquidated, assets of the liquidated company are distributed to the various guaranty funds as they are to other creditors. The defunct insurer may have sufficient assets to reimburse the guaranty funds in full. For instance, the Mission Group insolvency, which was the largest to date at the time it occurred in the mid-1980s, has resulted in guaranty fund payments of $246.9 million through 1990. Recently, the estate paid $107 million to state guaranty funds, and the liquidators expect to be able to return even more in the future. To date, the recoveries and funds held by other state insurance departments total almost eighty percent of the total assessments under the Mission failure.[17]

Measures of Riskiness of Insurance Companies. The topic of insolvency indicators in property/casualty insurance companies has been a highly researched and reported subject during the last decade. Additionally, there has been a growing body of published research concerning the pricing of guaranty funds on a risk-adjusted basis, similar to the suggested reforms to FDIC pricing. Guaranty fund premiums are set at a flat percentage, and this results in inequities as policyholders of risky insurance companies are subsidized by policyholders and shareholders of more conservative, safer companies. The bulk of the literature on this question relates to the banking industry, but Cummins (1988) developed an options-based model for insurance insolvency guaranty fund premiums similar to the models found in Ronn and Verma (1986) and Marcus and Shaked (1984) for the banking industry.

Currently, the main regulatory early-warning system is the Insurance Regulatory Information System (IRIS), a set of financial ratios computed from the insurance company's financial statements. These eleven ratios are computed for all companies, and companies with four or more ratios outside the normal range are targeted for enhanced scrutiny.

The IRIS system has received strong criticism by the GAO recently [GAO (1991)] as well as criticism from some academic sources [see Bar Niv and Hershbarger (1990)]. Part of the criticism rests on the fact that each of these ratios is equally weighted under IRIS, although there is significant collinearity and overlap between the ratios. Additionally, they are computed from insurer-supplied financial information that may be manipulated by an unscrupulous insurer. This shortcoming, as well as the system's inability to detect management fraud, are serious limitations. The GAO report also cited the system's propensity to falsely spotlight many companies that are truly sound, thus wasting scarce regulatory resources. The system is defended by the NAIC as just one tool in the solvency monitoring process, but many of these criticisms are warranted and work continues on development of enhanced monitoring devices. The NAIC is aware of the problem and continues to search for resolutions.

Major Causes of Insurer Insolvency. Several GAO studies [GAO (1990a), (1989a), (1987)] in the last few years have addressed the property/casualty insurance solvency monitoring system. The NAIC has attempted to stave off renewed calls for federal regulation by imposing stricter guidelines and peer rating systems for assessing the ability of the individual states to monitor insurers domiciled in those states. Some of the problems plaguing various states in their efforts to control insolvencies in their states have centered around a lack of funding for their

departments, plus a dearth of trained, qualified personnel to implement solvency monitoring.

While the problems of poor management practices, fraud, over-zealous growth, poor reserving techniques and lax regulation have been problems in the past, the reinsurance problem is relatively new. In several of the recent large multi-state insolvencies, reinsurers refused to honor reinsurance treaties, citing fraudulent activities on behalf of the ceding companies. This has resulted in significant litigation, and has prompted calls for tighter regulatory controls on reinsurance transactions and reinsurance accounting [GAO (1989b)].

Growth can cripple an insurer simply because of the statutory accounting practices mandated by regulatory authorities. The insurer may be writing extremely profitable business, but the accounting system robs them of capital faster than it can be earned. This is due to the fact that expenses are recognized immediately while income recognition is deferred, which results in hidden equity for the insurance company that will only be recognized if and when the insurer ceases to write new business. The higher the percentage of losses to total premiums, the longer hidden equity is contained in the balance sheet, and the more contributed equity is required to support operations. Therefore, absent any profit or additional contributions to the capital base, simple growth will erode the capital of an insurance company and force it into technical insolvency. The rate of decay of the equity base is dependent on the rate of growth in premiums, the earnings rate, and the mix of loss and underwriting expenses.

Note, however, that growth is rarely achieved by overpricing or by breakeven pricing, but usually by below-cost pricing. It is possible for a company to grow at such a rate because of investment earnings, which more than offset the losses in underwriting earnings. However, it is still possible to outgrow the investment earnings as well. Given two insurers with identical policyholders, investment portfolio, loss and expense ratios, and payout patterns but with differing growth rates, the insurer with the higher growth rate is in greater danger of insolvency, simply owing to the accounting practices.

Often the cash-flow underwriting process accompanies the growth process. Obviously, if a company can earn more on its investments than it loses in underwriting business, there will be some form of profit and no decay in capital. However, the earnings have to be higher than the underwriting loss and they must more than offset any underwriting losses in order to maintain capital.

One of the major problems with cash-flow underwriting is the mismatching of assets and liabilities that usually occurs. There is a risk that interest rates will decline sharply, thus decreasing the yield on securities held because of lower reinvestment earnings on the coupon payments. Conversely, interest rates could skyrocket, causing the price of the underlying security to decline and exposing the investor to the possibility of having to liquidate bond holdings well below their carrying value. Therefore, with mismatching of assets and liabilities, the insurer opens itself up to a great deal more investment risk than it would otherwise experience.

Under-reserving usually accompanies a growth strategy or cash-flow underwriting. When a company begins taking on risks that it has no experience with, it often does so at a loss. The "good" business has already been written, and usually the only way to attract substantial amounts of new business is by cutting the price substantially. The new business attracted by price is often less desirable than existing business, but often the insurer uses the same existing reserving techniques to address the new business. For instance, if the existing business generates a frequency of .10 and a severity of $10,000 then the pure premium (the expected value of loss per unit of exposure) for that business is $1,000. The new business

attracted may have a frequency of .20 and a severity of $20,000 for a pure premium of $4,000, while the insurer continues to price it and reserve for it at the $1,000 pure premium level. Often, some allowance is made for the increased risk of the new business, but still there is a perception of desirability that may not prove true in the long run.

In recent years, unrecoverable reinsurance has been cited as a major contributor to several of the larger insolvencies experienced during the 1980s. Reinsurance experienced a boom in the 1980s as new reinsurance companies proliferated, either as stand-alone companies or as new divisions of existing companies [Webb (1988)]. There are relatively few controls on the reinsurance business, as it is considered to be an insurance transaction between knowledgeable professionals. Also, the international nature of the reinsurance business renders state regulation impossible, although federal regulation of some sort has been proposed for alien reinsurers, and may yet be imposed in some form for all reinsurers at some future date.

The unrecoverable reinsurance problems of the recent past have stemmed partly from reinsurer unwillingness to pay and partly from reinsurer inability to pay losses. For instance, citing fraud on behalf of the direct insurer, several reinsurance companies refused to honor treaties under the Mission failure [Rappaport (1989): 11]. A class action suit has been filed against the directors, management and accountants for Integrity Insurance Company by the New Jersey Insurance Commissioner, alleging fraud (among other causes) on their parts contributing to the demise of the company.

Another problem with reinsurance has been with the question of fraud on the part of the direct insurers. The line between mismanagement and fraud is often nebulous. What could truly be incredible stupidity on the part of senior management often looks suspiciously like fraudulent behavior, but may be difficult to prove. However, to the extent that the delay allows the reinsurer to build up funds through higher premiums and investment income, it could well be to the reinsurer's advantage to challenge payments to insolvent companies where there is questionable business judgement present.

An additional regulatory problem is the degree and sophistication of the various states with regard to regulation of insurers doing business across state lines as poor regulation in one state can affect the consumers residing in another state. Recently, the NAIC has implemented a peer review system and other enhancements to the solvency regulatory system. However, critics contend that the NAIC moves are a response to the increase in attention from federal sources.[18] J. Robert Hunter, president of the National Insurance Consumer Organization, cites Congressional interest as the motivating factor behind the recent increase in activity by the NAIC in this area.[19]

Another perceived problem with the state regulatory system is in the individuals who perform the regulatory function. Many insurance commissioners are perceived (whether rightly or wrongly) as tools of the insurance industry, too weak to stand up to major insurance companies doing business within their area of responsibility. In some areas this may be partially true; in other areas, just the opposite is true.

Whatever the causes of the individual states' regulatory weakness, the main factor is the individuality of the regulatory effort. In its current form, the regulators in a given state must concentrate their efforts on their domiciliary companies, leaving the detailed supervision of foreign companies to other states' regulators. In the past, this system worked well enough as most insolvencies were regional problems confined to only one state, or perhaps a few neighboring states. The insolvency problems in the 1980s have shown that the pattern of insolvencies has radically changed.

Table 2.1 *Right Hand Side of the Balance Sheet Changes over Time*

PERIOD	LOSS & LOSS ADJUSTMENT EXPENSE RESERVE	UNEARNED PREMIUM RESERVE	OTHER LIAB'S	SURPLUS
1930-39	16.91%	29.46%	4.52%	46.29%
1940-49	19.77%	30.75%	5.29%	44.19%
1950-59	21.30%	31.78%	5.39%	41.53%
1960-69	26.58%	26.56%	5.63%	41.24%
1970-79	40.39%	21.73%	8.69%	29.18%
1980-88	47.52%	16.32%	8.30%	27.85%

Source: Raw data from *Best's Aggregates & Averages* (1989).

Changing environment. In addition to regulatory weakness, management weakness or lack of management controls are often cited as a cause of insurer insolvency. These are easy labels to apply, as insolvency is almost by definition "management weakness." However, a more proper definition is the inability of management to handle successfully changes in their environment. Some of the major changes in the insurance environment in recent years include:

a) the increase in the liability portion of total losses;

b) the highly charged volatility of investment markets, coupled with very high nominal and real interest rates during the 1980s;

c) the liability crisis and increasing litigiousness of the American society;

d) the move away from cartel pricing towards a more market-driven system;

e) the increased availability of information technology in the form of desk-top computers, enhancedoperating systems and improvements in mainframe software and hardware;

f) increasing competition for the remaining business after introduction of alternative forms of insurance protection, such as risk-retention groups (RRGs), captives, etc.;

g) a hostile regulatory environment.

While this list is not exhaustive, it does give some insight to changes in the industry affecting the way insurers do business, and by extension the solvency monitoring systems currently in place. A brief discussion of each factor follows:

Increase in the Liability Portion of Total Losses. Table 2.1 presents the composition of the right-hand-side of the aggregate balance sheet for stock insurance companies. As the table

Table 2.2 *Federal Products Liability Suits Filed, 1974-89.*

Year	*Cases filed*	*Percent change from previous year*
1974	1,579	----
1975	2,886	83.0
1976	3,696	28.0
1977	4,077	10.0
1978	4,372	7.0
1979	6,132	40.0
1980	7,755	26.0
1981	9,071	17.0
1982	8,944	-1.0
1983	9,221	3.0
1984	10,745	17.0
1985	11,495	6.9
1986	14.153	23.1
1987	16,166	14.2
1988	13,408	-17.1
1989	18,679	39.3
Average per year		19.8
% Change from 72-89		1082.9%

Sources: *Annual Report of the Director of the Administrative Office of the United States Courts*, various issues.

Table 2.3 *Performance of the Non-life Industry over Time.*

PERIOD	ROA_{UW}	ROA_{INV}	LEV_L	LEV_P	LEV_O	ROA_{ALL}	LEV_{ALL}	ROE_{ALL}
1930-39	1.37%	2.19%	0.72	1.25	0.19	3.56%	2.16	7.70%
1940-49	1.41%	3.43%	0.80	1.25	0.21	4.84%	2.26	10.95%
1950-59	0.53%	5.15%	0.88	1.31	0.22	5.67%	2.41	13.67%
1960-69	-0.45%	3.87%	1.10	1.10	0.23	3.42%	2.43	8.29%
1970-79	-0.33%	5.22%	1.95	1.05	0.42	4.89%	3.43	16.74%
1980-88	-3.57%	7.42%	2.36	0.81	0.41	3.85%	3.59	13.81%

ROA_{UW}: Underwriting profit return on assets = (Underwriting Profit / Total Assets)

ROA_{INV}: Investment profit return on assets = (Investment Profit / Total Assets)

LEV_L: Leverage factor attributable to loss/l. e reserves = ((Assets/Surplus) * (Loss & LAE Reserves / Total Liabilities))

LEV_P: Leverage factor attributable to unearned premium reserves = ((Assets/Surplus) * (Unearned Premium Reserves / Total Liabilities))

LEV_O: Leverage factor attributable to other liabilities = ((Assets/Surplus) * (Other Reserves / Total Liabilities))

ROA_{ALL}: Total profit return on assets = ((Underwriting + Investment Profit) / Total Assets)

LEV_{ALL}: Total leverage = (Sum of Leverage Factors)

ROE_{ALL}: ROA_{ALL} x LEV_{ALL}

Source: Raw data is from *Best's Aggregates & Averages* (1989).

shows, the proportion attributable to loss and loss adjustment expense reserves has grown substantially over time. This is due to the fact that the long-tail liability lines have increased in volume over time, with a longer and longer holding period for reserves against these losses. There was an especially large jump in the late 1970s and 1980s that is continuing. As the distributions illustrate, the major changes occurred in each category in the 1970s, and it is these fundamental shifts in the accounts of the balance sheet representing the changing insurance environment. The accounting and financial analysis measures, however, have not kept pace with the changes, nor has the regulatory community with regards to solvency assessment and monitoring.

Volatility of Investment Income. As can be seen in Table 2.2, investment income has been the predominant source of income for the aggregate insurance portfolio for a number of years and has become increasingly important to the total return. Additionally, the increase in leverage (defined as total assets to total equity) has increased dramatically, owing to the increasing amount of loss reserves in the balance sheet. This has helped to push down underwriting income, as these losses are immediately recognized, no matter that they will not be paid for a significant number of years. Nominal long term treasury bond yields rose sharply in the early 1980s and were at historical high levels throughout the 1980s.

The Liability Crisis. The United States is becoming more and more litigious as time goes on, with the brunt of the financial burden of this litigiousness falling on insurance companies. Table 2.3 shows the product liability tort filings in federal courts over the last 16 years. These grew by an average of almost 20% per year. The result is that insurers are paying higher and higher awards, often for risks that were not envisioned when they accepted the insured's premiums. The extremely long-tail of some of these claims, which do not arise until years or even decades have passed, creates financial risks to insurers that are unprecedented. For instance, a small insurer who once wrote general liability insurance may find itself on the brink of financial ruin when the claims begin pouring in long after the contract has expired. If reinsurers are no longer available, serious problems may arise. This scenario is not as unlikely as it seems, as judicial interpretation of insurance contracts adds a certain amount of whimsy to the insurance process.

Market-driven Pricing. In the past, insurers used the same rates and bureau pricing was the rule. Increasingly, insurers (especially larger insurers) are developing rates based on their own data, and niche-pricing and cost containment are now feasible. With the increasingly segmented pricing systems, the move is away from the law of large numbers and more and more towards the law of pretty-big-numbers, meaning that the use of company-specific data is more prone to error than aggregate data for all companies combined. The increasing volatility of loss estimates makes the individual companies more prone to financial difficulty.

Information Technology. Computers have allowed managers, actuaries, claims persons, underwriters, and everyone in between more opportunities to increase productivity. This has also increased competition among insurers, as now a small insurance company can easily be operated on desktop equipment. The marketing force has gone to the computer as well, as agencies become automated. One effect has been to make the solicitation of quotes or submission of business faster as an independent agent is now able to provide rate quotes by dozens of companies with the push of a button. One result has been that insurers are facing increased price competition, which is detrimental to many companies' overall plans. It becomes more difficult to differentiate companies based on quality when the technology explosion has resulted in the production of much price information but almost no quality information, which narrows the marketing focus of the agency force.

Competition From Other Forms of Risk Management. Businesses are increasingly turning to alternative forms of risk management, other than traditional insurance as self insurance may be a more efficient alternative for certain insurance consumers. The very good business, the preferred business, is the business that is moving to alternative forms. The *Economist* states that thirty percent of the industry's commercial business has switched to self insurance.[20] Simple economic logic dictates that insureds with better experience who are lumped in with insureds with poorer experience will eventually form their own insurance pool with similar preferred risks. The increasing use of captives, risk retention groups, and administrative-services-only arrangements contribute to the increasing risk of the remaining insureds, who are by and large a more volatile group. This makes the solvency issue for an individual insurance company a much more lively topic.

Adversarial Regulatory Environment. Insurance regulators, spurred by legislatures and bellicose consumer advocates, are increasingly focusing on the process of restricting premiums rather than ensuring adequacy. The propagation of Proposition 103-like legislation throughout the country during the last several years is clear evidence. Even where these measures have been defeated (either at the polls or in court), the message has been sent that consumers are unhappy with the product, and are looking for ways to materially change the operating environment where insurers operate. The current emphasis is on personal lines insurance, but the last market cycle produced a legislative reaction in the form of the risk-retention act for commercial insureds, and the next one will spark who-knows-what new form of competitive disadvantage and changes in the business environment.

Underwriting Cycles. The U.S. non-life insurance industry experiences a profit cycle that is linked to the medical malpractice crisis, the auto liability crisis, and the solvency crisis. Harrington, Cummins, and Klein (1991) define the cycle as a series of events occurring regularly leading back to a stationary point. Figure 2.1 shows the combined ratio over time.[21] As can be seen in the figure, there appears to be a cyclical pattern in the combined ratio. Since 1934 there have been eight cycles. Normally the period from trough to trough has averaged about 6 years. However, towards the late 1970s to the present the period seems to be increasing. The latest period also had a combined ratio above 100 for sustained periods corresponding to the time period of the liability crisis.

The NAIC commissioned a study on the underwriting cycle. The authors found a number of theoretical reasons for the cycle's existence and provided empirical support. Some conclusions of the report are that the cycle is a result of numerous factors that are outside of the control of the government.[22] For example, Harrington and Danzon (1991) believe that price cutting behavior of the firms is related to differences in insurer expectations about the future as well as excessive risk taking by some firms. The government can not regulate the insurer's expectation formation process, although it can prohibit the insurer from accepting certain risks, but to do so would deny insurance to a buyer. In addition, Doherty and Garvin (1991) find that interest rate changes may trigger the market's switch between hard and soft markets. Again, the state governments are not able to affect interest rate policy.

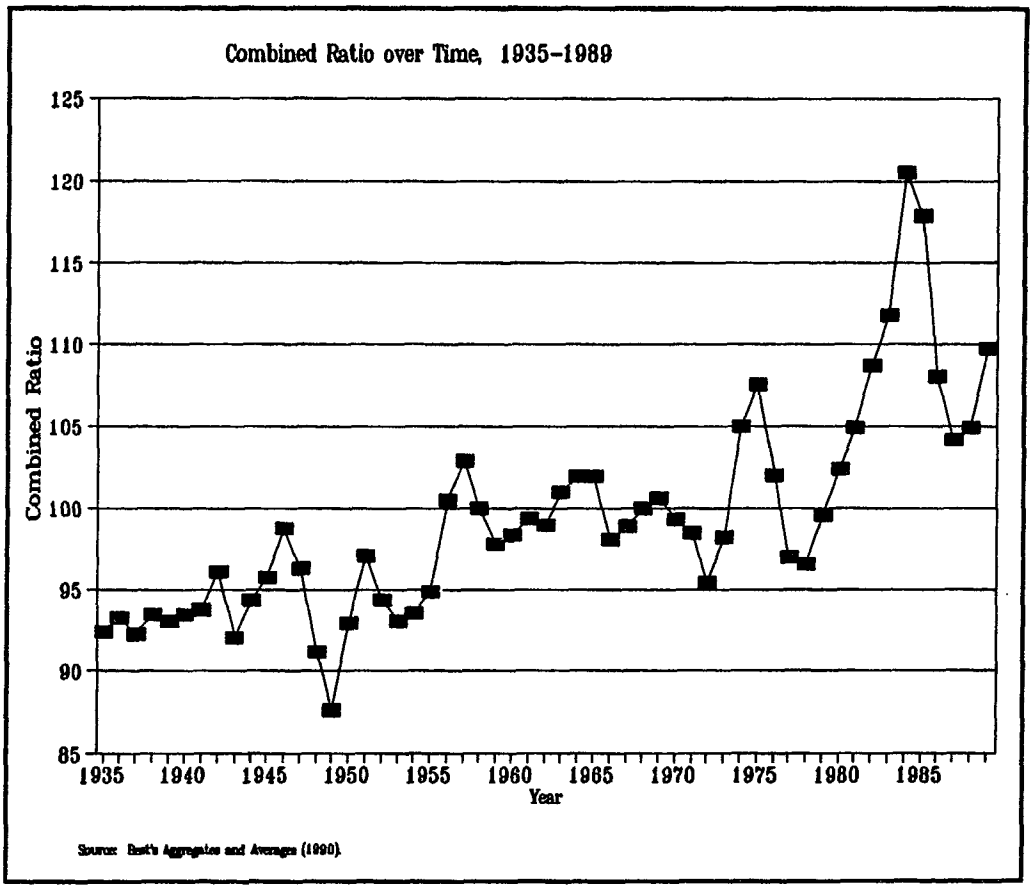

Figure 2.1 *Cyclicality in the Underwriting Cycle using the Combined Ratio*

H. Responses to these Crises

All of the above problems are at the forefront of the state and federal government's attempts to reform or regulate the insurance industry. California has reacted by imposing strict price regulation on politically sensitive products like automobile insurance, repealed the California antitrust exemption for insurers, and allowed banks to market insurance to the public. These proposals were designed to increase competition, prohibit monopoly pricing, and promote efficiency.

In addition, the attorneys general for twenty states brought suit against the major insurers alleging antitrust violations not protected by the McCarran-Ferguson Act exemptions. The attorneys general claim that the industry engaged in boycotts and intimidation to (1) alter general liability policies from claims made to occurrence; (2) to exclude accidental pollution from coverage; and (3) to limit insurance company obligations to cover defense costs of the insured. The attorneys general believed that the insurers' ability to collude

allowed them to reduce coverage and availability that help to cause the liability crisis.

Other state-based regulatory approaches have been to change legislatively the tort liability system. For example, states enacted tort reforms to minimize the effects of the (in the most part) judicial expansion of tort liability. With the medical malpractice crisis came damage limitations, limits on the use and amounts of punitive damages, elimination of joint and severable liability, and required the use of an offset for collateral payments made by insurance or other third party payers to reduce the total award. It is interesting to note that as the judicial system expanded the rights of plaintiffs or expanded the scope of liability for a defendant, the legislative branch has sought to reduce plaintiff rights or reduce the amount of the defendant's responsibility.

Proposals for tort reform, which are intended to lower the overall tort costs as well as to enhance predictability of future costs, have met opposition from the legal profession. Currently, federal proposals for tort reforms are being debated that would result in severe restrictions on punitive damages, would lessen the rampant costs inherent in the discovery process, and would restrict access through modification of the contingency fee system for lawyers. Whether these reforms or any similar reform measures will ever be implemented is an important question for the business community as a whole, and for liability insurers in particular [Caroll (1987)].

Numerous studies of the effects of tort reforms on medical malpractice rates exist. Tort reforms, such as reducing the statute of limitations, changes in joint and severable liability, placing damage caps, or requiring a pre-litigation affidavit from another physician stating whether the physician believes malpractice has occurred, may reduce malpractice rates. However, tort reform does not necessarily result in a welfare improvement as it tends to limit plaintiff's rights rather than limiting frivolous lawsuits and it rarely speeds up the compensation process for truly injured plaintiffs.[23]

Since the regulation of insurance and the tort system are both state concerns, these responses are completely within the states' prerogatives. However, there are some federal concerns that may supersede or complement state regulation. The first concern is the problems posed by fifty-one political jurisdictions each having their own products liability law. Foreign industries claim that the multiple state products liability laws act as a barrier to entry as state standards often conflict. Congress is reluctant to enter a traditional state domain, but since most products liability cases are heard in federal court, the federal interest is arguably strong enough for congress to standardize the laws through the use of its commerce power.

An additional area of federal concern is the potential repeal of the McCarran-Ferguson Act's limited antitrust immunity for the insurance industry. By repealing the antitrust exemption, it is felt that competition will coerce the industry into providing "fair" prices and prevent it from restricting availability through anti-competitive means.

III. The Economics of the U.S. Non-Life Insurance Industry

The economics of the U.S. non-life insurance industry has received scant attention compared to other regulated industries. Telecommunications, electricity production and distribution, and banking have been the subject of study for many years, but thorough analyses of the non-life insurance industry commenced in 1973 with Joskow's examination of the industry's conduct, structure and performance. This chapter examines the economic issues that affect the non-life insurance industry today. Part A contains a description of the scope of the U.S. non-life business leading to a discussion of the industry's structure detailed in Part B. Part C focusses on an analysis of issues surrounding the industry's conduct and Part D concludes with a brief discussion of the industry's long run profitability.

A. Major Categorizations of Property-Liability Insurance

The major lines of property-liability insurance are usually categorized by the risks they protect against, although there does not exist a single definitive listing of all of the lines. For example, in the National Association of Insurance Commissioners (NAIC) annual statement, there are thirty-four categories listed on the Exhibit of Premiums and Losses (Page 14). There are seventeen categories in the Exhibit of Losses and Loss Expenses (Schedule P), the detailed historical loss and loss reserve exhibits. In the A.M. Best's classification system, twenty categories are provided. Obviously, the total property-liability insurance cake may be sliced in several ways.

Property insurance usually provides first-party[24] protection for either real or personal property either owned or in the care of the insured party. Liability insurance generally provides protection for obligations of the insured party to third parties. Many of the lines of insurance are combinations of both property and liability coverages, and this leads to further distinctions as well. Insurance lines are often classified as either "long-tailed" or "short-tailed," depending on the relative length of the payout profile.[25] Another common dichotomy is between personal lines and commercial lines, with the former being insurance coverage provided to individuals and the latter being insurance coverage provided to businesses or professionals.

In addition to these categorizations, there are the reinsurance and surplus and excess lines categories to be considered. Reinsurance is coverage provided to insurance companies for risks they have accepted. The reinsurer reimburses the primary insurer for all or part of the losses that the primary insurer becomes obligated to pay to its policyholders.

In cases where the commercial market fails to provide certain coverages, surplus or excess lines insurance can fill the gap. For example, in recent years when medical malpractice insurance became difficult to obtain, some physicians turned to the surplus or excess lines market in order to obtain coverage.[26] While the surplus and excess lines insurance market is relatively small, it makes up an important segment of the industry and serves to partially alleviate some of the market imperfections faced by insurance buyers. There is relatively little regulation and supervision of the surplus or excess lines market, and policyholders of non-admitted carriers have no recourse to the guaranty funds in case of insolvency.

Long-Tailed Lines of Insurance.

The following coverages, with the exception of the automobile physical damage

portion of automobile insurance, are what are considered the "long-tailed" liability coverages.[27] These lines are singled out for special reporting in the common financial statements filed annually by all insurance companies (the NAIC annual statement blank). These lines are considered special because of the lengthy delay in the final payout of claims and the concomitant volatility of underwriting results. Because of the long delays in settlement of claims, these lines are especially vulnerable to *adverse development* of loss reserves, meaning that the actual value of the claims payments exceeds the expected value of the claims payments. Of course, the possibility of favorable development also exists, with favorable consequences for the insurer.

Automobile Insurance. Of the traditional insurance lines, the largest segment of the industry is the automobile market, representing over forty percent of the total premiums. This line includes both private passenger automobile and commercial automobile coverages, although the private passenger sector dwarfs the commercial market (see Table 3.1). There are two broad classes of automobile insurance: liability insurance and physical damage insurance. The physical damage insurance is first party property insurance that reimburses automobile owners for damages to their own vehicles. Liability insurance usually provides payments to third parties who are injured by a negligent policyholder, although no-fault coverages are mandatory in a number of states. The no-fault coverage provides medical expense reimbursement, funeral expenses, and lost wages to all persons injured in a traffic accident, regardless of fault. Additionally, uninsured motorists coverage is also often available, which provides first-party reimbursement for policyholders who are unable to recover their liability payments from negligent parties.

Part of the size of this market is attributable to the fact that automobile liability insurance is mandatory in the majority of states. There are almost 200 million registered private and commercial vehicles on the road today, and virtually all of these vehicles are carrying mandatory liability insurance in one form or another. Additionally, practically all financial institutions making automobile loans require the borrower to maintain physical damage coverage on the financed vehicle.

Obviously, this line has a tremendous impact on the property-liability industry as a whole. Recently, the private passenger automobile insurance industry has undergone considerable upheaval because of perceptions of over-pricing. California voters opted to impose mandatory rate rollbacks on insurers in that state, and similar measures have been attempted in many other jurisdictions. The ultimate decision on the legality of legislated rate rollbacks is still meandering its way through the legal system, but in the meantime the insurance industry has received extensive criticism from policyholders, regulators, legislators, and consumer advocate groups.

Workers Compensation. Another major coverage, accounting for slightly over fifteen percent of total premiums, is the workers compensation line. This line is also mandatory in most states and represents no-fault coverage for injuries suffered by employees at work. The automobile liability line and the workers compensation line are the two most heavily regulated of the common insurance lines, owing to the mandatory nature and the widespread coverage afforded under these lines. Recently, the workers compensation line has remained in a constant state of upheaval and turmoil. Often the benefits under workers compensation laws are politically motivated, with labor attempting to mandate the widest and most generous coverage available. The relatively long payout profile for this line of insurance magnifies thesefluctuations in potential benefits, as do the large residual markets and tight controls on pricing. Several states operate workers compensation funds competing with commercial insurers for market share, further restricting pricing freedom. In recent months, conflicts

Table 3.1 *Size and Relative Performance of Lines of Business in the Non-Life Industry (1989).*

LINE OF BUSINESS	NET WRITTEN PREMIUMS	% OF TOTAL	LOSS RATIO	EXPN RATIO	COMB. RATIO
FIRE	$4,442,378	1.93%	62.6%	43.6%	106.1%
ALLIED	2,134,233	0.92%	70.4%	40.1%	110.5%
FARM OWNERS MULTI-PERIL	992,526	0.43%	77.4%	39.8%	117.3%
HOMEOWNERS MULTI-PERIL	18,541,459	8.03%	81.6%	41.5%	123.1%
COMMERCIAL MULTI-PERIL	17,887,542	7.75%	70.6%	51.8%	122.4%
OCEAN MARINE	1,172,246	0.51%	83.0%	43.8%	126.8%
INLAND MARINE	4,416,930	1.91%	59.8%	42.5%	102.3%
FINANCIAL GUARANTY	624,965	0.27%	41.3%	48.6%	89.9%
MEDICAL MALPRACTICE	4,177,617	1.81%	86.5%	49.5%	136.1%
EARTHQUAKE	524,031	0.23%	27.3%	32.8%	60.0%
GROUP ACCIDENT & HEALTH	4,552,175	1.97%	87.0%	19.6%	106.6%
CREDIT ACCIDENT & HEALTH	208,979	0.09%	51.9%	42.2%	94.0%
OTHER ACCIDENT & HEALTH	2,256,851	0.98%	80.8%	30.9%	111.6%
WORKERS COMPENSATION	35,254,680	15.28%	94.1%	27.3%	121.4%
OTHER LIABILITY	18,103,227	7.84%	83.0%	54.0%	136.9%
PRIVATE AUTO LIABILITY	47,780,850	20.70%	95.0%	36.7%	131.7%
COMM AUTO LIABILITY	12,170,245	5.27%	84.9%	42.9%	127.8%
PRIVATE AUTO PHYS. DAMAGE	30,476,133	13.21%	71.2%	31.1%	102.2%
COMM AUTO PHYS. DAMAGE	4,732,866	2.05%	58.7%	38.9%	97.6%
AIRCRAFT	396,742	0.17%	93.8%	43.7%	137.5%
FIDELITY	906,784	0.39%	59.1%	40.2%	99.3%
SURETY	8,074,456	3.50%	28.4%	77.3%	105.7%
GLASS	18,286	0.01%	33.8%	64.2%	98.1%
BURGLARY & THEFT	109,291	0.05%	27.9%	43.3%	71.2%
BOILER & MACHINERY	661,895	0.29%	67.1%	53.1%	120.2%
CREDIT	397,340	0.17%	62.1%	46.9%	109.0%
INTERNATIONAL	191,702	0.08%	112.2%	29.9%	142.1%
REINSURANCE	7,715,076	3.34%	87.3%	34.8%	122.2%
AGGREGATE OTHER LINES	1,850,467	0.80%	68.7%	38.6%	107.3%
TOTAL, ALL LINES	230,771,972	100.0%	80.9%	39.5%	120.4%

Source: NAIC Annual Statement Compilation Tapes (1990).

over the future size and scope of mandatory workers compensation benefits have been at the heart of budget problems in several states.

Other Liability. While it is not the largest line, the Other Liability line represents one of the most volatile of the lines. This coverage provides indemnity for an insured who becomes legally obligated to pay damages to a third party, such as under a product liability suit. This coverage provides not only protection against judgements for special, general and/or punitive damages[28] but also pays legal expenses during the litigation phase. In recent years, insurers have been held liable for payments on claims that were not originally envisioned under this coverage, such as asbestos-related suits and environmental damages. Damages for these claims often take many years to manifest themselves, and as such may return to haunt an insurer many years after the expiration of the policy. The propensity of the judicial system to impart coverage into long-expired contracts has contributed significantly to the volatility of this line of insurance.

Multiple Peril Insurance. The multi-peril lines provide both property and casualty coverage under a single policy. The Commercial Multiple Peril package policies are the most common form of business insurance in use today. Other multiple peril lines provide coverage for homeowners and farms.

Medical Malpractice. This represents a professional liability coverage for medical personnel and hospitals. Formerly, this line was included in the Other Liability line but has been carried separately since the 1970s. This line of insurance is extremely volatile and difficult to price properly. There are relatively few medical malpractice claims, but the size of the individual claims has become a growing concern. Volatility in this line erupts periodically because of pricing fluctuations, and this led to the formation of a number of physician-sponsored mutual insurers during the 1970s as well as a number of risk retention groups in the 1980s as alternatives to purchasing insurance from traditional sources.

Special Liability Insurance. Three lines of insurance clustered together under the title "Special Liability" in Schedule P of the NAIC Annual Statement are the Aircraft line, the Boiler and Machinery line, and the Ocean Marine line. The Aircraft line consists of first-party hull coverage as well as third-party liability coverage for both passengers and non-passengers arising out of the operation of aircraft. Boiler and Machinery insurance provides coverage for losses resulting from the breakdown of boiler equipment or other equipment used in the control, transmission, transformation, or use of mechanical or electrical power.[29] Ocean Marine insurance, which is perhaps the oldest form of property-liability insurance and owes much of its distinctive nature to historical evolution, provides hull insurance, cargo insurance and Protection & Indemnity (P&I) insurance for sea-going vessels. The hull and cargo insurance is primarily a property coverage, while the P&I is third party liability protection.

Short-Tailed Lines of Insurance.

The remaining coverages are considered the less risky portion of the total insurance industry with regard to loss development. They are relatively quick to pay out, and adverse development, while still possible, appears more rapidly. A brief discussion of some of these lines follows, but the potential impact of these lines is less severe than the aforementioned coverages, with the exception of the Earthquake line.

Earthquake. Coverage for damages caused by earthquakes is very limited, because of the difficulty in predicting losses and the non-independence of the risk.[30] This peril is generally excluded from coverage under homeowners or commercial insurance, but may

be purchased separately. Government estimates of earthquake damage resulting from a large quake in an urban area run into the tens of billions of dollars, and such a catastrophe could easily swamp the entire insurance market. Because of the infrequency of the occurrence, this coverage is often omitted by insurance purchasers. However, during the recent tide of publicity about the possibility of a major earthquake in the New Madrid fault area, purchases of this supplemental coverage increased dramatically in many areas of the country. The government is considering making the purchase of earthquake coverage mandatory on federally insured mortgages in the future, much the same as flood insurance is required in certain areas.

Fire/Allied Lines. Fire and Allied Lines insurance is traditional first party coverage for damages to real property. Fire insurance was one of the first lines to be available to a wide number of consumers and the first regulated. Today, the fire insurance policy is a standardized document, although the attached forms and endorsements are not. While the premium volume in this line is relatively low, amounting to 1.93% of 1989 total premiums, the rates the premiums are based upon are relatively low as well, so the premium volume is not indicative of the widespread protection afforded under this line.

Inland Marine insurance. Inland Marine, which is a somewhat misleading term, provides protection to property in transit, property in the custody of bailees, and "floating" property. Inland Marine arose out of the Ocean Marine line and originally covered protection for transportation of goods in transit on inland waterways and on roads. Types of risks that may be covered under an Inland Marine insurance policy are spelled out in the "Nation Wide Marine Definition" promulgated by the NAIC and includes a host of diverse assets from personal jewelry to bridges and tunnels. Because of the diversity of this catch-all coverage, Inland Marine insurance is subject to less regulatory scrutiny than most other lines.

Fidelity & Surety. Surety is a guaranty by a third party to indemnify the performance of one of the parties to a transaction. For example, a contractor is required to provide a surety bond guaranteeing financial restitution should the contractor be unable to complete the construction of a building. The surety would then reimburse the person who is harmed by the contractor's failure to complete the contract. Fidelity bonds protect against dishonesty, and these lines are usually thought of as a set, although there are differences in protection.

B. Structure and Relations among Structural Elements

A basic methodology for analyzing the economics of an industry is the Structure-Conduct Performance paradigm (SCP). This paradigm allows economists to describe an industry's behavior and place it on the continuum between pure monopoly and pure competition. The structure of an industry relates to concentration and the ability to employ market power due to the presence of barriers to entry, institutional arrangements, or perhaps government regulations that limit entry or restrict competition. The examination of the industry's conduct is an examination of the industry's use of market power, pricing policies to restrict competition, or non-price competition, or opportunities to collude that may provide market power to the firms in the industry. Finally, performance concerns the long run profitability of the industry and its dynamics. Profits and innovation are the major focus of this line of analysis. Thus, a concentrated industry with high barriers to entry, above normal profits, and no innovation is closer to a monopoly while an industry with no abnormal profits, low barriers to entry, and innovative

products is more like the competitive ideal.

Table 3.2 *Four, Eight, and Twenty Firm Concentration Ratios Based on Total Premiums Written, Total Admitted Assets and Total Surplus (1990).*

	CR_4	CR_8	CR_{20}
Total Premiums	9.19	13.76	21.27
Total Admitted Assets	16.19	22.54	37.70
Total Surplus	14.33	22.17	36.56

Source: NAIC Annual Statement Compilation Tapes (1990).

The U.S. non-life insurance industry, as mentioned in Chapter I and described above in part A, is not a monolithic industry. However, even when taken as a whole, the industry is not very concentrated as shown in Table 3.2. The table shows the four, eight, and twenty firm concentration ratio for the entire non-life insurance industry in terms of premiums, surplus, and assets. Multiple market share measures are helpful especially in the case of a service industry when the correct definition of the industry's output is subject to debate or measurement problems. In terms of premiums written, the top four firms have less than ten percent of the market. Only by increasing the number of firms to the top twenty firms does the concentration ratio double.

For assets and surplus the industry looks a bit more concentrated with the top 20 firms holding approximately thirty-five percent of the total admitted assets and surplus. Although the industry looks more concentrated, these ratios when compared to the 1982 Census of Manufacturers average industrial four firm concentration ratio are extremely low. In 1982, for example, the average four firm concentration ratio was approximately thirty-eight percent.

On a more disaggregated level, similar conclusions can be drawn. Table 3.4 shows the Herfindahl index for each state for a few important lines. Only the medical malpractice

Table 3.3 *Distribution of Companies and Premiums Among the States*

Panel A. *Distribution of Companies by Number of State Licenses*

NO. OF STATE LICENSES	NO. OF COMPANIES	CUMULATIVE PERCENT	PERCENT
1	1,189	45.8%	45.8%
2-5	407	15.7%	61.5%
6-10	179	6.9%	68.3%
11-24	241	9.3%	77.6%
25-39	186	7.2%	84.8%
40 +	395	15.2%	100.0%
TOTAL	2,597	100.0%	100.0%

Panel B. *Distribution of Active Non-life Insurance Companies by Number of States with Positive Direct Written Premiums (1989).*

NO. OF STATES ACTIVE	NO. OF COMPANIES	PERCENT	CUMULATIVE PERCENT
1	959	42.5%	42.5%
2-5	415	18.4%	60.9%
6-10	174	7.7%	68.6%
11-24	223	9.9%	78.5%
25-39	140	6.2%	84.7%
40 +	346	15.3%	100.0%

NO. OF STATES ACTIVE	NO. OF COMPANIES	MILLIONS OF DOLLARS OF PREMIUM	PERCENT OF TOTAL
1	959	$24,060	10.8%
2-5	415	$13,452	6.1%
6-10	174	$8,105	3.6%
11-24	223	14,163	6.3%
25-39	140	11,570	5.1%
40 +	336	$154,634	68.4%
TOTAL	2,257	$221,084	100.0%

Source: NAIC, Annual Statement Compilation Tapes 1989.

Table 3.4 *Herfindahl Indices for Important Lines (1990).*

STATE	FIRE	LIAB PERS'L AUTO	DAM PERS'L AUTO	LIAB COMM'L AUTO	DAM COMM'L AUTO	WORK	OTHER	COMM'L MULTI-	MED MAL
ALASKA	0.059	0.116	0.106	0.059	0.044	0.069	0.051	0.051	0.280
ALABAMA	0.024	0.087	0.088	0.026	0.015	0.027	0.027	0.021	0.427
ARKANSAS	0.037	0.068	0.061	0.017	0.015	0.028	0.025	0.018	0.273
ARIZONA	0.024	0.055	0.053	0.040	0.015	0.130	0.028	0.019	0.188
CALIFORNIA	0.020	0.056	0.055	0.015	0.012	0.034	0.025	0.021	0.082
COLORADO	0.019	0.071	0.058	0.018	0.013	0.096	0.025	0.023	0.268
CONNECTICUT	0.026	0.025	0.025	0.025	0.027	0.029	0.038	0.021	0.135
WASHINGTON,D.C.	0.049	0.060	0.059	0.026	0.092	0.027	0.038	0.027	0.247
DELAWARE	0.023	0.063	0.066	0.021	0.021	0.024	0.068	0.017	0.145
FLORIDA	0.019	0.062	0.065	0.015	0.013	0.026	0.020	0.018	0.092
GEORGIA	0.014	0.061	0.052	0.012	0.011	0.021	0.027	0.015	0.218
IOWA	0.032	0.053	0.045	0.023	0.020	0.021	0.022	0.017	0.216
IDAHO	0.021	0.061	0.053	0.035	0.016	0.110	0.020	0.021	0.216
ILLINOIS	0.016	0.094	0.074	0.011	0.011	0.026	0.026	0.012	0.277
INDIANA	0.016	0.091	0.043	0.014	0.012	0.018	0.019	0.020	0.174
KANSAS	0.018	0.071	0.059	0.020	0.016	0.024	0.020	0.022	0.154
KENTUCKY	0.023	0.067	0.055	0.013	0.015	0.025	0.022	0.022	0.115
LOUISIANA	0.021	0.096	0.091	0.018	0.015	0.040	0.024	0.024	0.209
MASSACHUSETTS	0.019	0.044	0.043	0.038	0.035	0.046	0.032	0.014	0.076
MARYLAND	0.017	0.059	0.049	0.014	0.014	0.019	0.027	0.018	0.241
MAINE	0.023	0.031	0.029	0.035	0.037	0.080	0.023	0.027	0.253
MICHIGAN	0.024	0.084	0.071	0.028	0.021	0.033	0.077	0.015	0.164
MINNESOTA	0.022	0.064	0.061	0.023	0.016	0.022	0.024	0.015	0.224
MONTANA	0.018	0.081	0.070	0.021	0.014	0.023	0.028	0.013	0.069
MISSISSIPPI	0.031	0.061	0.069	0.037	0.032	0.034	0.037	0.037	0.287
MONTANA	0.026	0.076	0.063	0.033	0.023	0.051	0.018	0.040	0.170
NORTH CAROLINA	0.019	0.044	0.045	0.015	0.014	0.027	0.021	0.015	0.225
NORTH DAKOTA	0.030	0.046	0.048	0.026	0.026	0.156	0.024	0.020	0.188
NEBRASKA	0.044	0.064	0.058	0.028	0.029	0.019	0.023	0.019	0.241
NEW HAMPSHIRE	0.017	0.028	0.028	0.029	0.031	0.027	0.028	0.018	0.098
NEW JERSEY	0.019	0.044	0.047	0.018	0.020	0.028	0.040	0.014	0.243
NEW MEXICO	0.033	0.061	0.064	0.022	0.019	0.050	0.021	0.023	0.237
NEVADA	0.021	0.064	0.056	0.028	0.017	0.170	0.020	0.023	0.178
NEW YORK	0.021	0.046	0.043	0.014	0.017	0.022	0.040	0.015	0.138
OHIO	0.019	0.049	0.041	0.019	0.012	0.091	0.024	0.021	0.154
OKLAHOMA	0.016	0.063	0.056	0.022	0.019	0.026	0.025	0.021	0.280
OREGON	0.019	0.066	0.053	0.025	0.015	0.127	0.016	0.018	0.176
PENNSYLVANIA	0.017	0.042	0.051	0.014	0.015	0.021	0.030	0.014	0.133
RHODE ISLAND	0.023	0.035	0.037	0.025	0.030	0.073	0.034	0.015	0.098
SOUTH CAROLINA	0.015	0.076	0.070	0.015	0.015	0.031	0.021	0.016	0.333
SOUTH DAKOTA	0.024	0.045	0.042	0.025	0.021	0.021	0.012	0.017	0.335
TENNESSEE	0.026	0.069	0.054	0.014	0.015	0.026	0.027	0.016	0.315
TEXAS	0.019	0.072	0.069	0.015	0.012	0.026	0.035	0.015	0.091
UTAH	0.031	0.068	0.056	0.025	0.017	0.024	0.027	0.025	0.368
VIRGINIA	0.021	0.055	0.049	0.016	0.018	0.019	0.025	0.017	0.210
VERMONT	0.026	0.039	0.035	0.030	0.032	0.028	0.028	0.022	0.396
WASHINGTON	0.021	0.046	0.044	0.021	0.015	0.109	0.023	0.019	0.159
WISCONSIN	0.024	0.046	0.047	0.020	0.017	0.020	0.020	0.016	0.162
WEST VIRGINIA	0.027	0.104	0.089	0.028	0.027	0.094	0.032	0.035	0.144
WYOMING	0.019	0.082	0.069	0.028	0.021	0.073	0.036	0.035	0.257
UNITED STATES	0.015	0.057	0.053	0.010	0.012	0.019	0.033	0.014	0.040

Source: Author's Calculations based on data from NAIC, Annual Statements Compilation Tapes (1990).

market has any real concentration as measured by the Herfindahl index. As a result of the earlier malpractice crisis, many states have only one or two major providers other than a physicianowned malpractice insurance company. Thus, it is expected that the Herfindahl index will be relatively high compared to other lines.[31]

Table 3.5 tells a slightly different story. First, if firms rather than groups are examined, the top 300 companies provide about two-thirds of all premium dollars. Thus, there are a relatively large number of small firms in the market. This is consistent with low concentration and Herfindahl indices. This is potentially due to the fragmentation of the industry caused by state regulation and tax policies. For example, New York has the Appelton rule requiring any insurance company licensed to do business in New York to abide by New York law in all other states [Meier (1987)]. Since New York laws tend to be stricter in terms of investment and other operational restrictions, firms set up separate subsidiaries rather than submit the entire company to New York regulation. In addition some states, like Illinois, provide a very strong incentive to incorporate in Illinois to avoid a substantial discriminatory premium tax differential of two percent [Grace and Skipper (1990)]. Thus there are many companies set up to do business only in one state. This increases costs, reduces profits, and increases prices to consumers.

Panel B in Table 3.5 shows that when the firms are combined into groups, almost sixty percent of the groups account for eleven percent of the premium volume. The majority of groups are active in less than forty states. This shows a tremendous fragmentation that is quite possibly due to the state regulation of business, restrictions against interstate commerce, and state-based protectionism of the home industry. Thus, even though there are low concentrations, it should be noted that there are also a tremendous number of companies that write very small amounts of business.

For the entire U.S. market by line of business the Herfindahl index is very small as a result of the relatively large number of companies writing in one state. The Herfindahl index for the entire market based on total premiums written for all lines is 0.0124.[32] Normally, an important question to address is the relevant market, but with national and state Herfindahl indices of this size, it is clear, based on this measure alone, that concentration is not a problem in the non-life insurance industry whether the state or national market is used. Thus, no matter how the market is divided, the concentration appears low in absolute value and in relation to other industries.

Concentration in an industry can be the result of either natural causes such as economies of scale or unnatural causes such as regulation allowing barriers to entry. Some of these unnatural causes are the result of government intervention while others are possibly the result of industry collusion.

Barriers to Entry

Entry into an insurance market is a simple procedure in theory, but significant delays and costs may arise in practice. The delays are dependent to some degree on whether the aspiring market entrant is an established insurer seeking to expand, a new subsidiary company of an existing insurance group, or an entirely new creation. Licensing requirements vary from state to state, and may be based on such criteria as initial capitalization, historical operating experience standards, asset composition standards, and personal background assessments of the officers of the company. In addition, insurers currently licensed to write business in a state that wish to expand their lines of business may experience delays in obtaining the additional licensing agreements needed, although in practice it is simpler for an established company to expand into new lines than it is for a new insurer to become licensed for the first time. Some of the barriers to be discussed

Table 3.5 *Distribution of Groups and Premiums among the States*

Panel A. *Distribution of Premiums for Groups by Number of State Licenses (1989).*

NO. OF STATE LICENSES	NO. OF COMPANIES	CUMULATIVE PERCENT	PERCENT
1	33	14.4%	14.4%
2-5	19	6.6%	21.0%
6-10	33	8.3%	29.3%
11-24	30	14.4%	43.7%
25-39	99	13.1%	56.8%
40 +	229	43.2%	100.0%
TOTAL	229	100.0%	100.0%

Panel B. *Distribution of Non-life Insurance Groups by Number of States with Positive Direct Written Premiums (1989).*

NO. OF STATES ACTIVE	NO. OF GROUPS	PERCENT	CUMULATIVE PERCENT
1	17	7.6%	7.6%
2-5	20	8.9%	16.4%
6-10	24	10.7%	27.1%
11-24	30	13.3%	40.4%
25-39	28	12.4%	56.8%
40 +	106	47.1%	100.0%

NO. OF STATES ACTIVE	NO. OF GROUPS	MILLIONS OF DOLLARS OF PREMIUM	PERCENT OF TOTAL
1	17	$2,520	1.3%
2-5	20	$2,983	1.6%
6-10	24	$2,996	1.6%
11-24	30	$7,578	4.0%
25-39	28	$3,674	2.0%
40 +	106	$167,510	89.5%
TOTAL	225	$187,260	100.0%

Source: NAIC, Annual Statement Compilation Tapes, 1989

below are product differentiation, capitalization requirements, the often-lengthy licensing process itself, economies of scale, and marketing and distribution systems.

Product Differentiation. Even though concentration is very low, regulators and consumer groups have complained about the difficulty in comparing insurance contracts from different companies. Insurers have an incentive to engage in product differentiation if the consumer can not determine whether one contract is better than another. Some states have mandated that all companies must use the same policy form so that coverage limits and prices are easily determinable and comparable across contracts. However, an FTC study concluded that consumers are really more sophisticated concerning prices and coverage than was previously believed [Plummer (1985)]. Given that certain lines are very competitive (e.g., the auto and home-owners lines) the policies have become more homogenous and many times can be purchased over the phone with very little search costs for consumers.

Capitalization Requirements. Capitalization requirements are usually stated in terms of minimum paid-in capital (for stock companies) or minimum contributed surplus (for mutuals). In addition, there is a requirement for additional surplus, irrespective of organizational form. These requirements vary significantly from state to state. States which have low capitalization requirements tend to attract a relatively large number of companies, although the average size of the companies will be small. This places a larger regulatory burden on those states, as the primary responsibility for regulating insurance companies is assumed by the domiciliary state.[33] Several states also require newly formed or newly admitted companies to maintain a higher capital base than older, more established licensed insurers.[34]

The Licensing Process. The licensing process for an insurer may take a significant amount of time to complete on a state-by-state basis. An insurer must obtain a license from every state insurance department separately[35] in order to do business in that state. The requirements for filing an application with individual states are spelled out by statute, but there may be significant "unwritten" rules or regulations delaying the process. For instance, the state of Connecticut only accepts applications during certain months of the year, and significant backlogs may exist in various states at various times. Additionally, personality clashes between company personnel and harried regulators can easily bump a company's application to the bottom of the stack. The process, which seems relatively simple on paper, often takes years to complete without some form of intervention by hired lobbyists and may constitute a significant barrier to expansion.[36]

Economies of Scale. The level of quality and service of insurance companies, as well as their administrative costs, are strictly governed by scale economy restrictions. Larger insurers are better able to establish regional and local claims centers, purchase better data processing equipment, and attract higher-quality managers than smaller companies. However, the bulk of the costs in property-liability insurance, such as the loss expenses, does not exhibit significant scale economies, although the variability of the loss estimates is inversely related to size. Therefore, the scale economies that do exist in the insurance business tend to decrease the ability of smaller and newer companies to compete with the larger, more established companies. Thus, an entrant must enter with a large enough scale to be competitive. However, smaller firms may enter a particular market niche and survive because economies of scale may be exhausted at a smaller level of output for a particular line of business.

There have been a number of studies on the measure unit of scale and scope economies in the U.S. non-life market summarized in Geehan (1986). There are a number of problems with the empirical studies, related to

definition of output and definition of costs. Generally, there is no evidence of any diseconomies of scale in the insurance industry. Most evidence suggests that the industry experiences increasing or constant returns to scale. In fact, given the large number of small insurers in the U.S. it would be surprising to find anything but increasing returns to scale.

Most studies focus on the largest firms and thus these are the firms likely to have constant (or near constant) returns to scale. Economic theory predicts that constant returns to scale (CRS) is the equilibrium position for competitive firms. To the extent that a firm could increase its output, the firm would desire to do so because marginal cost is still decreasing. If on the other hand decreasing returns exist, the firm would reduce its output to the point where returns are constant because marginal cost is increasing.

One of the major problems with scale studies in the past is that they lumped all outputs into one measure of output.[37] Thus, for multi-line companies, all premiums from each line were summed into total premiums. Any evidence of cost savings from multiline operations, economies of scope, would be hidden by this methodology. Economies of scope potentially exist due to the firm's use of a shared input. For example, a local telephone network can handle both local and long distance calls due to the fact that the network is a shared input into the production of local and long distance calls rather than having two networks. With the replicative investment, it is cheaper to use one network for the two services.

In the insurance industry, overhead might serve the same purpose. Overhead, i.e., those management expenses that would be incurred to provide one line of insurance, can be further spread if a second line is also provided. More formally, economies of scope exist if the cost of producing a given output bundle (A,B) jointly is cheaper than producing A and B separately.

Because the technology to estimate these scale economies is relatively new, only three studies exist that examine the insurance industry. Two examine the life industry [Kellner and Mathewson (1983) and Grace and Timme (1992)] and one examines the Canadian non-life insurance industry [Suret (1991)]. Although, not exactly identical to the U.S. industry, it is similar enough to provide a rough gauge concerning economies of scale and scope. Suret divided his sample of Canadian firms into three groups - small (with assets less than $CAN 40 million), medium (with assets between ($CAN 40 and $CAN 100 million), and large (with assets greater than $CAN 100 million).[38] For the medium group there exists evidence for scale economics for the entire study period (1986-1988) while scale economies existed for small and large firms only once out of three years. In addition, there is no systematic evidence of economies of scope between the two main product lines as he defined them (property/liability insurance and automobile insurance).

Other economies of scale studies found increasing returns to scale disappeared for larger firms [Allen (1974)], and found evidence of weak or non-existent returns except for mutual auto companies [Joskow (1973)]. Others have found mixed evidence [Johnson, Flannigan, and Wiesbart (1982)], but none of these older studies used the superior methodology employed by Suret. It is likely that for the very largest firms, constant returns to scale exist and that for smaller firms, increasing returns to scale exist. Theoretically, in the long run all firms should be at constant returns to scale. It may be that the smaller firms can take advantage of barriers to entry, or state regulations, or product diversification and still survive in the market even without long run cost minimization.

Weiss (1991) has attempted to examine another facet of this issue by directly examining the efficiency of the non-life insurance industry. Three categories of efficiency are examined: Technical efficiency, allocative efficiency, and

scale efficiency. Technical inefficiency occurs when the firm is not operating on its production possibility frontier. Allocative inefficiency exists when the firm produces a non-optimal output mix or employs a non-optimal input mix to produce its output. Finally scale inefficiency occurs when inputs and outputs are not allocated in proportion to the correct input and price ratios so that the marginal revenue product is not set equal to the inputs' wage rate.

Numerous reasons could exist for industry inefficiency. For example, lack of competition or government regulation could cause the firm to sub-optimize or misallocate resources. Weiss finds that there exist potentially large inefficiencies. Capital is over utilized with respect to labor (allocative inefficiency) and capital is not used in the correct long run proportion to achieve scale efficiencies. Weiss also tested for effects due to regulation and found that for long-tailed lines too much labor relative to outputs was used in competitive states (allocative inefficiency) and for regulated states too little labor was used relative to outputs for long-tailed lines. Combined, these inefficiencies amount to between 12.6 and 33% of average net premiums.

Weiss did not account for all government regulations. For example, she did not account for regulations tending to fragment the market - such as discriminatory premium taxes or New York's Appelton Rule, nor did she examine other structural impediments to open competition. However, if her most conservative estimate of 12.6 percent is employed it is obvious that there are serious inefficiencies in the non-life markets. In addition, since state regulations affect firms who do business in many states it is difficult to assess the effect of one state's regulation on any one firm.

Marketing and Distribution Systems. One cause of inefficiency in the non-life insurance industry is thought to be its marketing system. The independent agency system allows companies to use existing distribution systems in lieu of starting up their own system from scratch. The downside of this is the fact that the costs are higher for distribution through independent agents, and competition is more tied to price than to quality. There has been significant growth in the market share for direct writers of insurance in recent years because of the lower costs involved, and this would operate as a significant entry barrier to a new company or to a smaller company that could not afford the initial investment in personnel, equipment and office space.

Historically, the non-life insurance industry has relied upon agents to sell insurance to the public. These agents are like independent contractors and are often contrasted to agents who are employees of the insurance firm. The independent agents are compensated by commissions on premiums written. In the past rate bureaus enforced collusion among agents by not allowing them to sell the insurance of non-member firms. This collusion and the power of agents has attracted attention by scholars concerned about the efficiency of the distribution system.

Joskow (1973) found that, all other things held constant, non-liability agency firms had expense ratios almost eleven percent higher than firms employing their own agents (direct writers) in 1967. In addition, the expense ratios for auto insurers averaged about six percent less than those of fire companies. Since auto insurance is arguably more competitive than fire insurance, Joskow concludes that it is competition that drove down costs as agency firms competing against direct writers would have to cut auto commissions to stay competitive. N e than when Joskow undertook his original study there was generally more regulation and price collusion among firms than there is today.

A second study by Cummins and Vanderhei (1979) examined agency/direct cost differences over time (from 1968 to 1976). This study allowed a test of one of Joskow's

hypotheses: competition drives down expenses. If there was an eleven percent cost differential between the two marketing systems, one should observe firms switching from the high cost system to the low cost system or agency writers would cut costs in another part of the business.

Cummins and Vanderhei find that the direct writers are significantly more efficient than agency companies by 15-20 percent (depending on the measurement of costs used) and this relationship does not change appreciably over time. In addition, they found that these inefficiencies stem from the marketing distribution function rather than the loss adjustment function. Since 1972 the percentage of business direct writers have written in the auto lines has increased from 52 to 65 percent and in the fire lines from 28 to 53 percent. Given that this is occurring, why do companies still employ agents?

It has been argued that agency operations allow for a higher quality service to the customer. However, in studies of agency and non-agency firms, the firm's self-reported quality indicators were not statistically different [Etgar (1976) and Cummins and Weisbart (1977)]. It may be that consumers perceive a difference that the retailers do not, i.e., a face to face meeting with an insurance representative is preferred to a phone conversation. This particular assertion has not been examined in the literature.

A second reason that agency firms are able to compete is that agencies are getting more efficient and are able to provide service at lower costs. Cummins and Vanderhei have shown that this was not the case for 1967 to 1976. Barrese and Nelson (1992) examine the industry from 1978 to 1990 and find that for most years a significant cost differential still exists between direct writers and agency firms. This suggests that agency firms are still not cost efficient.

One further point: agency firms *have* increased their premiums written since 1967 even though agency firms seemingly are not as efficient as direct writers. The relatively poor performance is because the direct writers' growth has been greater. As certain personal lines become more homogeneous, one might expect that agency writers will be at a comparative disadvantage for this business. However, when a face to face interaction is truly required, the agency system may provide a desired service. Thus, it is possible to see growth and continued viability of the agency system.

Operating Restrictions and Regulatory Caused Inefficiencies

In addition to creating barriers to entry for insurance companies and causing company inefficiency, the various states impose operating restrictions as well that are designed to dampen competition among insurers and to limit insurer risk-taking, as well as to protect the public and the industry from an insurer's predatory practices. The protection afforded to personal lines insurance purchasers is customarily superior to that afforded to commercial lines purchasers, based on the assumption that businesses are better able to protect themselves than individuals. Additionally, the regulatory protection for those lines of insurance mandated by law is generally greater than the protections afforded to non-mandatory lines.

For instance, most states require individuals to purchase third-party automobile liability insurance. In order to protect the consumers who have been forced to purchase this coverage, many states place restrictions on insurers' ability to cancel or not renew auto insurance policies. Additionally, most states require insurers to file their rating plans and policy forms with the insurance commissioner's office for approval, often in advance of their use. A few states, such as Texas and Virginia, mandate identical language for all automobile insurance policies to insure uniformity of the insurance product. These restrictions limiting

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Rating laws are generally categorized in one of the following four categories ordered from most stringent to least stringent: a) "Prior Approval", b) "File and Use", c) "Use and File", and d) "No Filing Required". Prior approval laws require the insurer to receive permission from the state insurance commissioner prior to implementing any changes in their rating structure.[39]

"File and Use" laws require the insurer to submit proposed changes in rating systems to the insurance commissioners office prior to implementation. If the insurance commissioner has any objections to the proposed rates, the insurer must satisfy those objections before the filing is approved and the changes may be implemented. If there are no objections from the insurance commissioner, the filed plan is implemented on its filed effective date.

In a "Use and File" state, the insurer must file a copy of the revised rating plan with the state insurance commissioner within a specified period of time after implementation of the rating plan. The insurance commissioner has the option of rejecting the rate filing and forcing the insurer to suspend the changes to the rating plan, or may simply approve the change. The final category, that of "No Filing Required", means that the insurer is free to modify its rating plan as warranted without seeking specific approval.

Rating laws vary by state and by line. Generally speaking, personal lines are the most stringently regulated. Some states require some form of insurance department approval for personal lines and workers compensation while disregarding other commercial lines rating plans. Most states do not require rate filings for the Inland Marine line of insurance because of its catch-all nature. Additionally, the stringency of the rating law is often modified in practice by the insurance commissioner's office. Certain states, even though they operate under a "Use and File" or "File and Use" system, are very strict about allowing rate increases in the personal auto lines. These operating restrictions, while not codified, are indeed a fact of life for many insurance companies.

Harrington (1984a and 1984b) presents evidence of the effect of state regulation on prices. In his study, he found that loss ratios are higher (underwriting "profit" is lower) in states with prior-approval statutes. Other studies by Witt and Urrutia (1983) find insignificant differences, but a more rigorous analysis by Cummins and Harrington (1987) support this result. Specifically, Cummins and Harrington dissagregated the data and analyzed four lines of business: commercial auto, private auto, homeowner's and general liability. They found that the average price of private auto insurance in a regulated state was 9 percent lower than in a competitively rated state. Similar, but slightly smaller differences, were found for commercial auto insurance and homeowners. However, there was no difference at all for other liability.

In a study mentioned above, Weiss (1991) also found distortions in the production process

due to regulation. However, she also found that firms operating in unregulated states also suffered from different operational inefficiencies. This may be the result of the fact that a state's regulation of the business of a multi-state company may have extra-territorial results, that is strict regulation in state A may lead to other inefficiencies for the company as a whole.

Other operating restrictions are often extensions of entry or exit barriers, such as countersignature laws. These require insurance policies to be countersigned by resident agents within a state and are an extension of the entry barrier with regard to establishment of a marketing system. Maintenance of minimum capital levels is an extension of the capitalization barrier, although the relatively modest levels of capital required for insurers in most states are less of a barrier today.

Additionally, state-specific quirks must be addressed by insurance companies, such as Connecticut's requirement for an insurer's claims examiners to attend a state licensing course prior to handling claims arising in that state. While individually these requirements appear to be reasonable, they do impose operating restrictions on multi-line, multi-state insurers that must expend resources to track legislative and administrative law changes (as well as the unwritten rules under which each insurance department operates) in each of the fifty states and to tailor operations to meet those diverse requirements.

Furthermore, regulators and legislators impose investment restrictions on insurers in order to ensure that they operate in a narrowly defined scope as insurance companies. Routinely, insurance companies are restricted from investing freely in investment assets. Typical restrictions may preclude investment of more than five percent of admitted assets in common stocks or real estate, or in any one class of investment assets with the exception of U. S. government bonds.[40] Insurers are also restricted from owning controlling interests in the common stock of non-insurance corporations, effectively limiting attempts to diversify within other financial services areas. Note, however, that these restrictions vary widely and significantly from state to state.

Also, insurers are sometimes required to maintain deposits within the states in which they operate. These deposits are often in the form of government securities (both federal and state), but also may be in the form of cash, bank deposits or other specified instruments. This requirement may be waived by certain states when the company's domiciliary state submits certification that the required deposits are maintained in the domiciliary state. The deposit requirement was originally intended to provide a source of funds to guaranty the obligations of the insurer, but this necessity has been largely superseded by the introduction of insolvency guaranty funds in all states. Still, the deposit requirement allows state insurance departments some measure of control over the actions of foreign insurers doing business in that state and thus acts as a check on their actions.

Barriers to Exit

Barriers to exit may be even more oppressive to an insurance company than barriers to entry, and those states with strict operating restrictions or exit barriers tend to have more difficulty in attracting new market participants. This is consistent with competitive market theory, which requires ease of both entry and exit. While the property-liability insurance industry does experience some instances of regulatory impediments to exit, insurers enjoy relative freedom of exit from markets. Figure 3.1 shows percentage change in the number of firms over time in the non-life lines. However, by examining the numbers of entrants and exits relative to the total size of the industry, the number is really inconsequential. Thus real exits or a withdrawal from a market (i.e., to cease writing premiums)are not represented in the above figure.

Many states have exit regulation in place because of the potentially long delay between receipt of premium and final payment of obligations in property-liability insurance. Some controls are necessary to insure completion of contractual obligations for insurers who are exiting a market voluntarily. Generally, this is not a problem, as an insurer may secure a portfolio reinsurance agreement and cede its business to another company and thus remove itself from the market. Currently, the NAIC is working on a model law in this area that would spell out the notification requirements and procedures for this type of transfer. In the meantime, in order to maintain an orderly withdrawal, some temporary restrictions on policy cancellations are used in some states in particular lines. For instance, insurers are usually required to give some form of notification to their policyholders, with the interval between notification and effective date of cancellation being decided by the state.

Often these requirements are spelled out in statutes or regulations, although "unwritten" rules also often apply. Prior to the vote on California's Proposition 103, several automobile insurers in that state voluntarily withdrew from the market or ceased taking on any new customers; after passage of the bill, the restrictions on withdrawal were significantly increased. Some of the more risk-averse insurance companies simply withdrew from the market prior to the outcome of the referendum because of the potential of significant exit barriers.

Regulatory efforts at erecting exit barriers come in several forms. Companies may be simply barred from leaving a market, or they may be required to surrender all licenses rather than solely the license for an undesirable line of business, or they may be required to pay significant fines, fees or other monetary levies. For instance, in Massachusetts, thirteen companies (representing about one-quarter of the total private passenger automobile insurance market) have withdrawn since 1986. Of these, seven were forced to relinquish all licenses and the other six were made to pay large penalties.[41] Currently, the actions of the Massachusetts regulatory authorities, as well as similar actions by the New Jersey Insurance Commissioner, are being challenged in court.

Figure 3.1 shows the percentage change in the number of firms in the non-life insurance industry over time. As can be seen, the change in the number of companies seems to follow a cyclical pattern. One reason for this pattern might be due to the relationship between entry and profitability. Since profits allegedly follow a cycle, the number of entrants should also follow a cycle. However, the change in the number of firms in the industry is not necessarily related to the "true" entrants into a market, as an established firm may just enter a new market by writing one dollar of insurance. The costs of entry are much lower for an established firm, so one would expect that most entry would be accomplished through incumbent firms. One measure of entry then would be the availability of funds to use to back new policies. A potential measure of this is company surplus representing assets on hand that can be used to satisfy claims.[42] As can be seen in the figure, surplus seems to lead the percentage change in the number of firms. This suggests that increases (decreases) in surplus is followed by entry (exit) of new firms. Since established firms have lower costs of entry, then it seems likely that they will act sooner than a start-up to enter a market.

Firms enter a market because there are profits to be earned. By plotting an accounting measure of profit, combined income (underwriting profit plus investment profit), against the change in the number of companies and the change in surplus, we see that changes in combined income seem to lead surplus but do not seem to be related to the percentage change in the number of firms. Thus, profits seem to attract entry and the industry is relatively

responsive to changes in profit levels.

Given the weak evidence about the relationship between entry and profits, further study of the relationship is needed. Relying on a static representation like the Herfindahl index or the concentration ratio does not really provide information about the long run dynamic conduct of the industry needed to assess the competitiveness and contestablility of the market. In addition, it should be noted that alternative forms of insurance (substitutes) such as risk retention grous (RRGs) and self insurance are not measured in either the concentration measures or the long run entry and exit relationships. Thus, most reported figures understate concentration as well as entry and exit.

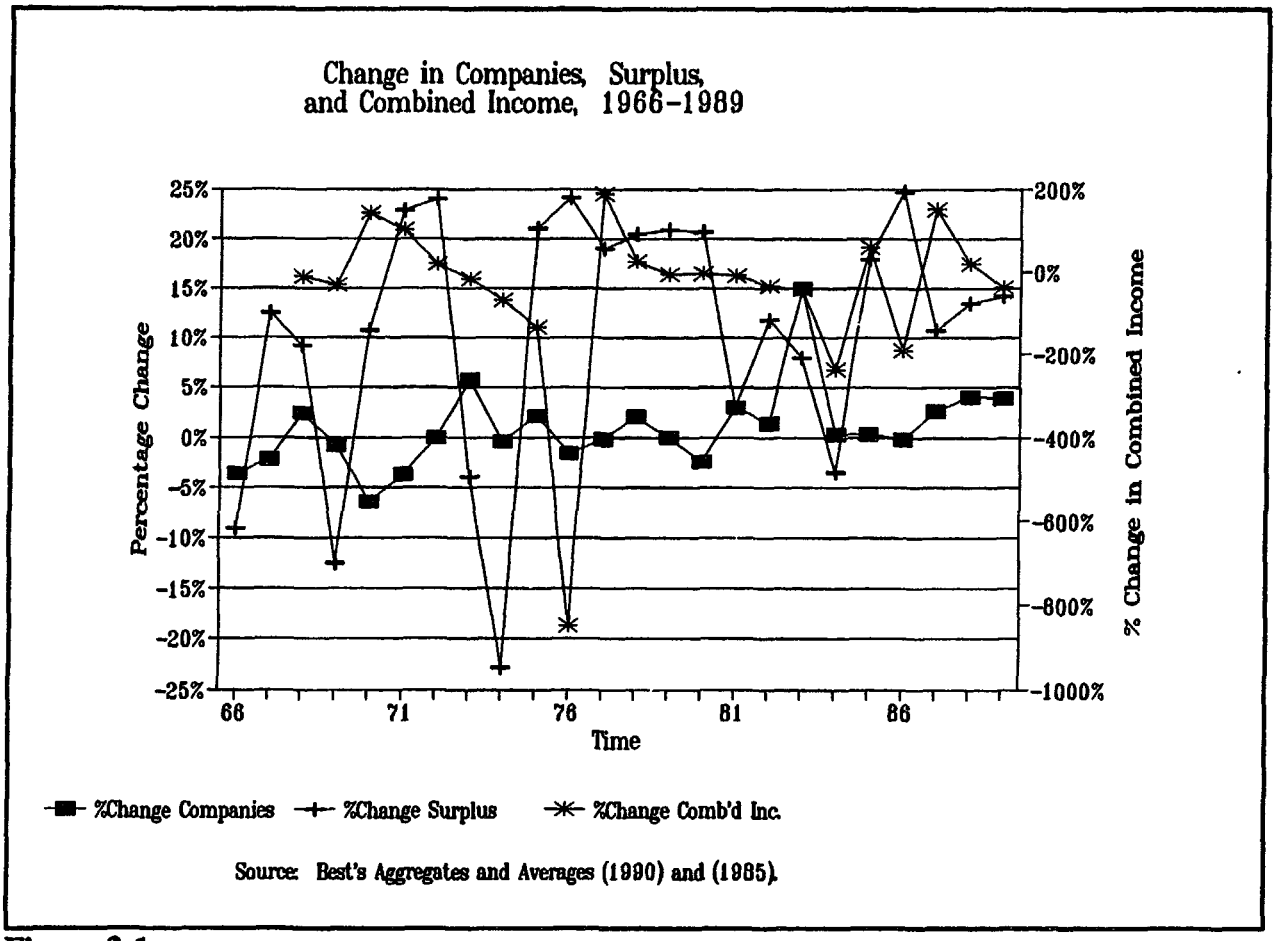

Figure 3.1

Corresponding Elements of Structure -- Organizational and Market Form

Description of Organizational Structures. When describing the property-casualty insurance industry, it is essential to understand the different organizational structures and the expected behavior of the organizations represented in the U.S. non-life insurance industry. There are four major types of

insurance company organizations: a) stock companies, b) mutual companies, c) reciprocal exchanges, and d) Lloyd's organizations. Also, companies may be organized as e) captive insurance companies, to include risk retention groups, or f) public insurance entities. Sometimes there is overlap between organizational structures, such as the case of a mutual insurer owning a stock insurance company or a captive insurance company organized through the issuance of stock.

Stock companies are corporations with the financial ownership of the company represented by shares of common stock. The owners of the company have a controlling financial interest, but are not generally purchasers (although there is no real reason why they cannot be customers as well as owners). These companies operate much the same as any other corporation, with the owners receiving returns on their capital investments in the form of dividends and appreciation in the value of the common stock. Very few of these stock insurance companies have actively traded shares or a broad secondary market; most stock companies are closely held, either by individuals or by other insurance companies or insurance holding companies.

A different relationship exists with mutual insurance companies, which are organized as corporations but with no capital stock. The customers/policyholders are the nominal owners of the corporation, with an ownership interest represented by the amount of premiums and/or the number of policies they have purchased from the company. While in theory the policyholders may install a new board of directors and replace management if they are dissatisfied, in practical terms it is virtually impossible to gather a sufficient block of policyholder/owner votes to wrest control, and often the "owners" of mutual insurance companies are relatively unaware of their rights. Because of these difficulties, in larger organizations management is self-perpetuating and subject to few controls by the owners. The mutual form of organization is not a common method for organizing a new insurance company today.[43] Most of the existing mutual organizations are well-established, mature companies with large relative market shares. This form is also more common in the personal lines business than in commercial lines of insurance.

Reciprocal exchanges are organizations where "subscribers" (policyholders) exchange insurance guaranties with each other through an organized exchange managed by an attorney-in-fact. These exchanges are unincorporated, and subscribers are usually required to prepay a deposit in order to establish a surplus-equivalent reserve to protect against large fluctuations in the exchange's loss experience. These excess funds, usually identified as surplus on the annual statement, represent "credits" to the subscribers' separate insurance accounts. Depending on their operating philosophy, the exchanges may provide for assessing policyholders for reserve shortfalls, may provide for returning excess premiums, or they may do a combination of these or neither. The attorney-in-fact is generally compensated by payment of a percentage of premium, but other methods may be used. The liability of the subscribers is limited to the value of premiums paid.

In contrast to a stock or mutual insurance company, a Lloyd's organization is an unincorporated association of individuals assuming a specified portion of the risk of each policy issued by the organization. This structure is based on the famous international insurance organization, Lloyd's of London (hence the name "Lloyd's" organization). The underwriters operate through an attorney-in-fact and in some cases may participate in the operation of the insurer, or may simply put up funds with the attorney-in-fact as a deposit to cover claims costs. Liability may be limited to the deposit, or it may be unlimited, depending on the organization of the association. In practice, reinsurance against excess losses often limits the obligation of the underwriters, and often these organizations cede 100 percent of their business

to an affiliated company. This form of organization is rare in the United States.

Because the management function in a stock insurer is separated from the ownership/risk-bearing function, conflicts of interest may arise from the agency relationship where the managers may be motivated to maximize their own utility at the expense of shareholders and customers [see Mayers and Smith (1987)]. Management controls are usually installed to minimize this problem, but given the technical complexity of the insurance industry's accounting and profit measurement systems, this may pose severe problems for owners. This agency problem may be even more pronounced in a mutual company. While the policyholders are the legitimate owners of the company, true control is generally vested in management of a mutual company, with the result that the agency problem between the managers and the owners/policyholders is more pronounced. With the reciprocal exchanges and the Lloyd's organizations, day-to-day operations are controlled by the attorney-in-fact. The agent/principal problem as it pertains to owners and managers does not apply, but a similar conflict arises between the policyholders and management.

Agencies and Marketing Structure. Another source of conflict is between the company management, agents and/or policyholders. The company management is assigned with the task of maximizing the wealth of shareholders at the expense of the policyholders, while the policyholders are attempting to maximize their value from the insurance transaction. The policyholder often has a higher degree of knowledge of the individual risk of loss, but often little knowledge of the aggregate class risk. There are informational asymmetry problems, with policyholders often having to rely on insurance agents for guidance in selecting the best value coverage. At the same time, the insurance company is relying on the agent to provide a first line screening of insurance applicants in order to properly price the applicant.

In the United States, the independent agency system is still a very strong force in the marketing of insurance products even though the costs of operating the system are higher than for non-agencies as described above. The agent's compensation is often tied to the premium level of the product, so there is an incentive to provide higher priced products in order to maximize agent wealth. Independent agents represent any number of separate insurance companies, and therefore are better able to provide price information as well as quality information to the customer. The independent agents therefore provide an information service, which often results in higher average prices paid for insurance products obtained through the independent agency system relative to the direct marketing system or the tied (one company) agency system. Most of the studies above related to a comparison of costs between agency and non-agency firms in personal lines. When these products are near-commodities, an agency system adds little value. In other lines, however, where an agent adds some value, the use of an agency system may be justified based on increased quality of service.

Captive Insurance Companies. The agency conflict between owners, managers and policyholders is avoided through the use of captive insurance companies, which in the U.S. may be organized as stock or mutual companies, depending on the law of the state of domicile. The *Captive Insurance Company Directory 1991* [Tillinghast (1991)] defines a captive insurance company as

> "A closely held insurance company whose insurance business is primarily supplied by and controlled by its owners, and in which the original insureds are the principal beneficiaries." [Tillinghast (1991): 1]

The size of the captive market is large and growing. The *Captive Insurance Company Directory 1991* lists over 3,000 captive organizations world-wide, with the bulk of these being single-parent companies, with over $10 billion in premiums during 1990. Other sources put the size of this market much larger, representing 30% of the commercial market and the equivalent of $50 billion in premiums [Foppert (1991)]. Factors contributing to the growth rate of captive insurers include the availability and affordability of primary insurance markets in the U.S., the evolution of the European Common Market, tax issues both in the U.S. and abroad, and relaxation of regulatory controls.

Risk Retention Groups. Risk Retention Groups, which are a subset of the group captive segment, are a result of recent relaxation of U.S. regulatory controls. The original Risk Retention Act of 1981 was expanded significantly in 1986 to allow widespread formation of these organizations. Under the federal Risk Retention Act, groups may be formed to provide certain lines of commercial insurance. Risk Retention Groups must obtain a license in one state and then may provide insurance coverage in all other states with a minimum of regulatory oversight. They have become especially attractive in the Medical Malpractice line of insurance, having captured significant market share during the 1980s.

Some Economics of Organizational Form

Because of the principal-agent problem, owners must find some manner of organizing their business that assures them of at least a competitive return on their investment. The classic argument states, however, that as long as the organization is on the market, the managers will manage competently or lose their jobs. This is because there is a potential take-over market where potential buyers look for undervalued firms. Because the transactions costs are extremely high for outsiders to obtain information regarding some insurance firms, as they are not publicly traded, alternative mechanisms for monitoring and controlling management is required.

One reason firms may not be publicly traded is because of their underlying purpose. Mutual companies were formed to serve the interests of the policyholders and not necessarily to make the owners wealthy. The mutual company is akin to a club and its roots, especially in farm owners insurance and life insurance, are often found in social clubs or regional groups of similarly situated consumers. The mutual firm is owed by the policyholders and is operated for the benefit of the policyholders and not shareholders. Thus, because most mutual policyholders do not view themselves as owners and because the firm is not publicly traded there is a higher likelihood that the management is immune from the market for takeovers. In addition, policyholders have less ability and inclination to monitor the management as the costs are relatively high.

A second discipline on the management exists from the market for the product or service itself. If the firms costs and prices are not consistent with the market, policyholders will defect to the lower priced firm. However, if policyholders do not shop and search for other lower priced products, then this discipline has little effect on the management either. Thus, high search costs could allow the management to behave in a way that does not maximize the value of the firm.

Mayers and Smith (1987) have promoted a rather innovative theory of organizational form suggesting certain forms have a comparative advantage for lines of business with certain characteristics. If the cost of controlling management in mutual companies is higher than in stock firms (because the value of the firm is not determined in a competitive market), then

mutuals should be more prevalent in lines of insurance where management exercises little discretion in setting rates. For example, if a line has a "good" actuarial table and a stable legal environment, then the management merely sets rates based on the table and pays claims when they come due. If discretion is required, then a stock form may be preferred as one can view the results of the manager's use of discretion as it affects the value of the firm in the market. Furthermore, the more concentrated geographically the firm's operation is, the easier it is to observe the firm's performance. Even for mutual company participants, policyholders can attend annual meetings and can communicate with other policyholders about management performance at lower costs.

Mayers and Smith found that stocks are less geographically concentrated than mutuals, but that mutuals and stocks appear about the same in terms of the lines of business in which they operate. This, of course may be resulting from the lack of relevance of the discretion hypothesis or more likely that, even though the market for takeovers does not discipline the managers, the external product market is a good discipline on the firms and organizational form does not matter.

From a corporate finance perspective Datta and Doherty (1989) show that the form may be irrelevant as both types of firms make basically the same decisions. Mutuals, according to the standard theory, are more likely to exist when the costs of expanding and contracting assets and when the costs of obtaining accurate information about the value of the firm are low. Datta and Doherty model the firm's operating and financing decisions together, as the decision to sell additional policies is akin to increasing debt. Because the non-life insurance industry has a mix of mutual and stocks, one would think that one form would eventually evolve to dominate the market. Datta and Doherty show that the reason both forms exist is that when the operating and financing decisions of the mutual are considered together, under certain reasonable situations both forms have similar financing decisions and neither form should perform better than the other.

C. Conduct

Pricing. In the traditional sense, conduct refers to the behavior of the industry in response to prices and the ability to collude to set prices. In the insurance industry, it is rather difficult to believe that the industry is one large cartel, given the low concentration levels described above. However, there is a suspicion that the firms collude to set prices, exclude competition, or reduce availability. This is the basis for recent regulatory changes in many states lessening the ability of firms to collude. In addition, these concerns underlie the attorneys general suit against the industry.

Stigler's (1968) theory of oligopoly is the classic statement on the subject. Oligopoly requires a small number of firms in the industry, an inelastic market demand, a relatively large market share for the oligopolists, easy detection of cheating, no ability to compete based on non-price terms and a homogeneous product.

The insurance industry, even when allowed to collude legally, does not meet these criteria. Danzon (1983) provides evidence that even when collusion was legal, collusion was not used to prohibit entry and make above-normal profits. Rating bureaus, such as the Insurance Services Office (ISO), provided "services" rather than collusion. The reason is simple: Even in prior approval states where it was easy to detect rate changes (i.e., cheating), there are no strong entry barriers. Even though ISO rates were more likely to be observed in prior approval states, large firms were the ones that deviated. This is consistent with the view that small firms purchased the rating information because they did not have the expertise to set their own rates.

Recently, there has been tremendous concern about auto rates that has manifested

itself in politically controlled prices. The thought was that insurers were using their market power to earn supra-normal profits. In many areas of the country, auto insurance rates doubled in the 1980s. Two reasons explain the rise. The first is general inflation. The CPI has increased approximately 50% since 1980. Secondly, the price increases are related to real cost increases in the industry (Harrington, 1988).

Pricing conduct in the non-life area has a number of dimensions: cash flow underwriting; non-price competition; cyclicality; and collusion. In a perfectly competitive market, all prices would be identical for all products within a given market. The assumptions underlying perfect competition are that no individual firm has the ability to set price. Only the market can affect the price.

One problem with the perfect competition model is that it assumes perfect and costless information by all buyers and sellers. In the insurance industry, this assumption is not necessarily true. For example, insurers can not predict perfectly whether a consumer is a good or a bad risk. In addition, the insurer cannot necessarily predict whether an insured will have big claims or small claims against the firm. On average, the firm can make good estimates, but errors do occur.

A second problem is that the insurance consumer can not readily tell if the insurance company is a "good" company, i.e., it pays its claims promptly, or is a "bad" company in the sense it is very difficult to obtain reimbursements. Also, the consumer can not tell whether the company is charging a price that reflects actuarial estimates of the necessary reserves to back the policy in case of loss. When faced with two contracts identical in coverage, the consumer will select the coverage with the lower price. However, if the probability of payment in case of loss is substantially less than one for a particular contract, it is possible that a higher-priced contract (with proper reserving) is the preferred product. Information about this product-quality dimension is not necessarily available, so firms have an incentive to price below costs to gain market share.

This so-called "cash-flow" underwriting works in the short run because searching and switching to another insurer imposes transactions costs on the consumer. In the long run, profitability suffers and potential insolvency can occur for some firms.

This problem has led, in the past, to calls for price regulation of the non-life insurance industry. However, in a market where quality is not observable, price should be a good proxy for quality. For example, suppose an individual searches and obtains five price quotes of $100 and a sixth price of $50 for identical insurance contracts. The five firms could be colluding to keep prices high (the low-price firm is not part of the cartel). Alternatively, the five firms' prices could take reserving into account while the low-cost firm does not. In this case, the low-cost firm is of low quality as its probability of payoff in the event of a claim is low.

Given the competitive nature of the non-life insurance industry, one can argue that consumers "pay for what they get." That is, collusion is really not possible, so a deviation in price reflects a deviation in quality. A consumer who purchased a low cost fire policy in the late 1800s, especially after the massive bankruptcies of the large city firms, must have known that a low price implied low quality. Thus it is questionable whether fixing prices through regulation did no more than increase the number of firms and allow them all to sell at prices above true long-run marginal costs.

French and Samprone (1981) examined regulated markets to determine whether price competition or non-price competition existed relative to competitive markets. Non-price competition arguably occurs in regulated environments where price movements are

restricted. Thus, firms have an incentive to compete along other dimensions. The test for whether the benefits of non-price competition outweigh its costs is to determine the product costs in a regulated state and compare them with a product in a competitive state, holding everything else constant. In a test of auto and liability insurance, French and Samprone found that regulation (and thus non-price competition) had no effect on the aggregate demand for auto insurance. Thus, regulation of prices to prevent cash flow underwriting did not affect demand.

If consumers truly desired protection from unscrupulous firms that failed to reserve properly *and* consumers were not able to discern the difference between a "good" firm and a "bad" firm, then regulation should have increased the demand for insurance. For liability lines, French and Samprone had some relatively impressive evidence that consumers place a value of only $.14 on each additional $1.00 spent on service or other quality dimensions. It seems that regulation to prevent price competition does not serve the public's interest.

This cash flow underwriting problem has also been called destructive competition. Few economists subscribe to the belief that there are welfare losses due to competition. While the industry may not like the situation, if there is continual entry, availability of products (at prices consumers are willing to pay), and long-run industry normal profits, from an economic perspective no problem exists.

The long-run profitability seems to be an issue in two dimensions of the conduct-structure-performance paradigm. First, it manifests itself in the underwriting cycle and second in the long-run performance of the industry. The underwriting cycle implies different prices over time and will be discussed here. However, because different prices may imply different or changing profitability, they will be discussed in the performance section, too.

Underwriting Cycles. The traditional reason given for the existence of property-liability cycles supposes an equilibrium position disturbed by some exogenous shock. This shock causes an increase in profits, which in turn, increases the firm's capacity to write insurance. An increase in capacity then increases the firm's desire to sell more insurance allowing the firm to lower prices in order to employ its capacity. This price cutting behavior then causes a decrease in profitability that, in turn, results in a decreasing surplus. The firm then starts pricing its product in a manner supposedly reflecting its true costs, eventually leading to higher prices and an increase in surplus [Stewart (1987)]. This reasoning does not suggest anything about the shocks that start the cycle, nor the pre-shock equilibrium.

Industry folklore states the reason cycles exist is because there is no market restraint. The proponents of the "lack of restraint" theory believe the cycle is caused by the lack of ability to control price. When everyone else is cutting price to lure new customers, the proponents believe that the industry should refrain from lowering price [Stewart (1987)].

There is some economic intuition behind this "lack of restraint" theory. Cycles could also exist as a result of a Cournot two period game. In this game firms make a choice of capacity in the first period and then compete on price in the second. If capacity choice is greater relative to the market demand, then prices fall. Similarly, if capacity is chosen too low, then prices will rise in the second period The problem here is that the game generates relatively random behavior and not cyclical behavior.

Rotemberg and Soloner (1986), however, present a very interesting theory of oligopoly behavior that could cause cycles. Using a tacit collusion model, they introduce a stochastic market demand. At each period the players learn the current state of demand and then simultaneously choose their prices. If the demand is high, the incentive to undercut the

"tacit collusion price" is high. If, in addition, the penalty for price cutting (lost future profits) is small, then firms will abandon their monopolistic pricing, thus engaging in a price war. This description of behavior sounds suspiciously like the industry's "lack of restraint" complaint.

Other theories of cycle behavior generally are industry specific. Berger (1988), for example, presents an economic model that also explains the cyclicality observed in the insurance markets. Berger's result is based on a simple model of firm behavior based on the fact that profits feed into surplus with a lag. The firm sets its underwriting policy for the coming year based upon its current surplus that then leads to offsetting shifts in supply.

Venezian (1986) suggests a further reason why one might observe cyclical patterns in profits. The fault, according to Venezian, is that regulatory and accounting systems are imperfect and these imperfections allow errors to creep into the firm's decision making process. Specifically, Venezian claimed that the naive use of past lost experience to predict future losses can cause cycles. This is plausible on its face, but one would expect that firms would eventually learn that it is their forecasting naivete that is leading to volatility in the market; thus providing them with an incentive to develop better methods. However, if firms used bureau rates, as they did in the past, then this incentive is minimized.

The fact that cycles exist, in theory or in fact, is disturbing given some belief in efficient and competitive markets. Most would agree that in the U.S. insurance industry the market is competitive, yet the U.S. has a very cyclical underwriting pattern. In perfectly competitive markets there should be no cycles, because everyone has perfect information about all the relevant variables and everyone is able to make an unbiased forecast of the future. In fact, under a rational expectations framework where the firm can make its best guesses about the future, there should be no cycles [Cummins and Outreville (1987)].

McGee (1986), in contrast to other researchers, allows for the possibility that firms have different expectations about the future. He suggested cycles exist because insurance firms may differ as to their future expectations concerning losses. For example, companies with optimistic conjectures about future claims may write policies with premiums below the average expectation of the future losses. Thus, companies may still be profit maximizing by allowing prices to fall below the expected future loss since they desire sales volume to cover their fixed costs.

Harrington (1984) took a more complete approach to the thinking about the causes of cycles. He believed that the market cyclicality may be caused by more than one of the above factors and perhaps others. Differing expectations about future losses, lags in adjustment, excessive risk taking, and random, but large, forecast errors may have contributed to market volatility. The problem with this area of research is that there was little evidence about the magnitude of the cycle, its length or the cycle's sensitivity to any of the possible causes.

Recently, researchers have started to collect empirical evidence about the cycle. Venezian (1986) did find that the cycle followed an AR(2) process and that it had a periodicity of about 6 years. Cummins and Outreville (1987) using Venezian's approach found there were empirically observable cycles in many countries. They hypothesized that the differences in cycle length may be attributable to institutional and regulatory arrangements in each of the countries. In an interesting follow-up, Outreville (1989) examined a cross section of the U.S. market to examine if certain state regulations were associated with the presence or duration of a cycle. If cycles are caused or coincide with a state or country's set of insurance regulatory policies, and if the cycles can be mitigated by removing these regulations, then the regulations

should be removed. In his study, Outreville examined the U.S. auto liability market and found that there was a significant relationship between the existence of an empirically observable cycle and regulation. For example, there was a relationship between the type of rate regulation in a state and the existence of a cycle. In those states with prior approval laws there was a higher likelihood a cycle would exist.

Outreville claimed that the prior approval laws were "mainly responsible" for the cycle existence. This may be a strong statement and may be misleading as many other possible causes could exist for empirically observable cycles. Non-competitive rating laws may be the symptom rather than the cause as other social or political attributes could be the true cause (or at least a partial contributing factor) for the cycles.

Cummins and Outreville also suggested that institutional and regulatory differences may be the cause of the underwriting cycle. Grace (1990) examined this hypothesis across countries and found that regulatory differences do matter. Countries with more restrictive regulatory policies tended to have cycles and greater volatility. Tennyson (1990), in a study of the U.S. market obtained similar conclusions. Finally, Winter (1991) theorizes that the cycle is a result of another form of regulation, solvency regulation, by the state. His model showed that when a premiums to insurer surplus constraint, like that used by insurance regulators is employed, a cycle results.

It is interesting to note, however, that the presumed basis of the cycle's existence is rooted solely within the industrial and regulatory institutions of the insurance industry. Intuition would dictate that this is not necessarily the case as general economic conditions should affect the decisions of all industries, including the insurance industry. Thus, it is important to determine whether the swings in the general business cycle are associated with the insurance cycle. Grace and Hotchkiss (1992) used econometric cointegration techniques to find that the general business cycle and the combined ratio were tied together over time. They found that real GNP and short term interest rates were both related to the combined ratio and that a shock to real GNP had a large effect on the cyclical behavior of the combined ratio but, although significant, the effect of a shock to the short term interest rate was very small.

Collusion and the Liability Crisis. The latest liability crisis, occurring in the mid 1980s at the peak of the underwriting cycle, has been subject to tremendous scrutiny. George Priest, the preeminent researcher in this area, has a very detailed theory about the causes of the liability crisis that relates to the change in the tort system assignment of liability from a negligence standard to a strict liability standard [Priest (1987)][44]

Under the traditional legal and economic analysis of liability rules [see Landes and Posner (1987)], the negligence rule and the strict liability rule are both efficient liability rules. Imposing a negligence standard requires the manufacturer to eliminate all risks that are efficiently eliminated through due care. Efficient elimination of risks requires that the manufacturer behave reasonably, or reduce the expected costs from a lawsuit below the costs of changing the product.

In the last fifty or so years, the U.S. tort system has moved manufacturers away from a negligence rule towards a rule of strict liability. Two goals are generally used to support this move. The first is that strict liability can prevent future preventable accidents as manufacturers increase the amount of care they undertake to produce their products. The second goal is to allocate the risk of unpreventable accidents. The switch from negligence towards strict liability, according the Priest (1988), has not reduced injuries caused by manufacturer's goods.[45] Thus, the first goal is not met. Secondly, Priest claims that use of the tort system to allocate the costs of unavoidable accidents is extremely inefficient.

One of the goals of product liability is to increase the safety of products. Priest (1988) analyzed the growth of product liability cases and compared this growth to accident rates. Priest found no reduction in accident rates, but dramatic increases in tort damage awards over time. He argued his finding is due to the insensitivity of product liability law to the cause of accidents. Both manufacturers and consumers have a role in accident reduction. Manufacturers must design and produce safe products. The consumer must use them in a reasonable manner. However, the law may not examine the consumer's use of the product and courts cannot guarantee that consumers use the product carefully. As a result of awards (even erroneous awards), manufacturers may design and manufacture safer products. The safer products may give consumers a false sense of security about the product. Consumers reduce the level of care they use causing an increase in the accident rate.[46]

Allegedly as a result of pressures brought to bear on the insurers, the industry leaders and industry related organizations met to alter one of the more troublesome contracts. The Insurance Services Organization provides standard contract forms as well as rating services to member firms. One of these contracts was for general pollution liability. Certain firms desired the contract terms to be changed so as to limit the time period of the obligation to insure, to limit the insurance companies' liability for accidental pollution, and to limit the contractual liability to cover legal fees in the event of suit.

The attorneys general of twenty states entered a joint lawsuit against the ISO and certain firms alleging that the firms engaged in practices in violation of the antitrust laws.[47] It is interesting to note that (1) the industry used its allegedly tremendous powers to collude (due to a federal anti-trust exemption), and (2) that the industry's attempt to change the contract form was not successful. The ISO had to offer both contracts as many of its member firms desired to provide the more expensive coverage even given the opportunity to offer a more restrictive contract. Thus, even with the liability crisis and the pressures brought about by poor underwriting performance, the industry did not successfully collude to restrict contract terms. This supports the contention that the market is relatively competitive.

D. Market Performance

The size and persistence of profits in the non-life insurance industry have been discussed for over twenty years. In the late 1960s, there was the concern that, relative to other industries, profits in non-life insurance were too low. Due to the heightened scrutiny insurers received from the liability crisis and the automobile insurance pricing crisis, profits were again the subject of definitional debate: using one standard, the industry earns below-normal profits, but using another standard it earns above-normal profits.[48]

The Insurance Services Organization (ISO) does not think unrealized capital gains should be included in the profit definition. The National Insurance Consumer Organization (NICO), however, claims that the industry is overly concerned with operating income measures and should consider capital gains and expenses that would be deducted under Generally Accepted Accounting Principles (GAAP). In addition, the industry fails to discount future losses and inappropriately deducts policyholder dividends [See Harrington (1988)].

The industry uses Statutory Accounting Procedures (SAP) to determine profitability. SAP is designed for the purpose of determining the solvency of a company rather than determining its market value.[49] Determining market value is the goal of GAAP accounting although GAAP accounting does not discount losses to market values either. However, in the last few years, the magnitude of this difference between SAP-determined value and GAAP-

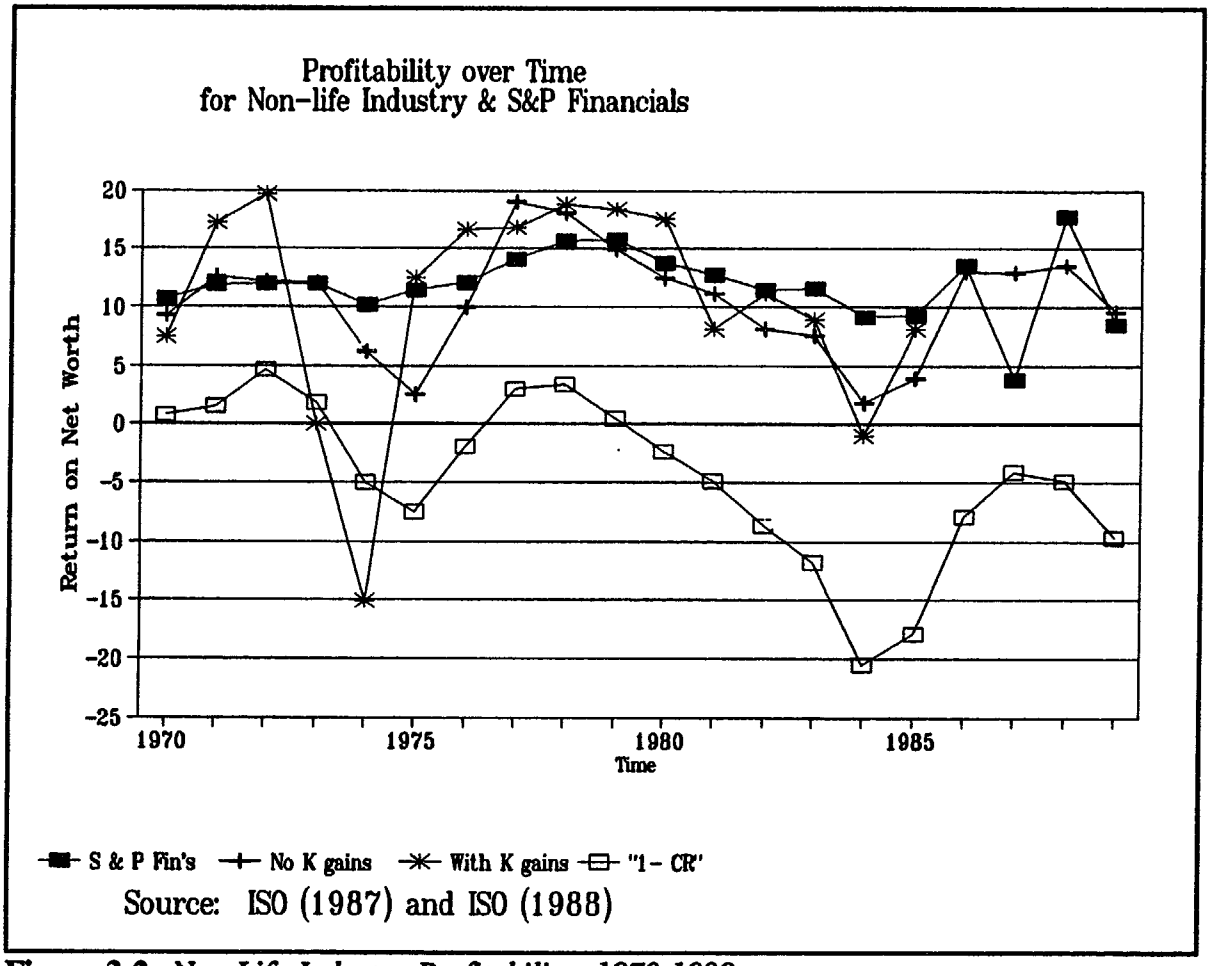

Figure 3.2 *Non-Life Industry Profitability, 1970-1989*

determined value has not been significant.

Figure 3.2 shows the industry profitability over time and compares the non-life insurance industry profit measures (with and without unrealized capital gains) with the Standard and Poors financials. As shown in the figure, for some years the non-life insurance industry performs better than the S&P financials while in other years the reverse is true. Over this time period, the mean return on net worth has been 11.85% for S&P financials, 10.55% for the non-life industry without capital gains, and 10.30% for the industry including capital gains.

In addition, the standard deviation of the S&P financials was 2.9 while it was 4.5 and 9.0 for the non-life industry without and with capital gains, respectively. Thus, relative to other financials, the insurance industry seems to be slightly less profitable and slightly more risky.

Because of the problem of comparing different industries one may argue that traditional accounting profit measures are not

Table 3.6 *Internal Rates of Return and CAPM Rates for various Lines, 1980-1989.*

Year	Other Liability	Home Owners	Comm Multi-Peril	Comm Auto Liability	Private Pass Auto Liability	Workers' Comp	CAPM
1980	0.233	0.108	0.230	0.189	0.291	0.236	0.094
1981	0.252	0.206	0.190	0.191	0.302	0.278	0.132
1982	0.198	0.162	0.133	0.139	0.265	0.256	-0.032
1983	0.134	0.127	0.045	0.070	0.195	0.157	0.101
1984	0.122	0.092	0.007	0.046	0.187	0.130	0.118
1985	0.107	-0.004	0.042	0.073	0.136	0.117	0.459
1986	0.134	0.082	0.207	0.108	0.103	0.078	-0.046
1987	0.141	0.251	0.388	0.132	0.101	0.135	-0.154
1988	0.144	0.156	0.268	0.125	0.095	0.133	0.029
1989	0.143	-0.071	0.103	0.097	0.084	0.131	NA
mean	0.161	0.111	0.159	0.177	0.0176	0.165	0.106*
std dev.	0.046	0.090	0.113	0.046	0.081	0.064	0.170*

*Mean and standard deviation taken from series for 1976-1988.
Source: Cummins and Weiss (1991), Tables 5 and 6.

helpful. Cummins and Weiss (1991) suggest the use of the internal rate of return (IRR). The IRR is the rate of return that sets the discounted cashflows from a project equal to zero. It is then compared to the target rate of return (or the cost of capital) to determine whether the return on the project is acceptable. A major problem with the IRR is that the NAIC does not require disclosure of the timing of premium flows for the various lines of insurance. In addition, there is an allocation problem due to the fact that the firm is generally a multiline company and there is no non-arbitrary method to allocate the firm's equity to each line.

Cummins and Weiss calculated industry-wide IRRs for six major lines for the period 1980-1990. They allocated surplus by line on the basis of reserves using the industry-wide reserves to surplus ratio in each year. Their results are shown in Table 3.6. Cummins and Weiss find high rates of return in the early part of the decade which they attribute to high interest rates and favorable underwriting results. In addition, they find that the IRRs fall during the so-called crisis years, 1984 and 1985. After the crisis years, general liability and commercial multi-peril return to more normal levels while returns to workers' compensation remain low and private automobile liability returns decline. These last two lines have been subject to intense regulatory scrutiny and this may explain their relatively poor performance. In contrast, less regulated lines such as general liability returned to more normal levels quickly after the crisis.

Cummins and Weiss then ask whether the IRR is a reasonable approach to examining cost

of capital issues. They then derived a capital asset pricing model cost of capital which is reported in the last column in the table. The IRRs for personal auto, workers' compensation, and general liability are close to the CAPM results in the first three years of the decade, but are below the CAPM results for the years 1983-1986. Again, general liability returns increase to the CAPM level, while personal auto and workers' compensation returns do not. Cummins and Weiss find that commercial multi-peril follows a pattern to general liability, while commercial auto and home owners tend to have lower returns. In general, unregulated lines seem to be earning adequate returns, while those lines subject to stricter regulation are arguably earning below adequate levels.

E. Conclusions

The U.S. non-life insurance industry exhibits low concentration whether one examines the national market or state markets. Even when examining the market on a line by line basis, concentration is low, especially related to the average four firm ratio of the industrial sectors of the economy. In addition, even with the limited ability to collude to set prices and contract terms, the industry seems to be competitive and earns profits below similarly situated financial firms. Finally, although subject to some definitional debate, insurer profitability is not consistently above or below normal returns. However, using the IRR as an indication of profitability it seems that the strictly regulated lines such as auto insurance and workers' compensation may earn below adequate levels for long term viability.

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Notes

1. Texas only repealed its very unpopular 75% local investments requirement in 1967 [Orren (1974)]. There might be grounds for such discriminatory investment restrictions on the basis of an infant industry argument. Protection may be justified until the industry is capable of competing with other firms. The problem is that protection may lead to higher costs and inefficiencies. A higher cost industry will never be able to compete with foreign low cost firms and thus, protection will be extended to the high cost and inefficient industry.

2. 75 U.S. (8. Wall) 168 (1868).

3. U.S. Constitution, Article I, § 8.

4. 15 U.S.C. § 1-2 (1988).

5. 15 U.S.C. § 1011-15 (1988).

6. For an excellent discussion of the liability crisis, see Priest (1987). The crisis is discussed further in Chapter III.

7. This change provoked the attorneys general of 30 states to sue major insurers for collusion to boycott certain types of coverage. See section H below.

8. Proposition 103 as codified in California Insurance Code § 1861.01(a).

9. *National Underwriter - Property/Casualty Edition* (August 26, 1991): 1.

10. In December of 1991, Congress passed a banking bill that keeps the strict division between insurers and federal banks intact. Congress is likely to revisit this issue in the near future.

11. Section 628.151(1), Florida Statutes (1991).

12. Several different plans were forwarded during the 1960s in Congress, including S. 2236, which proposed a national guaranty fund system in 1970.

13. Traditionally, insolvent companies were concentrated in the automobile insurance line, and especially in the high-risk portion of that market. Therefore, the inclusion of uninsured motorists coverage for at-fault drivers insured by insolvent companies transferred the insolvency cost to policyholders of solvent companies.

14. Those states allowing a premium tax offset are: Alabama, Arizona, Arkansas, Delaware, Kansas, Louisiana, Missouri, Nebraska, Nevada, Oregon, Tennessee, Texas, Utah, Washington, and Wisconsin. Additionally, Florida and Indiana allow an offset against income tax, and New Jersey allows a policy surcharge to cover the cost. Barrese (1991) shows how a combination of state offsets and federal income taxes can lead to actual tax liability (incidence) being passed from states with insolvencies to states without insolvencies.

15. *Best's Review-Property/Casualty Edition* (March, 1990): 20.

16. These figures do not include the New York State Insurance Guaranty Fund, which operates on a pre-funded basis.

17. "Mission Estate Pays $107 million to State Insurance Guaranty Funds," *National Underwriter-Property/Casualty Edition* (July 1, 1991): 33.

18. The implementation of guaranty funds in all states in the early 1970s was a direct response to federal initiatives to establish a national guaranty system.

19. *National Underwriter* (December 24, 1990): 8.

20. "A Survey of American Insurance," *The Economist* (October 27, 1990).

21. The combined ratio is the sum of the loss ratio and the expense ratio. Note that is does not include investment income. Thus, a firm with a combined ratio over 100% may be earning normal profits when investment income is included in the profit calculation.

22. These factors are discussed in Chapter III.

23. For studies involving the effect of tort reform on medical malpractice premiums see, Danzon (1986) and Bovbjerg (1989).

24. First party insurance refers to the situation where the insurance purchaser is protected for his own loss, as opposed to third party insurance, which covers damages to another person for which the insurance purchaser is responsible.

25. The payout profile, or payout pattern, is the annual percentage of incurred losses paid in each of the current and future development years. A reserve is set up for those losses which have occurred during a coverage period, but which remain unpaid for various reasons. These delays in claims payments may be substantial, often several years or even decades.

26. While there is a technical difference between surplus and excess insurance, this line is generally blurred and no material distinction is made between the two.

27. Private Passenger Auto Liability and Medical Payments, Commercial Auto Liability and Medical Payments, Homeowner/Farmowner Multi-Peril, Commercial Multi-Peril, Workers Compensation, Other Liability (General Liability), Special Liability (Aircraft, Boiler & Machinery, Ocean Marine), and Medical Malpractice.

28. Some states specifically exclude insurance coverage for punitive damages as being against public policy.

29. As a general rule, this coverage applies to losses which are excluded under the Fire and Allied Lines property damage insurance and is limited to losses *caused* by boiler/machinery problems.

30. One of the criteria for insurability is independence of loss exposures. For instance, automobile accidents are generally independent of one another. In the case of an earthquake, damage would be widespread and simultaneous, thus swamping the insurance industry's ability to respond. However, limited coverage with readily available catastrophe coverage under reinsurance treaties do make this coverage commercially insurable.

31. The Herfindahl index for a market is calculated as

$$H = \sum_{i=1}^{n} \left[\frac{S_i}{\sum_{i=1}^{n} S_i} \right]^2 .$$

A Herfindahl index ranges from 0 to 1 where 0 is no concentration and 1 is monopoly. The Department of Justice, when considering mergers of two firms in the same industry, has a presumption that market power exists if two firms would have a post merger Herfindahl greater than .18 and the change in the index is greater than .1. It is evident from Table 3.3 that few portions of the non-life industry even approach the 0.18 level.

In addition, the Herfindahl can be used as a method of determining the number of equivalently sized firms that could survive in the market. This number is calculated as $N = 1/H$. Thus, if the $H = .5$, then there is "room" for two equivalently sized firms in the market. This also yields an indication of concentration. In the examples above, the market shares s_i was calculated using net premiums written for each market.

32. Authors' calculation. Raw data from NAIC, *Annual Statement Compilation Tapes*, 1990.

33. This is a consequence of the fragmented nature of the regulatory system in the United States, where each state regulates all insurers doing business in that state. The sheer volume of insurers requires the state insurance departments to delegate the intense scrutiny of foreign insurers to their respective domiciliary states. This is discussed further in a later section of this paper.

34. The actual state requirements a. available form the Center for Risk Management and Insurance Research, College of Business Administration, Georgia State University.

35. The growth of Risk Retention Groups may be partially attributable to this restriction. These organizations must obtain a license in only a single state, and then they are able to operate in all other states without going through the lengthy licensing process. These organizations are formed under federal laws which supersede the state requirements.

36. This section draws heavily on Gardner (1991) as well as the one of the author's (Barth) own experience when serving as the supervisor of the state licensing effort of an expanding personal lines insurer during the late 1980's.

37. There is a definitional problem with the insurance firm's output. Risk shifting is the good that is being provided, but the traditional measure of output (premiums written) may not adequately reflect all that is being provided. For example, there is a quality component to the output. The consumer may be willing to pay for a solvent firm which pays claims quickly. This quality dimension is not discernable in the present insurance output measures.

38. As an aside, in 1989 the largest quartile (largest 570) of firms in the U.S. non-life industry ranged in size from $US 55 millions to $US 14,999 millions. The largest Canadian firms used in Suret's analysis would, if otherwise identical to U.S. firms, fall in the lower end of the largest quartile. Thus, the larger U.S. firms should also have little or no scale and scope economies.

39. While the discussion here is focused on rating systems, it is equally applicable to changes in the language or structure of policy forms and/or endorsements.

40. Insurers may invest more heavily if they desire, but the investment exceeding the state's cap is excluded from the statutory balance sheet, which directly reduces surplus.

41. Ballen (1991).

42. Because the amount of surplus is politically sensitive information, there is an alleged tendency to revise the reported figure downward in good times to prevent an appearance of earning supra-normal profits and to revise it upward in bad times to avoid an appearance of a solvency problem.

43. A number of physician mutuals were established during the medical malpractice availability crisis during the 1970's. Today, the Risk Retention Group form would probably be preferred over a mutual insurance company for similar availability problems.

44. For a very good summary and a critique of Priest's views see Croley and Hanson (1991).

45. See in general Litan (1992).

46. In addition, the use of the tort system as a compensation scheme is extremely costly. According to Litan, Swive, and Winston (1988), less than one half of the total spent on tort litigation goes to plaintiffs as damage awards.

47. See Chapter II for more on the background of this suit or see Priest (1989).

48. This section comes from Harrington (1988).

49. Note that the industry uses SAP because of government regulation and not out of an altruistic desire to use the accounting standard for solvency assurance.

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