THE ROLE OF COLLECTIVE PRICING IN AUTO INSURANCE

by

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Staff Report

Bureau of Economics

Federal Trade Commission

Washington, D.C.

November 1985

The analyses and conclusions set forth are those of the author and do not necessarily reflect the views of other members of the Bureau of Economics, other Commission staff, or the Commission itself.

EXECUTIVE SUMMARY

The purpose of this study is to determine the effects of collective ratemaking on the performance of auto insurance markets. Under the McCarran-Ferguson Act the states are empowered to regulate insurance and insurance is exempt from federal antitrust regulation. Several states allow or compel joint ratemaking or joint behavior that may facilitate joint ratemating by auto insurance companies. Joint ratemaking may allow cartel-like behavior by the auto insurance companies in a state leading to higher quality-adjusted rates. We will label this hypothesis the "cartel hypothesis". Economic theory concludes that joint ratemaking is unlikely to have a long term adverse effect in the absence of impediments to competition or barriers-to-entry. In some states, regulation results in impediments to competition by compelling joint ratemaking and/or enforcing joint rates. In such a situation, if the joint ratemaking resulted in supra-competitive rates, "cheating on the cartel" would be difficult because firms cannot individually set rates. Other, less restrictive regulations may result in impediments to competition that allow for long run supra-competitive rates. Therefore theory leads to a prediction that collective ratemaking could have a pronounced anticompetitive effect in states with regulatory systems that allow joint ratemaking; and in states where regulation enforces joint ratemaking, the anticompetitive effects may be even more pronounced.

Alternatively, collective ratemaking may allow the auto insurance industry in a state to exploit joint efficiences that would be uncapturable without collective action, leading to lower quality-adjusted rates. We will label this hypothesis the "efficiency hypothesis". Efficiences from collective ratemaking might derive from pooling loss information or from a reduction in the costs of complying with a state's rate filing and other disclosure requirements.

The study consists of three empirical exercises. Each exercise relies on information about the activities of a major ratemaking organization, the Insurance Services Office, Inc. (ISO). ISO is a non-profit organization that provides rating, statistical, policy form, and related services to member firms and subscribers. In theory, ISO might be used as a vehicle for cartel-like ratemaking (the cartel hypothesis). However, ISO clearly provides information and other services to auto insurance companies that may facilitate greater efficiency (the efficiency hypothesis).

The first empirical analysis discussed in the study examines the structural characteristics of the auto insurance industry across states. Herfindahl indices of concentration are calculated under two scenarios. The reason for the Herfindahl calculations derives from predictions of economic theory that cartel-like conduct can occur in the absence of cartelizing regulation only if industry concentration is sufficiently high. First, statewide Herfindahls are calculated under the assumption that all insurers in a state act independently. Then, statewide Herfindahls are calculated under the assumption that all members of ISO in a state act as a single firm. If for this second calculation the Herfindahl is sufficiently high, there may be reason for concern that joint activity facilitated by ISO could have significant anticompetitive effects.

The second empirical exercise of the study uses data from ISO's Premium Comparison Service, a survey of insurer's reported premiums for specific auto liability coverage by state, territory, and risk class. These data are used to calculate measures of adherence of individual insurers' rates to ISO rates, and to relate the extent of adherence to state collective pricing and regulatory characteristics. In the third empirical exercise, we estimate a cross-state multiple regression model of the effects of collective ratemaking and regulation on premiums and losses.

The basic conclusions of this study are that there is little evidence that collective ratemaking, as measured by the categorical and Herfindahl variables in this study, leads to significant anticompetitive effects. Similarly, there is little evidence that collective ratemaking relative to the joint collection of risk or loss data leads to significant efficiencies. We caution however that data limitations resulted in our only being able to derive fairly crude proxies for collective ratemaking. Nonetheless, since we used several types of evidence and measures of collective ratemaking without discerning any significant effect on rates, until better data is available to retest the hypotheses, our results suggest that changing state policies affecting collective ratemaking is not justified.

The results of the analysis of the effects of different regulatory environments on rates are somewhat mixed. When states are categorized dichotomously as a prior-approval or open-competition states -- the categorization used in virtually all previous studies of auto insurance markets -- regulation (i.e., prior-approval requirements) does not have a significant effect on rates or losses. However, in a multiple regression analysis in which we model the interaction between prior-approval regulation and predictions of state insurance commissioner behavior derived from a confidential study, we find that regulation raises rates and losses in some states and lowers them in others. These conclusions are only suggestive, since our regulatory and state insurance commissioner behavior variables are crude.

The study consists of seven chapters. Chapter I provides an overview of the study. Chapter II describes the structure of the auto insurance market across states, focusing on the role of shared market plans and their influence on underwriting. Statewide Herfindahl indices are calculated for 1981 and 1983. The auto insurance industry is relatively unconcentrated.

In Chapter III the evolution of the Federal antitrust exemption of insurance and the role of rating organizations are described. Particular attention is given to Insurance Services Office, Inc. (ISO) in its role as statistical agent and ratemaker for the industry. Other rating organizations and the few state rate bureaus are also discussed.

Chapter IV develops the theories underlying the cartel and efficiency hypotheses. First, a standard cartel model is considered. Then, a model of non-price competition with supra-competitive rates is described and its results interpreted. (The specifics of the model are laid out in Appendix 5.) The efficiency model focuses on the possible importance of service competition. The chapter concludes with a summary of previous empirical research on auto insurance.

In Chapter V two types of empirical evidence are presented. First, Herfindahls are calculated under the assumption that all ISO members in a state act jointly. These Herfindahl indices are sufficiently high in some states that if ISO members did act jointly, there is a potential for anticompetitive effects. Next, in order to test the hypothesis that ISO members act jointly, ISO's survey of insurers' stated premiums was compared to ISO-suggested rates to assess adherence to ISO-suggested rates. The evidence indicates that insurers' affiliation with ISO and adherence to ISO prices are greater in prior-approval states than in open-competition states and also greater in states for which ISO reports rates than in states in which ISO reports only loss and cost data. However, even in prior-approval or ISO-suggested-rates states, the market share accounted for by ISO members is not large. Furthermore, adherence to ISO-suggested rates in these types of states is not large. Therefore, the structural evidence presented in this chapter suggests that collective ratemaking, alone, is unlikely to have significant anticompetitive effects.

Chapter VI presents a multiple regression analysis of the effects of collective ratemaking on competition. Specifically, total auto liability insurance premiums (including shared-market premiums) and total losses per car year are regressed on alternative specifications which include measures of risk, economic and demographic characteristics, and measures of the effectiveness of collective ratemaking and of regulation. Three measures of private collective ratemaking are used, including the Herfindahl index calculated under the assumption that all ISO members act jointly. None of the specifications permitted rejection of the null hypothesis that collective ratemaking alone has no effect on premiums or on losses.

Since economic theory predicts that regulation is likely to be a necessary component of anticompetitive ratemaking, regulatory variables were also used in the regression analysis. The states regulate auto insurance in a variety of ways ranging from state-determined rates to prohibitions on collective ratemaking. Following previous studies, states were categorized as prior-approval or open-competition states according to the classification scheme devised by the National Association of Insurance Commissioners (NAIC). In specifications with this dichotomous regulatory variable there was no statistically significant relationship between regulation and premiums or losses. This result is consistent with previous empirical studies.

In some specifications the regulatory variable was interacted with predictions of state insurance commissioner behavior derived from a confidential study. This allowed, in principle, the effect of regulation to vary according to the reported goals of state insurance commissioners. The estimates of the models containing this interaction variable indicated that prior-approval regulation may raise premiums and losses in some states and lower them in others. These results are consistent with a model in which some combinations of prior-approval regulation and regulatory climate raises rates and then these supra-competitive rates are competed away, reflected by the increased losses associated with increased premiums. However, we caution that these results are based on a somewhat crude categorization of differences of the effects of various types of prior-approval regulation. The results however do suggest that further research that focuses on differences in regulations and regulatory environments is justified.

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ACKNOWLEDGEMENTS

I owe thanks to a great many people for their assistance.

Robert MacKay of the Federal Trade Commission served as overall supervisor and coordinator of the three FTC insurance studies, of which this is one. Bob was instrumental in helping to develop many of the basic premises and theoretical approaches used here, and much of the best work in this study reflects my discussions with him. Also at the Federal Trade Commission, Wendy Lee Gramm, the Director of the Bureau of Economics, Richard Higgins, Deputy Director, and John Peterman, Associate Director, all read various drafts and provided very helpful comments. James Dana, a graduate assistant, provided many comments and suggestions in addition to helping with some of the computer work. Marsha Harris provided additional comments as well as assisting in collection and organization of much of the data. Further data compilation was performed by Susan Painter and her able staff of statistical assistants in the Bureau of Economics. Mead Krim and John Hamilton, in the Bureau's data processing center, provided programming assistance beyond the call of duty.

I am deeply indebted to Pam Armiger, Francenia Tucker, and, most of all, Patricia ("Peaches") Allen, all at the Federal Trade Commission, for assistance in organizing materials, typing drafts and preparing the manuscript. All three worked late hours to meet many assorted external and self-imposed deadlines.

A number of people in the insurance community also provided helpful comments and, especially, data. Mavis Walters and Ann Farrell, of the Insurance Services Office, Inc., were patient in helping me to understand the intricacies of the ratemaking process, generous in providing data and information, and persistent in pointing out my occasional misunderstandings. Robert Hunter, of the National Insurance Consumer Organization, provided helpful comments and insight, especially where complicated actuarial procedures were involved.

Prof. Roger Sherman of the University of Virginia served as Chairman of my doctoral dissertation committee. He read carefully through many drafts and contributed greatly to both the style and substance of the dissertation, of which this work is a direct descendant. Keith Crocker and Charles Holt, also members of my dissertation committee, provided many insightful suggestions and comments. Other faculty at the University of Virginia also contributed, especially through their comments on my dissertation proposal, presented in October 1983.

In addition to expressing my gratitude to everyone who aided in this endeavor, I wish to absolve them of responsibility for remaining errors, which, of course, is mine alone.

CHAPTER I

INTRODUCTION

The auto insurance industry is exempt from the federal antitrust laws under the McCarran-Ferguson Act. As a result, insurance firms are permitted to engage in collective pricing, that is, to act jointly in determining their rates. The McCarran-Ferguson exemption is conditioned on state oversight of insurance rates, and virtually all states maintain authority to review and challenge the rates of insurance firms operating within their borders. Many states exercise this authority actively, requiring rates to be submitted prior to taking effect. About half of the states, on the other hand, allow rates to go into effect immediately upon being submitted or, in some cases, require no rate filing at all. States without prior-approval requirements are known as open-competition states.

There are a number of reasons why collective pricing in the auto insurance industry is of interest. First, private passenger auto insurance is the largest segment of the property-liability insurance industry, with premium revenues in 1983 of over $40 billion. If collective pricing influences market performance at all, the potential magnitude of any welfare effect is significant.

Second, the antitrust exemption for the insurance industry creates a unique natural experiment for evaluating market performance in the absence of the antitrust laws. In almost no other industry -- truck rating bureaus being one possible exception -- is joint pricing activity by competitors permitted to the extent it is in insurance.

Third, the auto insurance industry has not adequately been studied in the past. Perhaps because insurance falls between the fields of finance, which concentrates on banking, and industrial organization, which until recently has concentrated on "smokestack" industries, the auto insurance industry has not received the careful economic analysis warranted by its size and interesting institutional arrangements.

Nearly all of the empirical work on the determinants of auto insurance prices has concentrated on the role played by state regulation.[1] In particular, a number of studies have compared prices in states with prior-approval regulation to prices in open-competition states. In the best of these

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[1]See Scott Harrington, "The Impact of Rate Regulation on Prices and Underwriting Results in the Property-Liability Insurance Industry: A Survey," Journal of Risk and Insurance 51;4 (December 1984), pp. 577-623, for a complete survey of recent papers addressing rate regulation and related topics. We do not suggest that there has been no systematic attempt to address the collective pricing issue -- indeed, we cite several below. However, the bulk of the relevant empirical research has concentrated on state regulation and not taken explicit account of collective pricing.

studies, cross-state regression analysis is used to control for background factors, such as accident rates, that might cause insurance prices to differ. A dummy variable, equal to one in prior-approval states and zero otherwise, is included to capture the difference in regulatory regimes. Other studies simply compare prices in a single prior-approval state with prices in an otherwise similar open-competition state. While these studies have found a number of interesting differences associated with rate regulation, they have failed to demonstrate consistently any relation between insurance rates and state rate regulation.

Insurers undertake collective pricing activities through rating organizations -- jointly-owned, not-for-profit organizations that obtain data from insurers, perform actuarial analysis, and publish rates and/or the statistics companies need to develop rates themselves. The only major rating organization involved in private passenger auto insurance is the Insurance Services Office, Inc. (ISO).

Two theories of collective pricing are the "service model" and the "cartel model." The service model emphasizes the potential efficiency gains associated with joint activities, while the cartel model emphasizes the possibility that joint pricing activities facilitate collusion. Most studies of state regulation treat the cartel model as a maintained hypothesis, suggesting that collusion by rating organizations is facilitated and enforced by prior-approval regulation.

The few studies that have focused directly on the role played by collective pricing have relied on indirect tests of the service and cartel models. Sketchy data on the extent of adherence to ISO's suggested prices, the market share of ISO-affiliated firms, and the extent to which these factors are correlated with the type of rate regulatory regime, have been used to infer whether ISO facilitates collusion or produces efficiencies. Because these data can be reconciled with either the service or cartel model, there currently exists no satisfactory basis for determining whether collective pricing adds to or detracts from economic welfare.

The main purpose of this study is to distinguish between the cartel and service models of collective pricing. Since 1970, ISO has stopped publishing actual insurance rates in about half of the states. We use data on this and other cross-state differences in ISO procedures, and on the extent to which firms in each state affiliate with ISO, in a cross-state regression analysis of the effects of ISO activities on auto insurance prices.

An important by-product of this research is our analysis of the effects of state rate regulation. Because rate regulation and collective pricing have been hypothesized to exercise a joint influence on rates, assessment of the effects of either factor depends on accurate analysis of both. Indeed, the failure of previous studies of state rate regulation to control adequately for differences in collective pricing practices is an important potential source of misspecification.

In Chapter II we present a careful study of the automobile insurance industry. A number of factors complicate careful analysis of this industry, including the presence of different production technologies, a variety of government policies, and the complicated nature of the insurance product itself. We believe that many previous studies of this industry have erred in failing to account fully for these complicating factors.

In Chapter III we present a detailed description of ISO and related organizations involved in collective pricing. We also examine the evolution of collective pricing and of state oversight of auto insurance pricing decisions.

In Chapter IV we examine the potential benefits and costs of collective pricing, relying on the paradigm of the service and cartel models. We suggest that a jointly-owned rating organization may be economically efficient for at least some aspects of auto insurance ratemaking. We also find that rating organization activities might serve to facilitate collusion, either independently or in conjunction with state regulation.

In Chapter V we present new data on adherence to ISO prices and ISO affiliation. We find that very few firms adhere to the price recommended by ISO, and that adherence occurs almost exclusively in states with prior-approval rate regulation. This finding is not supportive of the cartel model of collective pricing. Adherence to ISO prices and, to a lesser extent, affiliation with ISO appear to be increased by the presence of prior-approval regulation, but this finding is consistent with both the service and cartel models.

In Chapter VI we examine directly the effects of collective pricing on the average price of auto insurance. The model we develop does not provide evidence that collective pricing affects rates, but suggests rate regulation tends (on balance) to increase them. We also find evidence that rate regulation is associated with higher service quality, suggesting that non-price competition supplants price competition in states with active rate regulation. The finding that rate regulation increases rates is at variance with some previous studies, a difference we attribute to an improved measure of price and a more complete treatment of rate regulation. The high degree of explanatory power of our empirical model suggests that we have effectively modeled the determinants of auto insurance prices.

We are able to draw a number of conclusions from this research. First, our findings do not support the hypothesis that ISO facilitates collusion among insurers. Few firms adhere to the ISO price, and adherence is especially rare outside of price-regulated states. More importantly, despite our use of a number of measures of ISO activity and affiliation, including variables capturing possible interaction between regulation and collective pricing, we are unable to find any systematic effect of collective pricing on the level of prices.

Second, our study of the joint activities undertaken by ISO suggests that some of these activities could be undertaken equally well by independent entities (unaffiliated with insurance companies), thus avoiding many of the potential antitrust problems associated with joint action through the rating organization. We do not try to assess how the antitrust laws -- if applied -- would ultimately affect the auto insurance industry, but our analysis of the efficiency aspects of various activities should provide the basis for further work in this area.

Third, the industry analysis conducted in Chapter II calls into question a number of accepted hypotheses concerning the differences between the two major types of auto insurance firms, direct writers (which sell directly to the public) and agency firms (which sell through independent agents). Whereas previous studies have suggested that direct writers earn excess profits and are subject to substantial entry barriers, the new data we introduce suggest the entire industry is amenable to competition and, absent organized collusion or government intervention, is likely to perform competitively.

Fourth, we provide relatively strong evidence -- consistent with economic theories of regulation -- that state regulation produces insurance prices different from the economically efficient price associated with competition. Our empirical results suggest that the finding of "no effect" reached by some previous studies is the result of an improper price proxy and/or inadequate proxies for state regulation.

In summary, we find an industry that, even with open and organized collusion by many firms, appears to work competitively except where government intervention inhibits competitive pricing. Given the low entry barriers and the competitive structure that characterize the industry, it is not clear to what extent this finding applies to other industries, where entry barriers might be higher and structural conditions less advantageous than those in the auto insurance industry.

CHAPTER II

THE AUTO INSURANCE INDUSTRY

In the first section of this chapter we present data on concentration, entry barriers and other structural characteristics of the auto insurance industry. These data suggest that, absent organized collusion or government intervention, industry performance would probably conform to the competitive model.

The second section of this chapter describes the process of classifying drivers into different risk categories, and discusses the role played by state-mandated auto insurance coverage and state-managed shared market plans. These peculiar characteristics of the auto insurance market raise problems for empirical analysis of the industry.

The Structure of the Auto Insurance Market

Firm-specific Characteristics: The insurance industry is divided into two major categories, life-health and property-liability, with private passenger automobile insurance falling into the latter category. (See Table 1.) Auto insurance firms are generally diversified within the property-liability field, often writing homeowners and other types of insurance. Moreover, individual firms are often affiliated with other

TABLE 1

NET PREMIUMS WRITTEN BY LINE
OF INSURANCE
TOTAL INSURANCE INDUSTRY, 1983

Property-Liability	Net Premiums Written*
Private Passenger Auto Liability	$23,343,939
Private Passenger Auto Physical Damage	16,974,304
Fire	3,011,743
Allied Lines	1,596,561
Farmowners Multi-Peril	691,553
Homeowners Multi-Peril	12,511,830
Commercial Multi-Peril	7,292,720
Ocean Marine	1,096,231
Inland Marine	2,649,461
Accident & Health	4,347,760
Workers Compensation	14,005,293
Medical Malpractice	1,568,001
Other Liability	5,679,295
Commercial Auto Liability	4,736,128
Commercial Auto Physical Damage	2,773,199
Aircraft	301,584
Glass	27,092
Burglary & Theft	105,825
Boiler & Machinery	355,861
Fidelity	376,651
Surety	1,272,198
Reinsurance	3,697,172
Other Lines	568,407
Total All Property-Casualty Lines	108,982,808
Life-Health (All Lines)	106,247,834**
TOTAL INSURANCE INDUSTRY	215,230,642

Source: A.M. Best Company, Best's Aggregates and Averages (Oldwick, N.J.: A.M. Best Company, 1984). A.M. Best Company, Best's Industry Composite of Life Health Companies (Oldwick, N.J.: A.M. Best Company, 1984).

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* Figures in thousands.

** This figure represents the summation of total industry premiums written and total reinsurance treaties assumed after the deduction of total reinsurance ceded. This figure gives the premium volume after all reinsurance transactions have taken place. It differs from net premiums written for property-casualty because the property-casualty line writes policies that must be renewed annually. Life-Health policies, on the other hand, are generally on-going and may remain in effect until the death of the policyholder.

companies through "groups" or "fleets." For example, a group may consist of one or more companies writing various types of property-liability insurance, a company specializing in auto insurance, and a company writing life and health insurance. Data on the companies making up the Aetna group, one of the largest groups, are presented in Table 2.

The degree of interdependence within groups appears to be quite variable. In many cases, groups are composed of companies that in fact have common managements. On the other hand, many groups appear to consist of largely independent companies that are related only by common ownership.[1] Despite the potential for independent behavior, however, we shall generally define an auto insurance firm to be all companies within a group that sell private passenger auto insurance. That is, we consider all companies within a group to be a single firm.

There are three types of organizational forms common to the auto insurance industry: stock companies, mutual companies, and reciprocal exchanges. (Premiums written by stock, mutual and reciprocal companies are shown in Table 3.) Stock companies are organized as corporations, with stock

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[1]One study found that companies within groups sometimes operate "entirely as independent units." See R. de R. Kip, "Insurance Company Groups," CPCU Annals 20 (1967), quoted at length in Joseph E. Johnson, George B. Flanigan, and Steven N. Weisbart, "Returns to Scale in the Property and Liability Insurance Industry," Journal of Risk and Insurance 48;1 (March 1981), pp. 21-22

TABLE 2

MEMBERS OF THE AETNA LIFE & CASUALTY GROUP
OF INSURANCE COMPANIES, 1983

Name	Major Lines	Assets*	Net Premiums Written*
Aetna Cas. & Sur. Co	Multiple Lines	7,605,217	2,959,855
Aetna Cas. & Sur. Amer.	Automobile	8,085	1,325
Aetna Cas. & Sur. Ill.	Multiple Lines	1,126,939	323,248
Aetna Life & Cas. Co.	Multiple Lines	4,465,936	550,580
Aetna Lloyd's	Multiple Lines	2,861	-
Amer. Excess Ins. Co.	Casualty-Workers Comp.	14,059	-2,873**
Amer. Re-Insurance Co.	Reinsurance	1,475,012	382,033
Automobile Ins. Hart	Multiple Lines	64,056	18,343
Farmington Cas. Co.	Multiple Lines	7,718	-
Standard Fire (Conn.)	Multiple Lines	409,871	183,432
Group Total		13,037,784***	4,415,943

Source: A. M. Best Company, Best's Aggregates and Averages (Oldwick, N.J.: A. M. Best Company, 1984)

* Last 000 omitted.

** A company may report negative net premiums written during a year if it cedes more business to reinsurers than it writes itself.

*** Group total for Total Assets has been adjusted for interownership and intercompany transactions. For further explanation see A. M. Best Company, Best's Aggregates and Averages (Oldwick, N.J.: A.M. Best Company 1984), p.10.

TABLE 3

PRIVATE PASSENGER AUTO INSURANCE
NET PREMIUMS WRITTEN,
BY TYPE OF COMPANY, 1973-1983*

	Stock	Mutual	Reciprocal	Totals**
1973	8,948,862 (58.04)	4,906,768 (31.82)	1,558,160 (10.11)	15,418,301
1974	9,017,945 (57.83)	4,973,622 (31.90)	1,596,505 (10.24)	15,591,977
1975	9,924,480 (57.83)	5,448,182 (32.62)	1,784,977 (10.90)	17,161,237
1976	11,790,919 (56.45)	6,813,594 (32.62)	2,276,789 (10.90)	20,886,540
1977***	13,510,363 (54.72)	8,311,562 (33.66)	2,859,177 (11.58)	24,690,301
1978	14,005,001 (52.67)	9,362,701 (35.21)	3,209,506 (12.07)	26,588,493
1979	15,351,917 (52.40)	10,374,041 (35.41)	3,558,483 (12.15)	29,294,852
1980	16,638,485 (52.53)	11,221,373 (35.42)	3,806,071 (12.02)	31,676,523
1981	17,647,172 (52.39)	11,942,718 (35.46)	4,085,169 (12.13)	33,683,782
1982	19,289,660 (52.45	12,982,173 (35.30)	4,499,439 (12.23)	36,779,538
1983	20,952,033 (51.97)	14,472,761 (35.90)	4,884,680 (12.12)	40,318,243

Source: A.M. Best Company, <u>Best's Aggregates and Averages</u> (Oldwick, N.J.: A.M. Best Company, 1974-1984).

* Figures in parentheses give percentage of total industry premiums.

** Total includes premiums written by Lloyds organizations.

*** Change in accounting procedures makes comparison with other years difficult. For further explanation see <u>Best's Aggregates and Averages</u>, (1979), p. 150.

owned by profit-seeking investors. Mutual companies and reciprocal exchanges are more akin to cooperatives than to corporations: They are owned by their customers and pay out any surplus funds to policyholders in premium rebates or dividends.[2] There is no evidence that different types of firms behave differently.[3]

There are currently two technologies in use for the retailing of auto insurance. Under the American Agency system, independent agents may represent several companies. Agents are compensated by commission, usually paid as a percentage of the premium volume written.[4] Direct writers, as

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[2]Reciprocal exchanges are a unique form of organization arising out of their members granting power of attorney to a single manager. The legal organization of insurance firms is described in U.S., Federal Trade Commission Structural Trends and Conditions in the Automobile Insurance Industry: Report of the Division of Industry Analysis, Bureau of Economics, Federal Trade Commission, to the Department of Transportation, (Washington: U.S. Government Printing Office, 1970), pp. 5-8. Hereafter cited as FTC, Trends.

[3]See, for instance, Richard A. Ippolito, "The Effects of Price Regulation in the Automobile Insurance Industry," Journal of Law and Economics 22;1 (April 1979), pp. 55-90, especially pp. 74-76.

[4]Insurance agent commissions were once set collectively, but it now appears that they are determined through bilateral negotiations between each insurance company and each agent. See Jon Hanson, Robert E. Dineen, and Michael B. Johnson, Monitoring Competition: A Means of Regulating the Property and Liability Insurance Business (Milwaukee: National Association of Insurance Commissioners, 1974), pp. 515-519. Agents are subject to state anti-rebating laws -- in effect, mandatory resale price maintenance. See Robert A. Jablon, Daniel Guttman and Ron M. Landsman, "A Legal Analysis of the National Association of Insurance Commissioners Advisory Committee Report on Investment Income and Profitability," in
(Footnote Continued)

the term suggests, by-pass the independent agents and sell directly to customers. Some direct writers rely mainly on exclusive agents -- self-employed agents who are compensated by commission but agree to sell exclusively for one company -- while others dispense with agents altogether and employ sales personnel on a pure salary basis. Many direct writers rely on mail and/or phone sales and thus reduce the need for extensive local agency networks.

Since 1945, direct writers have increased their share of the national auto insurance market from virtually zero to more than 60 percent. (See Table 4). As of 1983, the top four auto insurers are all direct writers, and while only 14 of the top 30 firms are direct writers, these 14 firms make up 50.6 percent of total premiums written compared with only 21.1 percent written by the 16 largest agency firms. (See Table 8 below.)

A number of explanations have been proposed to explain the rise of direct writers. Perhaps the most widely accepted hypothesis, proposed by Joskow, is that direct writers are

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Report of the Advisory Committee to the NAIC Task Force on Profitability and Investment Income, by Richard J. Haayen, Chairman, January 1983, Volume Two, pp. 41-44. Agents are also subject to state occupational licensure requirements. A complete catalogue of these requirements is found in State Regulations and Requirements Guide (Indianapolis: Pictorial Publishers, 1983).

TABLE 4

NET PREMIUMS WRITTEN BY DISTRIBUTION SYSTEM

1979-1983

	1983	1982	1981	1980	1979
Agency Firms	$15,564,816 (38.60)	$14,326,110 (38.95)	$13,044,893 (38.74)	$12,301,029 (38.85)	$11,608,665 (39.62)
Direct Writers	24,753427 (61.40)	22,446,423 (61.05)	20,635,694 (61.26)	19,357,501 (61.15)	17,687,705 (60.38)
TOTALS	40,318,243 (100%)	36,772,533 (100%)	33,680,587 (100%)	31,658,530 (100%)	29,296,370 (100%)

Source: A.M. Best Company, Best's Aggregates and Averages, (Oldwick, N.J.: A.M. Best Company, 1979-1984).

TABLE 5

UNDERWRITING EXPERIENCE BY AGENCY COMPANIES & DIRECT WRITERS
TOP 30 AUTO INSURERS

1979-1983

TYPE OF CO. & YEAR		Net Premiums Written ($000) Priv Pass Auto Liab & Phys Dam	RATIOS TO PREMIUMS WRITTEN (%) Losses Inc'd	Adj Exp Inc'd	Losses & Adj Exp Inc'd	Comms & Brok Inc'd	Other Acq Inc'd	Gen Exp Inc'd	Taxes Inc'd	Total Underwriting Exp Inc'd	Underwriting Profit (or Loss)
1979	AGENCY COS.	5,025,690	63.1	8.0	71.0	15.5	4.2	6.5	2.9	29.1	(0.1)
	DIR. WRITERS	14,412,799	66.7	10.5	77.2	6.4	7.6	2.9	2.7	19.6	3.2
1980	AGENCY COS.	5,369,803	64.1	8.4	72.5	15.6	4.2	6.6	2.7	29.1	(1.6)
	DIR. WRITERS	15,590,984	66.0	10.9	76.9	6.0	7.6	2.8	2.5	18.9	4.2
1981	AGENCY COS.	4,999,020	68.4	8.9	77.4	15.2	4.4	7.3	2.8	29.8	(7.2)
	DIR. WRITERS	17,048,635	70.2	11.3	81.5	6.2	7.7	3.0	2.6	19.4	(0.9)
1982	AGENCY COS.	4,180,235	68.7	8.8	77.5	15.8	4.9	6.6	2.8	30.1	(7.6)
	DIR. WRITERS	18,959,647	69.7	11.3	81.0	6.3	7.8	3.1	2.6	19.8	(0.8)
1983	AGENCY COS.	4,113,979	68.4	9.0	77.4	15.1	4.2	6.6	3.0	28.9	(6.3)
	DIR. WRITERS	21,059,139	68.2	11.0	79.2	6.3	7.9	3.1	2.5	19.9	0.9
TOTAL 1979-1983	AGENCY COS.	23,688,727	66.4	8.6	75.0	15.4	4.4	6.7	2.8	29.4	(4.4)
	DIR. WRITERS	87,071,204	68.3	11.0	79.3	6.2	7.7	3.0	2.6	19.5	1.2

Source: A.M. Best Company, Best's Aggregates and Averages (Oldwick, N.J.: A.M. Best Company, 1980-1984).

more efficient than agency firms.[5] This hypothesis is based on evidence that direct writers' expense ratios -- the ratio of selling and administrative expenses to premiums -- are lower than those of agency firms, and their rates of return (on sales) are higher than agency firms'. While the empirical evidence Joskow presented was relatively weak, other evidence tends to support both findings. (See Table 5, for example.)

An obvious alternative to Joskow's "relative efficiency" hypothesis is that direct writers offer a different level of service (or mix of services) than agency firms. While some recent analyses have assumed service quality to be identical between direct writers and agency firms,[6] others have disagreed. A 1977 study by the Department of Justice, noting Joskow's criticism of the American Agency system, concluded that

> We do not necessarily agree with this characterization. . . . Rather we assume that [the agents'] function has definitive value, the debate having been over its extent.[7]

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[5]See Paul L. Joskow, "Cartels, Competition and Regulation in the Property-Liability Insurance Industry," Bell Journal of Economics 4;2 (Autumn 1973), pp. 375-427, especially pp. 399-405.

[6]See, for example, J. David Cummins and Jack VanDerhei, "A Note on the Relative Efficiency of Property-Liability Insurance Distribution Systems," Bell Journal of Economics 10;2 (Autumn 1979), pp. 709-719, and Ippolito, p. 76.

[7]U.S., Department of Justice, The Pricing and Marketing of Insurance: A Report to the U.S. Department of Justice Task Group on Antitrust Immunities (Washington, D.C.:
(Footnote Continued)

Other studies have gone further, explicitly using the proportion of business written by agency firms in a state as a proxy for non-price competition, on the basis of the assumption that "the independent agency method provides more consumer services."[8]

The only direct evidence available on service quality is from survey data. A 1978 study by Cummins and Weisbart found significant differences in consumers' evaluation of services offered by agency firms and direct writers in 13 of 14 areas surveyed.[9] While not all of the questions are directly relevant to evaluating service quality as such, the Cummins-Weisbart data indicate that independent agents review their clients' policy limits more frequently than direct writers and that independent agents are more likely to provide post-loss services and to be available after hours for reporting of claims. This evidence is consistent with the fact that the difference in the expense ratios of direct

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U.S. Government Printing Office, 1977), p. 303. Hereafter cited as DOJ, Pricing.

[8]H.E. Frech and Joseph C. Samprone, Jr., "The Welfare Loss of Excess Nonprice Competition: The Case of Property-Liability Insurance Regulation," Journal of Law and Economics 23;2 (October 1980), pp. 431-432. See also Joseph C. Samprone, Jr., "State Regulation and Nonprice Competition in the Property and Liability Insurance Industry," Journal of Risk and Insurance 46 (December 1979), pp. 683-696.

[9]J. David Cummins and S. Weisbart, The Impact of Consumer Services on Independent Insurance Agency Performance (Glenmont, New York: IMA Education and Research Foundation, 1977), especially pp. 300-301.

writers and agency firms is less pronounced when loss adjustment expenses are included in the expense ratio than when only selling expenses are included.[10]

Of course, evidence of different levels of service quality does not contradict the evidence of the greater profitability of direct writers. However, there are several reasons to doubt the relevance of return on sales data as a measure of either efficiency or economic return.

First, recent research has questioned the use of accounting profits as a measure of economic rates of return.[11] These criticisms are especially relevant in the insurance industry, where allocation of expenses and investment income to each line of insurance is necessarily imperfect. Where a given set of inputs (e.g. offices and administrative personnel) is used to produce multiple outputs (e.g. auto insurance and other types of insurance), the definition of average cost for each output loses theoretical

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[10]See Table 5 above. See also, Cummins and VanDerhei, "A Note on the Relative Efficiency," pp. 714-716.

[11]See, for example, Frederick M. Scherer, Industrial Market Structure and Economic Performance, 2nd. ed. (Boston: Houghton Mifflin Company, 1982), p. 273, and Franklin M. Fisher and John J. McGowan, "On the Misuse of Accounting Rates of Return to Infer Monopoly Profits," American Economic Review 73;1 (March 1983), pp. 82-97. See also the exchange between Fisher and several commenters in American Economic Review 74;3 (June 1984), pp. 492-517.

meaning.[12] Joskow avoided this problem by relying on data for all property-liability lines, but differences between lines of insurance limit the usefulness of such aggregate data for the evaluation of the auto insurance market.

The evidence on relative profitability also runs counter to the evidence that direct writers' market share appears to have leveled off, and that agency firms are not seen exiting the industry or converting into direct writers.[13]

The relatively liquid asset mix of insurance firms would seem to make exit a viable strategy for a firm making negative economic profits. Over 80 percent of the total assets of property liability firms consists of stocks and bonds, with another 15 percent made up of cash balances, real

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[12]See, for example, William J. Baumol, Elizabeth E. Bailey, and Robert D. Willig, "Weak Invisible Hand Theorems on the Sustainability of Multiproduct Natural Monopoly," American Economic Review 76;3 (June 1977), pp. 350-365, especially p. 354.

[13]Joskow (p. 404) argues that agency firms cannot convert into direct writers. The primary reason cited is a 1904 court decision (National Fire Insurance v. Sullard, 89 N.Y.S. 934, 97 App. Div. 233, 1904) in which insurance agents, not companies, are held to own property rights in policyholders. Under the terms of the decision, companies are prohibited from soliciting their customers directly. Thus, an agency firm that wished to change distribution systems would have to develop its customer base from scratch -- it could not, for instance, do a mass mailing to its current customers simply informing them that future transactions would be handled directly. However, we examined data from A.M. Best Company on new entrants (see note 27 below), and found at least two firms operating under both technologies simultaneously, suggesting that transition is possible.

estate and other readily marketable assets.[14] We would expect agency firms to be even more liquid than the average, because, unlike direct writers, they do not own their own retailing networks. Thus, an inefficient agency firm could easily refuse to renew its policies and exit the industry at little or no cost.[15]

The fact that direct writers are larger than agency firms may suggest that they are able to capture economies of scale not available to agency firms. Several empirical studies have estimated economies of scale in the property-liability insurance industry, but the results are conflicting and sensitive to the output measure used.[16]

Significant evidence arguing against the existence of scale economies is the persistence over time of firms of

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[14]A. M. Best Company, Best's Aggregates and Averages (Oldwick, New Jersey: A.M. Best Company, 1983.), p. 2.

[15]Data are not readily available on the assets of agency firms and direct writers. If it is the case, however, that agency firms have fewer assets, relative to sales, than direct writers, then the greater rate of return on sales exhibited by direct writers would not be an indication of a greater return on assets. It is the latter return, of course, that is relevant to the entry/exit decision.

[16]Studies that find economies of scale include Neil A. Doherty, "The Measurement of Output and Economies of Scale in Property-Liability Insurance, Journal of Risk and Insurance 48;4 (December 1981), pp. 390-402, and Johnson, et al. Studies that find no such economies include, Robert F. Allen, "Cross-Sectional Estimates of Cost Economies in Stock Property-Liability Insurance Companies," Review of Economics and Statistics 46;1 (February 1974), pp. 100-103, and Joskow, pp. 384-388.

TABLE 6

DISTRIBUTION OF AUTO INSURANCE COMPANIES BY SIZE CATEGORY, 1967 AND 1980

	Number of Companies	
	1967	1980*
All Firms	829	910
$50 Million** and Over	33	40
Less than $50 Million but Greater than $10 Million**	141	142
Less than $10 Million but Greater than $5 Million**	95	101
Less than $5 Million but Greater than $1 Million**	274	308
Less than $1 Million**	286	319

Source: Data for 1967 taken from FTC, Trends, p. 10. Data for 1980 taken from tape purchased from A.M. Best Company.

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* The 1980 size classification is based on direct premiums written; 1967 is based on net premiums written.

** In 1967 dollars.

widely disparate size. Table 6 shows the distribution of companies, by volume of auto insurance premiums written (adjusted for inflation), for 1980 compared with 1967.[17] Such a wide disparity of firm sizes would not be expected to persist over time unless the firms were able to produce at roughly equivalent costs.

In summary, the available evidence suggests that direct writers and agency firms compete on roughly equal footing, though firms may specialize in providing different levels of service quality.

Concentration and Ease of Entry: Previous studies are nearly unanimous in concluding that the structural characteristics of the auto insurance market are conducive to competition. Joskow, for example, concluded that:

> It is indeed difficult to find too many other industries which conform more closely to the economist's idealized competitive market structure.[18]

More recently, Ippolito reached a similar conclusion, stating that "by all indications, the structure of the industry appears to be amenable to competition."[19]

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[17]Because the 1967 data available classified individual companies (not groups), the data in Table 6 indicates the size of companies.

[18]Joskow, p. 391.

[19]Ippolito, p. 57.

Table 7 below shows the Herfindahl-Hirschman index for private passenger auto insurance for each state and the nation, for the years 1980 and 1983.[20] To place the indices in perspective, we note that the Department of Justice has classified markets with H-indices below 1000 as "unconcentrated," and indices above 1800 as "highly concentrated."[21] By these criteria, none of the state markets fall into the "highly concentrated" category. Moreover, there is no obvious trend towards increased concentration: - from 1980 to 1983, the H-index is up in 26 states and down in 25.

A second picture of market concentration is presented in Table 8, which shows market shares of the top 30 auto insurers (classified by premiums written in 1983) for 1978-1983. The data confirm that market concentration is not increasing. Moreover, while the State Farm Insurance Group is significantly larger than its largest rival in this market, its market share of 18 percent is far below the levels usually

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[20]The indices are calculated on the basis of premiums written (i.e. sales). The appropriate geographic market definition is somewhat ambiguous. On the one hand, companies must be licensed in each state in which they operate, suggesting that each state should be considered a separate market. On the other hand, we present data below suggesting that the barriers to entry into each state market are negligible.

[21]See U.S., Department of Justice, "Merger Guidelines," June 1984.

TABLE 7

HERFINDAHL-HIRSCHMAN INDICES BY STATE
PRIVATE PASSENGER AUTO INSURANCE BASED ON
DIRECT PREMIUMS WRITTEN

	1980		1983	
State	Firms*	Herfindahl**	Firms*	Herfindahl**
Alabama	127	1336	142	1348
Alaska	63	1206	66	1486
Arizona	131	1096	151	963
Arkansas	123	981	132	1141
California	152	906	170	842
Colorado	141	1043	147	1032
Connecticut	101	547	105	465
Delaware	98	1241	96	1390
District of Columbia	79	1348	79	1213
Florida	150	822	163	770
Georgia	143	856	150	795
Hawaii	46	910	53	799
Idaho	109	994	109	952
Illinois	176	991	171	1140
Indiana	164	788	173	770
Iowa	144	573	149	579
Kansas	123	997	121	919
Kentucky	130	689	131	723
Louisiana	131	934	150	1118
Maine	92	486	89	552
Maryland	108	890	119	887

* For 1980 the number of companies is the number with total premiums written greater than zero for all three lines. For 1983 the number of companies is largest number of companies in any one line. Thus, 1983 data may underestimate the actual number of companies. As noted above, multiple companies writing auto insurance within a single group are considered together as a single firm.

** 1980 H-indices are based on premiums written for all firms. 1983 H-indices are based on top 30 firms only. The error associated with using only the top 30 firms is minimal: The 30th largest firm never accounts for more than one percent of premiums.

TABLE 7 - Continued

State	1980 Firms	1980 Herfindahl	1983 Firms	1983 Herfindahl
Massachusetts	80	546	85	523
Michigan	127	1159	128	1163
Minnesota	134	917	131	867
Mississippi	118	1080	121	1184
Missouri	148	1041	153	1064
Montana	99	1056	102	1077
Nebraska	117	791	124	789
Nevada	99	1469	111	1157
New Hampshire	84	412	80	405
New Jersey	113	775	116	717
New Mexico	110	1046	118	1067
New York	137	533	138	567
North Carolina	110	548	116	545
North Dakota	106	701	103	680
Ohio	143	621	155	648
Oklahoma	128	914	131	960
Oregon	122	889	124	900
Pennsylvania	141	718	138	689
Rhode Island	90	559	84	595
South Carolina	97	933	112	982
South Dakota	111	779	110	812
Tennessee	137	855	146	874
Texas	147	674	166	769
Utah	100	1175	104	1121
Vermont	88	489	87	577
Virginia	128	900	129	859
Washington	123	815	122	739
West Virginia	100	1434	100	1400
Wisconsin	140	936	139	963
Wyoming	95	1041	90	1089
Total United States	462	528	507	523

Source: Data for 1980 taken from data tape purchased from A.M. Best Company. Data for 1983 from A.M. Best Co., Best's Executive Data Service Report A-2 (Oldwick, N.J.: A.M. Best Company, 1984).

TABLE 8

MARKET SHARE AND RANK OF TOP 30 AUTO INSURANCE GROUPS 1979-1983

NAME	Distribution System	1983	1982	1981	1980	1979
State Farm	DW	18.17 (1)	17.75 (1)	17.69 (1)	17.74 (1)	17.41 (1)
Allstate Ins Group	DW	10.72 (2)	10.89 (2)	10.92 (2)	10.79 (2)	10.41 (2)
Farmers Ins Group	DW	5.21 (3)	5.27 (3)	5.15 (3)	5.43 (3)	5.53 (3)
Nationwide Group	DW	3.62 (4)	3.53 (4)	3.65 (4)	3.76 (4)	3.78 (4)
Aetna Life & Cas	AW	2.75 (5)	2.89 (5)	3.09 (5)	3.19 (5)	3.16 (5)
USAA Group	DW	2.39 (6)	2.28 (7)	2.13 (7)	1.79 (11)	1.89 (9)
Travelers Ins Group	AW	2.22 (7)	2.30 (6)	2.19 (6)	2.11 (6)	2.12 (6)
Liberty Mutual Group	AW	2.10 (8)	2.12 (8)	2.06 (8)	2.03 (7)	1.92 (8)
Geico Corp Group	DW	1.76 (9)	1.79 (9)	1.80 (9)	1.82 (10)	1.88 (10)
Continental Corp.	AW	1.64 (10)	1.74 (10)	1.78 (10)	1.93 (8)	1.81 (11)
Kemper Ins Group	AW	1.48 (11)	1.64 (11)	1.76 (11)	1.84 (9)	1.96 (7)
Interin Auto Cl Scal	DW	1.46 (12)	1.54 (12)	1.56 (12)	1.52 (12)	1.46 (13)
Cigna Group	AW	1.33 (13)	1.35 (13)	1.42 (13)	1.39 (13)	1.49 (12)
Calif State Auto Asn	DW	1.23 (14)	1.22 (15)	1.24 (15)	1.18 (20)	1.10 (21)
U.S. Fidelity & Guaranty	AW	1.22 (15)	1.21 (16)	1.19 (18)	1.16 (21)	1.20 (19)

TABLE-8 Continued

NAME	Distribution System	1983	1982	1981	1980	1979
Firemans Fund Group	AW	1.21 (16)	1.13 (19)	1.10 (20)	1.20 (17)	1.30 (16)
Prudential of Am Group	DW	1.21 (17)	1.30 (14)	1.41 (14)	1.32 (14)	1.22 (18)
American Family Group	DW	1.19 (18)	1.19 (17)	1.23 (16)	1.24 (15)	1.19 (20)
Safeco Ins Group	AW	1.11 (19)	1.09 (20)	1.08 (21)	1.02 (22)	1.04 (23)
Hartford Ins Group	AW	1.04 (20)	1.07 (22)	1.12 (19)	1.20 (18)	1.32 (15)
Auto Club Mich Group	DW	1.03 (21)	1.08 (21)	1.20 (17)	1.22 (16)	1.29 (17)
Comm Union Assur Cos	AW	.99 (22)	1.15 (18)	.99 (23)	.81 (24)	.73 (26)
Sentry Ins Group	DW	.96 (23)	1.04 (23)	1.06 (22)	1.18 (19)	1.36 (14)
Metropolitan Group	DW	.92 (24)	.81 (26)	.70 (27)	.57 (36)	.38 (45)
General Acc Group	AW	.93 (25)	.86 (25)	.78 (25)	.76 (26)	.77 (25)
Ohio Casualty Corp	AW	.93 (26)	.93 (24)	.95 (24)	1.01 (23)	1.07 (22)
Erie Ins Group	AW	.74 (27)	.69 (30)	.69 (28)	.65 (29)	.63 (33)
Home Ins Group	AW	.73 (28)	.72 (27)	.66 (30)	.66 (27)	.71 (28)
Southern FB Group	DW	.71 (29)	.66 (32)	.62 (33)	.60 (33)	.57 (35)
Royal Ins Group	AW	.68 (30)	.67 (31)	.63 (32)	.64 (31)	.66 (29)

Source: A.M. Best Company, Best's Aggregates and Averages (Oldwick, N.J.: A.M. Best Company, 1980-1984).

identified with the "dominant firm" problem.[22] Thus, market concentration is low by any standard.

The importance of entry barriers in the analysis of market structure is now widely recognized. The Federal Trade Commission, for example, states in its merger policy statement that,

> The issue of entry barriers is perhaps the most important qualitative factor [in analyzing market structure], for if entry barriers are very low it is unlikely that market power, whether individually or collectively exercised, will persist for long.[23]

Available evidence suggests that state regulation imposes no significant entry barrier into the auto insurance market. Munch and Smallwood, for example, examine the effects of minimum capital requirements and other types of state regulations on the number of firms operating in each state market. While they found that high capitalization requirements do reduce the number of companies domiciled in a state, the evidence that they affect the total number of companies licensed to do business in a state is described as "weak."[24]

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[22]See Scherer, p. 232.

[23]U.S., Federal Trade Commission, "Statement of Federal Trade Commission Concerning Horizontal Merger Policy," June 14, 1982, p. 5.

[24]Patricia Munch and Dennis E. Smallwood, "Solvency Regulation in the Property-Liability Insurance Industry: Empirical Evidence," Bell Journal of Economics 11;1 (Spring 1980), pp. 261-279, especially pp. 269-70.

This finding is consistent with a wide body of other evidence. For example, a 1979 General Accounting Office (GAO) study presents data showing that annual entries and exits combined accounted for from 5.3 percent to 26.7 percent of the firms in each state market.[25] The same study included a survey of insurance company representatives, which

> confirmed that entry and exit patterns support the competitive model. That is, firms sought to expand or enter in States where they saw the potential for profit, and they reported no regulatory or monopolistic barriers to entry.[26]

Another study reports data on the personnel costs (e.g., legal salaries) incurred by one company in filing licensure applications in 48 states over three years. The total cost reported was $100,000, and the study concludes that "[t]he implied average personnel cost per state is trivial."[27]

To confirm that entry is feasible, we examined data reported by A.M. Best Company to determine the number of new firms entering the auto insurance industry between 1978 and

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[25] U.S., General Accounting Office, Issues and Needed Improvements in State Regulation of the Insurance Business (Washington: U.S. Government Printing Office, 1979) p. 78. Hereafter cited as GAO, Issues.

[26] See Ibid., p. 75.

[27] Patricia Munch Danzon, "Rating Bureaus in U.S. Property Liability Insurance Markets: Anti or Pro-competitive," The Geneva Papers on Risk and Insurance 8;29 (October 1983), p. 386. See also Joskow, p. 391, and James Robert Eck, A Critical Analysis of State Regulation of Insurance, Ph.D. dissertation, University of Illinois at Urbana-Champaign, 1979. State financial oversight activities are described in GAO, Issues, pp. 36-41.

1982.[28] While the reported data is not sufficient to classify each and every firm with certainty, it appears that the approximately 300 new auto insurance companies were founded during this five-year period, of which about 200 were agency companies. While most of these new companies were affiliated with groups that already wrote some auto insurance, approximately 60 were either not affiliated with other property-liability insurers or affiliated with companies that did not previously write auto insurance.[29]

This evidence indicates that new firms are able to enter the auto insurance industry. Combined with the evidence we have presented on the lack of scale economies, the presence of an array of price-quality options, and low market concentration, the finding of low entry barriers indicates that basic conditions in the auto insurance market are conducive to competition.

Of course, the fact that the industry is exempt from the antitrust laws, so that insurers can (and do) meet openly to discuss prices, raises significant questions about the relevance of this market structure data. Before addressing

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[28]The year of incorporation for all property-liability firms is reported in A.M. Best Company, Best's Key Rating Guide (Oldwick, N.J.: A.M. Best Company, 1983). Detailed information on each firm is reported in Idem., Best's Insurance Reports (Oldwick, N.J.: A.M. Best Company, 1978-1983).

[29]The 60 included about 20 direct writers and 40 agency firms.

further the issues raised by antitrust exemption and state regulation, however, we embark (in the following section) on a small detour to present information on some important institutional aspects of the market.[30]

Mandatory Insurance Requirements, Underwriting and the Shared Market

A brief description of three related aspects of the auto insurance market is necessary to provide a basis for what follows. Mandatory insurance requirements are important because they may affect the amount of auto insurance purchased by many drivers.[31] Shared market plans are important because they are apparently associated with significant (state-imposed) cross-subsidies. Underwriting behavior is important because underwriting results in the placement of many drivers into the shared market. However, it is the interaction between these three factors -- in particular between underwriting policies and the shared market -- that causes us to treat them together at this point. We also take this opportunity to present some institutional detail that may be

[30]Readers not particularly interested in institutional detail may prefer to skip over the remainder of this chapter.

[31]Of course, such requirements may be efficient responses to market imperfections. [See William R. Keeton and Evan Kwerel, "Externalities in Automobile Insurance and the Underinsured Driver Problem," Journal of Law and Economics 26;2 (April 1984), pp. 149-179.]

helpful to the reader who is not familiar with the auto insurance market.

<u>Mandatory Insurance Requirements</u>: Liability coverage and physical damage coverage are the two major types of auto insurance. Liability insurance covers damage to other persons (bodily injury liability) and their property (property damage liability); physical damage insurance covers losses from accidents (collision coverage) or other hazards (comprehensive coverage) to the insured automobile. Liability coverage typically specifies the maximum amounts the company will pay, either as a single limit or, more frequently, as separate limits for the amount paid to a single injured individual, the amount paid to injured individuals for a single accident, and the amount paid for property damage from a single accident.[32] Physical damage coverage typically covers the entire value of the insured car, but often includes deductibles, under which the company pays only for damage above a specified dollar amount.

No-fault insurance, which pays for injuries sustained by occupants of an insured car regardless of who is at fault, is a third category. Though usually associated with states

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[32] These limits are frequently abbreviated and separated by slashes: the term "15/30/10 coverage," for instance, refers to maximum payment limits of $15,000 for each individual injured, a total of $30,000 in bodily injury payments for any one accident, and $10,000 for property damage payments for any one accident.

that have enacted "no-lawsuit" statutes -- statutes that require that a minimum level of injury be sustained before an auto accident victim can bring a tort action in the courts -- insurance against injuries to the occupants of the insured car is available in all states. Table 9 shows the various types of auto insurance coverage in greater detail.

State laws make liability insurance mandatory for most drivers. All individuals are required to purchase minimum levels of liability insurance in 33 states, and an additional 15 states require individuals to carry no-fault insurance. The remaining states require only individuals who have been involved in serious accidents and/or not been able to satisfy auto accident-related judgments against them to carry minimum liability protection.[33]

States do not require ownership of physical damage insurance. However, the requirements imposed by lenders may be nearly as effective in forcing owners of new cars to purchase such coverage. The GAO concludes, "physical damage insurance is effectively required everywhere so that financing can be obtained."[34]

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[33]Data on minimum liability requirements is presented in American Insurance Association, Summary of Selected State Laws and Regulations Relating to Automobile Insurance (New York: American Insurance Association, 1981). Data on self coverage requirements and no-fault provisions is from the same source and from No Fault Press Reference Manual (Bloomington, Indiana: State Farm Insurance Companies, n.d.).

[34]GAO, Issues, p. 75.

TABLE 9

COMMONLY AVAILABLE AUTOMOBILE INSURANCE COVERAGES

Coverage Name and Description	Representative Amounts
Bodily Injury Liability (BI) -- covers legal liability for bodily injury losses to others.	\$10,000/\$20,000; \$20,000 \$40,000; \$50,000/\$100,000 (per person/per accident). The minimum is set by the state financial responsibility law.
Property Damage Liability (PD) -- covers leal liability for damage to the property of others. (In some states this may not depend upon fault.)	\$10,000[a].
Personal Injury Protection (PIP) -- covers the insured's[b] own income loss, medical expenses, loss of services and death benefits due to automobile accidents.	Varies by coverage and state law.
Uninsured Motorist (UM) -- covers bodily injury losses to the insured for accidents where an uninsured motorist was at fault.	\$10,000/\$20,000 (the minimum is set by the state financial responsibility law).
Accidental Death and Dismemberment (ADD) -- covers death and dismemberment of the insured; regardless of fault.	\$5,000; \$10,000.

[a] Higher limits are generally available.

[b] "Insured" usually includes passengers as well as family members injured in or by other automobiles.

TABLE 9 - Continued

Medical Payments (MED) -- covers the medical expenses of the insured, which are due to automobile accidents, regardless of fault.	$1,000; $2,000 per person.
Collision (COLL) -- covers loss to the insured automobile caused by collision.[c]	$50 or $100 deductible (up to the actual cash value).
Comprehensive (COMP) -- covers loss to the insured automobile due to most causes other than collision (e.g., fire, theft, glass breakage, flood).	No deductible; $50 deductible[d] (up to the actual cash value).
Towing (TOW) -- reimburses towing expenses.	$25 maximum.

Source: Barbara Casey, Jacques Pezier and Carl Spetzler, <u>The Role of Risk Classifications in Property and Casualty Insurance: A Study of the Risk Assessment Process</u> (Menlo Park: Stanford Research Institute, 1976), Supplement, p. 4

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[c] In some states this may only apply when another party is at fault.

[d] "Limited collision" is available in states with no-fault compensation; pays only when third party is at fault; may be purchased with no deductible.

Despite these requirements, many drivers are not insured. One way of estimating the proportion of drivers insured is to compare the number of auto registrations with the number of written car-years.[35] In 1980 there were about 121 million cars registered in the U.S. and about 107 million car-years of liability insurance written, suggesting that about 88 percent of all registered cars were insured. Because not all registered cars are actually driven, and because car-years of insurance may include insurance on trucks and motorcycles that are not registered as automobiles, this is an inexact estimate. Indeed, as shown in Table 10 below, the ratio of car-years to registrations frequently exceeds one, suggesting that this figure is strongly biased by this measurement problem.

Additional evidence on the extent of insurance coverage is presented in a recent study of those involved in automobile accidents.[36] Overall, 92.4 percent of the 1,849 injured persons in the nationwide sample had auto insurance. There was some evidence of cross-state variation in this proportion: Among the 12 states with 50 or more injured

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[35]A car-year of insurance is defined as policy coverage of one car for one year. The figures used here are for liability coverage (including no-fault coverage), the type most commonly required.

[36]Ann Durand, "Extent of Auto and Health Insurance," All Industry Studies by the All-Industry Research Advisory Council, Research Report A80-3 (July 1980).

TABLE 10

EXTENT OF AUTO INSURANCE COVERAGE, 1980

State	Written Car Years As a Percentage of Automobile Registrations
Alabama	76.3
Alaska	89.0
Arizona	90.8
Arkansas	96.3
California	83.9
Colorado	93.8
Connecticut	83.9
Delaware	103.8
District of Columbia	62.9
Florida	73.6
Georgia	89.8
Hawaii	86.4
Idaho	109.9
Illinois	80.3
Indiana	91.7
Iowa	100.0
Kansas	111.3
Kentucky	98.7
Louisiana	87.7
Maine	91.9
Maryland	92.8

TABLE 10 - Continued

State	Written Car Years As a Percentage of Automobile Registrations
Massachusetts	77.2
Michigan	89.9
Minnesota	98.5
Mississippi	74.5
Missouri	101.6
Montana	119.9
Nebraska	108.9
Nevada	103.7
New Hampshire	76.4
New Jersey	86.9
New Mexico	81.5
New York	90.9
North Carolina	89.7
North Dakota	115.8
Ohio	81.7
Oklahoma	84.9
Oregon	99.4
Pennsylvania	97.0
Rhode Island	70.3
South Carolina	93.7
South Dakota	109.0
Tennessee	80.8
Texas	76.9
Utah	106.8
Vermont	85.8
Virginia	91.0
Washington	98.2
West Virginia	91.0
Wisconsin	96.9
Wyoming	102.9

Source: AIPSO Insurance Facts (New York: Automobile Insurance Plans Service Office, 1983).

persons in the sample, the percentage holding auto insurance ranged from a maximum of 99.2 percent in New York to a minimum of 82.5 percent in Texas. However, these differences in the extent of coverage were not statistically significant.[37]

Shared Market Plans: Mandatory insurance requirements are one rationale for the existence of automobile insurance "shared market" plans, the purpose of which is to make auto insurance available to those who do not meet underwriting standards developed by individual insurance companies. These plans are operated jointly by insurance companies and state governments, with state governments closely regulating shared market rates. In most cases, shared market plans operate at a loss, and companies participate (on a pro rata basis) because they are required to do so as a condition of doing business in each state. It is widely agreed that shared market customers are subsidized by those who purchase through the voluntary market.[38] Nationally, only about six percent of all cars are insured through shared market plans, but, as indicated in Table 11, this percentage varies from 56 percent in Massachussetts and New Jersey to practically nil in many

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[37] Ibid., p. 2.

[38] See, for example, GAO, Issues, p. 155 and DOJ, Pricing pp. 72-74. Most shared market plans offer only limited coverage, often only liability coverage. See AIPSO Insurance Facts, pp. 288-99, for a complete summary of shared market plan provisions.

TABLE 11

DATA ON SHARED MARKET PLANS, 1980

State	Percentage of Insured Autos in Shared Market 1980	Profit or Loss*
Alabama	0.72	$341,880
Alaska	2.67	374,582
Arizona	0.10	-5,587
Arkansas	0.55	257,491
California	2.04	-11,501,230
Colorado	0.04	104,734
Connecticut	16.18	-26,463,762
Delaware	10.71	-1,905,573
District of Columbia	2.11	-101,248
Florida	7.55	12,498,038
Georgia	4.61	-3,680,160
Hawaii	1.29	2,714,749
Idaho	0.08	90,392
Illinois	0.49	-5,398,331
Indiana	0.14	142,832
Iowa	0.10	70,899
Kansas	4.20	103,962
Kentucky	1.59	20,843
Louisiana	11.78	-12,622,310
Maine	3.71	254,102
Maryland	4.24	-14,802,000

*States use different accounting systems, so data may not be strictly compatable across states.

TABLE 11 - Continued

State	Percentage of Insured Autos in Shared Market 1980	Profit or Loss
Massachusetts	56.05	927,951
Michigan	2.07	-11,119,659
Minnesota	1.36	-1,087,084
Mississippi	1.90	328,706
Missouri	0.71	286,212,874
Montana	0.12	24,478
Nebraska	0.11	71,267
Nevada	0.23	77,086
New Hampshire	30.72	13,439,062
New Jersey	56.31	-320,167,802
New Mexico	0.18	107,483
New York	16.28	-107,876,339
North Carolina	29.17	10,113,474
North Dakota	0.40	-85,163
Ohio	0.07	-32,790
Oklahoma	0.18	-48,782
Oregon	16.28	170,801
Pennsylvania	29.27	-59,422,440
Rhode Island	8.68	-7,362,316
South Carolina	24.96	34,196,164
South Dakota	0.13	16,604
Tennessee	2.68	320,464
Texas**	4.56	-
Utah	0.10	28,908
Vermont	4.40	240,782
Virginia	7.61	3,949,065
Washington	0.88	268,762
West Virginia	1.15	-871,479
Wisconsin	0.17	140,200
Wyoming	0.22	29,274

Source: AIPSO Insurance Facts (New York: Automobile Insurance Plans Service Office, 1983).

** Data was not available on profits and/or losses in Texas.

states. Virtually all of the states with high proportions insured through the shared market are those with relatively active state rate regulation (see below), and/or where large losses are incurred by the shared market plan.[39]

To fully understand the shared market, however, one must understand something about the underwriting behavior of insurance companies and, more generally, about the way auto insurance risks are classified.

Risk Classification and Underwriting: The actuarial procedures associated with risk classification are quite complex, and a complete description is beyond the scope of this study. The basic aspects of the process, however, are relatively simple.[40]

The essence of insurance is the pooling of risks. By combining many individual risks, insurance companies take advantage of the law of large numbers to reduce the proportional variation in losses. That is, as an insurer writes more policies, it can be increasingly confident that

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[39]A somewhat dated, though still useful study of assigned risk plans is Dennis M. Reinmuth and Gary K. Stone, A Study of Assigned Risk Plans: Report of the Division of Industry Analysis, Bureau of Economics, Federal Trade Commission, to the Department of Transportation (Washington: U.S. Government Printing Office, 1970.)

[40]For a more complete description, see Barbara Casey, Jacques Pezier and Carl Spetzler, The Role of Risk Classifications in Property and Casualty Insurance: A Study of the Risk Assessment Process (Menlo Park: Stanford Research Institute, 1976). (Hereafter cited as SRI Report.)

the proportion of policies that actually incurs losses in any period will approach the mean loss probability for all such policies.[41]

The problem faced by insurance firms is greatly complicated by two factors: First, the true expected loss, even for the whole population, is unknown. Second, while they do know that some policyholders have lower expected losses than others, they cannot accurately separate the "good" risks from the "bad" ones.[42]

Insurers begin the rate development process by estimating expected losses for the overall population independently for each state. The risk classification system is imposed on the statewide rate to separate individuals with high expected losses from those with low expected losses. The system consists of a set of territorial and individual rate

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[41]See John E. Freund and Ronald E. Walpole, Mathematical Statistics, 3d edition (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1980), p. 170. A recent study reduces the principle to a pertinent example:

> Consider . . . an insurance company underwriting 100,000 automobile insurance contracts. Assume claims are independent and the average claim rate is one in 10 years. The expected number of claims during one year is 10,000. The insurer has less than a 2% chance that the actual number of claims exceeds the average by more than 2%. (Emphasis added.) SRI Report, p. 40.

[42]A third complication involves the effects of different liability limits and deductibles on losses. Insurers develop rates for a single set of liability limits and deductibles and then estimate multiplicative or additive factors to adjust for different limits.

"relativities", which are added to or multiplied by the statewide base rate to calculate the rate for each individual. Territorial relativities are developed on the basis of data indicating that cars garaged in some parts of a state are associated with higher expected losses than those garaged in other geographical regions.

Relativities for different individuals are usually developed on the basis of national data. Different companies use different plans, with the number of risk classes varying between approximately 60 and 360.[43] However, all the rating plans rely on a similar set of characteristics, and one recent study concluded that different rating plans would seldom result in vastly different rates for identical individuals.[44] (A list of the characteristics typically used in risk classification appears in Table 12.)

The way these different characteristics are factored together to arrive at rate relativities for a given individual

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[43]See GAO, Issues, pp. 104-142. See also D. Nye, An Evaluation of Risk Classification Systems in Automobile Insurance (Gainesville, Florida: Florida Insurance Research Center, 1979), in Private Passenger Risk Classification, A Report of the Advisory Committee, by Nicholas F. Miller, Chairman, (Milwaukee: National Association of Insurance Commissioners, 1979), pp. 283-366.

[44]See GAO, Issues, pp. 104-142.

TABLE 12

GLOSSARY OF RATING TERMS

Age of the Automobile -- Refers to the model year. Usually the year changes on October 1, so that policies written after this date reflect the new model year.

Age of the Driver -- Means age last birthday.

Annual Mileage -- The estimated mileage to be driven in the coming year.

At School -- If a child is away at school for the full year, he is usually ignored in the rating of the automobile; if an unmarried child goes to school over 100 road miles from home and does not regularly drive the automobile, he is usually rated as if he were married.

Business Use -- Usually means that the automobile is customarily required or involved in the usual duties of the insured; it may also apply when over 50% of the use of the automobile is due to the insured's profession. In addition, automobiles owned by corporations are often classified as business use. Some risks, such as clergy and U.S. government employees, are exempted from this category and rated as otherwise applicable.

Drive to Work -- Usually includes any portion of the journey to or from the place of regular employment. Participation in a car pool counts as driving to work, although weekly driving totals are usually considered.

Driver Training Credit -- Usually extended for approved courses meeting minimum standards of instruction.

Farm Use -- Means that the automobile is principally garaged on a farm or ranch and not used to drive to work or in a business other than farming or ranching.

Good Student -- Usually defined as a full-time student who is in the top 20% of his class, has a B average, or who has made the dean's list or honor roll for the latest school year.

Married -- Means legally married and living with one's spouse. It may also apply if the spouse is in the armed forces or if the person has legal custody of a child who lives in the same household.

TABLE 12 - Continued

Multiple-Car Discount -- Applies to two or more cars insured in the same company by the same owner, or two or more cars owned jointly by relatives living in the same household.

Newly Licensed Operator -- Means an operator who has received a license within the last year.

Operator -- Means anyone customarily driving the vehicle or, in some cases, any licensed driver living in the same household.

Principal Operator -- Means the driver operating the vehicle the most; if the total of the percentage usage of different vehicles by youthful operators exceeds 50%, the highest-rated youthful operator is considered a principal operator. A youthful operator who owns a vehicle is considered its principal operator.

Single -- Means not married.

Source: SRI Report, Supplement, p. 29.

-- e.g. for a married male of age 47 driving a particular type of car, etc. -- reflects the limitations imposed by the size of the sample. Theoretically, it would be desirable to predict the expected loss for each individual cell (i.e. type of driver). However, the amount of data available is not sufficient for such an approach. As one study explains,

> If the insurer were to consider all combinations of drivers, automobiles, and territories separately, there would not be enough individuals in each group to develop meaningful rates.[45]

One of the simplest results of actuarial theory is that there is a trade-off between the number of risk classes and the ability to predict expected losses within each classification.[46] In the absence of a risk classification system, one would predict only the average loss for the population as a whole. The data base would be adequate to yield an extremely accurate prediction. As the number of classes increases, experience within each class decreases, and the within-class prediction becomes less accurate. Put another way, as more classification variables are added, the assumption that each variable has an independent influence on expected losses is more likely to be invalidated.

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[45] SRI Report, Supplement, p. 49.

[46] See Ibid. See also Donald T. Sant, "Estimating Expected Losses in Auto Insurance," Federal Trade Commission, Bureau of Economics Working Paper Number 20, October 1979, and Roger G. Woll, "A Study of Risk Assessment Using Massachussetts Data," in Private Passenger Risk Classification, pp. 367-432.

Partly because of this limitation on the formal risk assessment process, insurers rely on a less formal type of risk classification known as underwriting. In general, underwriting refers to the criteria used by insurance companies to select policyholders from the overall population. That is, companies apply a set of criteria by which they determine if they will agree to insure a particular individual.[47] The criteria are generally based on subjective judgments about which individuals are most likely to incur losses greater than the average for the cell into which the formal classification system places them. For example, it is commonly believed that some occupations are associated with higher losses than the average, and members of these occupations may find it difficult to obtain insurance from some companies.[48] Other ("non-standard") companies specialize in insuring these drivers at rates above the "standard" rate structure.[49]

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[47] In some states, insurers are required to accept all applicants, but may later cede the less desirable risks into a reinsurance pool.

[48] See SRI Report, Supplement, pp. 21-28, for a detailed description of underwriting standards and their application.

[49] This terminology is somewhat dated Traditionally, insurance companies have been divided into three categories, those insuring "preferred risks," "standard risks" and "sub-" or "non-standard risks." See U.S., Federal Trade Commission, Insurance Accessibility for the Hard-to-Place Driver: Report of the Division of Industry Analysis, Bureau of Economics, Federal Trade Commission, to the Department of Transportation (Footnote Continued)

Interaction Between Underwriting and the Shared Market: It is clear the proportion of drivers insured through the shared market may be an extremely complex function of company underwriting standards, individual behavior, and regulatory policy. The shared market population will be a positive function of the extent to which shared market rates are subsidized by the voluntary market (since subsidization will make it more attractive for those rejected by "standard" companies to insure through the shared market than through "non-standard" companies that must at least break even). However, the shared market population is also a function of the strictness of underwriting policies, and these policies are presumably influenced, in turn, by state restrictions on rates (with binding rate ceilings leading to more restrictive underwriting policies).

This interaction creates significant problems for empirical analysis. Indeed, the interaction of underwriting policy and cross-subsidization makes it nearly impossible to compare actual policy prices across states. Even if one has data on the price for a single risk class and set of coverages, there is no way to know if the price contains a

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(Washington: United States Government Printing Office, 1970). However, the traditional categorization appears inadequate to describe the current situation, in which different companies apparently utilize a continuum of underwriting standards and charge a continuum of rates.

cross-subsidy for the shared market, or whether companies apply similar underwriting standards in different states.

In summary, the presence of mandatory insurance requirements, the shared market and the risk classification/underwriting system creates obvious difficulties for empirical analysis. We address these problems below as we develop our empirical approach.

Summary

In this chapter we have examined the characteristics of the auto insurance market most likely to have an effect on industry performance. The structure of the market is clearly conducive to competition. Concentration is low, there is no evidence of significant entry barriers, and there appears to be a variety of price-quality options. The complex nature of the auto insurance market creates analytical difficulties. However, none of the peculiar characteristics of the product would seem likely to make competition unworkable or lead necessarily to anticompetitive results.

CHAPTER III

COLLECTIVE PRICING AND RATING ORGANIZATIONS

The aim of this chapter is simply to describe the institutions involved in collective pricing of auto insurance, especially the dominant rating organization in the auto insurance market, the Insurance Services Office, Inc. (ISO). Because states license and regulate rating organizations as well as regulating auto insurance rates directly, we also present a description of state regulation. Our major finding here is that, despite a trend away from joint ratemaking and strict state regulation, joint pricing under strict state oversight is the system still used in many states.

The first section below discusses the evolution of pricing practices and state regulation in the auto insurance industry. The second section describes the current practices of ISO. The third section describes the role of other rating organizations [including the Automobile Insurance Plans Service Office (AIPSO), which serves the shared market], and of statistical and advisory organizations that provide related services.

The Evolution of Rating Organizations

South-Eastern Underwriters and the McCarran-Ferguson Act: The modern evolution of the insurance industry begins with the Supreme Court's 1944 decision in United States v. South-Eastern Underwriters Association, in which the Court determined that insurance constitutes interstate commerce subject to the antitrust laws.[1] The decision raised the possibility that the existing system of making insurance rates -- under which insurers were required by state governments to be members of rating bureaus and to adhere to rating bureau rates[2] -- could be successfully challenged under the Sherman Act. At the urging of state regulators and the industry, Congress reacted to the South-Eastern decision by passing the McCarran-Ferguson Act, which exempts the "business of insurance" from the Clayton, Sherman, and Federal Trade Commission Acts -- except "to the extent that such business is not regulated by state law" and except for agreements or acts of coercion or intimidation.[3]

By limiting antitrust immunity to activities "regulated by state law," the McCarran-Ferguson Act provided

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[1]See 322 U.S. 533, 1944, reversing Paul v. Virginia, 8 Wall 168, 1869, A review of the issues involved in the case is found in DOJ, Pricing, pp. 17-20.

[2]The pre-1944 rating environment is described in Joskow, pp. 391-94.

[3]15 U.S.C.A., 1011-1015, passed March 9, 1945.

the impetus for passage of relatively activist state regulatory statutes.[4] The National Association of Insurance Commissioners (NAIC) drafted a model bill for state insurance rate regulation that included specific permission for joint ratemaking through rating organizations and required prior state approval of all rates before they could go into effect.[5] By 1955, 44 states had adopted the essential features of the NAIC bill. Five other states and the District of Columbia enacted bills that called for either state-made rates or mandatory adherence to bureau-set rates.[6] At the opposite extreme, California enacted an "open-competition" statute that did not require rate filing but did specifically authorize collective rating activities.

The majority of the new laws, however, maintained the status quo with respect to collective rating. While rating bureau rates were not technically mandatory, rating bureaus were "almost an adjunct of the [state] regulatory

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[4]It should be noted that the breadth of the Act's exemption is somewhat uncertain. See, for example, DOJ, Pricing, pp. 20-26, and Judith K. Mintel, Insurance Rate Litigation (Boston: Klewer-Nijhoff Publishing, 1983) pp. 253-254.

[5]Actually, separate bills were drafted for property and casualty insurance, with auto insurance falling under the latter category.

[6]The states were Louisiana, Mississippi, North Carolina, Texas and Virginia.

mechanism."[7] Thus, the rates set by the rating organization (and approved by the state regulators) effectively became the "standard" rates, and insurers wishing to deviate from those rates had to ask for and receive state permission to do so. Rating organizations could require members to adhere to their rates, could oppose deviation filings (by member or non-member companies) before state regulators,[8] and could require companies to subscribe for all lines of insurance if they subscribed for any. The passage of these laws by most states is described in an NAIC report as "the highwater mark of those championing concerted rate activity and uniformity."[9]

During the following two decades, pricing practices in the insurance industry, and in the auto insurance industry in particular, evolved somewhat in the direction of increased competition. A series of court decisions impeded the ability of rating organizations to limit membership and challenge filings by other companies;[10] state insurance regulators began limiting the activities of rating bureaus;[11] and a U.S. Senate investigation and report spurred a reexamination of the

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[7]Hanson, et al, p. 20.

[8]Ibid., p. 395.

[9]Ibid., p. 33.

[10]See SRI Report, Supplement, p. 70, and Joskow, p. 396.

[11]See, for instance, Hanson, et al, pp. 35-53.

existing system in 1958-61.[12] However, the basic provisions of the state regulatory regimes remained unchanged through the mid-1960's.

The Trend Towards Open Competition: In 1967, Florida and Georgia both passed "use-and-file" rate regulation laws that eliminated the requirement for prior submission and approval of auto insurance rates. While these laws (unlike California's) still required rates to be filed with state regulators after being put into effect, the lack of a prior-approval requirement was nevertheless a significant step towards deregulation.

Within a few years, several additional states passed laws that significantly reduced the filing burdens placed on firms, and the trend towards passage of open-competition statutes has continued ever since. As shown in Table 13, a total of 24 states currently operate under open competition statutes.

Rate regulation laws have traditionally been divided into the two major categories of prior-approval laws and open-competition laws, with three states -- Massachusetts, North Carolina, and Texas -- classified separately because they make

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[12] See DOJ, Pricing, p. 34.

TABLE 13:

RATE REGULATION REGIMES AND ISO PROCEDURES BY STATE, 1984

State	Rate Regulation	ISO Procedure
Alabama	Prior-Approval	Traditional
Alaska	Prior-Approval	Traditional
Arizona	Open-Competition	Loss-Cost
Arkansas	Prior-Approval	Loss-Cost
California	Open-Competition	Loss-Cost
Colorado	Open-Competition	Loss-Cost
Connecticut	Open-Competition	Loss-Cost
Delaware	Prior-Approval	Traditional
District of Columbia	Prior-Approval	Traditional
Florida	Prior-Approval	Loss-Cost
Georgia	Open-Competition	Loss-Cost
Hawaii	Open-Competition	Loss-Cost
Idaho	Open-Competition	Loss-Cost
Illinois	Open-Competition	Loss-Cost
Indiana	Prior-Approval	Loss-Cost
Iowa	Prior-Approval	Traditional
Kansas	Prior-Approval	Traditional
Kentucky	Open-Competition	Loss-Cost
Louisiana	Prior-Approval	Traditional
Maine	Prior-Approval	Traditional
Maryland	Open-Competition	Traditional*
Massachussetts	State Bureau	State Bureau
Michigan	Open-Competition	Loss-Cost
Minnesota	Open-Competition	Loss-Cost
Mississippi	Prior-Approval	Traditional
Missouri	Open-Competition	Loss-Cost
Montana	Open-Competition	Loss-Cost
Nebraska	Prior-Approval	Traditional

TABLE 13, Continued

State	Rate Regulation	ISO Procedure
Nevada	Open-Competition	Loss-Cost
New Hampshire	Prior-Approval	Traditional
New Jersey	Prior-Approval	Traditional
New Mexico	Open-Competition	Loss-Cost
New York	Prior-Approval	Traditional*
North Carolina	State Bureau	State Bureau
North Dakota	Prior-Approval	Loss-Cost
Ohio	Open-Competition	Traditional*
Oklahoma	Prior-Approval	Traditional
Oregon	Open-Competition	Loss-Cost
Pennsylvania	Prior-Approval	Traditional
Rhode Island	Prior-Approval	Traditional*
South Carolina	Prior-Approval	Traditional
South Dakota	Open-Competition	Loss-Cost
Tennessee	Prior-Approval	Traditional*
Texas	State Bureau	State Bureau
Utah	Open-Competition	Loss-Cost
Vermont	Open-Competition	Loss-Cost**
Virginia	Open-Competition	Loss-Cost
Washington	Prior-Approval	Traditional
West Virginia	Prior-Approval	Tradiitonal
Wisconsin	Open-Competition	Loss-Cost
Wyoming	Open-Competition	Loss-Cost

Source: See Appendix 1. Data on ISO procedures provided by ISO.

*Rates are distributed but are developed without committee involvement.

**The Loss-Cost system has been approved but had not been implemented as of August 1984.

rates through state-operated rating bureaus.[13] To some extent, this distinction is an artificial one. While there are clear differences at the extremes [with states such as California (having no filing requirements whatsoever) juxtaposed against states such as New Jersey (which takes a very active role in determining what rates companies can charge)], there is also a wide gray area in which states retain some authority to exercise control but do not exercise it, or conversely, have little statutory authority but exercise the available authority very actively.[14]

Limitation of Antitrust Immunity and the Advent of ISO: On August 1, 1971, Illinois allowed its 1969 open-competition rating law to lapse altogether.[15] The absence of any rating law apparently voided McCarran-Ferguson Act immunity for a period of about a year, until June 1972, when a new law was passed. The new law provides for the licensing of advisory organizations that compile statistics, prepare policies, bond forms and underwriting rules, and furnish statistics and forms

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[13] See Appendix 1 for more detail on classification of rating laws.

[14] There is also a good deal of diversity across states in the resources devoted to regulation. Many states lack the staffing resources that would be needed to undertake comprehensive review of rates. (See GAO, Issues, Chap. 3.)

[15] See Robert C. Witt, "The Automobile Insurance Rate Regulatory System in Illinois: A Comparative Study," Prepared for the Illinois Insurance Laws Study Commission, September 1977, p. 1.

to insurance companies.[16] Conspicuously absent from this definition, however, is any provision for or mention of joint ratemaking. The practical effect of the 1971-1972 developments in Illinois was thus to remove the antitrust exemption from rating organization activities directly involving rates. Since 1971, nine additional states have put in place restrictions with similar effects on the activities of rating organizations.[17]

The Insurance Services Office, Inc.

History and General Framework: Apparently by coincidence, 1971 also saw the consolidation of six rating bureaus and insurance service organizations into ISO.[18] ISO operates as a non-profit corporation (incorporated in Delaware). It is a licensed rating organization[19] in all 50 states and the District of Columbia, though it operates as a rating

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[16]Illinois Laws, 1972, at 105, Sec. 123A-2(a), quoted in Hanson, et al, pp. 421-22.

[17]The states are Arkansas, Colorado, Connecticut, Florida, Hawaii, Kentucky, New York, Virginia and Wyoming. See Appendix 1 for details on the nature and extent of state restrictions on rating organizations. The trend appears to favor such restrictions. In fact, a model rating law endorsed by the NAIC in 1981 would prohibit company-owned rating organizations from publishing "rates that include expenses . . . or profit." See NAIC Proceedings, 1981, Volume I, pp. 342-352 and p. 363.

[18]See Hanson, et al, pp. 441-444.

[19]Some states use the term "rate service organizations" or, like Illinois, allow only advisory organizations.

organization for private passenger automobile insurance in only 47 states. In 1984 ISO employed about 2,600 people and planned to spend about $140 million (for its activities in all lines of insurance).[20]

Insurance companies participate in ISO either as members, subscribers, or service purchasers. The only pertinent distinction is that only members are permitted to vote for and serve on the board of directors and its committees, and only members and subscribers are permitted to serve on operating committees. All companies "authorized by applicable law to write . . . insurance in . . . the United States"[21] are eligible for all three types of participation.

ISO describes its purpose in part as "To make available to any insurer rating, statistical, policy form and related services."[22] What this means in practice, and in the auto insurance market in particular, is that ISO collects statistics on the costs of providing auto insurance, uses these statistics to project likely costs for the coming year, and (in many states) suggests specific rates to be charged for

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[20]ISO's real expenditures have been declining over recent years, as has its total employment, which is now about half the 1971 level of 5,800. According to ISO staff, this decline largely reflects increased use of computers.

[21]Insurance Services Office, Inc., "Certificate of Incorporation," p. 1. A list of current members of relevant ISO committees is found in Appendix 2.

[22]Ibid., p. 3.

each risk class and territory. In addition, ISO formulates a commonly-used risk classification system, develops policy forms and manuals, testifies on its suggested rates, classification systems and forms before state regulatory authorities, and provides additional services such as a premium comparison service, filing of advisory rates with state regulators on behalf of companies, and physical printing and distribution of manuals to insurance agents.

ISO is less anticompetitive than the rating bureaus that proceeded it.[23] Most importantly, ISO involves no agreements among member companies to adhere to ISO's advisory rates.[24] Second, while some states would still permit ISO to intervene in opposition to rate filings different from its own, the organization's by-laws explicitly state that ISO "shall not oppose deviations or independent filings whether or not statutory authority to do so exists."[25] Similarly, companies no longer face an "all or nothing" decision in determining whether to take part in collective pricing activities. While some ISO services remain bundled, and there

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[23]Indeed, ISO rejects the term "bureau" and prefers to be known as a rating organization.

[24]Many states would apparently allow such agreements. See Appendix 1.

[25]Indeed, ISO is bound by its by-laws to act as agent for its members in submitting independent filings, even if these filings deviate from ISO's suggested rates. (Insurance Services Office, Inc., "Certificate of Incorporation and By-laws," p. 32.)

is a "basic fee" or fixed charge that all companies must pay in order to purchase any of its services, the organization's fee schedule allows firms to choose the extent of their affiliation by line of insurance, type of service, and state.[26] Finally, ISO appears to have provided a minimum of resistance to efforts to limit collective pricing activities. In many cases, its decisions to implement arguably more competitive procedures have come without overt urging from state regulators.[27] In all of these respects, ISO is markedly different from predecessor rating bureaus.

Ratemaking Procedures: The definitive aspect of collective rating is the pooling of loss experience by many companies. Pooling of data allows the industry to estimate better the expected losses of the entire population of policyholders as well as of each risk class.[28] However, collective ratemaking goes far beyond pooling loss information. Under the traditional procedure, still used by ISO in many states, the

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[26] ISO provided copies of its pricing schedules for examination by the author. These policies are also examined in some detail in Munch, pp. 14-15.

[27] ISO's current policy is to adopt its "loss-cost" procedures (see text below) in all states without prior-approval requirements. The effect of this policy is to implement the loss-cost procedure in many states that would allow continued distribution of actual rates. See "ISO Adopts New Personal Lines Procedures in Competitive Rating States," ISO Chief Executive Circular CE-83-2, January 5, 1983.

[28] We discuss the nature of these potential economies at greater length in Chapter IV.

rating organization has used its base of loss experience, combined with expense data, to develop advisory rates for each territory and each risk classification.

The actuarial technique used in these states is known as the "loss-ratio" method. Under this method, the first step in the rate development process is the development of an <u>expected</u> expense ratio, the ratio of expenses (plus a provision for profits) to premiums.[29] This ratio is based on the average nationwide experience of ISO companies, but it also reflects ISO judgment. For instance, the provision for profits is generally five percent of premiums, a figure which is essentially arbitrary, and which exceeds the average figure attained by a wide margin.[30] Similarly, the usual 20 percent provision for selling expenses is based on the higher-than-average experience of agency companies.[31]

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[29] The term "expected" is somewhat misleading. As the discussion here indicates, it is not clear that anyone "expects" the expected expense ratio to prevail.

[30] The five-percent target for underwriting profit is based on a 1921 NAIC report, which established this target as the basis for evaluation of rate filings. See <u>Report of the Advisory Committee</u>, Appendix II, for historical material on the development of this target.

[31] See Table 5. While there is no reason why ISO's target expense and profit ratios should be based on industry averages (especially if firms using ISO rates realize expense ratios above the average), these figures seem to indicate that many state regulators allow ISO a good deal of leeway in determining advisory rates.

The expected expense ratio is crucial to the ratemaking process. Once determined, it is subtracted from unity to yield the expected loss ratio.[32] This ratio is compared with a projected loss ratio for each state, which is arrived at by predicting what losses and premiums would be if the current rate structure were retained for the coming year. The projected loss ratio reflects the development of actual losses to include an estimate of losses due but not yet paid, and the trending of losses to reflect changes in claim frequencies and claim costs.

Loss development and trending involve complicated actuarial procedures, but each process is conceptually very simple. Loss development is used to account for the fact that the losses associated with a particular accident may not actually be paid until several years later. ISO calculates (within ranges) the dates of the accidents upon which prediction is based, and multiplies the losses associated with each period by a development factor to reflect the ultimate expected cost of those accidents. As accident data mature, the loss rates for each period are multiplied by successively lower multiples until, after 87 months, it is assumed that all losses have been paid.[33]

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[32] As before, the word "expected" is a term of art.

[33] This procedure is explained in great detail in ISO's rate filings with state regulators. See, for example, Insurance Services Office, Inc., "Circular: Illinois Private (Footnote Continued)

Trend factors are exactly what the name suggests: they are intended to account for trends in the frequency and cost of accidents. As explained in an ISO rate filing,

> They are based upon the latest 12 quarterly year-ended average paid claim costs and the latest 24 quarterly year ended (sic) average paid claim frequencies. . . . The claim cost data is used to measure the inflationary trend in the settlement cost of accidents. The claim frequency data is used to measure the change in the number of claims per 100 cars insured. The method of trend determination utilized by ISO . . . makes use of the Least Squares Method fitted to the reported time series data, specifically an exponential curve. . . . To ensure stability, the statewide data is tempered with comparable countrywide data utilizing . . . credibility standards.[34]

The ratio of the projected loss ratio to the expected loss ratio gives the recommended percentage change in the statewide average rate. To arrive at a base rate for each territory in the state, ISO compares loss experience and trends in each territory with the state average.

While the actuarial procedure is undertaken by ISO staff, representatives of ISO-member and -subscriber companies exercise direct oversight. Actuarial guidelines are developed by ISO's Actuarial Committee, and staff rate proposals are

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Passenger Loss Costs Revised," October 18, 1982, p. I-B-2. (Hereafter cited as ISO, "Illinois Circular.")

[34]Ibid., p. I-B-3. Once again, it should be emphasized that a great deal of judgment is inherent in the development and trending process. ISO provided several rate filings for examination by the author, and in virtually every case the development and/or trending factor that resulted from the purely mathematical part of the exercise was discarded in favor of a different figure arrived at on the basis of judgment.

reviewed by the Private Passenger Automobile Committee.[35] (See Appendix 2.)

ISO was formed at about the time the Illinois rating law expired, and the new organization was thus faced with the need to develop a system consistent with the Illinois regime. The procedure it developed, now in use in Illinois and 25 other states, differs from the traditional procedure in two important respects: First, ISO refrains altogether from developing suggested rates, distributing instead only projected loss-costs -- the portion of premiums accounted for by losses and loss adjustment expenses.[36] Thus, companies

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[35]Because the staff proposals are not made public and the meetings of the committee are conducted in private, there is no direct evidence available on the committee's actual deliberations. However, the minutes of ISO committee meetings are made available to state insurance regulators and to the NAIC as part of routine examinations. The NAIC conducts such examinations once every five years, while state oversight varies according to state.

[36]The actuarial procedure used to develop loss-costs is known as the "pure premium" method. While it is actuarially equivalent to the loss ratio method, it does not require the initial development of a target expense ratio. Instead the pure premium method estimates the relationship between <u>car years</u> and losses. The average loss per unit of exposure is calculated, trending and development factors are applied, and the result is a projected loss per unit of exposure. Just as in states using the traditional procedure, the statewide average projected loss-cost is combined with classification and territorial relativities to provide a schedule of specific loss-costs. Loss adjustment expenses (per unit of exposure) are the only component of expenses that are incorporated into the figures published by ISO in the states that use this procedure. (The rationale for this treatment is simple: loss adjustment expenses are a direct function of accidents. Thus, loss adjustment expenses can be predicted by the same procedures used to predict losses.)

that subscribe to ISO are responsible for calculating their own expense and profit factors for each rate. Second, under this "competitive" procedure the Private Passenger Automobile Committee does not review the loss-costs developed by staff.[37] (The procedures in use in each state are shown in Table 13.)

ISO also plays an important role in developing territorial and risk classification definitions and relativities, as well as insurance policy forms. Typically, the definitions of territories and the factors used in risk classification change much less frequently than rates. For example, during 1984 the ISO began introducing a new 202-class risk classification plan to replace the 161-class plan introduced in most states during the late 1970's.[38] Territorial relativities, on the other hand, may be altered with each new rate filing.[39]

<u>Distribution of Rates or Loss Costs</u>: In virtually all states, ISO files its rates (or loss costs) with the state

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[37] ISO has also eliminated committee review of rates in some "traditional" states where rates are published. See Table 13.

[38] There is some variation in classification plans across states, due partly to state restrictions on what factors can be used.

[39] Other aspects of the actuarial process are also revised periodically, on an "as needed" basis. For example, the ISO altered its 1976 increased limits tables for auto liability insurance in 1982.

authority. In states using the traditional procedure, this filing can actually take the place of filings by individual companies: that is, affiliated companies that adhere to ISO rates can satisfy their filing requirements by notifying the state of their intention to do so.[40] Companies that decide to deviate from ISO rates, of course, must make filings and present data to support their deviations.

In states where the loss-cost procedure is used (and in a few other states) ISO files its advisory rates or loss costs with the state authority as a "reference document." In most of these states, companies may avoid the need to file extensive supporting material with their rate schedules by referring to the ISO reference document in their filings. Again, companies that elect to charge rates different from those indicated by the ISO document still have to document their rates independently.

ISO also publishes manual rate pages for direct distribution to insurance agents. Thus, in states in which the traditional procedure is used, companies that elect to use ISO advisory rates need not involve themselves in ratemaking in any significant way. Rates are developed, submitted for state approval, and distributed to agents by ISO.

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[40] ISO tries to keep unaffiliated companies from free-riding off this data by copyrighting its rate filings and the circulars it sends to companies. There is no ready means of knowing how effective this measure really is.

ISO as a Statistical Agent: Nearly all states[41] require insurers to report aggregate loss data, usually through one or more "designated" or "official" statistical agents.[42] The ISO is a designated statistical agent in nearly every state. Unlike the other statistical organizations described below, ISO requires firms to report statistics in a form consistent with the ISO classification plan. This requirement provides ISO with the detailed breakdowns necessary for development of rates, classification plans and territorial definitions.

Premium Comparison Service: In addition to the rating services described above, ISO provides a Premium Comparison Service. The service, which is made available only to insurance companies, provides periodic reports on actual rates charged by various insurers in states in which ISO operates. Three categories of insurers are surveyed, National Agency Companies, State Agency Companies, and Direct Writers, and generally enough companies are included that a substantial portion of the market is represented.[43] To facilitate

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[41]The only exception appears to be California.

[42]South Carolina and Massachusetts collect statistics directly.

[43]For instance, for the Maryland Premium Comparison Circular dated November 8, 1983, a total of 10 companies were included, and these companies accounted for 65.8 percent of total market premiums. In addition, state fund rates are displayed accounting for an additional three percent of premiums. We describe the Premium Comparison Service Reports in greater detail in Chapter 5 below, where data from these (Footnote Continued)

comparison, ISO chooses a particular set of coverage limits and deductibles, driver characteristics, automobile type, mileage, etc., surveys prices for that particular policy for each territory.

Other Rating Organizations and Related Organizations

AIPSO and Rating in the Shared Market: The Automobile Insurance Plans Service Office (AIPSO) provides statistical, rating and management services to about 40 state shared market plans.[44] AIPSO is similar in structure to ISO, but, unlike ISO, AIPSO's expenses (about $18 million in 1983) are supported by company contributions mandated by the state governments AIPSO serves.

An important question for this study is to what extent anticompetitive activity in the shared market could have an impact on voluntary market rates. If the impact is potentially great, then extensive study of AIPSO would be appropriate. Otherwise, we should concentrate on the determination of voluntary market rates.

The "residual" nature of the shared market guarantees that shared market collusion could not result in a collusive

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reports is used to estimate the degree of adherence to ISO rates.

[44]AIPSO manages shared market plans in 38 states, and makes rates in most of these states and a few others in addition. (In Florida, for instance, AIPSO provides rates but not management services.) See AIPSO Insurance Facts (New York: Automobile Insurance Plans Service Office, 1983), p. 10.

outcome for the voluntary market. If shared market rates were allowed to rise above the competitive level while voluntary market rates remained competitive, the demand for shared market insurance would fall to zero -- everyone would insure through the voluntary market. Collusion in the voluntary market would therefore appear to be a necessary condition for a collusive outcome in the market as a whole.[45] Thus, while we take explicit account of the shared market in the empirical work below, an extensive study of AIPSO does not appear to be justified.

State Bureaus: Rates are made by state insurance commissions in three states: Massachusetts, North Carolina and Texas. ISO does not operate as a rating organization in these states. Instead, rates are made through direct interaction between state regulators and *independent* rating organizations.[46]

In Massachussetts, the independent rating organization is the Massachussetts Auto Rating and Accident Prevention Bureau (MARAPB), which is governed by a committee structure similar to ISO's. MARAPB makes advisory rates, which are

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[45] Of course, the evidence that shared market plans incur large losses suggests strongly that collusion is not occurring there. See Table 11 above.

[46] ISO is involved in these states in lines other than personal auto insurance, and it may perform non-rating services (such as collecting statistics or providing actuarial guidance), but it is not involved as a ratemaking organization.

presented to the state insurance commission along with suggested rates developed by the state Attorney General's office and a state-operated rating organization. The commission takes all of this evidence into consideration when making rates. Companies are not required to belong to MARAPB, but because MARAPB distributes its members' rates, rules and forms to agents at low costs, membership is nearly universal.[47] An officer of the state rating organization estimates that companies adhering to the state-made rates in Massachusetts account for at least 95 percent of auto insurance premiums.[48]

The Texas Automobile Insurance Service Office (TAISO) operates in essentially the same manner as MARAPB, presenting rates which are, along with rates presented by state-employed actuaries, taken into consideration by the state insurance commission in its rate-making deliberations. TAISO is also charged by the insurance commission with distributing rates and with various other administrative functions, and thus is somewhat more an arm of the state than MARAPB. However, the

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[47]John Gallagher, Vice President, MARAPB, Telephone interview, 24 February 1984.

[48]Howard C. Mahler, Director, Massachusetts State Rating Bureau, Telephone interview, 24 February 1984.

extent of adherence to state-promulgated rates appears to be much greater in Massachusetts than in Texas.[49]

In North Carolina, rates for private passenger automobile insurance are made by the North Carolina Rate Bureau (NCRB). Unlike MARAPB and TAISO, the NCRB is specifically authorized by statute, and all companies writing auto insurance in the state are required to belong. Moreover, there is no opposing submission made by a state rating organization. As in Massachusetts and Texas, companies control the organization through a committee system similar to the ISO's, and all companies are expected to charge the rates approved by the commissioner, unless they receive written permission for specific deviations.[50]

Hawaii Insurance Rating Bureau: The fourth state with an independent rating organization is Hawaii. The Hawaii Insurance Rating Bureau (HIRB), is also very similar in structure to the ISO. Unlike the other three states with independent organizations, however, Hawaii prohibits collective involvement in the determination of specific rates. Thus, HIRB's operations with respect to private

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[49]Letter from Doris Engelke, Office Administrator, TAISO, to author, 24 February 1984, and letter from Evelyn F. Ireland, Research and Information Services, Texas State Board of Insurance, to Mark Plummer, Federal Trade Commission, August 6, 1984.

[50]"Constitution of the North Carolina Rate Bureau," as amended October 20, 1981.

passenger auto insurance closely resemble ISO's loss-cost competitive rating procedure described above.[51]

Advisory and Statistical Organizations: In addition to rating (or rate service) organizations, most state insurance codes provide for joint insurer activity through advisory organizations and statistical organizations. Advisory organizations are organizations of insurers that do research and provide information related to the business of insurance. As noted above, statistical organizations collect data required by state authorities.

While ISO is the only major rating organization, there are at least three advisory/statistical organizations that offer some competing services.[52] The National Association of Independent Insurers (NAII) is a trade association that is also a licensed advisory organization and statistical organization. The National Insurance Statistical Service (NISS) and the the American Association of Insurance Services (AAIS), both somewhat smaller than NAII in terms of

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[51]Letter from Thomas H. Hopcroft, President, Hawaii Insurance Rating Bureau, to author, 24 January 1984. See also Appendix 1.

[52]The Highway Loss Data Institute (HLDI) and the Insurance Information Institute (III) are among several additional advisory and/or statistical organizations that exist primarily to provide insurance statistics. However, the role played by these organizations is too far removed from ratemaking for them to be considered collective pricing organizations. For example, HLDI's function is mainly to collect data on the crashworthiness of automobiles.

membership, also serve as advisory and statistical organizations in some states.[53] All three organizations collect statistics at a more aggregated level of detail than ISO, and the compilations they publish are designed mainly to satisfy the reporting requirements of state regulators. Because regulatory statutes allow insurers to report data in a form consistent with their own classification system, and because different insurers use different systems, the data reported by the statistical agents generally reflects the "lowest common denominator."[54]

Nevertheless, the services provided by these organizations are potentially attractive substitutes for those provided by ISO. For example, NAII offers studies on classification criteria, territorial definitions, loss ratio trends, and other technical matters of risk classification, as well as advice on employee relations and taxes.[55]

Summary

ISO is currently the only major rating organization involved in making auto insurance rates. At least on the

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[53]See Table 15.

[54]NAII, for example, reports data by territory and type of coverage, but not by risk classification.

[55]National Association of Independent Insurers, "Outline of Major NAII Services and Programs," (n.d.). See also American Association of Insurance Services, "Fact Book," 1983.

surface, ISO follows far less restrictive practices than did its predecessors, and the development of both state regulation and rating organization procedures shows a trend towards a more competitive regime than in the past. While ISO is the only major rating organization in the auto insurance market, other insurer organizations provide related services and arguably compete with ISO.

However, the joint action by competitors undertaken through ISO, in particular the development of suggested prices or loss-costs, creates the basis for a concern that collective pricing may facilitate collusion. In the next chapter we review previous studies that have examined pricing in the auto insurance industry, and we develop some testable hypotheses about the possible effects of collective pricing on industry performance.

CHAPTER IV

POTENTIAL BENEFITS AND COSTS OF COLLECTIVE PRICING

The two major theories of collective pricing were described aptly in one recent study as the "cartel model" and the "service model."[1] In the cartel model, rating organizations serve as a means of arriving at and maintaining supracompetitive prices. The service model discounts the possibility of collusion, and hypothesizes that rating organizations are the lowest-cost means of providing certain services. While retaining this characterization of the two alternative models, we emphasize that they are not mutually exclusive. Collective pricing could produce both benefits (in the form of lower costs) and costs (in the form of an increased probability of collusion), and a benefit-cost framework is thus appropriate for the examination of collective pricing activities.

In the first section below we examine the potential cost savings emphasized by the service model. Whereas previous studies have emphasized the existence of scale

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[1]See Danzon. See also Patricia Munch, The Role of Rating Bureaus in Property-Liability Insurance Markets (N.P.: Alliance of American Insurers, 1980).

economies, we concentrate on the question of whether joint action by insurers is necessary to achieve scale economies. We examine potential costs in the second section, concentrating on the general (cartel model) hypothesis that collective pricing facilitates collusion. The third section presents a brief summary of the chapter.

Collective Pricing and Economic Efficiency

The primary justification for collective practices by rating bureaus is that the pooling of data is necessary for more accurate classification of risks and determination of premiums. A Stanford Research Institute report, for instance, concludes that

> Many firms, especially the small ones, do not have enough internal experience and therefore must rely on the bureau's collection of statistics and promulgation of rates. Some large firms use the bureau in small states where they feel it is not cost-effective to make their own rates.[2]

A recent NAIC report agrees, stating that

> [Rating organizations] provide loss experience data and technical expertise that insurers need to estimate future loss costs with confidence.[3]

Some analysts have distinguished between the information sharing and ratemaking functions, arguing that only

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[2] SRI Report, p. 18.

[3] See Report of the Advisory Committee on Competitive Rating to the National Association of Insurance Commissioners, by William D. Bailey, Chairman (Hartford, Connecticut: n.p., 1980). Appendix, p. 63. (Hereafter cited as Bailey, et al.)

information sharing should be permitted.[4] A Department of Justice study concludes that

> access to past industrywide experience, trended losses, and current price data should be sufficient to enable all companies to independently construct rates.[5]

The National Commission for the Review of Antitrust Laws and Procedures agreed, concluding that "the joint collection of expense data and publication of advisory rates is unnecessary."[6]

Among the insurers themselves, some companies have been critical of joint rate development. Edward B. Rust, President of State Farm Mutual Auto Insurance Company and a member of the NAIC Advisory Committee on Competitive Rating stated in his comments on the advisory committee's report that

> The most frequently suggested justification for continuing to permit the development of manual rates by a rate service organization is that "many small companies presently lack a credible volume of data and the technical expertise needed to develop manual rates appropriate for their use." However,

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[4]A further distinction, addressed below, is between sharing of pure past loss experience (as in the case of the data published by NAII and NISS), on the one hand, and sharing of trended and developed loss costs (as is currently done by ISO in Illinois and the other loss-cost states), on the other.

[5]DOJ, Issues, p. 134.

[6]Report to the President and the Attorney General of the National Commission for the Review of Antitrust Laws and Procedures (Washington, D.C.: U.S. Government Printing Office, 1979), Volume Two, p. 238. See also n. 46, in which the Federal Insurance Administration states that "FIA's position is that insurers should not only be allowed, but should be required to compete with respect to expenses."

> this "analysis" does not go far enough. It considers only the burden to the industry if companies had to perform the entire rate-making function individually. It does not address the question of whether companies are capable of setting their own prices if furnished only unanalyzed statistical information on past losses by advisory organizations.[7]

ISO, while implementing its loss-cost system in states with competitive rate regulatory regimes, continues to favor development of advisory rates in at least some states. In its questionaire response to the same NAIC advisory committee, it stated that

> It is our belief that . . . [statistical, advisory and ratemaking services] . . . serve to enhance competition by providing essential services to small, medium and large insurers with no adherence requirement thus enabling them to provide coverage in the marketplace. The availability of these products and services lowers entry barriers for new companies and aids existing insurers in expanding their markets . . . result[ing] in lower overall expenses than would be the case in the absence of such an organization.[8]

Supporters of the loss-cost system point to the experience in Illinois (and, more recently, in other loss-cost states) to support their contention that advisory rates are not necessary for the continued existence of small companies. Supporters of the continued development of advisory rates question whether the Illinois experience provides sufficient data:

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[7]"Comments of Mr. Rust," in Bailey, <u>et al</u>, p. 157.

[8]Insurance Services Office, Inc., "NAIC Advisory Committee on Competitive Rating Questionaire Issue 4: Response of the Insurance Services Office," January 14, 1980, p. 25. Hereafter ISO, "Response."

> [S]everal committee members questioned whether the Illinois experience is conclusive evidence that a prohibition on final rate making would be workable on a countrywide basis. Illinois is only a single state, surrounded by others for which manual rates continue to be available. Some insurers may be using Illinois loss data along with comparable loss data and corresponding manual rates in adjoining or demographically comparable states to arrive at their manual Illinois rates.[9]

In the discussion that follows, we describe the potential efficiencies associated with collective ratemaking. We divide rating organization functions into four categories: pooling loss data and developing risk classifications; applying trending and development factors to loss data; producing actual rates and distributing them to agents and state regulators; and, researching new techniques. For each activity, we attempt to answer several questions. First, are there economies of scale? Second, are these economies industry economies or firm economies?[10] Third, is joint action necessary to achieve these economies?

Pooling Joint Loss Data and Developing Risk Classifications: There is overwhelming agreement that auto insurers should continue to be permitted to share loss data. The Stanford Research Institute and NAIC studies cited in the previous

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[9]Bailey, et al, p. 59.

[10]The distinction is between efficiencies that accrue solely to the individual firm and those that accrue to an industry as a whole. See, for instance, P.R.G. Layard and A.A. Walters, Microeconomic Theory (New York: McGraw-Hill Book Company, 1978), pp. 224-27.

paragraphs are just two of many that conclude that scale economies can be captured through the pooling of loss data.[11]

Direct evidence on this score is provided by credibility theory, a branch of statistics developed specifically to provide guidelines for the weighting of actuarial data depending on the number of observations available.[12] ISO's territorial credibility standards appear in Table 14 below. What the table indicates is the weight assigned to the three-year experience in a territory, relative to experience for the state as a whole, based on the number of claims in each territory.[13] Thus, if there were 3,000 claims in a single territory, the credibility factor would go to 1.00, meaning that only "within cell" data would be used to calculate the territorial relativity. The higher the level of credibility, the less reliance is placed on the questionable assumption that data are comparable across different cells.

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[11] Some of the benefits associated with the pooling of data pre-suppose the existence of a uniform classification plan. Data from incompatible classification plans would be of limited usefulness.

[12] See, for example, Donald Sant, "Estimating Expected Losses in Auto Insurance," Federal Trade Commission, Bureau of Economics Working Paper No. 20, October 1979.

[13] These credibility standards provide an idea of the numbers involved in obtaining large-sample estimates. The Stanford Research Institute study estimates the annual accident probability of the average driver to be about one in twenty. If 3,000 claims are needed in each territory to achieve 100 percent credibility, then data must be kept on roughly 60,000 policies (60,000 = 3,000 x 20) in each territory to obtain full credibility.

TABLE 14:

CREDIBILITY FACTORS FOR WEIGHTING TERRITORIAL EXPERIENCE

Credibility	Number of Claims
0	0 - 29
0.10	30 - 119
0.20	121 - 269
0.30	270 - 479
0.40	480 - 749
0.50	750 - 1,079
0.60	1,080 - 1,469
0.70	1,470 - 1,919
0.80	1,920 - 2.429
0.90	2,430 - 2,999
1.00	3,000 or more.

Source: ISO, "Illinois Circular: ISO Private Passenger Loss Costs Revised," October 18, 1982, p. I-B-16.

Thus, a higher level of credibility permits more accurate prediction of losses.

In general, full credibility is not obtained. For instance, in a recent ISO revision of Illinois loss-costs, full credibility was obtained for only three of 26 territories.[14] Likewise, full credibility is often not obtained in several aspects of the rating process in which credibility tables are used. Thus, the insurance industry appears to be operating in the range of increasing returns to scale with respect to the volume of loss data.[15]

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[14]See "Illinois Circular."

[15]This finding does not contradict the suggestion above that marginal cost in the auto insurance industry is roughly constant; diseconomies of scale in other aspects of the production process may counterbalance economies of scale in risk assessment.

Interpretation of the credibility data is somewhat ambiguous due to the nature of the risk assessment process. We have noted that there is a tradeoff between the reliability of expected loss estimates and the number of risk classes. Thus, minimum efficient scale may depend heavily on the homogeneity of policies issued, and smaller companies may achieve sufficiently accurate estimates of expected losses by confining their business to particular risk classes or territories.[16]

Despite this problem of heterogenous data, however, it would appear the information gathered by one firm can contribute to greater accuracy in the loss estimates of other firms -- that is, that these economies are industry economies. While some companies may operate in unusual ways and underwrite unique risks, thereby reducing the correlation between their data and that of other companies, these situations appear to be more the exception than the rule. Moreover, even where different companies write grossly different types of policies, each may know that its losses

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[16]The history of entry into insurance suggests that entering firms have attempted to take advantage of this factor by specializing. State Farm restricted its business to farmers; Allstate preferred blue-collar workers; other companies, including established firms, have specialized in insuring various other groups. Presumably, such specialization also reflects a presumption that expected costs for the target group are below prices being charged under existing classification schemes. See <u>SRI Report</u>, pp. 16-17, and Nye, <u>et al</u>, "An Evaluation of Risk Classification Systems."

tend to be some reasonably stable function of the others' losses. Thus, the experience of one company will in general be useful to other companies in assessing risks. However, groups of similar companies might find their data more useful than would be the average taken across all companies. This possibility may be one reason for the existence of the NAII and NISS as statistical agents independent of ISO.

The analysis used in most previous studies stops at this point, presuming that the existence of industry economies alone is sufficient to justify joint action. While some previous studies[17] have suggested that some functions now performed by ISO could be performed by independent consultants, none has laid out a systematic rationale for determining when, if ever, joint ownership is desirable.

In considering the option of independent firms as compilers of loss data, the NAIC advisory committee stated:

> The consensus . . . was to permit industry ownership and control over rate service organizations and to oppose delegating this important management function to a government or independent group. Most committee members believe . . . that a restriction on industry control would stifle creativity and potentially limit the organization's responsiveness to the changing needs of the marketplace. Further, continued insurer control would help maintain a commitment to the standardized data collection programs that are essential to the performance of a rate service organization.[18]

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[17]For example, DOJ, Pricing, and Bailey, et al.

[18]Bailey, et al, p. 60.

One way of interpreting these concerns is in terms of the potential for an independent organization to behave opportunistically. Klein, for example, suggests that transactions costs and incomplete contracts may lead to a "hold-up problem":

> Given the presence of incomplete contractual arrangements, wealth-maximizing transactors have the ability and often the incentive to renege on the transaction by holding up the other party, in the sense of taking advantage of unspecified or unenforceable elements of the contractual arrangement.[19]

The incentive to "hold-up" is a function of the appropriable quasi-rents involved, i.e. the difference between what the party to be held up is receiving under the current contract and the best he can do by contracting with someone else. Where fixed costs are involved in meeting contractual obligations, such as when one party has to invest in a particular type of machine that would have little value in alternative uses, appropriable quasi-rents are likely to be substantial.[20] Of course, the greater the potential for hold-

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[19]Benjamin Klein, "Transaction Cost Determinants of 'Unfair' Contractual Arrangements," American Economic Review: Papers and Proceedings 70;2 (May 1980), p. 256.

[20]See also Benjamin Klein, Robert G. Crawford, and Armen A. Alchian, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," Journal of Law and Economics 21 (October 1978), pp. 297-326. While most research relying on the transactions cost approach has focused on vertical integration, it is agreed that the approach has validity with respect to horizontal integration and joint ventures as well. Goetz and Scott, for instance, include in their discussion of such contractual relationships "most
(Footnote Continued)

ups, the greater the incentive to avoid the market and to rely instead on internal production within a firm.

Application of these principles to the problem of information sharing by insurance firms is straightforward. Reporting of data may require that investments be made to keep information in a certain format, investments that may include designing company risk categories and price structures to correspond to the needed format. Once a format is chosen, continued receipt of data in that form may quite literally be necessary for continued company operation. Multiple sources of data in the needed format would not normally be available, and/or would take time to develop, and the sudden unavailability of data could thus be extremely costly.[21]

Under these circumstances, insurance companies might be reluctant to place responsibility for data collection and publication with an independent firm. Once investments were made to conform to an independent firm's method of reporting,

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generic agency relationships, including distributorships, franchises, joint ventures, and employment contracts." [Charles J. Goetz and Robert E. Scott, "Principles of Relational Contracts," Virginia Law Review 67; 6 September 1981), p. 1091.] Williamson also explicitly applies a transactions cost analysis to horizontal issues. See Oliver E. Williamson "Economies As An Antitrust Defense Revisited," University of Pennsylvania Law Review 125;4 (April 1977), pp. 699-736.

[21]ISO notes that "the statistical operations of insurers are quite costly and complex. The statistical organizations which serve to receive and compile data from many insurers also incur those high costs in terms of equipment, personnel and complexity of procedures." (ISO, "Response," p. 5.)

that firm could be in a position to hold-up subscribing firms, by refusing to provide data, raising prices, or threatening to change formats.[22] The existence of this threat raises the expected cost of sharing data, and thus reduces the amount of information shared below the amount that would be optimal in the absence of this market failure.

Joint ownership of the information-sharing mechanism avoids the potential for opportunistic behavior by shifting control back to the companies that rely on the data. As a result, joint ownership may be an economically efficient solution to the information sharing problem.

It should also be noted that joint ownership may be advantageous with respect to the free rider problem that is inherent in publication of information. An insurance company that "cheated" on an independent provider of loss data (say by reselling the data to other firms) might expect the independent company to experience losses as a result, a side-effect about which it may not be concerned. If the cheater is also part-owner of the "victim", however, the incentive to

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[22]In calculating whether to engage in opportunistic behavior, a firm would consider "reputation" effects, such as the possibility that its "victims" would begin to look elsewhere for a supplier of information, but there is no guarantee that these costs would be sufficient to deter the hold-up.

cheat is reduced. Thus, joint ownership may alleviate the free-rider problem to some extent.[23]

In summary, this discussion indicates that a jointly-owned organization, such as ISO, may be an efficient means of capturing scale economies in the development of a risk classification system and pooling of loss data under such a system. We would expect insurance costs to be higher in the absence of such a system. Because information sharing is universally permitted, however, there is no ready means of testing this hypothesis.

Development and Trending of Losses: The next step in the rate development process is the development and trending of loss costs to yield prospective loss costs. Development of losses is necessary to account for losses that may be due to policyholders but have not yet been paid (e.g. losses associated with cases still in litigation). Trending accounts for inflation in claim costs and other factors that may cause claim costs to vary over time.[24]

Previous studies have been divided on whether trending and development by rating organizations should be permitted, apparently out of uncertainty whether individual companies

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[23]The problem will still exist, however, since the gains from reselling the data accrue solely to the cheating firm, while the losses are split among all the joint owners.

[24]These processes are described in Chapter III above.

possess sufficient expertise to undertake this function themselves or would be able to purchase the necessary expertise (e.g. from consultants). The Department of Justice specifically recommended that trending be performed by independent firms:

> We envision a system in which the bureau, as presently structured, would continue to collect, compile, and disseminate past expense and loss data. However, the trending function would be assumed by independent advisory organizations, such as A.M. Best Company or any private-consulting firm or statistical organization.[25]

Where outside advice was required, the report concluded,

> Independent actuarial and rate consultants can be retained by an insurer for the purpose of evaluating its own experience and the relevance of the industrywide experience.[26]

These conclusions appear to be based on a finding that any economies of scale in trending and development can be achieved through the free market. While we doubt that any scale economies here are substantial, we agree that joint ownership is not necessary for such economies as may exist to be achieved.

The trending and development processes themselves do not appear to be subject to significant economies of scale. Loss development requires relatively simple statistical methods to calcula'.e the historic relationship between losses

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[25]DOJ, Issues, p. 178.

[26]Ibid., p. 186.

incurred after an initial period and those finally incurred. For instance, if the ratio of losses incurred after 15 months to losses incurred after all claims are ultimately settled was historically 1.2, then insurers using data on accidents incurred 15 months earlier can estimate total eventual losses from these accidents by multiplying current losses by 1.2.

Trending is also relatively simple. ISO uses simple regression analysis to calculate expected changes in claim frequency and claim costs, analysis that today can be performed on relatively inexpensive personal computers. Thus, even if we were to make the unrealistic assumption that trending and development services were not available from consultants, it is not obvious that these operations involve economies of scale significant enough to affect minimum optimal scale.[27]

Of course, it might be argued that trending and development are subjective exercises and therefore economies of scale reside in the ability of larger firms (or the rating organization) to employ specialized staff to exercise good judgment. The service model's emphasis on the need for ISO to provide "technical expertise" seems to reflect a belief that such economies do exist.

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[27]This analysis assumes that the necessary data are available.

There is no doubt that judgment plays a role in determining both industry average trend and development factors and in determining how individual firms' trend and development factors should vary from the average. An example of the role of judgment in determining average factors is contained in ISO's determination of loss costs for Illinois.[28] The technical calculation of trend factors for bodily injury liability and property damage liability in the circular yields factors of 1.3 percent and 4.8 percent, respectively. However, the rate calculations ignore these trend factors in favor of minimum limitations of eight percent and nine percent, respectively. ISO explains:

> This additional trend may be necessary in order that loss costs not be inadequate in the current and prospective inflationary environment.[29]

Clearly, this judgment affects trend and development factors across the board, for all companies.

ISO also emphasizes that the need for judgment may be firm-specific. With respect to trending, it notes that "the amount of data and the most appropriate curve to be used to fit this data . . . should be considered by each company."[30] Similar caveats apply to loss development:

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[28]See "Illinois Circular," pp. I-B-7 through I-B-12.

[29]Ibid., p. I-B-4.

[30]Ibid., p. I-B-3.

> It is important to emphasize that an individual company may find different loss development factors appropriate for adjusting its accident year experience, as a result of differing company loss development data and/or alternative methods for determining loss development factors.[31]

Because some judgments concerning trending and development are inherently firm-specific, associated economies of scale are to some extent firm economies. Still, this discussion suggests that some industry economies may reside in the specialized expertise needed to make some trending and development judgments.

It is difficult, however, to see how _joint_ industry action is necessary to capture any industry economies that may reside in the trending and development process. Unlike data pooling, companies need make no specialized investments to partake of advice concerning trending and development. While independent organizations and consultants may be an efficient means of capturing scale economies, there is no apparent efficiency justification for joint ownership of trending and development activities.[32]

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[31] Ibid., p. I-B-2.

[32] Of course, the fact that joint ownership is not _necessary_ to capture scale economies does not imply that a jointly-owned organization cannot be _one means_ of capturing these economies. Because trending and development is available through ISO in all states where it operates, there is no apparent means of testing this hypothesis.

Ratemaking and Distribution: It is extremely doubtful that there are economies of scale in combining projected losses with projected expenses to arrive at rates. The process, once each factor is known, is one of simple addition and/or multiplication. While firms that have traditionally relied on ISO for this service may initially find it burdensome, this is not because there are economies of scale. There may be a "learning curve" effect,[33] but it could hardly be a significant one. ISO has even published simple-minded "how-to" manuals for insurers developing rates from loss-costs for the first time.[34]

The pooling of expense data is also unlikely to be a source of significant efficiency benefits. While expected losses can best be estimated by looking at a large body of statistical data, expected expenses are presumably subject to an individual firm's control. A firm can vary its purchases of inputs and knows the price it pays for each, and its costs are more closely related to these factors than to any industry average. Moreover, expense ratios vary widely across firms, indicating that information about the average is likely to provide limited information about a particular firm's

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[33] That is, costs may decrease with experience.

[34] See Insurance Services Office, Inc., Turning Loss Costs into Final Rates: A "How To" Guide for Insurers (New York: Insurance Services Office, 1983).

costs.[35] There is, therefore, no apparent economic justification for joint activity in actual production of rates.

Joint distribution of rates, on the other hand, may enhance economic efficiency, and joint distribution may depend on the rate uniformity that results from joint ratemaking. Previous studies have argued that there may be economies in the process of submitting rates to state authorities for approval and, once approved, distributing them to agents. ISO, for instance, justifies the publication and distribution of rates as follows:

> In many states for many lines of insurance, the service organization staff, together with insurer representatives, develop (sic) manual rates which are printed and distributed to insurers, producers and insurance regulatory officials where required. There are certain practical advantages to this activity. If all insurers were required to develop manuals there could be significant cost duplication and many producers [i.e., agents] would need to maintain several manuals. For smaller and medium sized insurers the additional costs and effort could result in less frequent but more significant rate revisions.[36]

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[35]It is possible, however, that insurance firms utilize joint expense data as a means of monitoring their own performance. Joint action is clearly not necessary for this data to be published, however. Moreover, as indicated above, ISO bases its rates on somewhat arbitrary expense provisions, not on the actual expenses of a representative cross-section of firms.

[36]ISO, "Response," p. 11.

Other studies emphasize that joint filing and publication "eliminates duplication,"[37] and suggest that there may be scale economies in "filing rates and meeting other requirements of regulations."[38]

With respect to distributing rates to agents, it is obvious that a group of companies that charge the same rates will incur lower costs if they send only one set of manual rates to agents. Moreover, the cost savings seem to represent industry economies, since they are shared by all participating firms. For these economies to be realized, however, firms must know in advance that a substantial proportion of them are going to charge the same rates. That is, there are no economies to be had if each firm charges different rates and thus requires a separate manual.[39]

A third-party service that compiled manuals containing rates and other materials might succeed in capturing at least some of these economies. If a number of insurance companies elected to charge the same rates, an independent third-party firm could issue a standardized manual presenting these rates,

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[37]Munch, p. 7.

[38]Danzon, p. 375.

[39]There may be economies of joint publication if firms adhere to an identical schedule of rate relativities and, therefore, need only publish a single schedule of base rates with separate tables of multipliers for each company (or vice versa). ISO's system of fees, which gives discounts to companies that adhere to its schedule of rate relativities, may reflect these efficiencies.

and give discounts to companies adhering to the standardized table, discounts that would reflect the benefits to society that such standardization might imply.[40] This system might be subject to some of the same "hold-up" problems discussed in connection with the sharing of loss data above,[41] but the magnitude of the problem would appear to be smaller (since a single firm can, if need be, print its own manuals, whereas it cannot independently generate the loss data it needs to develop rates).

State requirements for rate filing and approval are another possible source of scale economies. The most obvious economy associated with joint filing is in the fact that many companies can submit a single document to state regulators for review, rather than each company submitting a separate document. Not only do companies avoid the need to prepare the necessary forms and documents, state regulators also may prefer reviewing a single submission from the rating

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[40] An analogous problem exists with respect to airline prices. Travel agents claim that the costs of monitoring thousands of constantly-changing fares are substantial. A downfall of the present system of pricing is that it fails to place costs of price proliferation on the firms responsible. Pricing schedules that took account of the costs of proliferation could yield cost savings. The fact that no such pricing schedule has been developed may suggest that the potential cost savings are not very significant.

[41] For example, the publisher of rates might suddenly raise its prices knowing that, as the only publisher using a particular set of rate relativities, its prices were still cheaper for subscibing firms than if each subscribing firm had to print its own manuals.

organization to reviewing separate applications from many individual companies.[42] It seems doubtful, however, that such economies could be very substantial.[43]

Joint rate development may also produce economies with respect to costs imposed by state regulators on firms that choose to deviate from ISO rates. Previous studies have produced evidence suggesting that adherence to ISO rates is more frequent in prior-approval than in open competition states. For example, the 1977 Department of Justice study found that "a substantially larger share of the market is priced independent of the bureau in California than in New Jersey or Pennsylvania. . . ."[44] Previous studies have also noted that "the cost of deviating tends to be a fixed cost,"[45] suggesting that smaller firms benefit more from adhering to ISO rates than larger firms.

These findings are consistent with evidence that state regulators may use ISO rates as a benchmark, presuming these rates to be "safe."[46] Small companies that deviate from ISO

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[42]Most states permit the rating organization to file on behalf of member companies, and one state, Mississippi, even requires agency filing.

[43]The entire budgets of regulatory authorities are only about one one-hundreth of one percent of premium volume. See GAO, Issues, p. 20.

[44]DOJ, Pricing, pp. 39-50, 76-86.

[45]Danzon, p. 375.

[46]See Hanson, et al, p. 49.

rates may do so on the basis of a relatively sparse data base, and thus may be perceived by regulators as requiring strict oversight to ensure solvency. Rates that differ markedly from ISO rates may simply trigger an extended review process, a process that inevitably imposes costs on the deviating firm.

Under the service model, joint ratemaking by ISO can be viewed as reducing the costs, to both regulators and firms, inherent in the rate regulation process.[47] If this model is accurate, then we would expect a larger percentage of firms to affiliate with ISO, and adhere to ISO rates, in prior-approval than in open competition states. Moreover, we would expect costs (and thus prices) to be lower in prior-approval states where ISO publishes (and files) rates than in prior-approval states where ISO publishes only loss costs.[48]

Research and Development Activities: The discussion above has been conducted under the tacit assumption that the technology of rate development (statistical procedures for trending, credibility tables, etc.) is static. Of course, we have

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[47]It is not clear whether the "hold-up" problem is significant with respect to joint rate filing activity. An independent rate filer could potentially hold-up its customers by refusing to file rates on their behalf. However, the only costs incurred by the victims would be the one-time cost of self-filing, plus the costs of looking for a more reputable filing agent.

[48]Obviously, we are ignoring for the present the potential effects of rate publication, etc., in facilitating collusion.

already noted in passing several instances in which these procedures have changed in recent years, and there is no reason to expect this evolution to stop.

The role of ISO in developing new procedures has been substantial. As noted above, its classification plan and territorial definitions are commonly used by both affiliated and unaffiliated insurance companies, presumably because they represent technological improvements over alternative systems. ISO also performs primarily research-oriented studies, such as a recent study of product liability claims.[49]

Research may be subject to economies of scale because of the need for sophisticated equipment and highly educated personnel, the synergistic effect of many researchers working together and sharing ideas, etc. Moreover, such economies are industry economies: Technological progress can reduce costs for all firms in an industry.

In terms of the analysis here, the only remaining question is whether <u>joint</u> activities are necessary. While the economic theory of innovation and technological change is incomplete, it is commonly recognized that joint research and development activities may be useful, for at least two reasons. First, innovations are subject to the free-rider problem: once a new product is produced or a new process made public, it may be difficult to prevent imitation. Second,

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[49]See ISO, "Response," p. 3 and pp. 8-10.

some theorists have argued that duplication of research efforts is excessive under competition. Jointly sponsored industry activities avoid both of these problems by eliminating duplication and reducing the incentive for firms to free-ride.[50]

ISO has argued that elimination of joint ownership could result in freezing the current risk classification plan and rate relationships in their existing form.[51] While complete paralysis seems unlikely, there is a fairly strong argument that innovation in classification plans would be reduced by the elimination of joint research and development activities.

Summary of Potential Benefits: We have examined four categories of ISO activities, asking in each case whether joint ownership and control is necessary for scale economies to be achieved. For two types of activities, pooling loss data and research and development, joint activity appears to be justified. However, it is not clear that joint activity is necessary for efficient trending and development of loss data,

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[50]For a review of economic theories of technical change and its relationship to market structure, see Morton L. Kamien and Nancy L. Schwartz, Market Structure and Innovation (Cambridge: Cambridge University Press, 1982). See also Morris E. Morkre, "Innovation and Market Structure: A Survey," Federal Trade Commission Bureau of Economics Working Paper No. 82 (April 1983).

[51]ISO, "Response," p. 10.

formulation of rates, and distribution of rates to agents and state regulators.

The world does not yield natural experiments that would allow us to test some of the hypotheses we might develop from this discussion. However, in Chapter VI we test several hypotheses concerning the effects of ISO rate formulation on prices. In Chapter V we present data on affiliation with ISO and adherence to ISO prices that is consistent with the conjecture that ISO is an efficient means of meeting state filing requirements.

Collective Pricing and Collusion

Previous studies of the auto insurance market, though concentrating on the effects of state regulation, have frequently suggested that collective pricing may play a role in facilitating non-competitive conduct. Joskow, for example, suggests that prices "are kept above competitive levels by the combined actions of rating bureaus and regulators."[52] (Emphasis added.) Ippolito places even stronger emphasis on the role of rating organizations, suggesting that the role of state regulation may be limited to "sanctioning the cartel-like rates that exist,"[53] and noting that

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[52]Joskow, p. 377.

[53]Ippolito, p. 57.

> The key element of controversy in state price regulatory schemes is the critical role played by the so-called "bureau rates."[54]

Indeed, Ippolito argues that "state price regulators impose significant costs on firms that wish to deviate from the ISO pricing scheme,"[55] and he bases his empirical analysis on

> the Stiglerian suspicion that price regulatory schemes cloak an effort by insurance firms to effectively cartelize rates.[56]

These studies, and many others like them,[57] are the basis for what Danzon has labelled the "cartel model" of rating organizations. Danzon characterizes this model as suggesting that

> cartelization is possible through the combined operation of rating bureaus, which provide a forum for setting cartel prices, and prior-approval rate regulation which provides a legal mechanism for enforcing adherence to bureau rates.[58]

We certainly recognize that state regulation and collective pricing might jointly result in collusion, and we analyze the role played by state regulation later in this chapter. First, however, we consider the possibility that ISO might facilitate collusion <u>independently</u> of state regulation.

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[54]Ibid.

[55]Ibid., p. 58.

[56]Ibid.

[57]See Harrington, "Survey."

[58]Danzon, p. 374.

The Explicit/Tacit Collusion Hypothesis:

A potential cartel can be characterized as facing two somewhat separate hurdles. First, it must determine what price maximizes the profits of its (potential) members. Second, and of crucial importance, there must be a way of "policing a collusive agreement."[59] Posner emphasizes the need to examine the incentives facing individual firms:

> A firm's decision to collude, whether expressly or tacitly, is presumably made by balancing the potential gains of collusion to the firm against the costs of collusion to it, . . . By examining the factors that bear on the private benefits and costs of colluding, we can identify the kinds of market settings in which collusion is likely to be attempted and the amount of communication, formality, etc. that would be required to enable the attempt to succeed.[60]

As we noted in Chapter II, the structural characteristics of the auto insurance market are not conducive to collusion. However, the presence of collective pricing provides a mechanism for communication among firms that throws doubt on the importance of the structural evidence.

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[59]This quotation, and the idea of collusion as depending on the ability of a cartel to police its decisions, is due to Stigler. See George J. Stigler, "A Theory of Oligopoly," in Idem., ed., The Organization of Industry (Homewood, Illinois: Richard D. Irwin, 1968) p. 44.

[60]Richard A. Posner, Antitrust Law: An Economic Perspective (Chicago: The University of Chicago Press, 1976), p. 47. A formal model in which firms compare the benefits of colluding with the benefits of "cheating" on the cartel is found in L.G. Telser, "A Theory of Self-enforcing Agreements," Journal of Business 53;1 (1980), p. 27.

The hypothesis that rating organizations might foster collusion even in the absence of rate regulation has not received much academic attention. Some industry observers, however, have suggested that insurance firms might collude through "conscious parallelism."[61] In fact, Joskow can be interpreted as supporting a type of conscious parallelism theory. He argues that:

> The behavior of direct writers is . . . consistent with profit-maximizing oligopoly behavior of a small group of low-cost firms. . . .[62]

Thus, Joskow also seems to believe there is something more going on in the industry than simple "Stiglerian" regulation.

Rating organizations are well suited to coping with the first problem a potential cartel must overcome -- successfully negotiating a cartel price agreeable to all the members. Because of the complexity of auto insurance, any price structure negotiated among insurance firms must be extremely complex.[63] However, rating organizations are formed

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[61]See John W. Wilson and J. Robert Hunter, "Investment Income and Profitability in Property-Casualty Insurance Ratemaking," in Report of the Advisory Committee, Vol. 2, pp. 54-60.

[62]Joskow, p. 377.

[63]Stigler's comments on this point are particularly apt here:

> Homogeneity is commonly defined in terms of identity of products. . . . Yet it should be obvious that products may be identical to any or every buyer while buyers may be quite different from the viewpoint of sellers. . . . The heterogeneity of purchase commitments (buyers),

(Footnote Continued)

explicitly to aid their members with complex aspects of the rating process. Judgments on trending, loss development, rate relativites across territories and risk classifications, etc., are all explicitly made by the rating organization. Indeed, the rating organization develops the standard risk classifications, territorial definitions and policy forms that make joint pricing possible.

Rate development also requires judgments about how expenses and profits are to be incorporated into rates. A potentially important aspect of ISO's loss-cost procedure is that it does not explicitly treat the expense allocation problem and provide suggested rates. While the loss-cost procedure does not prevent companies from inferring ISO's advisory rate,[64] it is possible that the absence of a published rate increases the costs of collusion. Especially if tacit collusion by firms outside the rating organization is

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however, is surely often at least as large as that of products within an industry, and sometimes vastly larger. (Stigler, "Oligopoly," p. 44.)

[64]See Bailey, et al, p. 59. See also DOJ, Pricing, pp. 159-164. As noted in Chapter III, ISO calculates its permissible loss ratio on the basis of nationwide data, and typically varies the ratio across states only to the extent that tax provisions differ. In the rate filings provided by ISO for this study, the provision for commissions and production expenses was always 20 percent, the provision for general expenses was 8.5 percent, and the provision for profits and contingencies was five percent. Thus, companies in loss-cost states might infer the ISO rate by adding the standard expense provisions to the published ISO loss-cost only rate. Alternatively, companies may infer the ISO rate in loss-cost only states by observing the the published ISO rate in neighboring states using the traditional procedure.

necessary for non-competitive prices to prevail, the presence of published prices may play an important role in facilitating focal point pricing.[65] Because rates are not published in states using the loss-cost procedure, we can test this hypothesis by comparing prices in loss-cost states with prices in other states.

The absence of direct committee review of rates in some states might also affect collusive price-setting. Given the complexity of auto insurance price schedules, direct contact between insurers practically may be necessary for agreement on a set of cartel prices. Whether the indirect control over rates -- through procedures made by the ISO Actuarial Committee and/or through pressure on ISO staff -- that could be exercised in the absence of committee review would be sufficient to achieve a collusive price schedule is questionable.[66] Because the committee reviews rates in some states but not others, however, we are able to test for effects of committee involvement on prices.

Even if price collusion is successful, competition may occur in non-price dimensions of auto insurance.[67] First,

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[65] See Scherer, pp. 184-193, for a discussion of rule of thumb and focal point pricing behavior.

[66] See Hanson, et al, pp. 452-453 for a discussion of this issue.

[67] As we noted in Chapter II, there is a range of price quality options available in the auto insurance market.

firms may compete by adjusting their underwriting standards. For example, if prices were set above the competitive level, firms might loosen their underwriting standards, accepting customers who could not have been insured for a profit at the competitive price but who are profitable to insure at the cartel price. While price cuts would be easy to detect, company underwriting standards are not commonly public, so such cheating would not be directly observable.[68]

A more conventional form of non-price competition involves competition in service quality.[69] In the auto insurance market, firms may increase their advertising, improve the number and attractiveness of their retail outlets, hire better-trained sales personnel, increase the array of products they offer, or provide a variety of other "frills."[70]

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[68]Ippolito argues that the loosening of underwriting standards cannot, by itself, completely deplete cartel profits. (Ippolito, p. 69.) If the price for a given risk class is set above the competitive price, insurers will loosen underwriting standards until marginal economic profits are zero, but this would not affect the positive economic profits earned on inframarginal drivers; average and total profits would remain positive.

[69]The seminal work on non-price competition is Stigler's. See George Stigler, "Price and Non-Price Competition," Journal of Political Economy 76;1 (January-February 1968), pp. 149-154. See also George W. Douglas and James C. Miller III, Economic Regulation of Domestic Air Transport (Washington, D.C.: Brookings Institution, 1975), especially pp. 57-60.

[70]Service competition of this type is frequently observed in markets with price collusion and/or price regulation. On service competition in the securities brokerage industry, for example, see Jeffrey A. Eisenach and (Footnote Continued)

Yet another possibility is that firms might compete in the generosity of their loss settlements.

Certain aspects of ISO activities could be useful in detecting non-price competition. For instance, detailed data on loss experience reported to the rating organization might be useful in determining if a reporting firm has loosened its underwriting or claims payment policies (higher losses per unit of exposure would provide a basis for this inference), and the detailed analysis of these data undertaken by the rating organization might have as a by-product the detection of cheaters.[71] The nationwide expense ratio published by ISO could also serve as a benchmark for the detection of cheaters.[72]

Despite the lack of any evidence that ISO actively promulgates underwriting and service quality standards, then, we cannot exclude a priori the possibility that ISO firms, at least, successfully collude on both price and service quality. Previous studies that have rejected the explicit/tacit collusion hypothesis would not dispute this

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James C. Miller III, "Price Competition on the NYSE," Regulation 5;1 (January/February 1981), pp. 16-19.

[71]Of course, firms could avoid this possibility by reporting data in less detail, or reporting through one of the other statisical organizations, though this would make use of the ISO's data base more costly due to the ISO's price discounts for reporting.

[72]Firms with expense ratios greater than the ISO benchmark, for example, might be presumed to be engaging in service quality competition.

conclusion. Danzon, for example, suggests that even the service model of rating organizations allows that "in setting recommended rates the bureau will set those rates that maximize the expected profits of its members."[73] Instead, previous studies have rejected this hypothesis on the basis of evidence that only a minority of firms are affiliated with ISO. Danzon cites data indicating that ISO serves as a statistical agent for companies writing only about 30 percent of auto insurance premiums nationwide. (See Table 15.)[74] Unfortunately the extent of correlation between the firms that report statistics to ISO and those that receive (and/or charge) ISO rates has, until now, been unknown. However ISO has provided data for this study that allows us to take a far more detailed look at the extent of affiliation. We examine this data in Chapter V.

<u>The Role of State Regulation</u>: Previous studies, notably Joskow's and Ippolito's, have suggested that prior-approval regulation conforms to the Stiglerian or "capture theory"

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[73] Danzon, p. 376.

[74] Danzon, pp. 382-383.

TABLE 15

DISTRIBUTION OF AUTO INSURANCE BUSINESS
BY STATISTICAL AGENT, 1977

	ISO	NAII	NISS	Other
Liability Written Car Years*	26,867	47,440	5,574	10,555
Percentage of Total	29.75	52.52	6.17	11.69

Source: National Industry Committee on Automobile Insurance Plans, "Distribution of Business by Statistical Agent," Circular No. RC 79-14, June 12, 1979.

* (000's omitted)

model[75] -- that is, that prior-approval regulation serves to enforce cartel prices.

The prior-approval/open-competition dichotomy seems to capture one important aspect of state regulation. That is, prior-approval states are more likely to exercise stringent review of rates than are open-competition states. While all states technically permit regulatory authorities to review and reject rates, the cost of _ex post_ disapproval of rates is clearly higher than the cost of _ex ante_ disapproval (because, for example _ex post_ disapproval requires that rating manuals

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[75]See George Stigler, "The Theory of Economic Regulation," _Bell Journal of Economics_ 2;1 (Spring 19 1), pp. 3-21; Sam Peltzman, "Toward a More General Theory of Regulation," _Journal of Law and Economics_ 19 (1976), pp. 211-240; and, Richard A. Posner, "Theories of Economic Regulation," _Bell Journal of Economics_ 4;2 (Autumn 1974), pp. 335-358.

be recalled from agents and reprinted). These costs are imposed initially on the firms suffering disapproval, but they can shift the costs to state regulators through lobbying efforts and/or court challenges. Thus, states that expect to disapprove rate filings will generally prefer prior-approval systems to systems that allow for only ex post review of rates.[76]

Previous studies have consistently found at least three effects of prior-approval regulation:

(1) Adherence to ISO prices is more frequent in prior-approval states than in open competition states.[77]

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[76] It must be recognized, however, that the stringency of review probably is a complex function of the exact type of filing process, the resources devoted by the insurance department to reviewing rates, and other factors not completely captured by the prior-approval/open-competition dichotomy. For a discussion of different rate filing systems, see Hanson, et al, pp. 53-58. For data on diversity across states in the resources devoted to regulation, see GAO, Issues, Chap. 3.

An entirely different rationale for distinguishing between prior-approval regulation and ex post regulation rests in the developing literature on "facilitating practices." This literature suggests that prior notification of price changes may facilitate oligopolistic pricing by reducing the gains to potential cartel "cheaters," For example, Charles Holt and David Scheffman, "Facilitating Practices and the FTC's Ethyl Case," manuscript, Federal Trade Commission, 1984.

[77] See the discussion at pp. 97-98 above. See also Danzon, pp. 376-381.

(2) The proportion of drivers insured through the shared market is higher in prior-approval states than in open competition states.[78]

(3) The market share of direct writers is lower in prior-approval states than in open competition states.[79]

It is possible to argue that these findings support the capture-theory hypothesis. Greater adherence to ISO prices in prior-approval states may reflect adherence to a cartel price. A large proportion of drivers in the shared market may reflect a form of price discrimination. And, it is plausible that supracompetitive rate levels imposed by "captured" regulators protect agency firms from competition from direct writers. Ippolito concludes, for example, that regulation "acts to lengthen the expected economic life of more inefficient [agency] firms."[80]

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[78]Ippolito concludes that "The effect of regulation is to more than double the size of the assigned risk pool." (p. 81.) See also DOJ, Pricing, pp. 61-75, Hanson, et al pp. 315-322, and Joskow, pp. 407-411.

[79]See especially Ippolito, who concludes that regulation reduces direct writers' market share by about 15 percent. (See p. 78.) See also GAO, Issues, pp. 407-411.

[80]Ippolito, p. 87. Agency firms would also benefit from price floors if they efficiently provide a higher level of service (at a higher price). In either case, agency firms may have an incentive to see prices set above the competitive level. If agency firms are more efficient at providing high-quality, high-priced service than direct writers, then these firms would benefit from price floors because direct writers would be unable to compete effectively at the state-mandated price levels. An informal model demonstrating this proposition appears in Appendix 4.

However, support for the capture-theory is less than convincing unless evidence is produced indicating that prices are increased by regulation. The evidence on this score is extraordinarily weak. Ippolito's results are typical of those reached in many studies: Using pooled cross-section/time-series data on policy prices in ten states over a six-year period, he found that regulation actually tended to lower prices. In a second set of regressions, using the loss ratio as a proxy for the price of insurance, he found regulation to have no significant effect.[81] Other studies have found regulation to increase prices,[82] but overall support for this finding is weak. Indeed, a recent survey of results in this area concludes that

> A considerable amount of evidence suggests that average loss ratios and prices did not differ between [open-competition and prior-approval] states during the overall time periods analyzed.[83]

The lack of empirical evidence of price effects raises serious questions about the validity of the capture theory of regulation and, in view of the possible joint effects of rate regulation and collective pricing, about the cartel model of collective pricing as well. However, no previous study of the

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[81]Ippolito, pp. 65-69.

[82]See, for example, Richard P. Saba, "An Alternative Theory of the Regulation of Automobile Insurance," Southern Economic Journal 45;2 (October 1978), pp. 469-476.

[83]Harrington, "Survey," p. 57.

determinants of auto insurance prices has accounted explicitly for differences in rating organization procedures and affiliation across states, or examined carefully the possibility that such differences might exert an independent influence on prices.

In addition, very few studies have looked at possible subtleties in state regulatory behavior. For example, nearly all previous studies have assumed prior-approval regulation will have the same effect in all states. These studies ignore the importance of the <u>standard</u> for regulatory approval. It is quite possible that regulators in some prior-approval states view themselves as restraining potential cartel pricing, and thus generally disapprove the highest rates, while other regulators, perhaps seeing themselves as guarantors of insurance company solvency, tend to disapprove the lowest rates. The standards contained in most state insurance statutes are broad enough to accomodate either possibility.

A few earlier studies have addressed this problem, relying on three different approaches to capturing variation in regulatory behavior. First, some studies have noted variation in the explicit criteria states use for evaluating rates. In particular, some states explicitly consider investment income in ratemaking decisions, while others base their review primarily on the relationship between premium revenues, on the one hand, and expenses and losses on the other. Some advocates of considering investment income in ratemaking decisions have argued that failure to do so may result in approval of rates that are "too high."[84] If so, states that consider investment income might be considered relatively likely to conform to the public interest model.

The investment income approach fails for two major reasons. First, studies that have analyzed the effects of considering investment income have not found a statistically significant effect.[85] Second, and more important, the consideration of investment income in ratemaking decisions would only be important if there were a scientific (or at least well-defined) process by which rates are evaluated. The fact is, in most states regulators rely on broad rules of thumb and/or subjective judgments. The fact that investment income is considered says nothing about whether the regulator views it to be an important factor, nor does it necessarily imply meaningful limits on the broad discretion most regulators possess. These factors, plus the difficulty of quantifying the wide variation in the use of investment income in ratemaking, lead us to reject this approach.

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[84] See, for example, Report of the Advisory Committee to the NAIC Task Force on Profitability and Investment Income, by Richard J. Haayen, Chairman (January 1983), especially Vol. 2.

[85] See, for example, William B. Fairley, "Investment Income and Profit Margins in Property-Liability Insurance: Theory and Empirical Results," Bell Journal of Economics 10;1 (Spring 1979), pp. 192-210.

A second, related approach is pursued in the GAO study. That study hypothesized a connection between regulatory behavior certain quantifiable aspects of regulatory institutions. For example, one hypothesis tested involved the means by which regulators are selected, suggesting elected insurance commissioners might be more likely to represent consumers' perceived interests than commissioners appointed by state governors. However, no evidence of differential effects was found.[86]

A third approach to capturing differences in regulatory behavior is the "random coefficients" technique applied by Harrington. He argues that

> researchers have noted that the impact of prior approval regulation may differ substantially among states with prior approval laws due to differences in enforcement and administrtion of the laws by state insurance departments. However, the studies have not employed methodologies that adequately reflect the possible variation in regulatory behavior when estimating the impact of prior approval regulation. Instead, a dummy variable for prior approval regulation generally has been included in the loss ratio model, and the coefficient for the regulatory dummy variable has been assumed to be constant for all prior approval states.[87]

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[86] See GAO, Issues, Appendix III. Glassner also utilizes a variant on this approach, with similar results. See Glassner, pp. 58-59 and p. 71.

[87] Scott Harrington, "A Random Coefficient Model of Interstate Differences in the Impact of Rate Regulation on Auto Insurance Prices," manuscript, 1984, p. 3.

Harrington attempts to correct the problem by using a random coefficients model that allows the coefficient on the prior-approval term to vary across states. While we believe his study is flawed by its reliance on the loss ratio as a dependent variable (see below), his results do indicate that prior-approval regulation differs across states.

In this study, we take a more direct approach. A 1980 survey of state insurance commissioners, based on the literature on government regulation cited above, found that

> Whereas one group [of state insurance commissioners] was aligned with the public interest theory, the other was closer to the political-economy models of regulation.[88]

Specifically, the survey asked state insurance commissioners which of the following characterizations best described their view of their job:

> <u>Commissioner as Representative of the Public Interest</u>: "It is my opinion that the regulator should represent the public interest and not the insurance industry. I don't believe, as the insurance industry does, that there should be a position which is the arbiter between the industry and the public."
>
> <u>Commissioner as Arbiter between Public and Industry</u>: "We seek to develop a relationship of trust between the public and ourselves, between ourselves and the industry, and between the public and the industry. The industry is part of our constituency. They are the public as much as individuals, although they need less help than the individual consumer."

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[88] See Robert H. Miles and Arvind Bhambri, <u>The Regulatory Executives</u> (Beverly Hills: Sage Publications, 1983), pp. 26-27.

Commissioners were asked to agree with only one of the statements, and they were promised that their responses would be kept confidential. While the guarantee of confidentiality means we cannot simply include the commissioners' responses as dummy variables in our model, empirical analysis of the responses included in the study showed that "public-interest-motivated" commissioners were most likely to reside in urban states. In our empirical work below, we rely on this correlation to capture differences in regulatory behavior, reasoning that the public interest theory is more likely to be validated in urban states.[89]

We further refine our treatment of state regulation by accounting for a third dimension of rate regulation -- state "shared market" or "assigned risk" plans. As indicated above, the proportion of drivers insured through the shared market is correlated with the type of rate regulation. Nationally, only about six percent of all drivers were insured through the shared market in 1980, but this proportion varied between practically nil in many states to over 50 percent in New Jersey and Massachusetts. (See Table 11.) With only a few

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[89] The urban/non-urban distinction was one of several that was found to be a significant predictor of regulatory behavior, but it was the most powerful predictor. See Ibid., pp. 79-80. Of course, this finding is consistent with public choice models of the regulatory process, which suggest consumer groups may be more influential where the costs of communicating are low, e.g. where most consumers live in urban areas.

exceptions (i.e. Florida, Oregon and Virginia), all of the states in which a large proportion of drivers are insured through the shared market are also states with prior-approval rate regulation or rates made by state rating bureaus. The converse is not true, however: not all prior-approval states have large proportions of drivers in the shared market. This suggests that regulators in prior-approval states sometimes (but not always) manipulate voluntary market rates to force drivers into the shared market.[90]

The cross-subsidization involved in the shared market could impose costs on producers and consumers of auto insurance through a number of mechanisms. For example, cross-subsidization may require companies to devote greater resources to selecting low-risk drivers, thereby increasing overall costs. Thus, it is important to account for the shared market in empirical studies of auto insurance prices, and we do so in our empirical work below.

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[90] There would appear to be two possible mechanisms by which states influence the proportion of drivers in the shared market. First, regulators might hold shared market rates below cost, in which case drivers would choose to insure through the shared market in order to obtain subsidized rates. Alternatively, regulators might hold voluntary market rates below cost (that is, below the cost of insuring the worst drivers in a given risk class, which of course is greater than the cost of insuring the best drivers), in which case companies would choose to insure only the best drivers in each risk class, and force the rest into the shared market. Ippolito finds the presence of prior-approval regulation to roughly double the size of the shared market.

Summary

The service model of collective pricing suggests that joint activities, including joint ratemaking, may capture economies associated, for example, with statistical properties of ratemaking methods, practical problems of printing materials, or costs imposed by state regulators. The case for joint ownership of an organization performing some ratemaking functions is in some cases difficult to make, however. The argument for joint ownership is fairly strong with respect to sharing of data, formulation of risk classification schemes, and research and development, but less convincing with respect to trending and development of loss data and formulation of actual rates.

The cartel model suggests collective pricing facilitates collusion. Previous studies have recognized the possibility that collective pricing operates jointly with state rate regulation to facilitate collusion, but studies of rate regulation have failed to produce evidence of price effects that would confirm the capture-theory hypothesis. We suggest a number of flaws in previous studies, including the failure to account explicitly for differences in collective pricing regimes and prior-approval regulation, and we present an explicit/tacit collusion hypothesis that suggests an independent effect of collective pricing on market performance.

Previous studies have yielded findings consistent with both the service and cartel models. In Chapter V we present new data that allows us to examine in greater detail the findings concerning adherence to ISO prices and affiliation with ISO. While this data cannot ultimately distinguish between the cartel and service models, it does provide insight into the role played by collective pricing and by ISO in particular. In Chapter VI we present results of cross-state price regressions that incorporate cross-state differences in collective pricing procedures, the extent of ISO affiliation, and in the administration of prior-approval regulation, and thus allow for a direct test of the cartel model versus the service model.

CHAPTER V

DATA ON AFFILIATION WITH ISO AND ADHERENCE TO ISO PRICES

In this chapter we present data on the extent of affiliation with ISO and on affiliation with ISO prices. The first section below discusses the predictions of the service and cartel models concerning affiliation and adherence. The second section presents relevant data on adherence to ISO prices, based on a large but non-random sample of prices in 40 states. The third section presents comprehensive data on ISO affiliation based on raw data provided by ISO and A.M. Best Company. The final section briefly summarizes the chapter.

Theoretical Predictions Concerning Affiliation and Adherence

The service model of collective pricing suggests that rating organizations may be an efficient means of meeting the requirements of rate regulation, and thus that affiliation with ISO and adherence to ISO rates may be more common in prior-approval states than in open competition states. The cartel model is also consistent with these propositions. Adherence to the "cartel" price should be greater where it is enforced by state regulators, and we might expect more firms to affiliate with ISO in states where regulators support the cartel. By similar logic, both models suggest that affiliation with ISO and adherence to ISO prices will be greater in states using ISO's traditional rating procedure than in states using the competitive rating procedures.

Two propositions follow from our discussion of the direct writer/agency firm dichotomy. First, agency firms may be more likely to affiliate with ISO than direct writers, either because ISO "produces" higher prices, or because agency firms are typically smaller than direct writers and affiliate to capture scale economies. Second, if regulation and collective pricing jointly raise prices, or if ISO ratemaking is a more efficient means of coping with state regulatory requirements for agency firms than for direct writers, then the effect of state regulation in increasing ISO affiliation should be stronger with respect to agency firms than with respect to direct writers.

Finally, the overall extent of affiliation with ISO and adherence to ISO prices obviously may be indicative of the importance of ISO's role in the market. In particular, the explicit/tacit collusion hypothesis presented in Chapter IV suggests that collusion is relatively likely in states where ISO affiliation is extensive. The data on overall affiliation and adherence presented below is thus relevant in establishing prior beliefs about the validity of the cartel and service models.

Data on Adherence to ISO Prices

As indicated in Chapter III, ISO publishes Premium Comparison Service (PCS) reports for every state. We obtained a complete set of the PCS reports issued nearest to July 1, 1980.[1] Each report contains price observations for two policy types, for every territory, for several companies. Companies are selected from three categories: national agency companies, state agency companies, and direct writers. Generally, the largest companies in each category are selected, guaranteeing that the companies for which prices are reported represent a substantial proportion of the market.[2]

There are a number of factors that must be considered in evaluating the data. First, prices are quoted for all territories in each state, and observed within-state variation in prices may simply represent variation across territories. More variation would be observed in a state with many (heterogenous) territories than in a state with only a few (homogenous) territories, even though the extent of cross-

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[1]Reports are issued on different dates in each state. The earliest report was dated May 15, the latest October 15.

[2]PCS reports include observations for companies representing at least 50 percent of total premium volume in each state, plus additional companies with significant (usually two percent or greater) market shares. Of the 16 reports that indicated the exact proportion of premiums accounted for by the companies surveyed, the lowest proportion was 63 percent and the highest was 89 percent, with a mean of 71 percent.

company variation was the same in the two states. This factor limits the usefulness for analyzing cross-company price variations of such gross measures of variance as the coefficient of variation.

Second, ISO prices are not available for seven states in which ISO published only loss-costs in 1980, or for the four states served by state-operated or independent rating organizations.

Third, the data set includes price observations for companies that write "sub-standard" business. Such companies' prices are often much higher than the ISO advisory rate. There is no easy way of identifying such companies, however, because there is no way of determining whether price variations are the result of different underwriting policies, differences in service quality or efficiency, or other factors. Thus, the analysis below includes all companies for which a price was given.[3]

Finally, the ISO selection process introduces some biases. First and foremost, ISO selects the companies it includes on the basis of size. As noted by Danzon,[4] one implication of the cartel model is that large firms are more likely to adhere to ISO prices than small firms; the service

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[3]A related issue is the treatment of shared market prices, which are sometimes given in the PCS reports. We excluded these observations from the analysis below.

[4]Danzon, p. 374.

model implies the opposite. Thus, the direction of this bias cannot be determined a priori.

A second type of selection bias involves the choice of policies for which prices are surveyed. ISO chooses the same policies for each survey, and companies may thus be aware which of their prices will be included in the survey. If the PCS is actually a means of detecting (and ultimately punishing) deviations from the cartel price, then we would expect cartel "cheaters" to adhere to the ISO price for the two policy types surveyed and deviate from the ISO price for other policy types. Thus, under the cartel model, the prices surveyed should overstate adherence to the ISO price.

Despite these limitations, this set of over 7,000 price observations in 40 states provides an excellent means of examining adherence to ISO prices. In the tables below we present summary data; a complete state-by-state analysis appears in Appendix 3.

Table 16 shows the number and percentage of observations in all 40 states in our sample, according to percentage deviation from the comparable ISO advisory price -- that is, from the ISO advisory price for the corresponding territory, state, and policy. Overall, only 4.0 percent of all prices are equal to the ISO advisory price, while over half of the observations fall more than 10 percent below the ISO price. It should be noted that an adherence rate of 4.0 percent is not substantial by common-sense standards of market

TABLE 16

DISTRIBUTION OF PRICE OBSERVATIONS
RELATIVE TO THE ISO ADVISORY PRICE
40 STATES

Percent Deviation From ISO		Absolute Frequency	Relative Frequency (Percent)
More than	-25	1826	25.0
	-25	2205	30.2
	-10	770	10.6
	- 5	678	9.3
	0	293	4.0
	5	457	6.3
	10	335	4.6
	25	425	5.8
More than	25	306	4.2
Total		7295	100.0

concentration, the pattern of wide dispersion around the ISO price is not indicative of cartel pricing. Thus, the overall pattern of prices does not provide support for the cartel model.

In Table 17 we compare prior-approval states with open-competition states, remembering that both the service and cartel models predict that adherence will be greater in states with prior-approval rate regulation. The proportion of price observations equal to the ISO price in open-competition states is 0.3 percent, compared with 5.3 percent in prior-approval states. While both proportions are relatively small, the difference is statistically significant.[5] Another finding of interest is that, in the absence of prior-approval regulation, virtually no prices are set equal to the ISO price.[6]

A second area of interest is the effect of traditional versus competitive rating procedures on adherence to ISO

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[5]We test the hypothesis that the proportions in the two samples are identical using the normal approximation to a binomial distribution. The test statistic is the familiar Z statistic.

$$Z = \frac{x_1/n_1 - x_2/n_2}{[(x_1 + x_2)/(n_1 + n_2)]\ (1/n_1 + 1/n_2)^{1/2}}$$

where n_i is the number of observations in cell i and x_i is the number of "successes."

[6]Obviously, the proportion of observations exactly equal to the ISO price is only one measure of deviation. As inspection of the tables indicates, however, the proportion of observations equal to the ISO price tends to be correlated with the "tightness" of the distribution around that price.

TABLE 17

DISTRIBUTION OF PRICES RELATIVE TO THE ISO ADVISORY PRICE
PRIOR-APPROVAL STATES VS. OPEN-COMPETITION STATES

	Prior-Approval States		Open-Competition States	
Percent Deviation From ISO	Absolute Frequency	Relative Frequency (Percent)	Relative Absolute Frequency	Frequency (Percent)
More than -25	1103	20.4	723	38.4
-25	1631	30.1	574	30.5
-10	610	11.3	160	8.5
-5	568	10.5	110	5.8
0	287	5.3	6	0.3
5	388	7.2	69	3.7
10	269	5.0	66	3.5
25	364	6.7	61	3.2
More than 25	190	3.5	116	6.2
Total	5410	100.0	1885	100.0

prices. In Table 18 we compare adherence in states in which the traditional rating procedure was in effect in 1980 with adherence in states where rates were developed without involvement by the ISO committee.[7] In states where ISO's Private Passenger Auto Committee reviewed rates, 6.5 percent of the observations equaled the ISO advisory price, compared with 0.5 percent in no-committee states. Once again, we are able to reject the hypothesis that the proportions in the two states are equal and thus validate the predictions of the service and cartel models.[8]

These results strongly support the conclusion reached in previous studies that adherence to ISO prices is greater in prior-approval states than open competition states. The extent of adherence indicated here is also consistent with earlier estimates.[9] While the evidence of greater adherence in prior-approval/traditional rating states than in open

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[7]It is not possible, of course, to compare adherence to the ISO price in loss-cost states with traditional states, since no ISO price is developed in the former states.

[8]Interpretation of these results is complicated by the fact that rate regulatory systems and ISO pricing systems are not entirely independent. In particular, ISO implemented its no-committee procedures in states defined as open-competition states, some of which we classified as prior-approval states. Thus, states using the traditional procedure may essentially be a subset of regulated states, chosen on the basis of the stringency of regulation. Under these circumstances, is it difficult to disentangle the effects of regulation, on the one hand, from the effects of the traditional rating procedure, on the other.

[9]See especially DOJ, Pricing, pp. 76-85.

TABLE 18

DISTRIBUTION OF PRICES RELATIVE TO THE ISO ADVISORY PRICE
TRADITIONAL VS. COMPETITIVE RATING STATES

	Traditional Rating States		Competitive Rating States	
Percent Deviation From ISO	Absolute Frequency	Relative Frequency (Percent)	Absolute Frequency	Relative Frequency (Percent)
More than -25	1225	29.1	571	19.1
-25	1159	26.9	1046	35.0
-10	342	7.9	428	14.3
-5	432	10.0	246	8.2
0	278	6.5	15	0.5
5	217	5.0	240	8.0
10	207	4.8	128	4.3
25	259	6.0	166	5.6
More than 25	158	3.7	148	5.0
Total	4307	100.0	2988	100.0

competition/competitive rating states is consistent with either the service model or the cartel model of collective pricing, the low overall level of adherence does not support the cartel model.

Data on ISO Affiliation

For this study, ISO provided detailed 1980 affiliation data for each state. We combined these data with data from A.M. Best Company on direct automobile insurance premiums written by each firm in each state. Whereas our price data consisted of a non-random (though very large) sample, our data on affiliation constitute a nearly complete census of ISO affiliation by all firms writing auto insurance in the U.S. In the tables below we present summary data; a complete state-by-state analysis appears in Appendix 4.

A firm's decision to affiliate with ISO may be state-specific: firms affiliate in some states but do not in others.[10] To present data on nationwide affiliation, we count each firm/state combination as an observation. These data are presented in Table 19 for nine categories of ISO affiliation. Of the more than 5,600 observations, about 40 percent indicate some form of ISO affiliation, but these observations account for less than 30 percent of total auto insurance premiums. The data indicate that the combined market share of firms

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[10] ISO provided data on affiliation by companies within groups. We defined a group as being affiliated if _any_ of its member companies were affiliated, and we continue to define a firm as a group.

TABLE 19

AFFILIATION WITH ISO

Type of Affiliation	Firm/State Observations Number	Percent	Premiums Billions of dollars	Percent
Member	1309	23.3	$4.07	12.9
Subscriber	455	8.1	1.75	5.6
Service Purchaser	556	9.9	2.77	8.8
Receive Rates	1950	34.7	5.66	18.0
Filing Authorization*	1394	24.8	3.25	10.3
Distribution to Agents	1787	31.8	4.81	15.2
Actuarial Services	1309	23.3	5.82	18.5
Statistical Agent	1641	29.2	5.40	17.1
Premium Comparison Service**	135	2.4	1.33	4.2

Total Number of Observations: 5620

Total Premiums Written (all firms) = $31,532,076,000

* Filing authorization indicates that a company has given ISO authority to file rates on its behalf. The data provided by ISO does not indicate which companies actually file rates through ISO. It is probable that many companies that have given ISO authority to file nevertheless file their own rates, and possible that ISO receives authority to file for some companies on an informal or one-time basis that is not reflected in this data. Moreover, the national aggregation may be misleading, since ISO does not offer filing services in many states.

** The Premium Comparison Service is included in rates service. This data therefore reflects only those companies that purchase the Premium Comparison Service but do not receive rates.

using ISO as a statistical agent is 17.1 percent, much less than the 29.8 percent indicated in the data used by Danzon.[11] However, the Danzon data appear to give a reasonably accurate picture of overall affiliation.

While the data presented in Table 19 are interesting, they are not very valuable for analytical purposes. We have argued that the relevant market for measuring concentration is an individual state. Thus, the explicit/tacit collusion hypothesis suggests that collusion is more likely in states with high rates of ISO affiliation than low rates. Moreover, since tacit collusion among unaffiliated firms is necessary for a collusive result, we expect such a result is more likely in states with many evenly-sized unaffiliated firms than in states with only a few large independents.

To measure the effective degree of concentration in each state, we calculated Herfindahl-Hirschman indices for each state on the assumption that all firms that receive ISO rates act together as a single firm.[12] (See Table 20.) While

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[11]See Table 15. It is not clear whether the discrepancy represents a drop in ISO affiliation between 1977 and 1980 or, more likely, can be attributed to differences in the data itself. For example, the data used by Danzon calculates market share on the basis of car-years, while our data uses premiums.

[12]While intuition suggests that firms that pay to receive ISO rates are most likely to adhere to ISO rates and/or the ISO rate structure, the decision to concentrate on this measure of affiliation is to some extent an arbitrary one. As the data presented in Appendix 4 shows, however, all of the affiliation measures are highly correlated. Thus, the choice should not affect our results in a qualitative sense.

TABLE 20

HERFINDAHL-HIRSCHMAN INDICES
WHEN ALL ISO AFFILIATES ARE COUNTED
AS A SINGLE FIRM, 1980

State	Herfindahl-Hirschman Index
Alabama	1573
Alaska	1547
Arizona	1323
Arkansas	1217
California	1104
Colorado	1362
Connecticut	1644
Delaware	1592
District of Columbia	1456
Florida	1202
Georgia	1482
Hawaii*	910
Idaho	1153
Illinois	1191
Indiana	1169
Iowa	1345
Kansas	1339
Kentucky	1289
Louisiana	1425
Maine	2806
Maryland	1189

TABLE 20 - Continued

State	Herfindahl-Hirschman Index
Massachusetts*	546
Michigan	1335
Minnesota	1179
Mississippi	1768
Missouri	1243
Montana	1295
Nebraska	1018
Nevada	1591
New Hampshire	2790
New Jersey	1426
New Mexico	1286
New York	1119
North Carolina*	548
North Dakota	1031
Ohio	1092
Oklahoma	1245
Oregon	987
Pennsylvania	1081
Rhode Island	1799
South Carolina	2322
South Dakota	1214
Tennessee	1267
Texas*	674
Utah	1388
Vermont	2013
Virginia	1293
Washington	925
West Virginia	1571
Wisconsin	1019
Wyoming	1389

* ISO does not operate in these states; H-indices do not reflect rating organization affiliation.

the modified H-indices still fall below the "highly concentrated" benchmark of 1,800 in all but four states, there are substantial increases (relative to the indices presented in Table 7) in many states and dramatic ones in a few. In Maine, for example, the indicated H-index rises from 486 to 2806. These figures provide a priori support for the explicit/tacit collusion hypothesis, and we test this hypothesis (in Chapter VI) by incorporating these modified Herfindahl indices in our cross-state price regressions.

In Table 21 we present data on affiliation in prior-approval and open competition states. The data indicate that 35.4 percent of all firms affiliate in prior-approval states, compared with 33.8 percent in open competition states. However, the difference is not statistically significant at a reasonable level of confidence. Table 22 examines affiliation in states using the traditional and competitive ISO procedures.[13] The data indicate that 35.4 percent of firms affiliate in traditional rating states compared with the smaller proportion of 34.1 percent in competitive rating states. The difference is again not statistically significant, however. Thus, contrary to the implications of both the service and cartel models, there is no significant

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[13]We include in the competitive category states in which the ISO committee is not involved.

TABLE 21

AFFILIATION FOR RATES
OPEN-COMPETITION STATES VS. PRIOR-APPROVAL STATES

	All States		Open-Competition States		Prior-Approval States	
	Absolute Frequency	Relative Frequency	Absolute Frequency	Relative Frequency	Absolute Frequency	Relative Frequency
Unaffiliated Firms	3670	65.3	1597	66.2	2073	64.6
Affiliated Firms	1950	34.7	814	33.8	1136	35.4
Total	5620	100.0	2411	100.0	3209	100.0

TABLE 22

AFFILIATION FOR RATES
TRADITIONAL VS. COMPETITIVE ISO PROCEDURE

	All States		Competitive Rating States		Traditional Rating States	
	Absolute Frequency	Relative Frequency	Absolute Frequency	Relative Frequency	Absolute Frequency	Relative Frequency
Unaffiliated Firms	3670	65.3	1888	65.9	1782	64.7
Affiliated Firms	1950	34.7	978	34.1	972	35.3
Total	5620	100.0	2866	100.0	2754	100.0

difference in affiliation associated with rate regulatory regimes or ISO procedures.

Data on the propensities of agency firms and direct writers to affiliate with ISO are presented in Table 23. The data indicate that agency firms are more likely to affiliate with ISO than direct writers: overall, agency firms are affiliated with ISO in 36.6 percent of all observations, compared with 29.9 percent for direct writers, a difference that is significant at a 99 percent level of confidence. Table 23 also indicates that there is virtually no difference between direct writers' affiliation in open competition and prior-approval states, while more (37.5 percent) agency firms affiliate in prior-approval states than in open competition states (35.4 percent). While this finding is consistent with the implications of the service and cartel models, the difference between 37.5 percent and 35.4 percent is not statistically significant.

Summary

Differences in rate regulation and in ISO procedures clearly affect adherence to ISO prices, and they appear to exert a weak (though not statistically significant) influence on affiliation. Affiliation is also sensitive to firm-specific characteristics, with smaller, agency firms more likely to affiliate than larger, direct-writer firms. However, these findings are inconclusive as to whether

TABLE 23

AFFILIATION FOR RATES
DIRECT WRITERS AND AGENCY FIRMS

	Total		Open Competition		Prior Approval	
	Absolute Frequency	Relative Frequency (Percent)	Absolute Frequency	Relative Frequency (Percent)	Absolute Frequency	Relativ Frequenc (Percent
Direct Writers						
Unaffiliated Firms	1127	70.1	485	70.3	642	69.9
Affiliated Firms	481	29.9	205	29.7	276	30.1
Total Direct Writers	1608	100.0	690	100.0	918	100.0
Agency Firms						
Unaffiliated Firms	2543	63.4	1112	64.6	1431	62.5
Affiliated Firms	1469	36.6	609	35.4	860	37.5
Total Agency Firms	4012	100.0	1721	100.0	2291	100.0

collective pricing facilitates collusion, enhances efficiency, or both. The low overall rate of adherence to ISO prices and the relatively small market share of ISO affiliates provides little support for the cartel model. On the other hand, the modified Herfindahl indices in Table 20 are sufficiently high to provide some *a priori* support for the explicit/tacit collusion hypothesis.

CHAPTER VI

THE EFFECTS OF COLLECTIVE PRICING ON AUTO INSURANCE PRICES

As indicated in Chapter IV, the cartel model predicts that average prices will be higher in states where the rating organization plays an important role than in the states it does not, other things equal. Moreover, if regulation facilitates collusion, states with active rating organization <u>and</u> regulation will have higher prices than states with neither or only one of these factors. To the extent non-price competition occurs, states with supracompetitive unit prices may exhibit supracompetitive unit costs as well. The predictions of the service model are exactly opposite. That is, extensive collective pricing activity should be associated with lower costs and prices.

In this chapter we determine whether auto insurance premiums are higher or lower, on average, in states with effective collective pricing or regulation than in states without effect collective pricing or regulation. Specifically, we estimate a multiple regression model in which a measure of price is related to several factors, including measures of collective pricing and regulation. This technique enables us to estimate, based on actual market data from a cross section of states, the separate effects of our collective pricing and regulation measures. Of course, such estimates are only as good as our measures of collective pricing and state regulation. And, unfortunately, there are potential measurement problems.

First, assuming that we can adequately distinguish more or less effective collective pricing and more or less stringent regulation, regulation and collective pricing are not completely independent. For example, if states that prohibit collective ratemaking are classified as no-regulation states, we will probably not observe effective collective ratemaking in no-regulation states. Fortunately, there is sufficient variation in collective pricing practices across states that do not prohibit joint ratemaking for us to estimate the separate effects of regulation and collective pricing.

The second problem is how to measure regulation and collective pricing. Obviously, if we distinguish the relative stringency of regulation or the relative effectiveness of collective pricing incorrectly, a finding of (say) no effect on premiums of regulation does not accurately inform us of regulation's true effect. To deal with this problem with respect to collective pricing, we constructed three alternative measures of the effectiveness of collective pricing and, with respect to regulation, we adopted the regulation measure that has been used in several previous empirical studies of auto insurance. We maintain that if we obtain uniform results about collective pricing's effects, we can be more confident that our estimates are not merely the outcome of poor measurement. In the case of regulation, we are relying on the professional standards employed in prior research.

We have identified three quantifiable aspects of collective pricing procedures that may be relevant to the service and cartel models. First, ISO's "loss-cost" system may make collusion more difficult by raising uncertainty about the suggested ISO price and/or by imposing a cost on firms to discover the ISO price (see pp. 108-109). Because ISO does not file on behalf of firms in loss-cost states, the loss-cost system may also reduce incentives to collude associated with economies of joint filing. Thus, the cartel model predicts the loss-cost system should be associated with lower prices relative to the traditional rating procedure, other things equal. This effect could occur either independently of or jointly with the presence of prior-approval regulation. The service model, on the other hand, suggests that the loss-cost system should increase prices by hindering more efficient filing and distribution of rates.

Second, review of rates by the ISO Private Passenger Auto Committee may facilitate agreement on cartel prices by ISO members, suggesting that rates will be higher where the committee is involved. Again, the presence of state regulation may or may not be necessary for committee involvement to have an effect. It is not clear that the service model yields any predictions about the effect of committee involvement, since we identified no plausible efficiencies associated with committee review.

Third, explicit/tacit collusion hypothesis developed above is subject to another relatively straightforward test. Stigler develops a model in which tacit collusion is explicitly related to the Herfindahl-Hirschman Index,[1] and we have calculated this index using the assumption that all ISO firms act together as a single firm. If the explicit/tacit collusion hypothesis is correct, prices should be higher in states with high values of this index, other things equal.

There are several forms of regulation found among the various states (see Appendix 1). Regulation is most stringent at one extreme where the state regulatory body makes the rates and the lease stringent, where joint ratemaking is prohibited and rates need not be filed with the state authorities. The several states are located across this spectrum in nine different classes devised by the NAIC. Previous researchers have defined a dichotomous variable, prior-approval/open-competition, that distinguishes "regulatory" states from "non-regulatory" states. We have adopted this measure of regulation (again, see Appendix 1).

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[1]Stigler, "Oligopoly."

Obviously, this discussion has enumerated only a subset of the large number of hypotheses associated with possible direct and joint effects of various aspects of collective pricing and regulation. Several ancillary hypotheses are also tested here, but these are not central to distinguishing between the cartel and service models. We discuss the results of these tests as we present our empirical model below.

An important methodological issue must be resolved before development of the model can proceed: namely, how should one measure the price of auto insurance for purposes of our hypothesis tests? We discuss the desirability of alternative price proxies in the first section below. The second section presents the results of hypothesis tests based on our regression model. The third section summarizes the results of these tests.

Measuring Prices

Price is defined generally as revenue per unit, but in auto insurance the definition of a unit is ambiguous. Since each individual represents a unique expected loss, each policy sold is unique in the sense that the expected cost of providing it is associated with the unique buyer. This heterogeneity makes the choice of a price proxy somewhat problematic.

Three potentially attractive price proxies are: (1) the inverse loss ratio (ILR);[2] (2) the price for some specified policy (PSP); and (3) the average price (AP). The most frequently used of these appears to be the ILR. Studies that rely on the ILR generally justify its use by noting that it can be thought of as revenue per unit, where a "unit" of insurance is defined as a dollar of losses paid. If one defines insurance as protection against possible future losses, then the amount of losses actually paid out represents an accurate measure of the quantity of such protection produced. The loss ratio also has the intuitively pleasing quality of representing the proportion of a purchaser's premium dollar that he or she can expect, on average, to be paid in claims.[3]

There are three serious problems with the ILR as a proxy for prices. First, consumers, when they purchase insurance, clearly purchase more than just protection against future losses. Point of sale services, including provision of

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[2]The ILR is the inverse of the ratio of loss payments to premium revenues. A partial list of studies relying on this proxy includes DOJ, Pricing, GAO, Issues, Harrington, "A Random Coefficients Model," and Ippolito. See Harrington, "Survey," for a more complete listing.

[3]The ILR is not only intuitively pleasing: most theoretical studies of insurance markets define the "price" of insurance as the rate at which income in the no-loss state of the world can be exchanged for income in the loss state. See, for example, Isaac Ehrlich and Gary S. Becker, "Market Insurance, Self-Insurance, and Self-Protection," Journal of Political Economy 80 (1972), pp. 623-648.

information, are one example of such services. Loss adjustment services, such as convenient and rapid payment of claims, are a second example. The ILR ignores these services altogether. In using the ILR, one implicitly assumes that consumer welfare is reduced as the proportion of premium revenue devoted to producing point of sale services grows, a proposition that is far from self-evident.

A second problem is that the ILR may be negatively related to per-policy auto insurance prices. This result obtains, for example, if costs (other than losses) of producing and servicing an auto insurance policy are fixed with respect to policy price. If it costs a fixed amount to write an insurance policy (regardless of the premium charged for that policy), with the remainder of the premium available for payment of losses, then the ratio of premiums to losses will be lower in states with high per-policy premiums than in states with low per-policy premiums, other things equal.

Finally, and most important, losses may be directly affected by minimum prices through non-price competition. If insurers respond to supracompetitive prices by increasing their loss payments, there is no basis for predicting the effect on the ILR; it depends on how loss payments increase relative to prices. The effect of a price floor on the ratio of premiums to losses is thus theoretically indeterminate.[4] Indeed, later in this chapter we test the hypothesis that non-price competition affects loss payments, and we find that prior-approval regulation affects both losses and revenues, leaving the ILR unaffected.

A second type of price proxy used in previous work is an index based on the average price for a particular policy type, which we term a PSP price index. For instance, in 1973, the NAIC and the New York Department of Insurance asked a total of 71 insurance firms in ten states to provide price quotations for two different policy types, for three territories, in each of ten states. Averaging the price observations across companies and across territories yields an average price for each type of policy.[5]

However, there are substantial difficulties involved in using such PSP price indices as performance measures, especially for comparison across states. Typically, as in the NAIC survey, prices are surveyed for two or three types of territories, e.g. urban, suburban and rural, and one must

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[4]This criticism of the loss ratio is not new. See, David Glassner, "The Effect of Rate Regulation on Automobile Insurance Premiums," Ph.D. dissertation, University of California at Los Angeles, 1977, pp. 44-45. See also Ippolito, who argues that the empirical effect of such non-price competition is likely to be small.

[5]A summary of the data is found in Hanson, et al, pp. 348-360. Some of Ippolito's empirical work is based on this data set. See Ippolito, pp. 63-64.

assume that the territories chosen are comparable across states -- e.g. "urban" Wyoming is assumed to be comparable to "urban" New York. Even where prices for all territories are available, data for the weighting of observations by territory -- necessary because territories vary widely in size -- is not generally available. Moreover, one must assume that the policy for which prices are surveyed is comparable across states. For example, liability insurance prices would be misleading in states where self-coverage requirements result in losses being paid through self-coverage policies that would otherwise be paid through liability coverage.[6]

A second problem with PSP price data, noted in Chapter II, lies in the treatment of the shared market. If state regulators set voluntary market rates below market clearing levels, they may force companies to tighten underwriting standards, forcing more drivers into the shared market. Because auto insurers must absorb the losses they incur in the shared market, it seems likely that lower shared market rates result in higher voluntary market rates as

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[6]In addition, insurance regulators may set prices in order to subsidize some consumers at the cost of others. Such cross-subsidization appears to have been the case under state-made rates in Massachusetts: When insurance companies were permitted to submit their own rates there for a brief period in 1977, the main effect was to redistribute rates across territories and risk classifications. See "Opinion and Findings on the Operation of Competition Among Motor Vehicle Insurers, Rendered June, 1977," Commonwealth of Massachusetts, Division of Insurance.

insurers attempt to recoup their losses. This interdependence causes two problems.

First, we cannot determine how much of an observed voluntary market price represents a cross-subsidy for the shared market plan. Second, we cannot know whether the insurer charging that price is willing to insure all comers, or only some small percentage of drivers considered to be the best risks. Since underwriting policies and cross subsidies vary significantly across states, cross-state comparisons based on PSP data are of questionable validity.

The third potential proxy -- the one used here -- is the average price per policy (AP). An obvious problem for empirical analyses using the AP is that not all policies are the same. While we can define a unit as a policy covering a single car for a single year (a car year), all car years are not identical.

One approach to solving this problem is to consider the ways in which units differ. If individual units differ but the mix of units sold in each state is identical, and if we are only concerned with making cross-state comparisons, then the differences among individual units are not relevant -- differences in averages must faithfully reflect differences in the individual prices. Of course, the mix of policies is not identical across states: for example, there are more elderly drivers in Florida than in many states. In addition, consumers may purchase different levels of coverage in different states, with revenues per car year positively related to the amount of coverage purchased.

It is precisely for these sorts of problems that regression analysis is ideally suited. Assume average auto insurance prices in state s are a function of several types of variables:

$$AP_s = f(R_s, P_s, C_s, I_s),$$

where R_s represents factors determining the average expected loss (whether insured or not) per driver in state s, P_s represents factors determining the (non-loss) costs of doing business (i.e. the price level) in state s, C_s represents the extent to which losses are covered by insurance in state s, and I_s represents the collective pricing institutions in state s. Note that we have not specifically included variables to account for differences in risk classification mixes across states. This is because the dependent variable, AP_s, represents a statewide average -- i.e., the statewide average rate that results from the initial steps of the ratemaking process.

Remember from Chapter III that the risk classification system is used only to distribute rates across drivers <u>within states</u>. Thus, R_s consists of the factors that determine the statewide average rate, namely the average frequency and cost of accidents.[7] Data on the frequency of accidents and thefts

[7] Of course, the number of youthful drivers and other rating variables are presumably correlated with losses -- that (Footnote Continued)

in each state are available from the Department of Transportation.[8] Other data are available that can capture other cross-state differences in claim costs.

Cross-state differences in the average level of coverage (C_s) are more difficult to measure. Data are not available on the amount of business written for each set of deductibles and liability limits. However, we include terms in our regression equations intended to proxy for the level of coverage purchased and the percentage of drivers insured.[9]

Data on the other determinants of AP_s (P_s and I_s), are readily available. The corresponding proxies for the costs of doing business in each state and the dummy variables used to account for institutional differences are described below.

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is why insurers use them as rating variables.

[8]While R_s represents factors determining <u>expected</u> losses, we assume that expected losses are equal to actual losses plus a random error term. Thus, we use actual accidents and theft frequency as a proxy for expected frequency.

[9]Any bias from our inability to capture differences in coverage should work against our hypotheses. Assuming insurance coverage is not a Giffen good, that is, that an increase in the per unit price of coverage results in less insurance coverage being demanded, a price floor will cause consumers to shift into policies representing less coverage (e.g. lower liability limits). If we observe higher prices in states with prior- approval regulation, for example, then the price effect must dominate this substitution effect. The bias would be in the opposite direction, of course, if insurance coverage were a Giffen good, but there is neither theoretical nor empirical basis for assuming this to be the case.

TABLE 24:

DESCRIPTIVE STATISTICS AND SOURCES FOR REGRESSION VARIABLES*

Variable	Mean	Std. Dev.	Definition/Source
PPCY	278.16	56.519	Premium dollars written per written liability car year. Premiums from A.M. Best data tape. Car years from AIPSO Insurance Facts.**
LPCY	167.81	36.482	Losses (in dollars) incurred per liability written car year. Losses from A.M. Best data tape.
TINJ	0.0280	0.0114	Sum of auto fatalities and injuries, from Highway Statistics, (Washington, D.C.: U.S. Government Printing Office, 1983), divided by liability written car years.

*Except where noted, all of the data used in the regression analyses are for 1980.

**Data on premiums written in each state were taken from a tape purchased from A.M. Best Company that included data on total direct premiums written in each state for all three major lines of auto insurance for 1980. Data on written car years were taken from AIPSO Insurance Facts. Figures are compiled only for liability coverage, but this figure should be the most comprehensive measure of the number of policies written. That is, we expect that drivers who purchase comprehensive and/or collision coverage also purchase liability coverage.

THEFT	0.0090	0.0053	Number of automobile thefts divided by liability written car years, from Insurance Facts (New York: Insurance Information Institute, 1982).
DENS	349.91	1413.5	Residents per square mile, from Statistical Abstract of the United States (Washington: U.S. Government Printing Office, 1981).
AR7538*	8.8900	0.9748	Expenditures for wages and salaries in general auto repair shops divided by the number of employees in such shops. From Census of Service Industries (Washington: U.S. Government Printing Office, 1980).
PERINS	0.9166	0.1215	Written car years divided by auto registrations, both from AIPSO Insurance Facts. See Table 10.
PURB	0.6792	0.1506	Percentage of population living in urban areas, from Statistical Abstract of the U.S..
AMINC*	8.3333	9.1470	Dollar amount of minimum liability coverage required for all drivers. From American Insurance Association, State Laws and Regulations Affecting Auto Insurance (New York: American Insurance Association, 1981).

SELFC*	63.661	236.64	Dollar amount of minimum self-coverage required for all drivers. Source same as AMINC.
TORT	178.43	613.62	Dollar amount of tort exemption limit. Source same as AMINC.
UTORT	0.0392	0.1960	Dummy variable equals one where tort exemption is tied to physical harm rather than money damages. Source same as AMINC.
STATE	0.0588	0.2376	Dummy variable equals one where state governments promulgate rates (Massachusetts, North Carolina, and Texas). See text and Appendix 1.
REG	0.5490	0.5025	Dummy variable equals one where state governments exercise prior-approval over auto insurance rates. See Appendix 1.
RURB	0.3642	0.3386	Interaction term, equals REG times PURB.
ARPER	0.0514	0.0852	Shared market written car years divided by total written car years, both from <u>AIPSO Insurance Facts</u>.
PUB	0.8235	0.3850	Dummy variable, equals one where ISO publishes rates, as opposed to only loss-costs. From ISO.
RPUB	0.5098	0.5049	Interaction term, equals REG times PUB.

COM	0.5882	0.4971	Dummy variable, equals one where ISO committee reviews rates. From ISO.
RCOM	0.4706	0.5041	Interaction term, equals REG times COM.
RURBPUB	0.3260	0.3399	Interaction term, equals RURB times PUB.
RURBCOM	0.2930	0.3287	Interaction term, equals RURB times COM.
HGIR	1313.5	511.29	Herfindahl index calculated counting all firms affiliating with ISO for rates as a single firm. See Table 20.
RHGIR	847.69	827.05	Interaction term, equals REG times HGIR.

* Figures in thousands of dollars.

The Determinants of Auto Insurance Prices

In this section we present the results of two ordinary least squares (OLS) regression models of the determinants of auto insurance prices.[10] Model I examines the effects of different ISO procedures and of the extent of industry concentration on prices, under the maintained hypothesis that the effect of prior-approval regulation is the same in all states (that is, that prior-approval regulation either always increases prices or always decreases them). Model II is identical to Model I except that we allow for the possibility that prior-approval regulation may have different effects in different states. The results of the two models are consistent, though Model II exhibits slightly better characteristics in terms of explanatory power.

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[10] It might be argued that OLS is not an appropriate technique for the examination of market equilibrium, and that a simultaneous equations approach should be taken instead. While a two-stage least squares or other simultaneous equations approach could be theoretically superior, the evidence of constant returns to scale in the auto insurance industry justifies the exclusion of quantity variables from the right-hand side of the price equation. On this basis, we follow nearly all previous studies of the determinants of cross-state differences in auto insurance prices and rely on OLS. (One exception is a study that allowed for the endogenous determination not of quantity but of regulatory system. See S. D'Arcy, "An Economic Theory of Insurance Regulation," Ph.D. dissertation, University of Illinois, 1982.).

<u>Estimates of Model I</u>:

Table 25 presents the results of three regressions illustrating the development of Model I. Equation (1) is a regression of price on five "background" variables. TINJ is the combined number of auto fatalities and injuries divided by the number of liability written car years. We expect that a higher injury rate will result in higher auto insurance premiums.[11] THEFT is the rate of auto thefts per written car year, and is also expected to have a positive effect on prices.

AR7538 is a proxy for automobile repair prices suggested by Sam Peltzman and first used by Glassner:[12] it is the total payroll of general auto repair shops (SIC code 7538) divided by the number of auto repair shop employees.[13] Whereas TINJ and THEFT are included to capture loss frequency, AR7538 captures differences in claim costs. However, because annual salaries of auto repair shop employees are highly correlated with both per capita income and the price level, AR7538 may capture several effects, including the likelihood that residents of wealthy states purchase relatively high levels of coverage. Obviously, we expect insurance prices to

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[11]Regressions were also run including injuries and fatalities separately, but no increase in explanatory power resulted.

[12]See Glassner, pp. 99-100, n. 53.

[13]Data was only available for 1977.

TABLE 25:
ESTIMATES OF THE EFFECTS OF BACKGROUND FACTORS AND STATE REGULATION ON AUTO INSURANCE PRICES (PPCY)
(Numbers in parentheses are t-scores.)

Variable	Equation (1)	Equation (2)	Equation (3)
C	139.28	170.73	168.40
	(2.95)**	(3.98)**	(4.11)**
TINJ	1548.3	1974.3	1963.3
	(2.86)**	(3.91)**	(4.39)**
THEFT	6257.5	5382.6	5387.9
	(5.79)**	(5.41)**	(5.79)**
DENS	-0.00918	-0.01133	-0.01174
	(2.36)*	(3.18)**	(3.63)**
AR7538	12.775	12.203	12.031
	(2.91)**	(3.11)**	(3.35)**
PERINS	-77.492	-117.45	-112.30
	(1.93)	(3.03)**	(3.18)**
AMINC	-	0.58648	0.49109
		(1.39)	(1.21)
SELFC	-	0.05029	0.03517
		(3.34)**	(2.45)*
TORT	-	0.00192	0.00179
		(0.35)	(0.37)
UTORT	-	-38.333	-35.190
		(2.09)*	(2.04)*
STATE	-	-	-3.8992
			(0.56)
REG	-	-	-51.043
			(3.37)**
ARPER	-	-	123.42
			(2.67)*
R^2	0.82	0.87	0.91
F	41.84***	31.58***	31.30***
N	51	51	51

* Indicates coefficient is significantly different from zero in a two-tailed test at a 95 percent confidence level.

** Indicates coefficient is significantly different from zero in a two-tailed test at a 99 percent confidence level.

*** Indicates hypothesis that all coefficients are zero is rejected at a 99 percent confidence level.

be high where incomes and prices, especially auto repair prices, are high.[14]

DENS is persons per square mile, and is included to account for possible differences in selling and loss adjustment costs associated with population density. We have no basis for strong priors on the sign of DENS.

Finally, PERINS is the percentage insured in each state as measured by the ratio of written car years of insurance to automobile registrations.[15] We expect that auto insurance prices will be inversely related to PERINS, since losses associated with auto accidents involving uninsured drivers may sometimes result in higher losses being paid by the insured driver.

As indicated in equation (1) of Table 25, these five variables alone explain most of the cross-state variation in auto insurance prices. The signs of the estimated coefficients are all as predicted, and all of the coefficients (with the exception of PERINS) are significantly different from zero at high (95 percent or greater) levels of confidence. Furthermore, the magnitudes of the coefficients

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[14]A second price index, the average per-day price of a semi-private hospital room, was also included in some regressions, as was per-capita personal income. Neither variable had a statistically significant effect on the AP, nor did either significantly alter the coefficients of other variables. Thus, these regressions are not reported here.

[15]The properties of this variable are discussed in Chapter II. See Table 10.

are within expected and reasonable limits. For example, the coefficient on THEFT indicates that an additional theft per car year would add $6257.50 to the price of the average auto insurance policy, which accords with a reasonable expectation of the total costs (to the insurer) associated with an auto theft.

Equation (2) in Table 25 contains several additional variables intended to account for cross-state variations in regulatory policies affecting insurance. AMINC is zero for states without mandatory liability coverage requirements for all drivers, and equal to the minimum dollar amount of coverage required in remaining states. We expect such requirements to be binding on some drivers, and thus to increase the average amount of coverage purchased and, in turn, the average price of a policy.

SELFC is zero for states without mandatory self-coverage (i.e. no-fault coverage) and equal to the minimum dollar amount of such coverage otherwise. Like AMINC, we expect the minimum coverage requirements measured by SELFC to be binding on some drivers, and thus we expect the coefficient on SELFC to be positive. While we do not have data on how many drivers purchase minimum levels of coverage, we expect AMINC and SELFC to capture much of the cross-state variation in average levels of liability coverage.

TORT and UTORT capture differences in tort systems associated with no-fault laws. For states where tort exemptions are defined in dollar terms, TORT is the dollar amount of monetary damages that must be sustained before a tort action may be brought. A few states require that substantial physical injury be incurred before a tort action may be brought. To distinguish these states, we utilize UTORT, a zero-one dummy variable. If we believe that tort exemptions limit unnecessary litigation and so reduce insurance costs, we would expect the signs on both TORT and UTORT to be negative.

As indicated in Table 25, inclusion of these variables adds to the explanatory power of the model. With the exception of the insignificant coefficient on TORT, all of the coefficients are of the expected sign.

In equation (3) we add three variables to account for state regulation. REG is a zero-one dummy variable that is one for states with prior-approval regulation and zero otherwise. STATE is also a zero-one dummy variable that is one for the three states (Massachusetts, North Carolina, and Texas) where rates are made directly by the state.[16] ARPER is the percentage of car years written in the state shared market plan. The coefficient on REG is not significantly different from zero, suggesting that prior-approval regulation does not, on average, affect rates. The coefficient on STATE is significant and negative. Taken by itself, the coefficient

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[16] REG is zero where STATE is one.

implies that states where rates are made directly by state authorities have rates about $51 per policy lower, other things equal. The coefficient on ARPER is also significant but is strongly positive. It indicates that the price of the average auto insurance policy -- including both voluntary market and shared market policies -- increases by about $1.23 for each percentage of the market insured through the shared market.[17]

The model specified in equation (3) is a powerful predictor of cross-state variation in the average price of auto insurance. With the single exception of the coefficient on TORT, every coefficient is of the expected sign, and the coefficients on all but three variables, one of which is TORT, are significantly different from zero at greater than 95 percent levels of confidence.[18]

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[17]It is important to interpret the finding of a negative effect of state-made rates in conjunction with the finding that rates are positively correlated with the proportion of cars insured through the shared market. Because the proportion of cars insured through the shared market is very high in two of the three states with state-made rates, it is difficult to assess the net effect of this institutional arrangement.

[18]Under certain assumptions, heteroscedasticity can result in underestimation of the sampling variance of the estimated coefficients and overestimation of t-statistics. [See, for example, George G. Judge, et al, The Theory and Practice of Econometrics (New York: John Wiley and Sons, 1980), pp. 125-128.] In our model, one possible source of heteroscedasticity is a negative correlation between state size and sampling error, a problem often associated with use of average data. (See Judge, pp. 125-126.)

We applied a standard Goldfeldt-Quandt test to our (Footnote Continued)

Another important characteristic of these regression results is their stability for different model specifications. Given the possibility of multicollinearity among our right-hand-side variables, the stability of coefficients and t-scores indicated in Table 25 (and indeed in all of our regression results) suggests multicollinearity is not a significant problem here.[19]

In Table 26 we present the results of four regressions examining the effects of rating organization procedures on rates. Equation (4) is identical to equation (3) except we have added a dummy variable (PUB) which is equal to one only in states where the ISO publishes suggested rates.[20] If publication of suggested rates facilitates collusion, the coefficient on PUB should be positive; conversely, if rate publication is purely efficiency-motivated, then the

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model. When separate regressions were run on the 23 largest (according to premiums written) and 23 smallest states (five central observations were omitted), the ratio of the sums of squared residuals from the two regressions was almost identically equal to one. This ratio has the F distribution with (8,8) degrees of freedom, and the value of 1.00 is, of course, not sufficient to reject the null hypothesis of homoscedasticity.

[19] See, for example, J. Johnston, Econometric Methods (New York: McGraw-Hill Book Company, 1972), p. 160.

[20] The equations in Table 26 rely on 47 observations rather than 51 as in equations (1)-(3). The four observations omitted are the three states (Massachusetts, North Carolina and Texas) with state-made rates plus Hawaii, which has its own rating organization.

TABLE 26:

ESTIMATES OF THE EFFECTS OF DIFFERENT ISO PROCEDURES ON AUTO INSURANCE PRICES (PPCY) (MODEL I)
(Numbers in parentheses are t-scores)

Variable	Equation (4)	(5)	(6)	(7)
C	176.30 (4.24)**	171.39 (4.07)**	183.82 (4.29)**	170.59 (3.98)**
TINJ	2182.4 (4.66)**	2158.1 (4.30)**	2181.9 (4.63)**	2154.5 (4.23)**
THEFT	4425.2 (3.96)**	4393.1 (3.73)**	4449.4 (3.96)**	4422.0 (3.68)**
DENS	-0.01141 (3.47)**	-0.01155 (3.01)**	-0.01115 (3.35)**	-0.01140 (2.89)**
AR7538	12.961 (3.51)**	13.460 (3.41)**	12.410 (3.28)**	13.543 (3.37)**
PERINS	-122.10 (3.29)**	-128.87 (3.42)**	-120.14 (3.21)**	-128.48 (3.36)**
AMINC	0.87745 (1.91)	0.86743 (1.83)	0.93895 (2.01)	0.86383 (1.80)
SELFC	0.03524 (2.40)*	0.03253 (2.15)*	0.03575 (2.42)*	0.03273 (2.13)*
TORT	0.00014 (0.03)	-0.00030 (0.06)	0.00043 (0.09)	-0.00040 (0.08)
UTORT	-40.529 (2.32)*	-36.757 (2.09)*	-42.287 (2.39)*	-36.239 (2.01)
REG	-2.1007 (0.30)	-2.8731 (0.31)	-15.338 (0.85)	-4.7340 (0.38)
ARPER	130.77 (2.52)*	134.73 (2.56)*	128.70 (2.47)*	133.76 (2.50)*
PUB	-10.061 (1.08)	-	-16.642 (1.34)	-
COM	-	-0.9363 (0.10)	-	-3.0338 (0.23)
RPUB		-	15.403 (0.80)	-
RCOM	-	-	-	3.8024 (0.23)
R^2	0.91	0.91	0.91	0.91
F	29.78***	28.70***	27.24***	25.76***
N	47	47	47	47

* Indicates coefficient is significantly different from zero in a two-tailed test at a 95 percent confidence level.

** Indicates coefficient is significantly different from zero in a two-tailed test at a 99 percent confidence level.

*** Indicates hypothesis that all coefficients are zero is rejected at a 99 percent confidence level.

coefficient on PUB should be negative. As indicated in Table 26, the coefficient on PUB is negative, but not significantly different from zero.

Equation (5) replicates equation (4) except the variable PUB is replaced by COM, a dummy variable equal to one only in states where the ISO Private Passenger Auto Committee reviews rates. Again, a positive coefficient on COM would indicate committee review facilitates collusion. However, the coefficient is quantitatively very small and not significantly different from zero.

In equations (6) and (7), respectively, we test the hypotheses that PUB and COM might affect rates differently depending on the presence of prior-approval regulation: that is, prior-approval regulation might either limit or enhance any collusion-facilitating effects of these institutional arrangements. We test these hypotheses using interaction terms. RPUB, for example, is equal to one only in states with <u>both</u> publication by ISO of rates and prior-approval regulation. The positive coefficient on RPUB in equation (6) indicates prior-approval regulation limits the efficiency-enhancing effects of rate publication indicated by the negative coefficient on PUB. However, neither coefficient is significantly different from zero at a high level of confidence. Once again, neither of the coefficients associated with COM and RCOM (in equation 7) are either quantitatively large or significantly different from zero, and there would therefore not appear to be any effect of committee review of rates on the average price, regardless of the type of state regulation. Taken together, the regression results presented in Table 26 provide no support for hypotheses suggesting rating organization publication of rates or review of rates by the Private Passenger Auto Committee facilitate collusion. Indeed, we find weak support for the hypothesis that publication of rates is efficiency-enhancing, resulting in lower prices.

In Table 27 we present the results of regressions that test the explicit/tacit collusion hypothesis developed in Chapter IV above. The variable HGIR is the Herfindahl Index calculated by counting all firms that receive rates from the rating organization as a single firm (see Table 20 above). In equation (8) we add HGIR to the basic regression model developed in equation (3) above. While the coefficient is not significantly different from zero at even a 90 percent level of confidence, it is positive and, this result thus provides weak support for the explicit/tacit collusion hypothesis.

In equation (9) we add an interaction term to test the hypothesis that HGIR affects rates differently in prior-approval states and open-competition states. That is, if prior-approval regulation hinders collusion, then the sign of the interaction term (RHGIR) should be negative. As indicated in Table 27, this is in fact the result we obtain, but again the coefficient is not significantly different from zero.

TABLE 27:

ESTIMATES OF THE EFFECTS OF
DIFFERENT ISO PROCEDURES
ON AUTO INSURANCE PRICES (PPCY) (MODEL I)
(Number in parentheses are t-scores)

Variable	Equation (8)	(9)
C	127.98	105.20
	(2.63)*	(1.73)
TINJ	2198.3	2177.3
	(4.78)**	(4.68)**
THEFT	4509.9	4336.3
	(4.11)**	(3.80)**
DENS	-0.01186	-0.01209
	(3.69)**	(3.71)**
AR7538	14.853	15.406
	(3.98)**	(3.99)**
PERINS	-118.30	-123.30
	(3.24)**	(3.28)**
AMINC	0.90727	0.84476
	(2.01)	(1.82)
SELFC	0.03750	0.03656
	(2.58)**	(2.48)*
TORT	0.00001	0.00052
	(0.01)	(0.10)
UTORT	-37.970	-38.213
	(2.25)*	(2.25)*
REG	-4.7345	22.956
	(0.70)	(0.52)
ARPER	96.264	105.29
	(1.72)	(1.80)
HGI4	0.01474	0.03471
	(1.61)	(1.06)
RHGI4	--	-0.02209
		(0.64)
R^2	0.91	0.91
F	31.08***	28.22***
N	47	47

* Indicates coefficient is significantly different from zero in a two-tailed test at a 95 percent confidence level.

** Indicates coefficient is significantly different from zero in a two-tailed test at a 99 percent confidence level.

*** Indicates hypothesis that all coefficients are zero is rejected at a 99 percent confidence level.

Thus, our tests of the explicit/tacit collusion hypothesis yield only suggestive evidence that the hypothesis may be valid; the null hypothesis (that concentration and rating organization affiliation have no effect) cannot be rejected.

Estimates of Model II: Model II is identical to Model I except that we relax the assumption that prior-approval regulation has the same effect in all states. As discussed in Chapter IV above, there is evidence that prior-approval regulation may conform to the "capture-theory" model in some states and the "public-interest" model in other states. Moreover, there is both a theoretical and empirical basis for believing the capture theory is more likely to prevail in less urban states (see pp. 121-122).

In Model II we test the hypothesis that prior-approval regulation may affect rates differently in different states under the maintained hypothesis that the percentage of the population living in urban areas in a state is correlated with the behavior of regulatory authorities in that state. If we find that Model II is superior to Model I as a predictor of auto insurance prices, we may be inclined to place greater weight on the results of this model with respect to other explanatory variables, such as those associated with collective pricing.

In equation (10), shown in Table 28, we add the variables PURB and RURB to the model estimated in equation (3) above. PURB is the proportion of individuals living in urban areas, and RURB is PURB interacted with REG.[21] There is little change in the result from equation (3), with one important exception: Whereas the coefficient on REG was not significantly different from zero in equation (3), the addition of the interaction term yields a coefficient in equation (10) that is positive and significant at a 99 percent confidence level. The coefficient on RURB now is also significant and of the expected sign. In dollar terms, the coefficient on REG indicates the presence of prior-approval regulation increases the average annual price of an auto insurance policy by about $98, but the effect is mitigated by about $1.50 for each percentage of the state's population living in urban areas.

The result of equation (10) is consistent with our maintained hypothesis: Insurance regulators appear on average to enforce price ceilings in urban states and price floors in non-urban states. Moreover, our result seems to explain why previous studies -- relying on a simple zero-one dummy -- have failed to find an effect.

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[21] PURB is included to capture any independent effects of the percentage of urban dwellers on auto insurance rates, so that RURB represents the true joint incremental effect of regulation and percentage urban. Contrary to some expectations, PURB is not highly correlated with DENS: the simple correlation coefficient is only 0.37. Examination of the data indicates most people in sparsely populated states (e.g. New Mexico) live in cities.

TABLE 28:
ESTIMATES OF THE EFFECTS OF
DIFFERENT ISO PROCEDURES
ON AUTO INSURANCE PRICES (PPCY) (MODEL II)
(Numbers in parentheses are t-scores)

Variable	Equation (10)	(11)	(12)	(13)	(14)
C	54.416	73.278	59.517	75.628	59.565
	(1.13)	(1.29)	(1.15)	(1.30)	(1.13)
TINJ	2018.6	2079.6	1948.5	2069.6	1953.2
	(5.13)**	(4.81)**	(4.29)**	(4.71)**	(4.17)**
THEFT	4914.8	5036.0	4833.5	5030.6	4844.8
	(5.17)**	(4.52)**	(4.28)**	(4.45)**	(4.17)**
DENS	-0.01414	-0.01305	-0.01220	-0.01297	-0.01224
	(4.60)**	(4.23)**	(3.49)**	(4.14)**	(3.39)**
PERINS	-87.257	-91.017	-95.623	-94.124	-95.669
	(2.76)**	(2.57)*	(2.70)*	(2.56)*	(2.66)*
AR7538	14.770	14.575	15.905	14.788	15.904
	(4.46)**	(4.09)**	(4.21)**	(4.04)**	(4.14)**
PURB	95.126	78.176	88.110	76.049	87.746
	(2.55)*	(1.74)	(2.09)*	(1.66)	(2.03)
AMINC	0.44384	0.74212	0.65252	0.79232	0.65724
	(1.21)	(1.65)	(1.49)	(1.67)	(1.45)
SELFC	0.04073	0.03850	0.03968	0.03744	0.03952
	(3.22)**	(2.86)**	(2.89)**	(2.69)*	(2.78)**
TORT	0.00214	0.00157	0.00097	0.00149	0.00097
	(0.50)	(0.34)	(0.21)	(0.005)	(0.21)
UTORT	-41.458	-44.431	-41.255	-44.189	-42.255
	(2.73)**	(2.76)**	(2.58)*	(2.70)*	(2.54)*
REG	98.524	89.095	107.50	112.73	110.31
	(3.47)**	(2.21)*	(3.03)**	(1.52)	(1.88)
RURB	-149.55	-140.98	-156.79	-177.63	-160.63
	(3.70)**	(2.91)**	(3.34)**	(1.65)	(2.03)
ARPER	157.79	166.87	172.29	168.46	172.32
	(3.80)**	(3.40)**	(3.54)**	(3.37)**	(3.49)**
PUB	--	-7.3443	--	-7.3833	--
		(0.61)		(0.60)	
RPUB	--	3.2241	--	-22.442	--
		(0.18)		(0.32)	
COM	--	--	-5.1106	--	-5.0607
			(0.44)		(0.43)
RCOM	--	--	-2.8841	--	-6.1993
			(0.20)		(0.11)
RURBPUB	--	--	--	39.877	--
				(0.38)	
RURBCOM	--	--	--	--	4.5671
					(0.06)
R^2	0.93	0.93	0.93	0.93	0.93
F	36.10***	29.28***	29.45***	26.70***	26.73***
N	47	47	47	47	47

* Indicates coefficient is significantly different from zero in a two-tailed test at a 95 percent confidence level.

** Indicates coefficient is significantly different from zero in a two-tailed test at a 99 percent confidence level.

*** Indicates hypothesis that all coefficients are zero is rejected at a 99 percent confidence level.

When we compare the results of equation (10) (Model II) with those of equation (3) (Model I), it is apparent that equation (10) is a slightly better predictor of auto insurance prices. The R-squared statistic, which can be interpreted loosely as indicating the proportion of the total variance of the dependent variable (PPCY) explained by the model, increases from 0.91 in equation (3) to 0.93 in equation (10). Because the R-squared statistic increases with the number of explanatory variables used in the model, it is theoretically possible that this increase is accounted for simply by the fact that equation (10) has two more variables (PURB and RURB) than equation (3). However, it is possible to adjust the R-squared statistic to eliminate this potential bias. The adjusted R-squared statistic for equations (3) and (10) are 0.88 and 0.91, respectively, indicating equation (10) is indeed a more powerful explanator of insurance prices than equation (3).[22]

We now proceed to test our hypotheses regarding collective pricing using Model II. In equations (11) and (12) we replicate equations (6) and (7) from above, to test whether ISO publication of rates rather than loss costs or direct

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[22]An F-test was performed to determine whether the explanatory power of equation (10) (Model II) is the same as that of equation (3) (Model I). We can reject the null hypothesis at the 99% level of confidence in favor of the alternative that equation (10)(II) performs better than equation (3)(I).

involvement of ISO committees in the ratemaking process affects rates. The low t-scores on the relevant coefficients are consistent with the results obtained in Model I: These procedural factors do not appear to have any effect.[23]

In equations (13) and (14), respectively, we add the variables RURBPUB and RURBCOM, to explore further any possible interaction effects between the type of state regulation (as measured by REG and RURB) and different ISO procedures. If ISO's traditional rating procedure encouraged or facilitated the enforcement of price floors by regulators inclined to enforce price floors, then we would expect the signs on RPUB and RCOM to be positive and the signs of RURBPUB and RURBCOM to be negative. As Table 26 indicates, our results do not confirm these hypotheses.

Thus, as in Model I, we find no support for the cartel model hypotheses associated with ISO procedures. Indeed, the coefficients on COM and PUB, which according to the cartel model should be positive, are consistently negative. The fact that these coefficients are not significantly different from zero at high confidence levels prevents us from drawing strong inferences from this finding. However, these results are somewhat more supportive of the service model than of the

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[23]We also replicated equations (4) and (5), using PUB and COM respectively, without the interaction terms. Neither variable had a statistically significant effect.

cartel model because they indicate that unrestricted ISO activity might reduce, rather than increase, prices.

In Table 29 we apply Model II to our hypotheses regarding the effects of concentration and ISO affiliation on average auto insurance prices. As in equations (7) and (8) above, we utilize the modified Herfindahl-Hirschman indices calculated in Table 20 (HGIR), to capture both the extent of ISO affiliation and the concentration of unaffiliated firms. Equations (15) and (16) are directly analogous to equations (7) and (8): Equation (15) is a straightforward test of the explicit/tacit collusion hypothesis, and equation (16) tests for interaction between HGIR and prior-approval regulation. The results are again similar to those obtained using Model I, except the t-scores obtained here are somewhat lower and the results therefore somewhat less suggestive that HGIR has any effect on rates.

Overall, the results of Model II provide even less support than those of Model I for our hypotheses regarding the possible effects of collective pricing on insurance prices. Despite our efforts to explore different avenues through which collective pricing could affect prices, we found no strong evidence that ISO procedures or affiliation result in collusion <u>or</u> significant economies. Nor is there any apparent interaction between ISO procedures and/or affiliation and rate regulation. We discuss the implications of our findings at greater length at the end of this chapter.

TABLE 29:

ESTIMATES OF THE EFFECTS OF
ISO AFFILIATION
ON AUTO INSURANCE PRICES
(Numbers in parentheses are t-scores)*

Variable	(15)	(16)
C	43.080	30.050
	(0.78)	(0.48)
TINJ	2070.1	2061.1
	(4.89)**	(4.80)**
THEFT	4871.6	4790.5
	(4.43)**	(4.25)**
DENS	-0.01331	-0.01346
	(4.48)**	(4.45)**
PERINS	-89.408	-93.568
	(2.57)*	(2.57)*
AR7538	15.298	15.739
	(4.41)**	(4.33)**
PURB	89.738	85.778
	(2.18)*	(2.02)
AMINC	0.70188	0.67098
	(1.64)	(1.53)
SELFC	0.03951	0.03871
	(2.97)**	(2.85)**
TORT	0.00161	0.00188
	(0.34)	(0.41)
UTORT	-42.302	-42.426
	(2.74)**	(2.71)*
REG	89.573	107.42
	(2.78)**	(2.14)*
RURB	-138.70	-137.08
	(2.98)**	(2.90)**
ARPER	147.77	154.24
	(2.70)*	(2.70)*
HGIR	0.00812	-0.02166
	(0.88)	(0.71)
RHGIR	--	-0.01523
		(0.47)
R^2	0.94	0.94
F	32.68***	27.02***
N	47	47

* Indicates coefficient is significantly different from zero in a two-tailed test at a 95 percent confidence level.

** Indicates coefficient is significantly different from zero in a two-tailed test at a 99 percent confidence level.

*** Indicates hypothesis that all coefficients are zero is rejected at a 99 percent confidence level.

Non-Price Competition and the Welfare Effects of Regulation: The coefficient estimates from equation (10) can be used to estimate the revenue effects of state regulation in each state. By multiplying the coefficient estimates for the three state regulation variables, REG, RURB, and ARPER, by the values of these variables in each state, one obtains the joint predicted effect of these three variables on premiums per car year. In Table 30 we show the predicted effects of regulation on premiums per car year in the 28 states with prior-approval rate regulation during 1980. In 21 of the 28 states, the predicted total effect is positive, and in two states, New Hampshire and Vermont, it exceeds $50 per car year -- that is, $50 per policy. Overall, the magnitude of the indicated price effects is sizeable relative to a mean value of premiums per car year of $278.[24]

In Table 31 we present figures on the total revenue effects of regulation in each of these states. That is, in Table 31 we have multiplied the per car year figures from Table 30 by the number of written car years in each state, to arrive at total revenue effects. The figures presented in Table 31 indicate that, in 1980, consumers paid about $330 million more for auto insurance in these states than they would have paid in the absence of state regulation.

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[24]The relative magnitude of the three variables can easily be calculated from the coefficient estimates in Table 28 and the descriptive data in Table 24.

TABLE 30:

ESTIMATED EFFECT OF RATE REGULATION
ON PREMIUMS PER CAR YEAR

Alabama	$ 9.90
Alaska	6.14
Arizona	-26.68
Arkansas	22.19
Connecticut	2.62
Delaware	8.02
Indiana	2.71
Iowa	11.03
Kansas	5.11
Kentucky	24.99
Louisiana	12.53
Maine	33.11
Maryland	-15.18
Mississippi	30.71
Nebraska	4.90
New Hampshire	57.52
New Jersey	22.23
New York	-5.94
North Dakota	26.14
Oklahoma	-1.87
Pennsylvania	2.83
Rhode Island	-19.02
South Carolina	49.10
Tennessee	12.29
Vermont	54.61
Washington	-10.20
West Virginia	46.17
Wyoming	-21.71

TABLE 31:

ESTIMATED EFFECT OF RATE REGULATION ON
TOTAL PREMIUM REVENUES
(MILLIONS OF DOLLARS)

Alabama	$15.81	New Hampshire	25.98
Alaska	0.84	New Jersey	81.28
Arizona	-32.92	New York	-37.56
Arkansas	22.00	North Dakota	10.95
Connecticut	4.34	Oklahoma	-2.86
Delaware	2.65	Pennsylvania	15.88
Indiana	7.10	Rhode Island	-7.23
Iowa	18.36	South Carolina	70.16
Kansas	7.85	Tennessee	25.34
Kentucky	43.83	Vermont	12.57
Louisiana	21.41	Washington	-22.82
Maine	15.65	West Virginia	38.46
Maryland	-32.85	Wyoming	-6.14
Mississippi	27.85		
Nebraska	4.43		
		Total (28 states)	$330.36

We emphasize, however, that these figures are estimates of revenue effects, not welfare losses. Additional revenues associated with state regulation may be absorbed by companies as excess profits or, as hypothesized above, competed away through non-price competition. While we do not undertake the very difficult task of estimating welfare losses in a market where quality is variable, we can proceed one step further by testing for the presence of non-price competition.

Ideally, we would like to base an evaluation of cross-state differences in service quality on direct observation. For example, we might compare the number of active sales agents percapita in each state, or the average length of time between the occurrence of an accident and payment of the claim. No such indices appear to be available. Nor are data on insurance company expenses (which under certain fairly strict assumptions could proxy for some aspects of service quality) available by state.

Data are available, however, on the losses incurred in each state, and we have argued above that one possible outlet for service quality competition is more generous loss payments. (See especially Appendix 4.) We are somewhat dubious about placing too much emphasis on this avenue of service quality competition however, especially since the direct beneficiaries of more generous loss payments are not the owner of auto liability insurance. Unfortunately, losses are the only data we have available to measure non-price competition.[25]

In Table 32 we present estimates of our basic model using losses per car year as the dependent variable. (We also reproduce equation (10) for reference.) The results indicate that non-price competition may indeed be associated with the price effects of rate regulation. Regulation of prices has effects on losses per car year that mimic its effects on prices per car year -- where prices are increased by regulation, losses per car year also increase. Similarly, the effect of regulation that reduces prices is to reduce losses.[26]

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[25]Previous studies have used two approaches to evaluate non-price competition. Frech and Samprone assume that direct writers provide "low" service quality and agency firms provide "high" service quality. Then the proportion of agency firms in a market can be taken as a proxy for the extent of non-price competition.

A second approach was taken by Ippolito, who examined expense ratios for the 100 or so companies that operate in only a single state. Both of these approaches rely on very strong assumptions: Indeed, French and Samprone essentially assume the problem away by inputing higher quality to agency firms.

We considered a third approach, which followed the NAIC method of attributing expenses on a state-by-state basis proportionately to each company's premium volume in each state. If a company writes half of its premiums in one state, the NAIC assumes that half of its expenses were incurred there. However, the assumptions here are nearly as strong as in the other two methods, and the results of regressions run using expenses per car year as a dependent variable suggested that these assumptions were not valid. Therefore, we do not report the results of our work in this area.

[26]Regressions run on our data using the ILR as a dependent variable confirm the finding of earlier studies: rate regulation has no statistically significant effect.

TABLE 32
ESTIMATES OF THE EFFECTS OF
RATE REGULATION ON PRICE AND LOSSES
PER CAR YEAR
(Numbers in parentheses are t-scores)

Independent Variable	Dependent Variable PPCY	LPCY
C	54.416	19.298
	(1.13)	(0.48)
TINJ	2018.6	846.41
	(5.13)**	(2.54)*
THEFT	4914.8	2383.2
	(5.17)**	(2.96)**
DENS	-0.01314	-0.00651
	(4.60)**	(2.69)*
AR7538	14.770	8.4044
	(4.46)**	(3.00)**
PERINS	-87.257	-56.015
	(2.76)**	(2.10)*
PURB	95.126	102.43
	(2.55)*	(3.25)**
AMINC	0.44384	0.25161
	(1.21)	(0.81)
SELFC	0.04073	0.02930
	(3.22)**	(2.74)**
TORT	0.00214	0.00205
	(0.50)	(0.56)
UTORT	-41.458	-23.130
	(2.73)**	(1.80)
STATE	-49.481	-27.166
	(3.67)**	(2.38)*
REG	98.524	78.974
	(3.47)**	(3.29)**
RURB	-149.59	-113.17
	(3.70)**	(3.31)**
ARPER	157.78	143.17
	(3.79)**	(4.07)**
R^2	0.93	0.89
F	36.10***	19.88***
N	51	51

* Indicates coefficient is significantly different from zero in a two-tailed test at a 95 percent confidence level.

** Indicates coefficient is significantly different from zero in a two-tailed test at a 99 percent confidence level.

*** Indicates hypothesis that all coefficients are zero is rejected at a 99 percent confidence level.

Summary and Discussion of Results

In this chapter we have evaluated several hypotheses associated with the cartel model and the service model. On balance, our results do not support the cartel model. None of the coefficients associated with the cartel-model hypotheses is significantly different from zero, and even the signs on the estimated coefficients are not always consistent with the cartel model: While the degree of affiliation with ISO appears, if anything, to increase prices (consistent with the explicit/tacit collusion hypothesis), the procedures that should increase prices according to the cartel model appear, if anything, to reduce them (consistent with the service model).

We cannot, on the basis of this study alone, conclude with certainty that collective pricing does not result in collusion: We claim only to have looked hard and found no evidence of this effect. Given the high degree of explanatory power evidenced by our model, however, we think it unlikely that any collective pricing effect we may have missed is of quantitative significance. Indeed, one can interpret the R-squared statistic associated with Model II (0.93) to mean that we have explained over 90 percent of the cross-state variation in average auto insurance prices during 1980. Even if collective pricing were to account for some large proportion of the remaining variance, its effects would still be minor relative to the effects of other sources of cross-state variation. Of course, our findings are also consistent with the view that collective pricing does not vary significantly across the states despite the variation in our measures of joint ratemaking. We note however that the three variables used to measure the effectiveness of private collective action, including the Herfindahl measure, uniformly have no statistically significant effect on average premium/car year.

One of our models (Model I) confirms prior empirical studies' results about the effect of prior-approval regulation. Specifically, based on Model I we found that prior-approval regulation has no significant effect on average premium/car year. Our alternative Model II tells a somewhat different story. In Model II, we allowed the nature of prior-approval regulation to vary, depending on whether the regulation was practiced in the public interest or in the industry's interest, as confidentially reported by the state insurance commissioners themselves. According to this specification, state prior-approval regulation affects average auto insurance prices, and the magnitude and direction of the effect varies across states according to the reported behavior of state regulatory authorities. While our results should be regarded as somewhat tentative due to the difficulty of measuring regulatory behavior, we believe that they provide motivation for further research on cross-state variation in regulation.

We also found based on Model II that losses per car year respond to regulatory influences approximately proportionately to the response of premiums. This finding suggests that non-price competition, to the extent we have measured it accurately with losses per car year, supplants price competition when the latter is restrained by government regulation.

Third, the results concerning monetary tort exemptions (they do not reduce prices) and shared market plans (they appear to be quite costly) have obvious policy implications.

In a broader context, our results seem to provide support for modern theories of industry performance that emphasize the potential difficulties involved in forming and maintaining cartels in the presence of free entry and a heterogenous product.[27] The auto insurance industry operates under an exemption from the federal antitrust laws, and open discussion of prices is both common and highly organized. Despite this overt "collusion", our evidence does not support the view that the market reachs an anticompetitive result.

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[27]See, for example, Posner, Antitrust Law.

CHAPTER VII

CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

This study analyzes the collective pricing practices that have developed in the auto insurance industry under antitrust immunity. We posit two models of collective pricing, the service model and the cartel model, and we examine empirical evidence to determine whether collective activities achieve efficiencies, as the service model suggests, or facilitate cartel pricing. We also examine the role played by state regulators, who oversee collective pricing activities and directly regulate auto insurance rates. Our results indicate that collective pricing neither facilitates collusion nor generates discernible economies, but that state regulation may have important effects on industry performance.

In Chapter II we examine the structure of the auto insurance industry. The industry is relatively unconcentrated, with a nationwide Herfindahl-Hirschman index of 523 and H-indices in most states below 1000, and there is no apparent trend towards increased concentration. Entry into the industry appears to be easy, and approximately 60 new firms entered the industry between 1978 and 1982. All of these findings suggest that the auto insurance industry is amenable to competition.

In Chapter III we examine the current practices of ISO, a major collective pricing organization. We find that ISO's procedures are less anti-competitive than its predecessors', and that the trend is in the direction of more competitive pricing practices. Unlike its predecessors, ISO does not require its affiliates to adhere to its rates, nor does it contest independent rate filings before state regulators. In about half the states, ISO no longer publishes actual rates, but instead publishes only detailed data on losses. Similarly, the trend in state regulation is towards less active state oversight of rates, with 24 states now operating under open-competition laws which do not require companies to submit rates for approval prior to use.

In Chapter IV we develop the two competing models of collective pricing. The service model suggests that collective pricing is an economically efficient means of capturing economies in the ratemaking process. Our analysis of the ratemaking process concludes that some ratemaking activities, such as sharing loss data, can best be performed by a jointly-owned organization like ISO. Other activities now performed by ISO could probably be performed equally efficiently by independent organizations.

The cartel model suggests that ISO facilitates collusion. Previous studies of this industry have concentrated on the role played by state rate regulation, and have treated the cartel model of collective pricing as a maintained hypothesis. The failure of these studies consistently to demonstrate hypothesized correlation between prices and state regulatory systems provides some basis for questioning the cartel hypothesis itself. We suggest that technical failures might account for the lack of consistent results, and we find theoretical grounds to hypothesize that collective pricing, rate regulation, or both together might facilitate collusion. We offer the hypothesis that explicit collusion among ISO firms might increase effective industry concentration and allow tacit collusion to occur, perhaps independent of the state regulatory regime.

The few previous studies that have looked specifically at collective pricing focus primarily on data on affiliation with ISO and adherence to ISO prices, concluding that low rates of adherence and affiliation do not support the cartel model. In Chapter V we examine new data on adherence and affiliation. Our data are consistent with previous evidence. With respect to adherence to ISO prices, we find that only 4.0 percent of all prices in our non-random sample are equal to the ISO price, and that practically no price is equal to the ISO price in open-competition states. With respect to affiliation, we find that about 40 percent of all firms affiliate with ISO in some way, but that these firms account for less than 30 percent of private passenger auto premiums. Even fewer firms -- about 35 percent -- affiliate to receive ISO rates, and these firms account for only 18 percent of premiums. When we analyze ISO affiliation on a state-by-state basis, however, we find that enough firms affiliate in many states to substantially increase effective industry concentration. When Herfindahl-Hirschman indices are modified to reflect the assumption that all ISO firms act as one, we find concentration to be much greater than when all firms are assumed to act independently. In Maine, for example, the calculated H-index increases from 486 to 2806. This evidence provides _a priori_ support for the explicit/tacit collusion hypothesis proposed in Chapter IV. However, we point out that the evidence on adherence and affiliation ultimately does not provide a basis for deciding between the cartel and service models.

We test the service and cartel models directly in Chapter VI, formulating several specific hypotheses about how collective pricing should affect insurance prices under each model. The cartel model suggests collusion is more likely (and prices, therefore, likely higher) in states where ISO publishes proposed rates than in states where only loss data is published, in states where companies are directly involved in setting rates than in states where only the ISO staff makes rates, and in states where the modified H-index is high than in states where it is low. The service model predicts the opposite -- that is, more extensive collective pricing activity should reduce costs and therefore prices.

The role played by state rate regulation is clearly important. State regulators might, as previous studies have suggested, facilitate collusion. Alternatively, regulators might view themselves as restraining a cartel, and thus impose price ceilings. These effects might occur independently or in conjunction with variations in ISO procedures and affiliation. Moreover, it is possible that regulators impose price ceilings in some states and price floors in others, and there is evidence that regulatory behavior is highly correlated with other state characteristics, particularly the percentage of the population living in urban areas.

We test these hypotheses concerning rate regulation, collective pricing, and their possible joint effects using a cross-state regression model and 1980 data on the average price of insurance, several control variables (e.g. accident frequency), and regulatory and collective pricing institutions. The model exhibits a number of desirable characteristics, including an R-squared statistic of 0.93, stability of coefficient estimates for different model specifications, and no evidence of heteroscedasticity.

Our results do not provide support for the cartel model of collective pricing. Neither the variables associated with ISO procedures nor the modified H-indices exert a statistically significant effect on prices, either independently or when interacted with rate regulation variables. This finding holds for both specifications of state regulation used in our regressions.

The evidence on the effects of prior-approval regulation on pricing is mixed. On one model specification in which prior-approval regulation is measured solely by a zero-one dichotomous variable, regulation is found to have no effect on average premium per car year. In a second model specification, which was found to have significantly greater explanatory power, the effect of prior-approval regulation on average price is allowed to vary with the stated goals of state insurance commissioners -- more precisely with a proxy of these stated goals. Specifically, we differentiate between prior-approval regulation depending on whether the insurance commissioner in a particular state reported a bias toward consumers' interests or industry's interest. With this model specification, we find that prior-approval regulation does have significant effects on average premium per car year -- negative effects in some states and positive effects in others. Moreover, we find that when we assess the effects of regulation on losses per car year within this framework, regulation's effects on losses mirror those we find on prices. It appears according to this specification that where prices are artificially increased (decreased) by regulation, the result is higher (lower) service quality. We do not attempt to estimate quantitatively the net welfare effects of regulation under these circumstances. Moreover, we wish to urge the reader to rely on these results with caution, since our basis for differentiating among prior-approval regulations across states is preliminary. Until a complete model of regulatory behavior in auto insurance markets is designed, including analysis of the interaction between the voluntary market and the assigned-risk market, we hesitate to rely heavily on our findings about regulation's effects.

Several areas are suggested for further research. First, our results suggest that ISO affiliation and concentration, as measured by our modified H-index, do increase rates, but the coefficients of interest are not significantly different from zero. Similarly, we found weak evidence that some ISO procedures are efficiency-motivated. A study that combined cross-section with time-series data might answer the questions raised by these findings, since a larger number of observations would result in a lower standard error and greater confidence in the estimated regression coefficients. The model developed here is a robust one, suggesting that the costs of data collection would be repaid with empirical results.

Second, our results concerning state regulation create the basis for further research to determine what factors influence regulatory behavior. It is extremely difficult to quantify regulatory behavior, but it is possible that random coefficients techniques, simultaneous equations techniques with regulation as a dependent variable, or perhaps some combination of the two, could yield further results in the area of rate regulation.

Third, additional information on the potential effects of the antitrust laws on auto insurance pricing regimes would be useful. For example, in the absence of the McCarran-Ferguson exemption, would state auto insurance regulation be exempt from the antitrust laws under the "state action" doctrine? Would joint action by insurers be exempt as political speech aimed at influencing state regulation? Policy solutions to the problems we have found with rate regulation depend on the answers to these and other primarily legal questions.

Finally, more research is required to determine if collective pricing produces significant efficiency benefits. There are several ways to approach this problem. For example, one might use detailed firm-specific data to determine if firms that affiliate with ISO have lower costs than firms that do not. A second approach would be to look at the determinants of ISO affiliation, perhaps using limited dependent variable techniques (PROBIT or LOGIT) to examine firms' decisions to affiliate with ISO. The simple tests of affiliation contained in Chapter V are a very rudimentary step in this direction.

The research agenda for the auto insurance area is longer than we can hope to enumerate here. This study has begun the process of answering one of the most important questions, namely whether the benefits of collective pricing under antitrust immunity exceed the costs.

APPENDIX 1

STATE REGULATION OF COLLECTIVE PRICING

This appendix describes state statutes and regulations directly affecting auto insurance pricing. We examine three areas: the standards by which rates are judged, the procedures for review, and the statutory and regulatory provisions governing collective pricing activities through rating organizations.

Standards for Evaluating Rates

All states other than Illinois have statutory provisions prohibiting rates that are "excessive, inadequate, or unfairly discriminatory."[1] However, the interpretation of this phrase varies a great deal from state to state. The traditional standard called for rates to be set five percent above combined losses and expenses. More recently, there has been pressure on regulators to consider insurers' investment income in ratemaking cases.[2] At present, 23 states explicitly consider investment income in evaluating auto insurance rates. (See Table A1-1 below.)

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[1]There are some variations in wording.

[2]The NAIC recently conducted an extensive study of the appropriate standards for use in ratemaking. See Report of the Advisory Committee.

TABLE 33

STATES THAT EXPLICITLY CONSIDER INVESTMENT INCOME IN EVALUATING AUTO INSURANCE RATES

Arizona	New Jersey
Arkansas	New Mexico
Colorado	New York
Connecticut	North Carolina
District of Columbia	Oklahoma
Florida	South Carolina
Georgia	Tennessee
Hawaii	Texas
Maryland	Virginia
Massachussetts	West Virginia
Mississippi	Wisconsin
Michigan	

Source: Haayen, et al, Appendix Five and Jablon, et al, pp. 22-25.

The fact that a state formally considers investment income, however, may not convey much information about regulation in that state. While some of the states listed above (e.g. New Jersey) exercise strict control over auto insurance rates, others (e.g. Colorado, Virginia) do not exercise prior-approval control. Moreover, the requirement that investment income be considered does not necessarily narrow the broad "excessive, inadequate, or unfairly discriminatory" standards in any meaningful way. A regulator might well reach the same conclusions under this standard regardless of whether investment income is considered.

Rate Filing Requirements

Rate regulation laws have traditionally been divided into two major categories, prior-approval laws and open competition laws. The crucial distinction is that prior-approval laws, as the term suggests, require rates to be submitted to state regulators before they can take effect. The NAIC classifies rate regulatory procedures into nine categories: (1) State Made Rates, (2) Mandatory Bureau Rates, (3) Prior-Approval, (4) Modified Prior-Approval, (5) File and Use (Adherence to Bureau Rates Required), (6) File and Use (Bureau Rates Advisory Only), (7) Use and File, (8) No File (Bureau Rates Advisory Only), and (9) No File, Rate Standards nor Rates in Concert. The first five categories are considered prior-approval and the rest are considered open competition.[3] However, the NAIC appears to have caused a good deal of confusion. In particular, the division between file and use laws (requiring rates to be submitted on or before their effective dates) and use and file laws (requiring rates to be submitted at some specified time after they take effect) has sometimes been a cause of confusion, particularly where insurers in use and file states in practice file rates before their effective dates.[4] Moreover, the NAIC's division between prior-approval and open competition laws is somewhat misleading, since the NAIC includes in the open competition category laws (falling into category 6) that require rates to be filed before their effective dates. The NAIC justified this division on the basis of the requirement in category 5

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[3]See Hanson, et al, pp. 54-58.

[4]The possibility of such confusion was recognized when the original classifications were published. See Ibid., p. 55.

states that members and subscribers obtain approval to deviate from rating organization rates. A *de facto* requirement for such approval would seem to exist in all prior-approval states, however, since all of these states require all rates to be submitted in advance by all companies.

The basic division between prior-approval laws and open competition laws will be retained here. We will define prior-approval laws as those which require rates to be submitted to the insurance commissioner for review before they can be put into use. Of course, rate regulation is extremely complex, and not all states fall cleanly into either category. In particular, practice sometimes departs from strictly interpreted statutory language, making it essential to distinguish the actual situation in a given state from the statutory provisions. The classifications that follow are derived from a variety of sources, as discussed at the end of the table.

Restrictions on Joint Activity

There is tremendous diversity among state insurance laws in how rating organizations are treated. At one extreme, Illinois' law simply fails to define the term, referring only to advisory organizations that are permitted to collect statistics and publish loss and loss adjustment expense data (but not rates). At the opposite extreme, rating organizations in North Carolina and Texas are essentially arms of the state: insurers are required to charge the rates

TABLE 34

AUTO INSURANCE RATE REGULATION IN THE UNITED STATES

State	Current Status	Recent Changes/Comments
Alabama	Prior-Approval	Only rate changes based on expense data must be approved. Rating organization affiliates can only deviate by a uniform percentage.
Alaska	Prior-Approval	Rates must be submitted 15 days before their effective date. Rating organization affiliates can only deviate by a uniform percentage.
Arizona	Open Competition	Open Competition law took effect July 1980. We treat Arizona as Prior-Approval during 1980.
Arkansas	Prior-Approval	File and Use law took effect July 20, 1979. Law requires rates to be submitted 10 days prior to effective date.
California	Open Competition	Original Open Competition statute (1947). No filings required.
Colorado	Open Competition	Replaced existing File and Use law with no file law effective January 1, 1980.
Connecticut	Open Competition	Rates for mandatory no-fault coverage must be submitted 15 days prior to effective date. Other rates must be submitted or or before effective date. Open competition bill creating presumption in favor of submitted rates

		became effective July 1, 1983; state is considered prior approval in 1980.
Delaware	Prior-Approval	Under File and Use law rates must be filed on or before their effective dates. Under a 1979 court ruling, however, the commissioner can disapprove rates without hearing; companies follow prior-approval procedures.
District of Columbia	Prior-Approval	Prior-approval reinstituted in October 1983. Previously, file and use law required rates to be filed on or before effective date. Classified as Open Competition during 1980.
Florida	Prior-Approval	Use and file statute enacted in 1967 allows rates to be filed on or before effective date. However, since 1982 the insurance department has required companies to obtain prior-approval. Classified as Open Competition during 1980.
Georgia	Open Competition	Use and file statuted enacted in 1967 allows rates to be filed on or before their effective date.
Hawaii	Open Competition	File and Use law enacted in 1973 requires compulsory no-fault and liability rates to be submitted on or before their effective date.
Idaho	Open Competition	No file law enacted in 1968.

Illinois	Open Competition	Rating law expired in 1971. Commissioner requires filings for information purposes only.
Indiana	Prior-Approval	Only rate changes based on expense data must be be approved.
Iowa	Prior-Approval	Rates must be submitted 15 days before effective date.
Kansas	Prior-Approval	Rates must be submitted 15 days before effective date. Rating organization affiliates can only deviate by a uniform percentage.
Kentucky	Open Competition	No file law took effect July 15, 1982, replacing prior-approval law.
Louisiana	Prior-Approval	Only rate changes based on expense data must be approved. Rating organization affiliates can only deviate by a uniform percentage.
Maine	Prior-Approval	Rates must be filed at least 30 days prior to use. Rating organization affiliates can only deviate by a uniform percentage.
Maryland	Open Competition	File and use law effective, July 1, 1984 requires rates to be filed on or before their effective dates. Replaced prior-approval law.
Massachussetts	State Bureau	Insurance Commissioner publishes rates. Insurers must obtain approval to deviate.

Michigan	Open Competition	Insurers may elect for rates to become effective immediately upon filing.
Minnesota	Open Competition	File and Use law enacted in 1969 allows rates to be filed on or before their effective date.
Mississippi	Prior-Approval	Rates must be submitted 30 days prior to their effective date. Rating organization affiliates can only deviate by a uniform percentage.
Missouri	Open Competition	Rates presumed to be approved, must be submitted within 30 days of effective date.
Montana	Open Competition	File and Use law enacted in 1969 allows rates to be filed on or before their effective date.
Nebraska	Prior-Approval	Rates must be submitted 30 days prior to their effective date. Rating organization affiliates can only deviate by a uniform percentage.
Nevada	Open Competition	File and use law enacted in 1971 allows rates to be filed on or before their effective date.
New Hampshire	Prior-Approval	Commissioner must formally approve rates.
New Jersey	Prior-Approval	Extensive requirements for treatment of investment income, rate relativities, etc.
New Mexico	Open Competition	Rates must be filed within 30 days of their effective date under 1975 Use and File law. However, rating organization affiliates can only deviate by a uniform percentage.

New York	Prior-Approval	File and use law enacted in 1970 was replaced with prior-approval statute effective February 1974.
North Carolina	State Bureau	State commission reviews rates set by North Carolina Rating Bureau. Insurers must obtain approval to deviate from these rates.
North Dakota	Prior-Approval	Rates must be submitted 30 days before their effective date. Rating organization affiliates can only deviate from its rates by a uniform percentage.
Ohio	Open Competition	Rates must be filed on or before their effective date under 1953 statute. State imposes relatively extensive filing requirements.
Oklahoma	Prior-Approval	Rates must be submitted 60 days before their effective date.
Oregon	Open Competition	File and use law enacted in 1970 allows rates to be filed on or before their effective date.
Pennsylvania	Prior-Approval	Rates must be submitted 30 days before their effective date. Rating organization affiliates can only deviate by a uniform percentage.
Rhode Island	Prior-Approval	Rates must be submitted 30 days before their effective date. Rating organization affiliates can only deviate by a uniform percentage.

South Carolina	Prior-Approval	Rates must be submitted 60 days before their effective date. Rating organization affiliates can only deviate by a uniform percentage.
South Dakota	Open Competition	File and use law enacted in 1979 allows rates to be filed on or before their effective date.
Tennessee	Prior-Approval	Rates must be submitted 30 days before their effective date. Rating organization affiliates can only deviate by a uniform percentage.
Texas	State Bureau	Insurance commissioner publishes rates. Insurers must obtain approval to deviate, and deviations must be by a uniform percentage.
Utah	Open Competition	File and use law effective in 1973 allows rates to be filed within 30 days of their effective date.
Vermont	Open Competition	File and use statute effective July 1, 1984 allows rates to be filed on or before their effective date, replacing prior-approval requirement.
Virginia	Open Competition	Under 1974 File and use law, rates must be filed on or before their effective date.
Washington	Prior-Approval	Rates must be submitted 15 days before their effective date. Rating organization members can only deviate from its rates by a uniform percentage.

West Virginia	Prior-Approval	Rates must be submitted 30 days before their effective date. Rating organization affiliates can only deviate by a uniform percentage.
Wisconsin	Open Competition	Under 1969 use and file law, rates must be filed within 30 days of their effective date.
Wyoming	Open Competition	No file law replaced prior-approval law effective July 1, 1983.

Sources: A wide variety of sources were consulted in preparing the table above. The main sources of information for state procedures are Rate Filing Procedures, State by State Requirements and Recommendations, (Des Plains, Illinois: National Association of Independent Insurers, 1983), and The State Filing Handbook, (New York: Insurance Services Office, Inc., 1983) which provide detailed explanations of state rate filing procedures intended for use by insurers.

The NAIC's original classification of state laws has been updated twice, once in 1980 and again in 1984, by the NAIC staff. Tables were provided directly by the NAIC. The American Insurance Association and State Farm Mutual Insurance Company also provided classifications prepared by their respective staffs.

We relied to some extent on a number of published studies that classified regulatory laws, including Ippolito.

Where necessary, we referred directly to state insurance statutes and/or telephoned state insurance departments. We would like to thank Michael Johnson of the NAIC for reviewing and commenting on this table.

submitted by the rating organization (and approved by the state) unless they receive permission to deviate.[5]

In Table AII-3 we list the states in which statutes prohibit, either by express provision or by implication, joint activities involving actual rates, and those that allow such activities. In the supporting material that follows we further divide states into seven categories based on the exact language of each state insurance statute. To facilitate a more detailed description of state provisions we divide state laws into seven categories. Categories (1) and (2) include states that essentially allow insurers to act in concert to make ratios; the remaining five categories consist of states that more or less prohibit joint activities involving rates. A complete list of statutory references follows in Table AI-4.

(1) A total of 26 states (including the District of Columbia) place no specific restrictions on the collective ratemaking activities of rating organizations. This is not to say that rating organizations are not regulated, as all of these states impose licensing and examination requirements on rating organizations and give the state insurance commissioner authority to police rating organization activities. Pennsylvania's statutory language is typical:

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[5]The system in Massachusetts is similar to that in North Carolina and Texas except that other organizations, including a public advocate, play a larger role in determining what rates are actually charged.

TABLE 35:

STATUTORY LIMITATIONS ON JOINT RATEMAKING
(Numbers in Parentheses Refer to Material Below)

States Allowing Collective Ratemaking	States Limiting Collective Ratemaking
Alabama (1)	Arkansas (4)
Alaska (1)	Connecticut (6)
Arizona (1)	Colorado (3)
California (2)	Florida (4)
Delaware (1)	Hawaii (5)
District of Columbia (1)	Illinois (7)
Georgia (2)	Kentucky (7)
Idaho (2)	New York (3)
Indiana (1)	Virginia (3)
Iowa (1)	Wyoming (7)
Kansas (1)	
Louisiana (1)	
Maine (1)	
Maryland (1)	
Massachusetts (1)	
Michigan (1)	
Minnesota (2)	
Mississippi (1)	
Missouri (2)	
Montana (2)	
Nebraska (1)	
Nevada (2)	
New Hampshire (1)	
New Jersey (2)	
New Mexico (2)	
North Carolina (2)	
North Dakota (1)	
Ohio (1)	
Oklahoma (1)	
Oregon (2)	
Pennsylvania (1)	
Rhode Island (1)	
South Carolina (1)	
South Dakota (1)	
Tennessee (2)	
Texas (1)	
Utah (2)	
Vermont (1)	
Washington (1)	
West Virginia (1)	
Wisconsin (2)	

Source: State insurance statutes; See below.

> Cooperation among rating organizations, or among rating organizations and insurers, and concert of action among insurers under the same general management and control in rate making or in other matters within the scope of thes Act is hereby authorized, provided the filings there from are subject to all the provisions of the Act which are applicable to filings generally. The Commissioner may review such activities and practices and if, after a hearing, he finds that any such activity or practice is unfair or unreasonable . . . he may issue a written order . . . requiring the discontinuance of such activity or practice.[6]

Thus, the statute vests general authority in the insurance commissioner to oversee rating organization activities, but places no explicit restrictons on joint activities so long as jointly-prepared rate filings are subject to prior-approval regulation.

(2) A total of 14 states allow collective ratemaking but specifically prohibit agreements among insurers to adhere to the collectively determined rates. Typically, these provisions have been included in open competition statutes. Nevada, for example, included the following provision in its 1971 File and Use law:

> No insurer shall assume any obligation to any person other than a policyholder or other companies under common control to use or adhere to certain rates or rules, and no other person shall impose any penalty or other adverse consequence for failure of an insurer to adhere to certain rates or rules.[7]

While adherence requirements are thus prohibited, this language poses no apparent barrier to ISO's use of its

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[6]See Pennsylvania Insurance Laws, Sec. 40-65-106(d).

[7]Nevada Revised Statutes, Sec. 686B.150.

traditional rating procedure. In practice, however, ISO uses competitive rating procedures in all of these states (see Table A1-3).

(3) The insurance statutes of Colorado, New York, and Virginia contain very similar provisions prohibiting a set of anticompetitive practices by rating organizations and insurers, including adherence requirements. Virginia's statute reads, in part:

> B. No insurer or rate service organization shall:
>
> 1. Monopolize or attempt to monopolize, or combine or conspire with any other person or persons to monopolize the business of insurance . . .;
>
> 2. Agree with any other insurer or rate service organization to charge or adhere to any rate, although insurers and rate service organizations may continue to exchange statistical information;
>
> 3. Make any agreement with any other insurer, rate service organization, or other person to unreasonably restrain trade;
>
> 4. Make any agreement with any other insurer, rate service organization or other person, the effect of which may be substantially to lessen competition in the business of insurance . . .;
>
> 5. Make any agreement with any other insurer or rate service organization to refuse to deal with any person in connection with the sale of insurance.[8]

Thus, the these three states place restrictions on insurers and rating organizations, with obvious similarities to the Federal antitrust laws. Indeed, the specific language stating

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[8] Code of Virginia, Sec. 38.1-279.44.

that "insurers and rate service organizations may continue to exchange statistical information" could be interpreted to imply that ratemaking as such is prohibited. While ISO publishes only loss costs in Colorado and Virginia, it continues to publish rates in New York.

(4) Arkansas and Florida effectively prohibit joint ratemaking by specifically excluding auto insurance in their provisions allowing joint ratemaking. Florida's statute, for example, states that

> two or more insurers may act in concert with each other and with others with respect to any matters pertaining to: (a) The making of rates or rating systems <u>except for private passenger automobile insurance rates</u>. (Emphasis added).[9]

The ISO uses its loss-cost-only procedure in both states.

(5) Hawaii's insurance statute contains unique language limiting inter-insurer contacts:

> Notwithstanding any other law to the contrary, no insurer shall agree, combine, or conspire with any other private insurer or enter into, become a member of, or participate in any understanding, pool, or trust, to fix, control, or maintain, directly or indirectly, motor vehicle insurance rates.[10]

As noted in Chapter 3, the Hawaii Insurance Rating Bureau uses procedures very similar to ISO's loss-cost procedures.

(6) Connecticut specifically prohibits rating organizations from publishing rates that include provisions for expenses and profits. Connecticut's statute states that

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[9] <u>Florida Insurance Code</u>, Sec. 627.314.

[10] <u>Hawaii Insurance Code</u>, Sec. 294,13(k).

rating organizations shall

> with respect to private passenger nonfleet automobile and homeowners insurance, neither compile for nor distribute to insurers generally, recommendations relating to rates that include expenses other than loss adjustment expense or profits, nor file rates, supplementary rate information or supporting information on behalf of an insurer . . .[11]

(7) It seems to be a common misperception that Illinois has no rating law. While the Illinois law applying to rate regulation expired in 1971, a new law was passed in 1972 that provided for joint activity through advisory organizations. Article 735A of the Illinois Insurance Code defines an advisory organization, in part, as an organization that

> (i)compiles insurance statistics, or (ii) prepares insurance policies, bond forms and underwriting rules, and (iii) furnishes that which it compiles and prepares to insurance companies who are its only members and subscribers.

No mention is made of rating organizations per se or of collective activities involving collective ratemaking, and the ISO has distributed only loss costs in Illinois since the old law expired in 1971. Kentucky and Wyoming are similar to Illinois in that the statutes of both states define only advisory organizations. However, both states also specifically prohibit collective ratemaking in language similar to Connecticut's. The Wyoming Insurance Code states that

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11Connecticut Insurance Laws Chap. 682, Sec. 38-201j,(b).

No advisory organization shall . . . compile or distribute recommendations relating to rates that include profit or expenses, except loss adjustment expenses.[12]

[12] *Wyoming Insurance Code*, Sec. 26-14-109.

TABLE 36:

STATE STATUTES AFFECTING COLLECTIVE PRICING ACTIVITIES BY INSURERS

Alabama Insurance Code, Secs. 27-13-20, 27-13-100, 27-13-105

Alaska Insurance Code, Secs. 21.39.060, 21.39.100

Arizona Insurance Code, Secs. 20-361, 20-368, 20-381, 20-389, 20-390

Arkansas Insurance Code, Secs. 66-3102, 66-3108, 66-3110, 66-3112

California Insurance Code, Secs. 1850.1, 1850.2, 1853, 1853.5, 1853.6, 1854, 1855

Colorado Insurance Code, Secs. 10-4-402, 10-4-408, 10-4-409, 10-4-410, 10-4-415

Connecticut Insurance Laws, Secs. 38-201a, 38-201d, 38-201f, 38-201g, 38-201j, 38-201k

Delaware Insurance Code, Secs. 2511, 2512, 2517, 2522, 2526

District of Columbia Insurance Code, Secs. 35-1705, 35-1706

Florida Insurance Code, Secs. 627.041, 627.231, 627.301, 627.314, 627.621

Georgia Insurance Code, Secs. 33-9-2, 33-9-9, 33-9-11, 33-9-12, 33-9-13, 33-9-17, 33-9-18, 33-9-37

Hawaii Insurance Code, Secs. 294-13(k), 431-696, 431-700

Idaho Insurance Code, Secs. 41-1415, 41-1425, 41-1436, 41-1437, 41-1438

Illinois Insurance Code, Article VIIA, and Department Rules, Parts 751-754

Indiana Insurance Code, Secs. 27-1-22-8, 27-1-22-13

Iowa Insurance Code, Secs. 515A.6-8, 515A.10

Kansas Insurance Code, Secs. 40-1114, 40-1115

Kentucky Insurance Laws, Secs. 304.13-011, 304.13-091, 304.13-111, 304.13-121, 304.13-131.

Louisiana Insurance Code, Secs. 22:1409, 22:1413

Maine Insurance Code, Secs. 2309-2311, 2316-2317, 2321, 2324

Maryland Insurance Code, Chapter 48A, Secs. 242(g), 242(h), 242(1)

Massachusetts Insurance Laws, C.175A, Secs. 8-10,12

Michigan Insurance Laws, Secs. 500.2436, 500.2438, 500.2446, 500.2456, 500.2462

Minnesota Insurance Laws, Secs. 70A.14, 70A.15

Mississippi Insurance Code, Secs. 83-3-109, 83-3-113, 83-3-201

Missouri Insurance Statutes, Secs. 379.430, 379.435, 379,440 379.445, 379.455, 379.465, 379.470

Montana Insurance Code, Secs. 33-16-301 -- 33-16-304, 33-16-308, 33-16-401, 33-16-402,33-16-404

Nebraska Insurance Code, Secs. 44-1418 -- 44-1428

Nevada Insurance Code, Secs. 686B.020, 686B.130 686B.140, 686B.150

New Hampshire Insurance Code, Secs. 413:1-413.4

New Jersey Insurance Laws, Secs. 17:29-A-1, 17:29-A-3 17:29-A-29.

New Mexico Insurance Code, Secs. 59-12-20, 59-12-31, 59-12-32, 59-12-34.

New York Insurance Laws, Secs. 177, 180, 181, 182, 185

North Carolina Insurance Code, Secs. 58-124.17 -- 58-124.24

North Dakota Insurance Code, Secs. 26.1-25-06 -- 26.1-25-08, 26.1-25-10

Ohio Insurance Code, Secs. 3935.06 - 3935.08, 3935.12

Oklahoma Insurance Code, Secs. 927, 928, 931

Oregon Insurance Code, Secs. 737.245, 737.255, 737.265, 737.350, 737.360, 737.365, 737.510

Pennsylvania Insurance Laws, Secs. 40-65-106 -- 40-65-108, 40-65-110

Rhode Island Insurance Code, Secs.27-9-5, 27-9-22, 27-9-25, 27-9-27, 27-9-30 -- 27-9-33

South Carolina Insurance Laws, Secs. 38-43-40, 38-43-910, 38-43- 920, 38-43-960, 38-43-990, 38-43-1010, 38-43-1050, 38-43-1210, 38-43-1220

South Dakota Insurance Code, Secs. 58-24-9, 58-24-35, 58-24-40--58-24-43, 58-24-46, 58-24-49 -- 58-24-54

Tennessee Insurance Code, Secs. 56-5-302, 56-5-310, 56-5-311, 56-5-313

Texas Insurance Code, Art. 5.16, 5.17, 5.73

Utah Insurance Code, Secs. 31-18-2, 31-18-9, 31-18-14 -- 31-18-16

Vermont Insurance Code, Secs. 4651, 4652, 4653

Virginia Insurance Code, Secs. 38.1-279.30, 38.1-279.41, 38.1-279.42

Washington Insurance Code, Secs. 48.19.140 - 48.19.220, 48.19.320, 48.19.330, 48.19.420

West Virginia Insurance Code, Secs. 33-20-6 -- 33-20-8, 33-20-10

Wisconsin Insurance Laws, Secs. 625.02, 625.31, 625.32, 625.33

Wyoming Insurance Code, Secs. 26-14-103, 26-14-109, 26-14-111

APPENDIX 2

MEMBERSHIP OF ISO BOARD OF DIRECTORS AND KEY COMMITTEES

TABLE 37

MEMBERSHIP ON ISO BOARD OF DIRECTORS

- Board of Directors Elected by the Members

Chairman	Melvin B. Bradshaw Chairman and Chief Executive Officer Liberty Mutual Insurance Company
Vice Chairman	Robert J. Clark Senior Vice President - Commercial Insurance Division Aetna Casualty and Surety Company

Term Expiring in 1984

John A. Schoneman, Chairman and Chief Executive Officer
Employers Insurance Of Wausau, A Mutual Company
Charles L. Niles, Jr., President
General Accident Insurance Company of America
Roger W. Gilbert, President, Great American-West Inc.
Great American Insurance Company
Francis P. Story, President
Holyoke Mutual Insurance Company
Melvin B. Bradshaw, Chairman and Chief Executive Officer
Liberty Mutual Insurance Company
John E. Fisher, General Chairman and Chief Executive Officer
Nationwide Mutual Insurance Company
Robert J. Vairo, Chairman and Chief Executive Officer
North River Insurance Company
John E. Riley, Senior Vice President-Personal Lines
SAFECO Insurance Company of America

Term Expiring in 1985

Robert J. Clark, Senior Vice President-Commercial Insurance Division
Aetna Casualty and Surety Company
Anton A. Lubimir, Senior Vice President
Hartford Fire Insurance Company
George H. Kasbohm, Vice President
Lumbermens Mutual Casualty Company
Don D. Hutson, President
Maryland Casualty Company
William A. Pollard, Chairman and Chief Executive Officer
Reliance Insurance Company
George W. Ansbro, Chairman, President and Chief Executive Officer
Royal Insurance
Robert J. Lindquist, Senior Vice President
Transamerica
Wheeler H. Hess, Senior Vice President
The Travelers Insurance Company

Term Expiring in 1986

Robert Sandler, Vice President - Actuary, AIG, Inc.
American Home Assurance Company
Edwin J. Goss, President
American States Insurance Company
Edward K. Trowbridge, Senior Executive Vice President
Atlantic Mutual Insurance Company
Thomas V.A. Kelsey, Executive Vice President
Federal Insurance Company
Gerald A. Isom, Senior Executive Vice President
Fireman's Fund Insurance Company
Steven H. Newman, Executive Vice President
Home Insurance Company
Frans R. Eliason, President and Chief Executive Officer-ARMCO
Northwestern National Insurance Company
Clifford H. Whitcomb, President and Chief Executive Officer
Prudential Property and Casualty Insurance Company

Source: Insurance Services Office, Inc., "Chief Executive Circular: Insurer Composition of Key ISO Committees and Subsidiary Boards for 1984 Announced," ISO Circular CE-84-3 (January 16, 1984).

TABLE 38

MEMBERSHIP ON ISO PERSONAL LINES COMMITTEE

Personal Lines Committee Elected by the Board of Directors

Chairman	John E. Riley, Senior Vice President SAFECO Insurance Company of America
Vice Chairman	Erwin F. Fromm, Senior Vice President Royal Insurance

Term Expiring in 1984

Davies W. Bisset, Jr., Vice President
Amica Mutual Insurance Company
Robert T. Haskins, Vice President-Personal Lines
CIGNA
George F. Fay, Jr., Vice President
Hartford Fire Insurance Company
Erwin F. Fromm, Senior Vice President
Royal Insurance

Term Expiring in 1985

Donald O. Scruggs, Vice President-Personal Lines
Continental Insurance Company
Clem H. Spalding, Vice President
United Services Automobile Association
James A. Mappus, Vice President
United States Fidelity and Guaranty Company
William L. Boyer, Vice President-Personal Lines
Westfield Insurance Company

Term Expiring in 1986

Robert P. Dunn, Executive Vice President and Chief Operating Officer
Dodson Insurance Group
John F. Knight, President
Republic Insurance Company
John E. Riley, Senior Vice President
SAFECO Insurance Company of America
Robert Fisher, Corporate Vice President
Sentry Insurance

Representative from Actuarial Committee Appointed by Chairman of the Board of Directors

Earl F. Petz, Actuary
Lumbermens Mutual Casualty Company

Source: Insurance Services Office, Inc., "Chief Executive Circular: Insurer Composition of Key ISO Committees and Subsidiary Boards for 1984 Announced," ISO Circular CE-84-3 (January 16, 1984).

TABLE 39

MEMBERSHIP ON ISO
ACTUARIAL COMMITTEE

Actuarial Committee Elected by the Board of Directors

Chairman	Robert J. Lindquist, Senior Vice President Transamerica
Vice Chairman	Wayne H. Fisher, Vice President and Senior Actuary Continental Insurance Company

Term Expiring in 1984

Wayne H. Fisher, Vice President and Senior Actuary
Continental Insurance Company
Robert G. Palm, Vice President and Actuary
Great American Insurance Company
Earl F. Petz, Actuary
Lumbermens Mutual Casualty Company
Charles A. Even, Jr., Vice President and Actuary
Travelers Insurance Company

Term Expiring in 1985

Robert Sandler, Vice President-Actuary, AIG, Inc.
American Home Assurance Company
George E. Davis, Vice President-Actuary
Commercial Union Insurance Company
Albert J. Quirin, Vice President
Hartford Fire Insurance Company
Urban E. Leimkuhler, Jr., Vice President-Actuary
United States Fidelity and Guaranty Company

Terms Expiring in 1986

Charles L. McClenahan, Vice President and Actuary
Continental Casualty Company
Raymond Barrette, Vice President and Actuary
Fireman's Fund Insurance Company
Robert J. Lindquist, Senior Vice President
Transamerica
Charles A. Bryan, Senior Vice President and Actuary
United Services Automobile Association

Source: Insurance Services Office, Inc., "Chief Executive Circular: Insurer Composition of Key ISO Committees and Subsidiary Boards for 1984 Announced," ISO Circular CE-84-3 (January 16, 1984).

TABLE 40

MEMBERSHSIP ON THE ISO PRIVATE PASSENGER AUTOMOBILE COMMITTEE

Private Passenger Automobile Committee

United States Fidelity and Guaranty Company - Chairman
Travelers Insurance Company - Vice Chairman
American States Insurance Company
Employers Mutual Casualty Company
General Accident Insurance Company of America
Hartford Fire Insurance Company
Home Insurance Company
Liberty Mutual Insurance Company
Motors Insurance Corporation
New Hampshire Insurance Company
Sentry Insurance A Mutual Company
Utica Mutual Insurance Company

Source: Insurance Services Office, Inc., "Chief Executive Circular: Insurer Composition of Additional ISO Committee Announced," ISO Circular CE-84-9 (April 3, 1984).

APPENDIX 3

EXTENT OF ADHERENCE TO THE ISO PRICE

The data presented below provides evidence on the extent of deviation from and/or adherence to the advisory rates published by the ISO in 39 states and the District of Columbia. The data was obtained from the ISO's Premium Comparison Service survey, which surveys prices for firms in three categories (National Agency Firms, State Agency Firms, and Direct Writers) and reports these prices (and the ISO advisory price) for each territory in each state.[1]

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[1]The twelve jurisdictions for which data is not available are the seven states in which the ISO's Loss-Cost-Only procedure was in effect (Thus, there was no ISO price with which to compare the prices surveyed.), plus the four states in which the ISO is not directly involved in making auto rates (Hawaii, Massachusetts, North Carolina and Texas). Reports for different states are issued periodically. We obtained reports dated approximately July 1, 1980. The policy for which prices are surveyed is identical within states. Generally, the policy surveyed is for coverage for an adult male, driving a standard automobile, with no accident points or violations.

STATE: ALABAMA
NUMBER OF OBSERVATIONS: 88

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	1.00
ISO < P <= 1.05 ISO	1.00
P = ISO	0.00
ISO > P >= 0.95 ISO	2.00
0.95 ISO > P >= 0.90 ISO	4.00
0.90 ISO > P >= 0.75 ISO	40.00
P < 0.75 ISO	40.00

STATE: ALASKA
NUMBER OF OBSERVATIONS: 51

P > 1.25 ISO	3.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	2.00
ISO < P <= 1.05 ISO	3.00
P = ISO	3.00
ISO > P >= 0.95 ISO	2.00
0.95 ISO > P >= 0.90 ISO	3.00
0.90 ISO > P >= 0.75 ISO	14.00
P < 0.75 ISO	21.00

STATE: ARIZONA
NUMBER OF OBSERVATIONS: 88

P > 1.25 ISO	9.00
1.10 ISO < P <= 1.25 ISO	2.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	6.00
0.95 ISO > P >= 0.90 ISO	5.00
0.90 ISO > P >= 0.75 ISO	12.00
P < 0.75 ISO	54.00

STATE: COLORADO
NUMBER OF OBSERVATIONS: 63

P > 1.25 ISO	7.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	1.00
P = ISO	0.00
ISO > P >= 0.95 ISO	0.00
0.95 ISO > P >= 0.90 ISO	2.00
0.90 ISO > P >= 0.75 ISO	18.00
P < 0.75 ISO	35.00

STATE: DELAWARE
NUMBER OF OBSERVATIONS: 39

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	3.00
1.05 ISO < P <= 1.10 ISO	3.00
ISO < P <= 1.05 ISO	5.00
P = ISO	3.00
ISO > P >= 0.95 ISO	3.00
0.95 ISO > P >= 0.90 ISO	8.00
0.90 ISO > P >= 0.75 ISO	12.00
P < 0.75 ISO	2.00

STATE: DISTRICT OF COLUMBIA
NUMBER OF OBSERVATIONS: 14

P > 1.25 ISO	1.00
1.10 ISO < P <= 1.25 ISO	3.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	1.00
P = ISO	1.00
ISO > P >= 0.95 ISO	1.00
0.95 ISO > P >= 0.90 ISO	2.00
0.90 ISO > P >= 0.75 ISO	3.00
P < 0.75 ISO	2.00

STATE: GEORGIA
NUMBER OF OBSERVATIONS: 171

P > 1.25 ISO	9.00
1.10 ISO < P <= 1.25 ISO	1.00
1.05 ISO < P <= 1.10 ISO	6.00
ISO < P <= 1.05 ISO	7.00
P = ISO	0.00
ISO > P >= 0.95 ISO	16.00
0.95 ISO > P >= 0.90 ISO	10.00
0.90 ISO > P >= 0.75 ISO	73.00
P < 0.75 ISO	49.00

STATE: IDAHO
NUMBER OF OBSERVATIONS: 24

P > 1.25 ISO	2.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	0.00
0.95 ISO > P >= 0.90 ISO	0.00
0.90 ISO > P >= 0.75 ISO	2.00
P < 0.75 ISO	20.00

STATE: INDIANA
NUMBER OF OBSERVATIONS: 375

P > 1.25 ISO	24.00
1.10 ISO < P <= 1.25 ISO	17.00
1.05 ISO < P <= 1.10 ISO	12.00
ISO < P <= 1.05 ISO	44.00
P = ISO	1.00
ISO > P >= 0.95 ISO	29.00
0.95 ISO > P >= 0.90 ISO	29.00
0.90 ISO > P >= 0.75 ISO	137.00
P < 0.75 ISO	82.00

STATE: IOWA
NUMBER OF OBSERVATIONS: 144

P > 1.25 ISO	12.00
1.10 ISO < P <= 1.25 ISO	3.00
1.05 ISO < P <= 1.10 ISO	1.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	0.00
0.95 ISO > P >= 0.90 ISO	0.00
0.90 ISO > P >= 0.75 ISO	23.00
P < 0.75 ISO	105.00

STATE: KANSAS
NUMBER OF OBSERVATIONS: 154

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	15.00
ISO > P >= 0.95 ISO	14.00
0.95 ISO > P >= 0.90 ISO	11.00
0.90 ISO > P >= 0.75 ISO	46.00
P < 0.75 ISO	68.00

STATE: KENTUCKY
NUMBER OF OBSERVATIONS: 192

P > 1.25 ISO	13.00
1.10 ISO < P <= 1.25 ISO	2.00
1.05 ISO < P <= 1.10 ISO	8.00
ISO < P <= 1.05 ISO	9.00
P = ISO	1.00
ISO > P >= 0.95 ISO	22.00
0.95 ISO > P >= 0.90 ISO	14.00
0.90 ISO > P >= 0.75 ISO	68.00
P < 0.75 ISO	55.00

STATE: LOUISIANA
NUMBER OF OBSERVATIONS: 240

P > 1.25 ISO	16.00
1.10 ISO < P <= 1.25 ISO	49.00
1.05 ISO < P <= 1.10 ISO	34.00
ISO < P <= 1.05 ISO	37.00
P = ISO	8.00
ISO > P >= 0.95 ISO	32.00
0.95 ISO > P >= 0.90 ISO	20.00
0.90 ISO > P >= 0.75 ISO	44.00
P < 0.75 ISO	0.00

STATE: MAINE
NUMBER OF OBSERVATIONS: 261

P > 1.25 ISO	12.00
1.10 ISO < P <= 1.25 ISO	10.00
1.05 ISO < P <= 1.10 ISO	8.00
ISO < P <= 1.05 ISO	4.00
P = ISO	46.00
ISO > P >= 0.95 ISO	24.00
0.95 ISO > P >= 0.90 ISO	23.00
0.90 ISO > P >= 0.75 ISO	88.00
P < 0.75 ISO	46.00

STATE: MARYLAND
NUMBER OF OBSERVATIONS: 144

P > 1.25 ISO	21.00
1.10 ISO < P <= 1.25 ISO	36.00
1.05 ISO < P <= 1.10 ISO	9.00
ISO < P <= 1.05 ISO	8.00
P = ISO	1.00
ISO > P >= 0.95 ISO	13.00
0.95 ISO > P >= 0.90 ISO	21.00
0.90 ISO > P >= 0.75 ISO	29.00
P < 0.75 ISO	6.00

STATE: MICHIGAN
NUMBER OF OBSERVATIONS: 272

P > 1.25 ISO	34.00
1.10 ISO < P <= 1.25 ISO	40.00
1.05 ISO < P <= 1.10 ISO	30.00
ISO < P <= 1.05 ISO	24.00
P = ISO	3.00
ISO > P >= 0.95 ISO	27.00
0.95 ISO > P >= 0.90 ISO	40.00
0.90 ISO > P >= 0.75 ISO	61.00
P < 0.75 ISO	13.00

STATE: MINNESOTA
NUMBER OF OBSERVATIONS: 81

P > 1.25 ISO	9.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	3.00
0.95 ISO > P >= 0.90 ISO	8.00
0.90 ISO > P >= 0.75 ISO	35.00
P < 0.75 ISO	26.00

STATE: MISSISSIPPI
NUMBER OF OBSERVATIONS: 56

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	2.00
ISO < P <= 1.05 ISO	4.00
P = ISO	8.00
ISO > P >= 0.95 ISO	4.00
0.95 ISO > P >= 0.90 ISO	3.00
0.90 ISO > P >= 0.75 ISO	8.00
P < 0.75 ISO	27.00

STATE: MONTANA
NUMBER OF OBSERVATIONS: 44

P > 1.25 ISO	8.00
1.10 ISO < P <= 1.25 ISO	4.00
1.05 ISO < P <= 1.10 ISO	3.00
ISO < P <= 1.05 ISO	6.00
P = ISO	0.00
ISO > P >= 0.95 ISO	4.00
0.95 ISO > P >= 0.90 ISO	3.00
0.90 ISO > P >= 0.75 ISO	5.00
P < 0.75 ISO	11.00

STATE: NEBRASKA
NUMBER OF OBSERVATIONS: 96

P > 1.25 ISO	6.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	0.00
0.95 ISO > P >= 0.90 ISO	0.00
0.90 ISO > P >= 0.75 ISO	16.00
P < 0.75 ISO	74.00

STATE:NEVADA
NUMBER OF OBSERVATIONS: 48

P > 1.25 ISO	4.00
1.10 ISO < P <= 1.25 ISO	2.00
1.05 ISO < P <= 1.10 ISO	1.00
ISO < P <= 1.05 ISO	2.00
P = ISO	0.00
ISO > P >= 0.95 ISO	4.00
0.95 ISO > P >= 0.90 ISO	0.00
0.90 ISO > P >= 0.75 ISO	20.00
P < 0.75 ISO	15.00

STATE: NEW HAMPSHIRE
NUMBER OF OBSERVATIONS: 390

P > 1.25 ISO	26.00
1.10 ISO < P <= 1.25 ISO	108.00
1.05 ISO < P <= 1.10 ISO	61.00
ISO < P <= 1.05 ISO	51.00
P = ISO	79.00
ISO > P >= 0.95 ISO	28.00
0.95 ISO > P >= 0.90 ISO	24.00
0.90 ISO > P >= 0.75 ISO	13.00
P < 0.75 ISO	0.00

STATE: NEW JERSEY
NUMBER OF OBSERVATIONS: 243

P > 1.25 ISO	8.00
1.10 ISO < P <= 1.25 ISO	16.00
1.05 ISO < P <= 1.10 ISO	18.00
ISO < P <= 1.05 ISO	21.00
P = ISO	56.00
ISO > P >= 0.95 ISO	25.00
0.95 ISO > P >= 0.90 ISO	45.00
0.90 ISO > P >= 0.75 ISO	53.00
P < 0.75 ISO	1.00

STATE: NEW MEXICO
NUMBER OF OBSERVATIONS: 75

P > 1.25 ISO	6.00
1.10 ISO < P <= 1.25 ISO	1.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	2.00
P = ISO	1.00
ISO > P >= 0.95 ISO	3.00
0.95 ISO > P >= 0.90 ISO	2.00
0.90 ISO > P >= 0.75 ISO	21.00
P < 0.75 ISO	39.00

STATE: NEW YORK
NUMBER OF OBSERVATIONS: 1260

P > 1.25 ISO	13.00
1.10 ISO < P <= 1.25 ISO	80.00
1.05 ISO < P <= 1.10 ISO	58.00
ISO < P <= 1.05 ISO	129.00
P = ISO	3.00
ISO > P >= 0.95 ISO	110.00
0.95 ISO > P >= 0.90 ISO	243.00
0.90 ISO > P >= 0.75 ISO	500.00
P < 0.75 ISO	124.00

STATE: NORTH DAKOTA
NUMBER OF OBSERVATIONS: 42

P > 1.25 ISO	3.00
1.10 ISO < P <= 1.25 ISO	1.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	3.00
P = ISO	0.00
ISO > P >= 0.95 ISO	4.00
0.95 ISO > P >= 0.90 ISO	4.00
0.90 ISO > P >= 0.75 ISO	19.00
P < 0.75 ISO	8.00

STATE: OHIO
NUMBER OF OBSERVATIONS: 613

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	1.00
1.05 ISO < P <= 1.10 ISO	9.00
ISO < P <= 1.05 ISO	16.00
P = ISO	0.00
ISO > P >= 0.95 ISO	29.00
0.95 ISO > P >= 0.90 ISO	25.00
0.90 ISO > P >= 0.75 ISO	194.00
P < 0.75 ISO	339.00

STATE: OKLAHOMA
NUMBER OF OBSERVATIONS: 77

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	14.00
ISO > P >= 0.95 ISO	1.00
0.95 ISO > P >= 0.90 ISO	4.00
0.90 ISO > P >= 0.75 ISO	32.00
P < 0.75 ISO	26.00

STATE: OREGON
NUMBER OF OBSERVATIONS: 128

P > 1.25 ISO	19.00
1.10 ISO < P <= 1.25 ISO	4.00
1.05 ISO < P <= 1.10 ISO	9.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	1.00
0.95 ISO > P >= 0.90 ISO	1.00
0.90 ISO > P >= 0.75 ISO	13.00
P < 0.75 ISO	81.00

STATE: PENNSYLVANIA
NUMBER OF OBSERVATIONS: 600

P > 1.25 ISO	2.00
1.10 ISO < P <= 1.25 ISO	13.00
1.05 ISO < P <= 1.10 ISO	26.00
ISO < P <= 1.05 ISO	35.00
P = ISO	7.00
ISO > P >= 0.95 ISO	184.00
0.95 ISO > P >= 0.90 ISO	84.00
0.90 ISO > P >= 0.75 ISO	217.00
P < 0.75 ISO	32.00

STATE: RHODE ISLAND
NUMBER OF OBSERVATIONS: 63

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	13.00
1.05 ISO < P <= 1.10 ISO	7.00
ISO < P <= 1.05 ISO	8.00
P = ISO	6.00
ISO > P >= 0.95 ISO	15.00
0.95 ISO > P >= 0.90 ISO	10.00
0.90 ISO > P >= 0.75 ISO	4.00
P < 0.75 ISO	0.00

STATE: SOUTH CAROLINA
NUMBER OF OBSERVATIONS: 128

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	2.00
1.05 ISO < P <= 1.10 ISO	2.00
ISO < P <= 1.05 ISO	9.00
P = ISO	18.00
ISO > P >= 0.95 ISO	8.00
0.95 ISO > P >= 0.90 ISO	16.00
0.90 ISO > P >= 0.75 ISO	56.00
P < 0.75 ISO	17.00

STATE: SOUTH DAKOTA
NUMBER OF OBSERVATIONS: 72

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	6.00
0.95 ISO > P >= 0.90 ISO	7.00
0.90 ISO > P >= 0.75 ISO	25.00
P < 0.75 ISO	34.00

STATE: TENNESSEE
NUMBER OF OBSERVATIONS: 141

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	3.00
1.05 ISO < P <= 1.10 ISO	5.00
ISO < P <= 1.05 ISO	13.00
P = ISO	0.00
ISO > P >= 0.95 ISO	14.00
0.95 ISO > P >= 0.90 ISO	17.00
0.90 ISO > P >= 0.75 ISO	56.00
P < 0.75 ISO	33.00

STATE: UTAH
NUMBER OF OBSERVATIONS: 40

P > 1.25 ISO	3.00
1.10 ISO < P <= 1.25 ISO	2.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	2.00
0.95 ISO > P >= 0.90 ISO	2.00
0.90 ISO > P >= 0.75 ISO	20.00
P < 0.75 ISO	11.00

STATE: VERMONT
NUMBER OF OBSERVATIONS: 88

P > 1.25 ISO	4.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	18.00
ISO > P >= 0.95 ISO	15.00
0.95 ISO > P >= 0.90 ISO	2.00
0.90 ISO > P >= 0.75 ISO	31.00
P < 0.75 ISO	18.00

STATE: VIRGINIA
NUMBER OF OBSERVATIONS: 240

P > 1.25 ISO	14.00
1.10 ISO < P <= 1.25 ISO	3.00
1.05 ISO < P <= 1.10 ISO	8.00
ISO < P <= 1.05 ISO	10.00
P = ISO	1.00
ISO > P >= 0.95 ISO	14.00
0.95 ISO > P >= 0.90 ISO	58.00
0.90 ISO > P >= 0.75 ISO	84.00
P < 0.75 ISO	48.00

STATE: WASHINGTON
NUMBER OF OBSERVATIONS: 300

P > 1.25 ISO	15.00
1.10 ISO < P <= 1.25 ISO	6.00
1.05 ISO < P <= 1.10 ISO	9.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	10.00
0.95 ISO > P >= 0.90 ISO	13.00
0.90 ISO > P >= 0.75 ISO	73.00
P < 0.75 ISO	174.00

STATE: WEST VIRGINIA
NUMBER OF OBSERVATIONS: 120

P > 1.25 ISO	0.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	0.00
ISO < P <= 1.05 ISO	0.00
P = ISO	0.00
ISO > P >= 0.95 ISO	0.00
0.95 ISO > P >= 0.90 ISO	2.00
0.90 ISO > P >= 0.75 ISO	30.00
P < 0.75 ISO	88.00

STATE: WYOMING
NUMBER OF OBSERVATIONS: 30

P > 1.25 ISO	3.00
1.10 ISO < P <= 1.25 ISO	0.00
1.05 ISO < P <= 1.10 ISO	3.00
ISO < P <= 1.05 ISO	4.00
P = ISO	0.00
ISO > P >= 0.95 ISO	3.00
0.95 ISO > P >= 0.90 ISO	5.00
0.90 ISO > P >= 0.75 ISO	10.00
P < 0.75 ISO	2.00

APPENDIX 4

AFFILIATION WITH ISO

The tables below present data on affiliation with ISO for the 50 states and the District of Columbia. For each of ten categories of affiliation, we indicate the number of firms that affiliate, the amount of premiums written in the state by those firms, the percentage of firms that affiliate, and the mean premium volume of each affiliating firm.[1]

In addition, for each state we show the total number of firms and the total premium volume written in the state; the reader may use this data to calculate other variables of interest, such as the premium volume of affiliating firms as a percentage of total premium volume in each state.

With the exception of "Auto Symbol Pages," the categories of affiliation used here are described further in Table 19 above and the accompanying text. Auto Symbol Pages consist of data on the relative theft and repair costs of different auto models and are used to calculate physical damage rates. Like the Premium Comparison Service, Auto Symbol Pages are automatically included with rates; the figures shown for these categories thus reflect firms that receive these services but do not receive rates.

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[1]The percentage of all firms that affiliate is the first entry in the second column for each category. The premiums written by the average affiliating firm is the second entry in the second column.

State: Alabama
Number of Observations: 127   Direct Premiums: $384,383

Variable	Sum	Mean
Members:		
Number	30.00	0.24
Premium Volume	$47650.33	375.20
Subscribers:		
Number	13.00	0.10
Premium Volume	18766.13	147.76
Purchasers:		
Number	14.00	0.11
Premium Volume	23857.00	187.85
Receive Rates:		
Number	48.00	0.38
Premium Volume	62476.90	491.94
Filing Authorization:		
Number	36.00	0.28
Premium Volume	46830.49	368.74
Distribution to Agents:		
Number	45.00	0.35
Premium Volume	59839.12	471.17
Actuarial Services:		
Number	31.00	0.24
Premium Volume	58520.09	460.79
Statistical Reporting:		
Number	40.00	0.31
Premium Volume	59099.29	465.35
Premium Comparison Service:		
Number	3.00	0.02
Premium Volume	8692.02	68.44
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	13862.43	109.15

State: Alaska
Number of Observations: 63 Direct Premiums: $53,265

Variable	Sum	Mean
Members:		
Number	17.00	0.27
Premium Volume	9208.38	146.16
Subscribers:		
Number	3.00	0.05
Premium Volume	4744.86	75.32
Purchasers:		
Number	3.00	0.05
Premium Volume	331.49	5.26
Receive Rates:		
Number	21.00	0.33
Premium Volume	11286.46	179.15
Filing Authorization:		
Number	18.00	0.29
Premium Volume	11285.08	179.13
Distribution to Agents:		
Number	19.00	0.30
Premium Volume	11285.08	179.13
Actuarial Services:		
Number	17.00	0.27
Premium Volume	11191.72	177.65
Statistical Reporting:		
Number	20.00	0.32
Premium Volume	11617.50	184.40
Premium Comparison Service:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Auto Symbol Pages:		
Number	0.00	0.00
Premium Volume	0.00	0.00

State: Arizona
Number of Observations: 131 Direct Premiums: $404,529

Variable	Sum	Mean
Members:		
Number	29.00	0.22
Premium Volume	51604.64	393.93
Subscribers:		
Number	8.00	0.06
Premium Volume	19185.83	146.46
Purchasers:		
Number	13.00	0.10
Premium Volume	30494.25	232.78
Receive Rates:		
Number	41.00	0.31
Premium Volume	65132.24	497.19
Filing Authorization:		
Number	31.00	0.24
Premium Volume	47101.65	359.55
Distribution to Agents:		
Number	38.00	0.29
Premium Volume	57060.37	435.58
Actuarial Services:		
Number	32.00	0.24
Premium Volume	72500.59	553.44
Statistical Reporting:		
Number	38.00	0.29
Premium Volume	80314.88	613.09
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	5244.16	40.03
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	20405.82	155.77

State: Arkansas
Number of Observations: 123 Direct Premiums: $227,274

Variable	Sum	Mean
Members:		
Number	29.00	0.24
Premium Volume	21947.58	178.44
Subscribers:		
Number	11.00	0.09
Premium Volume	14896.98	121.11
Purchasers:		
Number	13.00	0.11
Premium Volume	7648.64	62.18
Receive Rates:		
Number	47.00	0.38
Premium Volume	36886.17	299.89
Filing Authorization:		
Number	32.00	0.26
Premium Volume	21383.05	173.85
Distribution to Agents:		
Number	44.00	0.36
Premium Volume	36131.19	293.75
Actuarial Services:		
Number	27.00	0.22
Premium Volume	27162.80	220.84
Statistical Reporting:		
Number	36.00	0.29
Premium Volume	33799.80	274.80
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	4093.60	33.28
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	3921.05	31.88

State: California
Number of Observations: 152 Direct Premiums: $4,050,771

Variable	Sum	Mean
Members:		
Number	32.00	0.21
Premium Volume	447191.40	2942.05
Subscribers:		
Number	9.00	0.06
Premium Volume	263737.05	1735.11
Purchasers:		
Number	15.00	0.10
Premium Volume	239284.80	1574.24
Receive Rates:		
Number	43.00	0.28
Premium Volume	606493.86	3990.09
Filing Authorization:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Distribution to Agents:		
Number	37.00	0.24
Premium Volume	486169.80	3198.49
Actuarial Services:		
Number	33.00	0.22
Premium Volume	615279.82	4047.89
Statistical Reporting:		
Number	37.00	0.24
Premium Volume	537790.11	3538.09
Premium Comparison Service:		
Number	4.00	0.03
Premium Volume	65051.64	427.97
Auto Symbol Pages:		
Number	6.00	0.04
Premium Volume	167165.73	1099.77

State: Colorado
Number of Observations: 141 Direct Premiums: $419,692

Variable	Sum	Mean
Members:		
Number	32.00	0.23
Premium Volume	47584.42	337.48
Subscribers:		
Number	12.00	0.09
Premium Volume	32673.01	231.72
Purchasers:		
Number	15.00	0.11
Premium Volume	26787.99	189.99
Receive Rates:		
Number	51.00	0.36
Premium Volume	79043.86	560.59
Filing Authorization:		
Number	31.00	0.22
Premium Volume	44674.52	316.84
Distribution to Agents:		
Number	46.00	0.33
Premium Volume	73864.92	523.86
Actuarial Services:		
Number	32.00	0.23
Premium Volume	66021.97	468.24
Statistical Reporting:		
Number	38.00	0.27
Premium Volume	64139.97	454.89
Premium Comparison Service:		
Number	3.00	0.02
Premium Volume	7865.76	55.79
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	11482.67	81.44

State: Connecticut
Number of Observations: 101   Direct Premiums: $529,387

Variable	Sum	Mean
Members:		
Number	30.00	0.30
Premium Volume	170996.20	1693.03
Subscribers:		
Number	6.00	0.06
Premium Volume	23684.26	234.50
Purchasers:		
Number	6.00	0.06
Premium Volume	82755.68	819.36
Receive Rates:		
Number	37.00	0.37
Premium Volume	185524.94	1836.88
Filing Authorization;		
Number	33.00	0.33
Premium Volume	155286.23	1537.49
Distribution to Agents:		
Number	32.00	0.32
Premium Volume	139931.84	1385.46
Actuarial Services:		
Number	26.00	0.26
Premium Volume	246448.60	2440.09
Statistical Reporting:		
Number	35.00	0.35
Premium Volume	184843.52	1830.13
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	75758.08	750.08
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	81955.43	811.44

State: Delaware
Number of Observations: 98 Direct Premiums: $84,616

Variable	Sum	Mean
Members:		
Number	23.00	0.23
Premium Volume	14816.85	151.19
Subscribers:		
Number	6.00	0.06
Premium Volume	3107.09	31.71
Purchasers:		
Number	7.00	0.07
Premium Volume	6152.90	62.78
Receive Rates:		
Number	30.00	0.31
Premium Volume	17171.90	175.22
Filing Authorization:		
Number	25.00	0.26
Premium Volume	13861.29	141.44
Distribution to Agents:		
Number	29.00	0.30
Premium Volume	14363.74	146.57
Actuarial Services:		
Number	23.00	0.23
Premium Volume	20430.05	208.47
Statistical Reporting:		
Number	30.00	0.31
Premium Volume	18892.56	192.78
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	2591.77	26.45
Auto Symbol Pages:		
Number	3.00	0.03
Premium Volume	4777.72	48.75

State: District of Columbia
Number of Observations: 79 Direct Premiums: $59,293

Variable	Sum	Mean
Members:		
Number	21.00	0.27
Premium Volume	6185.83	78.30
Subscribers:		
Number	5.00	0.06
Premium Volume	2572.76	32.57
Purchasers:		
Number	5.00	0.06
Premium Volume	4251.99	53.82
Receive Rates:		
Number	27.00	0.34
Premium Volume	6967.70	88.20
Filing Authorization:		
Number	24.00	0.30
Premium Volume	5966.30	75.52
Distribution to Agents:		
Number	26.00	0.33
Premium Volume	5982.70	75.73
Actuarial Services:		
Number	23.00	0.29
Premium Volume	10428.02	132.00
Statistical Reporting:		
Number	26.00	0.33
Premium Volume	7543.16	95.48
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	3291.76	41.67
Auto Symbol Pages:		
Number	2.00	0.03
Premium Volume	3883.62	49.16

State: Florida
Number of Observations: 150 Direct Premiums: $1,380,166

Variable	Sum	Mean
Members:		
Number	31.00	0.21
Premium Volume	220971.17	1473.14
Subscribers:		
Number	15.00	0.10
Premium Volume	102643.82	684.29
Purchasers:		
Number	11.00	0.07
Premium Volume	110258.02	735.05
Receive Rates:		
Number	48.00	0.32
Premium Volume	288125.69	1920.84
Filing Authorization:		
Number	33.00	0.22
Premium Volume	203929.10	1359.53
Distribution to Agents:		
Number	44.00	0.29
Premium Volume	250614.69	1670.76
Actuarial Services:		
Number	34.00	0.23
Premium Volume	307904.97	2052.70
Statistical Reporting:		
Number	41.00	0.27
Premium Volume	309288.81	2061.93
Premium Comparison Service:		
Number	5.00	0.03
Premium Volume	53917.32	359.45
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	69491.06	463.27

State: Georgia
Number of Observations: 143 Direct Premiums: $680,843

Variable	Sum	Mean
Members:		
Number	30.00	0.21
Premium Volume	143056.69	1000.40
Subscribers:		
Number	15.00	0.10
Premium Volume	43865.40	306.75
Purchasers:		
Number	13.00	0.09
Premium Volume	75018.63	524.61
Receive Rates:		
Number	48.00	0.34
Premium Volume	180363.62	1261.28
Filing Authorization:		
Number	34.00	0.24
Premium Volume	130928.01	915.58
Distribution to Agents:		
Number	43.00	0.30
Premium Volume	151145.78	1056.96
Actuarial Services:		
Number	31.00	0.22
Premium Volume	173645.11	1214.30
Statistical Reporting:		
Number	39.00	0.27
Premium Volume	163428.06	1142.85
Premium Comparison Service:		
Number	5.00	0.03
Premium Volume	47687.62	333.48
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	28627.21	200.19

State: Hawaii
Number of Observations: 46 Direct Premiums: $137,434

Variable	Sum	Mean
Members:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Subscribers:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Purchasers:		
Number	23.00	0.50
Premium Volume	73912.67	1606.80
Receive Rates:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Filing Authorization:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Distribution to Agents:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Actuarial Services:		
Number	20.00	0.43
Premium Volume	61323.13	1333.11
Statistical Reporting:		
Number	23.00	0.50
Premium Volume	73912.67	1606.80
Premium Comparison Service:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Auto Symbol Pages:		
Number	10.00	0.22
Premium Volume	29137.76	633.43

State: Idaho
Number of Observations: 109 Direct Premiums: $118,153

Variable	Sum	Mean
Members:		
Number	24.00	0.22
Premium Volume	6931.42	63.59
Subscribers:		
Number	7.00	0.06
Premium Volume	6510.15	59.73
Purchasers:		
Number	13.00	0.12
Premium Volume	9168.93	84.12
Receive Rates:		
Number	36.00	0.33
Premium Volume	16075.23	147.48
Filing Authorization:		
Number	25.00	0.23
Premium Volume	6428.66	58.98
Distribution to Agents:		
Number	33.00	0.30
Premium Volume	14100.86	129.37
Actuarial Services:		
Number	26.00	0.24
Premium Volume	12131.63	111.30
Statistical Reporting:		
Number	30.00	0.28
Premium Volume	11635.22	106.75
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	1665.13	15.28
Auto Symbol Pages:		
Number	4.00	0.04
Premium Volume	4178.14	38.33

State: Illinois
Number of Observations: 176 Direct Premiums: $1,673,568

Variable	Sum	Mean
Members:		
Number	35.00	0.20
Premium Volume	127207.32	722.77
Subscribers:		
Number	16.00	0.09
Premium Volume	91996.53	522.71
Purchasers:		
Number	20.00	0.11
Premium Volume	131275.49	745.88
Receive Rates:		
Number	59.00	0.34
Premium Volume	245108.53	1392.66
Filing Authorization:		
Number	39.00	0.22
Premium Volume	124648.59	708.23
Distribution to Agents:		
Number	54.00	0.31
Premium Volume	226715.72	1288.16
Actuarial Services:		
Number	34.00	0.19
Premium Volume	215254.09	1223.03
Statistical Reporting:		
Number	46.00	0.26
Premium Volume	198421.66	1127.40
Premium Comparison Service:		
Number	6.00	0.03
Premium Volume	54580.98	310.12
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	54898.47	311.92

State: Indiana
Number of Observations: 164 Direct Premiums: $664,478

Variable	Sum	Mean
Members:		
Number	33.00	0.20
Premium Volume	49928.77	304.44
Subscribers:		
Number	15.00	0.09
Premium Volume	72328.28	441.03
Purchasers:		
Number	21.00	0.13
Premium Volume	115629.79	705.06
Receive Rates:		
Number	52.00	0.32
Premium Volume	136799.55	834.14
Filing Authorization:		
Number	33.00	0.20
Premium Volume	41660.68	254.03
Distribution Services:		
Number	48.00	0.29
Premium Volume	128761.31	785.13
Actuarial Services:		
Number	35.00	0.21
Premium Volume	131732.61	803.25
Statistical Reporting:		
Number	44.00	0.27
Premium Volume	105501.31	643.30
Premium Comparison Service:		
Number	8.00	0.05
Premium Volume	66648.37	406.39
Auto Symbol Pages:		
Number	5.00	0.03
Premium Volume	25242.80	153.92

State: Iowa
Number of Observations: 144 Direct Premiums: $363,456

Variable	Sum	Mean
Members:		
Number	27.00	0.19
Premium Volume	30465.16	211.56
Subscribers:		
Number	10.00	0.07
Premium Volume	16746.21	116.29
Purchasers:		
Number	22.00	0.15
Premium Volume	78144.92	542.67
Receive Rates:		
Number	46.00	0.32
Premium Volume	108058.53	750.41
Filing Authorization:		
Number	27.00	0.19
Premium Volume	27360.62	190.00
Distribution Services:		
Number	41.00	0.28
Premium Volume	101689.85	706.18
Actuarial Services:		
Number	25.00	0.17
Premium Volume	29278.21	203.32
Statistical Reporting:		
Number	37.00	0.26
Premium Volume	39532.84	274.53
Premium Comparison Service:		
Number	7.00	0.05
Premium Volume	11144.82	77.39
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	7300.94	50.70

State: Kansas
Number of Observations: 123   Direct Premiums: $327,854

Variable	Sum	Mean
Members:		
Number	27.00	0.22
Premium Volume	34774.87	282.72
Subscribers:		
Number	13.00	0.11
Premium Volume	21515.78	174.93
Purchasers:		
Number	14.00	0.11
Premium Volume	20642.48	167.83
Receive Rates:		
Number	47.00	0.38
Premium Volume	62738.44	510.07
Filing Authorization:		
Number	30.00	0.24
Premium Volume	36440.08	296.26
Distribution Services:		
Number	43.00	0.35
Premium Volume	61080.01	496.59
Actuarial Services:		
Number	29.00	0.24
Premium Volume	43630.22	354.72
Statistical Reporting:		
Number	37.00	0.30
Premium Volume	54491.49	443.02
Premium Comparison Service:		
Number	3.00	0.02
Premium Volume	5453.61	44.34
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	9157.17	74.45

State: Kentucky
Number of Observations: 130 Direct Premiums: $402,835

Variable	Sum	Mean
Members:		
Number	35.00	0.27
Premium Volume	66127.47	508.67
Subscribers:		
Number	14.00	0.11
Premium Volume	38229.51	294.07
Purchasers:		
Number	13.00	0.10
Premium Volume	56382.68	433.71
Receive Rates:		
Number	52.00	0.40
Premium Volume	103569.07	796.69
Filing Authorization:		
Number	41.00	0.32
Premium Volume	83560.97	642.78
Distribution Services:		
Number	48.00	0.37
Premium Volume	94188.28	724.53
Actuarial Services:		
Number	34.00	0.26
Premium Volume	87951.42	676.55
Statistical Reporting:		
Number	45.00	0.35
Premium Volume	102469.08	788.22
Premium Comparison Service:		
Number	4.00	0.03
Premium Volume	23364.58	179.73
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	23832.49	183.33

State: Louisiana
Number of Observations: 131 Direct Premiums: $621,725

Variable	Sum	Mean
Members:		
Number	26.00	0.20
Premium Volume	120132.59	917.04
Subscribers:		
Number	10.00	0.08
Premium Volume	38592.73	294.60
Purchasers:		
Number	7.00	0.05
Premium Volume	39845.05	304.16
Receive Rates:		
Number	37.00	0.28
Premium Volume	145299.59	1109.16
Filing Authorization:		
Number	31.00	0.24
Premium Volume	92876.53	708.98
Distribution Services:		
Number	35.00	0.27
Premium Volume	130752.48	998.11
Actuarial Services:		
Number	24.00	0.18
Premium Volume	167588.24	1279.30
Statistical Reporting:		
Number	35.00	0.27
Premium Volume	145185.34	1108.29
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	27301.54	208.41
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	37425.27	285.69

State: Maine
Number of Observations: 92 Direct Premiums: $118,311

Variable	Sum	Mean
Members:		
Number	27.00	0.29
Premium Volume	50193.25	545.58
Subscribers:		
Number	8.00	0.09
Premium Volume	25879.29	281.30
Purchasers:		
Number	5.00	0.05
Premium Volume	6034.84	65.60
Receive Rates:		
Number	36.00	0.39
Premium Volume	60123.92	653.52
Filing Authorization:		
Number	32.00	0.35
Premium Volume	57789.56	628.15
Distribution Services:		
Number	35.00	0.38
Premium Volume	57796.80	628.23
Actuarial Services:		
Number	25.00	0.27
Premium Volume	46529.07	505.75
Statistical Reporting:		
Number	33.00	0.36
Premium Volume	75901.55	825.02
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	4317.42	46.93
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	6027.59	65.52

State: Maryland
Number of Observations: 108 Direct Premiums: $629,228

Variable	Sum	Mean
Members:		
Number	26.00	0.24
Premium Volume	94944.62	879.12
Subscribers:		
Number	8.00	0.07
Premium Volume	34876.87	322.93
Purchasers:		
Number	7.00	0.06
Premium Volume	41555.42	384.77
Receive Rates:		
Number	37.00	0.34
Premium Volume	117128.10	1084.52
Filing Authorization		
Number	30.00	0.28
Premium Volume	93017.72	861.28
Distribution Services:		
Number	36.00	0.33
Premium Volume	99663.28	922.81
Actuarial Services:		
Number	25.00	0.23
Premium Volume	127181.64	1177.61
Statistical Reporting:		
Number	32.00	0.30
Premium Volume	120078.31	1111.84
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	20695.66	191.63
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	26669.89	246.94

State: Massachusetts
Number of Observations: 80 Direct Premiums: $935,402

NO ISO AFFILIATION INDICATED IN ISO RECORDS

State: Michagan
Number of Observations: 127   Direct Premiums: $1,464,771

Variable	Sum	Mean
Members:		
Number	31.00	0.24
Premium Volume	220080.66	1732.92
Subscribers:		
Number	11.00	0.09
Premium Volume	37087.12	292.02
Purchasers:		
Number	11.00	0.09
Premium Volume	72905.55	574.06
Receive Rates:		
Number	45.00	0.35
Premium Volume	209657.85	1650.85
Filing Authorization:		
Number	31.00	0.24
Premium Volume	74663.41	587.90
Distribution Services:		
Number	41.00	0.32
Premium Volume	148126.08	1166.35
Actuarial Services		
Number	31.00	0.24
Premium Volume	180894.41	1424.37
Statistical Reporting:		
Number	38.00	0.30
Premium Volume	250364.70	1971.38
Premium Comparison Service:		
Number	3.00	0.02
Premium Volume	44153.22	347.66
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	50746.83	399.58

State: Minnesota
Number of Observations: 134 Direct Premiums: $613,003

Variable	Sum	Mean
Members:		
Number	28.00	0.21
Premium Volume	62460.69	466.12
Subscribers:		
Number	11.00	0.08
Premium Volume	27640.69	206.27
Purchasers:		
Number	21.00	0.16
Premium Volume	97053.41	724.28
Receive Rates:		
Number	47.00	0.35
Premium Volume	102969.37	768.43
Filing Authorization:		
Number	29.00	0.22
Premium Volume	52389.52	390.97
Distribution Services:		
Number	42.00	0.31
Premium Volume	82242.49	613.75
Actuarial Services		
Number	27.00	0.20
Premium Volume	78954.39	589.21
Statistical Reporting:		
Number	36.00	0.27
Premium Volume	76087.44	567.82
Premium Comparison Service:		
Number	8.00	0.06
Premium Volume	68767.85	513.19
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	43144.34	321.97

State: Mississippi
Number of Observations: 118 Direct Premiums: $243,839

Variable	Sum	Mean
Members:		
Number	30.00	0.25
Premium Volume	56079.62	475.25
Subscribers:		
Number	10.00	0.08
Premium Volume	14801.84	125.44
Purchasers:		
Number	9.00	0.08
Premium Volume	14609.13	123.81
Receive Rates:		
Number	43.00	0.36
Premium Volume	70311.65	595.86
Filing Authorization:		
Number	35.00	0.30
Premium Volume	59315.73	502.68
Distribution Services:		
Number	40.00	0.34
Premium Volume	69129.80	585.85
Actuarial Services	27.00	0.23
Premium Volume	64012.37	542.48
Statistical Reporting:		
Number	38.00	0.32
Premium Volume	64187.15	543.96
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	7731.53	65.52
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	7874.79	66.74

State: Missouri
Number of Observations: 148 Direct Premiums: $626,687

Variable	Sum	Mean
Members:		
Number	32.00	0.22
Premium Volume	58602.57	395.96
Subscribers:		
Number	13.00	0.09
Premium Volume	19556.84	132.14
Purchasers:		
Number	17.00	0.11
Premium Volume	56777.61	383.63
Receive Rates:		
Number	52.00	0.35
Premium Volume	94091.32	635.75
Filing Authorization:		
Number	32.00	0.22
Premium Volume	47610.00	321.69
Distribution Services:		
Number	45.00	0.30
Premium Volume	79330.19	536.01
Actuarial Services:		
Number	30.00	0.20
Premium Volume	71216.58	481.19
Statistical Reporting:		
Number	41.00	0.28
Premium Volume	72050.82	486.83
Premium Comparison Service:		
Number	6.00	0.04
Premium Volume	27442.76	185.42
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	23816.04	160.92

State: Montana
Number of Observations: 99 Direct Premiums: $102,780

Variable	Sum	Mean
Members:		
Number	23.00	0.23
Premium Volume	10217.46	103.21
Subscribers:		
Number	7.00	0.07
Premium Volume	6839.30	69.08
Purchasers:		
Number	12.00	0.12
Premium Volume	3123.44	31.55
Receive Rates:		
Number	35.00	0.35
Premium Volume	17038.42	172.11
Filing Authorization:		
Number	21.00	0.21
Premium Volume	6992.80	70.63
Distribution Services:		
Number	30.00	0.30
Premium Volume	11277.86	113.92
Actuarial Services:		
Number	24.00	0.24
Premium Volume	11977.00	120.98
Statistical Reporting:		
Number	31.00	0.31
Premium Volume	12843.94	129.74
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	1119.23	11.31
Auto Symbol Pages:		
Number	3.00	0.03
Premium Volume	1750.22	17.68

State: Nebraska
Number of Observations: 117 Direct Premiums: $187,302

Variable	Sum	Mean
Members:		
Number	25.00	0.21
Premium Volume	15448.01	132.03
Subscribers:		
Number	9.00	0.08
Premium Volume	7998.80	68.37
Purchasers:		
Number	16.00	0.14
Premium Volume	14602.58	124.81
Receive Rates:		
Number	40.00	0.34
Premium Volume	30152.89	257.72
Filing Authorization:		
Number	26.00	0.22
Premium Volume	15128.02	129.30
Distribution Services:		
Number	36.00	0.31
Premium Volume	27304.35	233.37
Actuarial Services:		
Number	24.00	0.21
Premium Volume	17338.00	148.19
Statistical Reporting:		
Number	30.00	0.26
Premium Volume	18473.27	157.89
Premium Comparison Service:		
Number	5.00	0.04
Premium Volume	2955.52	25.26
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	4016.00	34.32

State: Nevada
Number of Observations: 99 Direct Premiums: $165,379

Variable	Sum	Mean
Members:		
Number	22.00	0.22
Premium Volume	14372.22	145.17
Subscribers:		
Number	6.00	0.06
Premium Volume	7009.48	70.80
Purchasers:		
Number	10.00	0.10
Premium Volume	11333.26	114.48
Receive Rates:		
Number	30.00	0.30
Premium Volume	19591.62	197.90
Filing Authorization:		
Number	22.00	0.22
Premium Volume	15662.83	158.21
Distribution Services:		
Number	25.00	0.25
Premium Volume	15818.97	159.79
Actuarial Services:		
Number	28.00	0.28
Premium Volume	26126.39	263.90
Statistical Reporting:		
Number	30.00	0.30
Premium Volume	24331.85	245.78
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	1063.28	10.74
Auto Symbol Pages:		
Number	5.00	0.05
Premium Volume	9916.96	100.17

State: New Hampshire
Number of Observations: 84 Direct Premiums: $129,885

Variable	Sum	Mean
Members:		
Number	27.00	0.32
Premium Volume	47990.03	571.31
Subscribers:		
Number	8.00	0.10
Premium Volume	21347.98	254.14
Purchasers:		
Number	4.00	0.05
Premium Volume	6337.07	75.44
Receive Rates:		
Number	36.00	0.43
Premium Volume	67133.21	799.20
Filing Authorization:		
Number	33.00	0.39
Premium Volume	63194.98	752.32
Distribution Services:		
Number	36.00	0.43
Premium Volume	67133.21	799.20
Actuarial Services:		
Number	25.00	0.30
Premium Volume	53268.44	634.15
Statistical Reporting:		
Number	33.00	0.39
Premium Volume	70075.14	834.23
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	3158.48	37.60
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	6336.51	75.43

State: New Jersey
Number of Observations: 113 Direct Premiums: $1,480,653

Variable	Sum	Mean
Members:		
Number	32.00	0.28
Premium Volume	357995.49	3168.10
Subscribers:		
Number	9.00	0.08
Premium Volume	74107.32	655.82
Purchasers:		
Number	5.00	0.04
Premium Volume	157329.64	1392.30
Receive Rates:		
Number	42.00	0.37
Premium Volume	401094.24	3549.51
Filing Authorization:		
Number	38.00	0.34
Premium Volume	301096.26	2664.57
Distribution Services:		
Number	41.00	0.36
Premium Volume	303686.30	2687.49
Actuarial Services:		
Number	26.00	0.23
Premium Volume	477390.73	4224.70
Statistical Reporting:		
Number	39.00	0.35
Premium Volume	473123.48	4186.93
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	51558.54	456.27
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	124919.77	1105.48

State: New Mexico
Number of Observations: 110 Direct Premiums: $159,073

Variable	Sum	Mean
Members:		
Number	27.00	0.25
Premium Volume	18958.07	172.35
Subscribers:		
Number	9.00	0.08
Premium Volume	9952.87	90.48
Purchasers:		
Number	12.00	0.11
Premium Volume	7571.25	68.83
Receive Rates:		
Number	40.00	0.36
Premium Volume	26320.03	239.27
Filing Authorization:		
Number	28.00	0.25
Premium Volume	20360.87	185.10
Distribution Services:		
Number	35.00	0.32
Premium Volume	23741.27	215.83
Actuarial Services:		
Number	30.00	0.27
Premium Volume	23374.43	212.49
Statistical Reporting:		
Number	33.00	0.30
Premium Volume	22590.50	205.37
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	1340.71	12.19
Auto Symbol Pages:		
Number	4.00	0.04
Premium Volume	3672.34	33.38

State: New York
Number of Observations: 137   Direct Premiums: $2,315,343

Variable	Sum	Mean
Members:		
Number	37.00	0.27
Premium Volume	545061.72	3978.55
Subscribers:		
Number	9.00	0.07
Premium Volume	70440.68	514.17
Purchasers:		
Number	9.00	0.07
Premium Volume	313159.56	2285.84
Receive Rates:		
Number	46.00	0.34
Premium Volume	593248.23	4330.28
Filing Authorization:		
Number	41.00	0.30
Premium Volume	410992.35	2999.94
Distribution Services:		
Number	43.00	0.31
Premium Volume	458097.96	3343.78
Actuarial Services:		
Number	28.00	0.20
Premium Volume	801469.63	5850.14
Statistical Reporting:		
Number	45.00	0.33
Premium Volume	706708.01	5158.45
Premium Comparison Service:		
Number	2.00	0.01
Premium Volume	240203.34	1753.31
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	263614.67	1924.19

State: North Carolina
Number of Observations: 110   Direct Premiums: $629,190

Variable	Sum	Mean
Members:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Subscribers:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Purchasers:		
Number	57.00	0.52
Premium Volume	226960.25	2063.28
Receive Rates:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Filing Authorization:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Distribution Services:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Actuarial Services:		
Number	35.00	0.32
Premium Volume	171161.62	1556.01
Statistical Reporting:		
Number	56.00	0.51
Premium Volume	223782.55	2034.39
Premium Comparison Service:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Auto Symbol Pages:		
Number	22.00	0.20
Premium Volume	76360.51	694.19

State: North Dakota
Number of Observations: 106 Direct Premiums: $832,994

Variable	Sum	Mean
Members:		
Number	20.00	0.19
Premium Volume	5545.67	52.32
Subscribers:		
Number	9.00	0.08
Premium Volume	6841.24	64.54
Purchasers:		
Number	18.00	0.17
Premium Volume	9214.34	86.93
Receive Rates:		
Number	36.00	0.34
Premium Volume	16442.12	155.11
Filing Authorization:		
Number	21.00	0.20
Premium Volume	5088.03	48.00
Distribution Services:		
Number	32.00	0.30
Premium Volume	10854.56	102.40
Actuarial Services:		
Number	25.00	0.24
Premium Volume	6894.68	65.04
Statistical Reporting:		
Number	28.00	0.26
Premium Volume	7657.68	72.24
Premium Comparison Service:		
Number	5.00	0.05
Premium Volume	2609.24	24.62
Auto Symbol Pages:		
Number	5.00	0.05
Premium Volume	2015.12	19.01

State: Ohio
Number of Observations: 143 Direct Premiums: $1,420,018

Variable	Sum	Mean
Members:		
Number	29.00	0.20
Premium Volume	135285.20	946.05
Subscribers:		
Number	14.00	0.10
Premium Volume	149964.25	1048.70
Purchasers:		
Number	21.00	0.15
Premium Volume	276872.60	1936.17
Receive Rates:		
Number	50.00	0.35
Premium Volume	323262.63	2260.58
Filing Authorization:		
Number	26.00	0.18
Premium Volume	88626.38	619.76
Distribution Services:		
Number	45.00	0.31
Premium Volume	267424.63	1870.10
Actuarial Services:		
Number	37.00	0.26
Premium Volume	379499.82	2653.84
Statistical Reporting:		
Number	41.00	0.29
Premium Volume	283344.19	1981.43
Premium Comparison Service:		
Number	6.00	0.04
Premium Volume	149012.94	1042.05
Auto Symbol Pages:		
Number	6.00	0.04
Premium Volume	188665.46	1319.34

State: Oklahoma
Number of Observations: 128   Direct Premiums: $334,367

Variable	Sum	Mean
Members:		
Number	30.00	0.23
Premium Volume	41283.97	322.53
Subscribers:		
Number	10.00	0.08
Premium Volume	16074.19	125.58
Purchasers:		
Number	11.00	0.09
Premium Volume	23279.46	181.87
Receive Rates:		
Number	45.00	0.35
Premium Volume	63595.83	496.84
Filing Authorization:		
Number	35.00	0.27
Premium Volume	47457.52	370.76
Distribution Services:		
Number	44.00	0.34
Premium Volume	61709.30	482.10
Actuarial Services:		
Number	26.00	0.20
Premium Volume	44960.83	351.26
Statistical Reporting:		
Number	39.00	0.30
Premium Volume	53699.29	419.53
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	5617.99	43.89
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	7094.16	55.42

State: Oregon
Number of Observations: 122 Direct Premiums: $409,257

Variable	Sum	Mean
Members:		
Number	22.00	0.18
Premium Volume	24458.23	200.48
Subscribers:		
Number	8.00	0.07
Premium Volume	20391.55	167.14
Purchasers:		
Number	13.00	0.11
Premium Volume	21083.41	172.81
Receive Rates:		
Number	33.00	0.27
Premium Volume	43147.55	353.67
Filing Authorization:		
Number	23.00	0.19
Premium Volume	20790.89	170.42
Distribution Services:		
Number	28.00	0.23
Premium Volume	33831.02	277.30
Actuarial Services:		
Number	27.00	0.22
Premium Volume	43643.89	357.74
Statistical Reporting:		
Number	30.00	0.25
Premium Volume	41840.60	342.96
Premium Comparison Service:		
Number	3.00	0.02
Premium Volume	4392.24	36.00
Auto Symbol Pages:		
Number	4.00	0.03
Premium Volume	11693.40	95.85

State: Pennsylvania
Number of Observations: 141 Direct Premiums: $1,751,991

Variable	Sum	Mean
Members:		
Number	34.00	0.24
Premium Volume	221247.02	1569.13
Subscribers:		
Number	18.00	0.13
Premium Volume	139372.59	988.46
Purchasers:		
Number	10.00	0.07
Premium Volume	220066.87	1560.76
Receive Rates:		
Number	55.00	0.39
Premium Volume	348427.41	2471.12
Filing Authorization:		
Number	45.00	0.32
Premium Volume	261138.10	1852.04
Distribution Services:		
Number	52.00	0.37
Premium Volume	308318.26	2186.65
Actuarial Services:		
Number	32.00	0.23
Premium Volume	418179.26	2965.81
Statistical Reporting:		
Number	50.00	0.35
Premium Volume	408411.06	2896.53
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	90496.36	641.82
Auto Symbol Pages:		
Number	2.00	0.01
Premium Volume	153697.02	1090.05

State: Rhode Island
Number of Observations: 90 Direct Premiums: $130,094

Variable	Sum	Mean
Members:		
Number	27.00	0.30
Premium Volume	48094.69	534.39
Subscribers:		
Number	5.00	0.06
Premium Volume	4054.07	45.05
Purchasers:		
Number	5.00	0.06
Premium Volume	16898.49	187.76
Receive Rates:		
Number	33.00	0.37
Premium Volume	51486.24	572.07
Filing Authorization:		
Number	28.00	0.31
Premium Volume	42519.57	472.44
Distribution Services:		
Number	30.00	0.33
Premium Volume	44945.13	499.39
Actuarial Services:		
Number	25.00	0.28
Premium Volume	59524.00	661.38
Statistical Reporting:		
Number	33.00	0.37
Premium Volume	51714.89	574.61
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	13213.80	146.82
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	15169.51	168.55

State: South Carolina
Number of Observations: 97 Direct Premiums: $401,556

Variable	Sum	Mean
Members:		
Number	29.00	0.30
Premium Volume	90905.17	937.17
Subscribers:		
Number	10.00	0.10
Premium Volume	78702.04	811.36
Purchasers:		
Number	5.00	0.05
Premium Volume	13930.53	143.61
Receive Rates:		
Number	40.00	0.41
Premium Volume	163718.00	1687.81
Filing Authorization:		
Number	35.00	0.36
Premium Volume	152521.27	1572.38
Distribution Services:		
Number	39.00	0.40
Premium Volume	160432.51	1653.94
Actuarial Services:		
Number	27.00	0.28
Premium Volume	111431.68	1148.78
Statistical Reporting:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	7762.95	80.03
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	11654.63	120.15

State: South Dakota
Number of Observations: 111 Direct Premiums: $71,181

Variable	Sum	Mean
Members:		
Number	23.00	0.21
Premium Volume	4903.28	44.17
Subscribers:		
Number	10.00	0.09
Premium Volume	7988.17	71.97
Purchasers:		
Number	19.00	0.17
Premium Volume	6956.59	62.67
Receive Rates:		
Number	42.00	0.38
Premium Volume	16206.95	146.01
Filing Authorization:		
Number	21.00	0.19
Premium Volume	4377.09	39.43
Distribution Services:		
Number	34.00	0.31
Premium Volume	8979.76	80.90
Actuarial Services:		
Number	25.00	0.23
Premium Volume	4848.24	43.68
Statistical Reporting:		
Number	29.00	0.26
Premium Volume	5824.68	52.47
Premium Comparison Service:		
Number	5.00	0.05
Premium Volume	2111.54	19.02
Auto Symbol Pages:		
Number	4.00	0.04
Premium Volume	1616.23	14.56

State: Tennessee
Number of Observations: 137   Direct Premiums: $509,361

Variable	Sum	Mean
Members:		
Number	34.00	0.25
Premium Volume	87237.32	636.77
Subscribers:		
Number	10.00	0.07
Premium Volume	26056.03	190.19
Purchasers:		
Number	16.00	0.12
Premium Volume	92045.73	671.87
Receive Rates:		
Number	49.00	0.36
Premium Volume	107636.93	785.67
Filing Authorization:		
Number	37.00	0.27
Premium Volume	87425.05	638.14
Distribution Services:		
Number	45.00	0.33
Premium Volume	98739.25	720.72
Actuarial Services:		
Number	30.00	0.22
Premium Volume	111144.29	811.27
Statistical Reporting:		
Number	42.00	0.31
Premium Volume	103703.87	756.96
Premium Comparison Service:		
Number	5.00	0.04
Premium Volume	28895.31	210.91
Auto Symbol Pages:		
Number	5.00	0.04
Premium Volume	78143.76	570.39

State: Texas
Number of Observations: 147 Direct Premiums: $1,695,661

Variable	Sum	Mean
Members:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Subscribers:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Purchasers:		
Number	52.00	0.35
Premium Volume	480725.48	3270.24
Receive Rates:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Filing Authorization:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Distribution Services:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Actuarial Services:		
Number	38.00	0.26
Premium Volume	465390.65	3165.92
Statistical Reporting:		
Number	52.00	0.35
Premium Volume	480725.48	3270.24
Premium Comparison Service:		
Number	0.00	0.00
Premium Volume	0.00	0.00
Auto Symbol Pages:		
Number	20.00	0.14
Premium Volume	222344.29	1512.55

State: Utah
Number of Observations: 100 Direct Premiums: $164,351

Variable	Sum	Mean
Members:		
Number	23.00	0.23
Premium Volume	17199.34	171.99
Subscribers:		
Number	6.00	0.06
Premium Volume	8001.79	80.02
Purchasers:		
Number	12.00	0.12
Premium Volume	15310.20	153.10
Receive Rates:		
Number	32.00	0.32
Premium Volume	25391.33	253.91
Filing Authorization:		
Number	23.00	0.23
Premium Volume	13352.20	133.52
Distribution Services:		
Number	29.00	0.29
Premium Volume	21925.60	219.26
Actuarial Services:		
Number	26.00	0.26
Premium Volume	26284.88	262.85
Statistical Reporting:		
Number	31.00	0.31
Premium Volume	28973.83	289.74
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	2600.97	26.01
Auto Symbol Pages:		
Number	3.00	0.03
Premium Volume	9987.17	99.87

State: Vermont
Number of Observations: 88 Direct Premiums: $60,637

Variable	Sum	Mean
Members:		
Number	27.00	0.31
Premium Volume	18112.00	205.82
Subscribers:		
Number	8.00	0.09
Premium Volume	7787.61	88.50
Purchasers:		
Number	4.00	0.05
Premium Volume	4485.67	50.97
Receive Rates:		
Number	36.00	0.41
Premium Volume	25011.88	284.23
Filing Authorization:		
Number	33.00	0.38
Premium Volume	24429.74	277.61
Distribution Services:		
Number	35.00	0.40
Premium Volume	24444.78	277.78
Actuarial Services:		
Number	27.00	0.31
Premium Volume	22183.85	252.09
Statistical Reporting:		
Number	33.00	0.38
Premium Volume	25627.17	291.22
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	3756.75	42.69
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	4470.63	50.80

State: Virginia
Number of Observations: 128 Direct Premiums: $679,904

Variable	Sum	Mean
Members:		
Number	34.00	0.27
Premium Volume	111507.90	871.16
Subscribers:		
Number	9.00	0.07
Premium Volume	45220.22	353.28
Purchasers:		
Number	11.00	0.09
Premium Volume	110702.75	864.87
Receive Rates:		
Number	48.00	0.38
Premium Volume	148723.67	1161.90
Filing Authorization:		
Number	37.00	0.29
Premium Volume	100778.33	787.33
Distribution Services:		
Number	45.00	0.35
Premium Volume	133072.92	1039.63
Actuarial Services:		
Number	28.00	0.22
Premium Volume	156627.59	1223.65
Statistical Reporting:		
Number	43.00	0.34
Premium Volume	130884.77	1022.54
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	34638.40	270.61
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	46324.75	361.91

State: Washington
Number of Observations: 123 Direct Premiums: $578,166

Variable	Sum	Mean
Members:		
Number	26.00	0.21
Premium Volume	43233.33	351.49
Subscribers:		
Number	8.00	0.07
Premium Volume	35022.53	284.74
Purchasers:		
Number	10.00	0.08
Premium Volume	20530.46	166.91
Receive Rates:		
Number	35.00	0.28
Premium Volume	66674.19	542.07
Filing Authorization:		
Number	26.00	0.21
Premium Volume	36569.23	297.31
Distribution Services:		
Number	31.00	0.25
Premium Volume	58670.71	477.00
Actuarial Services:		
Number	27.00	0.22
Premium Volume	69130.16	562.03
Statistical Reporting:		
Number	35.00	0.28
Premium Volume	69547.94	565.43
Premium Comparison Service:		
Number	2.00	0.02
Premium Volume	9952.67	80.92
Auto Symbol Pages:		
Number	3.00	0.02
Premium Volume	15034.17	122.23

State: West Virginia
Number of Observations: 100   Direct Premiums: $214,188

Variable	Sum	Mean
Members:		
Number	24.00	0.24
Premium Volume	19319.93	193.20
Subscribers:		
Number	9.00	0.09
Premium Volume	7204.89	72.05
Purchasers:		
Number	6.00	0.06
Premium Volume	12831.96	128.32
Receive Rates:		
Number	35.00	0.35
Premium Volume	26705.82	267.06
Filing Authorization:		
Number	29.00	0.29
Premium Volume	21373.37	213.73
Distribution Services:		
Number	32.00	0.32
Premium Volume	23164.22	231.64
Actuarial Services:		
Number	27.00	0.27
Premium Volume	35590.85	355.91
Statistical Reporting:		
Number	31.00	0.31
Premium Volume	24468.22	244.68
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	9094.49	90.94
Auto Symbol Pages:		
Number	2.00	0.02
Premium Volume	11757.42	117.57

State: Wisconsin
Number of Observations: 140   Direct Premiums: $574,540

Variable	Sum	Mean
Members:		
Number	30.00	0.21
Premium Volume	28697.81	204.98
Subscribers:		
Number	10.00	0.07
Premium Volume	18973.29	135.52
Purchasers:		
Number	21.00	0.15
Premium Volume	60571.56	432.65
Receive Rates:		
Number	48.00	0.34
Premium Volume	54699.02	390.71
Filing Authorization:		
Number	30.00	0.21
Premium Volume	28344.78	202.46
Distribution Services:		
Number	44.00	0.31
Premium Volume	52862.28	377.59
Actuarial Service:		
Number	29.00	0.21
Premium Volume	51677.79	369.13
Statistical Reporting:		
Number	38.00	0.27
Premium Volume	43063.60	307.60
Premium Comparison Service:		
Number	7.00	0.05
Premium Volume	28078.43	200.56
Auto Symbol Pages:		
Number	5.00	0.04
Premium Volume	39332.25	280.94

State: Wyoming
Number of Observations: 95 Direct Premiums: $68,921

Variable	Sum	Mean
Members:		
Number	21.00	0.22
Premium Volume	7003.34	73.72
Subscribers:		
Number	7.00	0.07
Premium Volume	5649.75	59.47
Purchasers:		
Number	10.00	0.11
Premium Volume	3503.03	36.87
Receive Rates:		
Number	34.00	0.36
Premium Volume	13668.07	143.87
Filing Authorization:		
Number	22.00	0.23
Premium Volume	6034.12	63.52
Distribution Services:		
Number	31.00	0.33
Premium Volume	12179.97	128.21
Actuarial Services:		
Number	23.00	0.24
Premium Volume	6252.07	65.81
Statistical Reporting:		
Number	26.00	0.27
Premium Volume	8601.37	90.54
Premium Comparison Service:		
Number	1.00	0.01
Premium Volume	560.31	5.90
Auto Symbol Pages:		
Number	1.00	0.01
Premium Volume	560.31	5.90

APPENDIX 5

A MODEL OF COLLECTIVE PRICING AND REGULATION

While empirical models, including the one estimated in Chapter VI, usually measure prices as averages -- that is, total revenue over total quantity -- it should be clear that neither rating organizations nor state regulators exercise direct influence over this price. The average price is the aggregation of the prices associated with thousands of individual transactions. If collective pricing influences the average price, it must in the first instance influence individual transactions prices.

Now let us consider how different pricing regimes may influence individual and, ultimately, average prices. Some preliminary conclusions on this score have already been reached above. In particular, we noted above that non-member companies are numerous, that there is no apparent barrier to entry into the business itself or into any given state market, and that uncertainty and product heterogeneity present possibly insurmountable barriers to collusion for companies that cannot communicate directly through a rating organization. These factors raise doubts about whether collective pricing, in the absence of state regulation, can result in effective collusion.

The existence of state regulation as a means of entering cartel prices explains how prices set by the rating organization could serve as price floors. If the rating organization is effective in lobbying (however tacitly) against price cuts by non-member companies, or if regulators believe that prices below those set by the rating organization are likely to be "inadequate," then the prices set by the rating organization may serve as more-or-less binding price floors. That is, regulators may be reluctant to approve, if they will approve at all, prices lower than those recommended by the rating organization.[1]

While collective pricing and/or regulation may affect prices directly, any effects on non-price competition would be indirect. Regulators control prices, but they do not exercise any apparent influence over either the quality of service provided or the generosity of companies' loss adjustment policies. Nor is the rating organization overtly involved in monitoring or policing these matters.

The usual theoretical treatment of non-price competition suggests that a binding minimum price will induce individual firms to alter their levels of service in an attempt to increase output.[2] Certainly this is a possibility

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[1]Of course, the efficacy of state regulation as a means of enforcing supracompetitive prices is irrelevant if the rating organization is unable or unwilling to generate such prices in the first instance. Whereas previous studies have assumed that the rating organization sets cartel prices with equal effectiveness in all states, the empirical work here emphasizes that differences within ISO may affect its ability to arrive at cartel prices in some states.

[2]See Stigler, "Non-Price Competition," pp. 150-151.

in the auto insurance market. A second possibility, however, is that price floors result in higher market shares for companies that are inherently high-frills companies, and lower market shares for low-frills companies. According to this interpretation, each company chooses a technology that is most appropriate for providing a given level of service, a level of service that is attractive to consumers (relative to the products offered by other companies) at a given price. If a price floor prevents the company from charging the price most appropriate for its level of service, that company's market share falls. Non-price competition occurs in the sense that low-frills companies sell fewer units, and the average level of quality is increased. Both interpretations can be illustrated using the exposition developed by Rosen.[3]

We assume that producers face an inverse demand curve

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[3]Sherwin Rosen, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," Journal of Political Economy 82;1 (January-February 1974), pp. 34-55. We rely on Rosen for expositional purposes, and we ignore the more esoteric aspects of his model, including the nature of equilibrium and necessary conditions for its existence. Subsequent developments of this type of model are found in H.E. Leland, "Quality Choice and Competition," American Economic Review 67;2 (March 1977), pp. 127-137, and Eilon Amit, "On Quality and Price Regulation under Competition and under Monopoly," Southern Economic Journal 47;4 (April 1981), pp. 1056-1062. The hedonic model has found wide use in labor economics. (See, for instance, Ronald G. Ehrenberg and Robert S. Smith, Modern Labor Economics (Glenview, Illinois: Scott, Foresman and Company, 1982), pp. 210-228.) It has been applied to the auto insurance market by Pauly, Kunreuther and Kleindorfer [See Mark Pauly, Howard Kunreuther and Paul Kleindorfer, "Regulation and Quality Competition in the U.S. Insurance Industry," Paper prepared for Conference on Cross-National Studies of Insurance Regulation, International Institute of Management, Berlin, January 1983, (manuscript).]

where price depends on the quality of units produced. For simplicity, we assume that quality has two dimensions, associated for our purposes with the generosity of the producer's loss adjustment policies and the overall quality of its selling efforts, including, for instance, advertising, point of sale services, and plush offices. We assume that each aspect of quality can be measured according to a monotonic index, and we denote the two aspects of quality as F_L and F_E, respectively. The cost of producing quality is assumed to be positive and increasing at an increasing rate (marginal cost is increasing), but we assume (realistically) that the cost of producing additional units of a given quality is constant. We can write a firm's profit as

$$(1)\ V = M \times P(F_E, F_L) - M \times C(F_E, F_L),$$

where M is the number of units produced, P( ) is the firm's inverse demand function, and C( ) is the firm's cost function. assumed to be strictly quasiconvex.[4]

Following Rosen, we assume free entry and require that firms make zero economic profits. Then we can define a firm's offer function as the locus of prices that yield zero profits

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[4] In general, P( ) will be a function of the quality produced by all firms. We simplify the problem by assuming that firms play Nash strategies, taking their rivals actions as given, and so we suppress the vector representing other firms' decisions.

for various (F_E, F_L) and satisfy $P(F_E, F_L) = C(F_E, F_L)$ (marginal revenue equals marginal cost). Together, these conditions require

$$(2)\ O(F_E, F_L) = C(F_E, F_L),$$

where O( ) is the firm's offer function.

We assume consumers have tastes defined over F_E, F_L, and other goods, G. Since G equals income minus the amount spent on insurance, P, and since income is given, we assume a consumer's utility can be described by

$$(3)\ U = U(F_E, F_L, -P),$$

where U( ) is assumed strictly quasiconcave. Consumers maximize utility subject to the offer curves of the firms in the market. Thus, we can replace -P in (3) with O( ), and assume that from their opportunities consumers choose F_E and F_L to maximize

$$(4)\ U = U[F_E, F_L, -O(F_E, F_L)].$$

First order conditions imply

$$(5)\ O_L/O_E = U_L/U_E.$$

Equation (5) states that consumers maximize utility by setting the marginal rate of substitution equal to the implicit ratio of the prices of selling services and loss generosity.

The formal problem becomes far more complicated when we allow multiple individuals and firms, with different tastes and technologies, respectively. We proceed with a graphical analysis and refer the reader to Rosen for a more formal treatment.

In Figure 1 we portray the equilibrium for a single aspect of service quality, called simply F. The curve C is an iso-profit curve, representing the set of combinations of frills and price which yield a constant profit for a given company. Assuming free entry, we are assured that C is associated with zero economic profits, which is to say that each point on C also gives the firm's cost of producing one unit with the indicated amount of frills. The curve U is an iso-utility curve. Since utility is a positive function of frills and a negative function of price, higher levels of utility are associated with curves, like U', that lie below and to the right of U.

Point E in Figure 1 represents an equilibrium for the consumer, assuming that only this single firm is in the market. At E, the consumer has reached the highest iso-utility curve attainable given the combination of price and quality offered by the firm.

In Figure 2 we represent the equilibrium for several consumers, assuming several firms participate in the market. The curve E* represents the locus of price/quality combinations observed in the market in equilibrium. Some consumers prefer low-price, low-quality service, while others

FIGURE 1

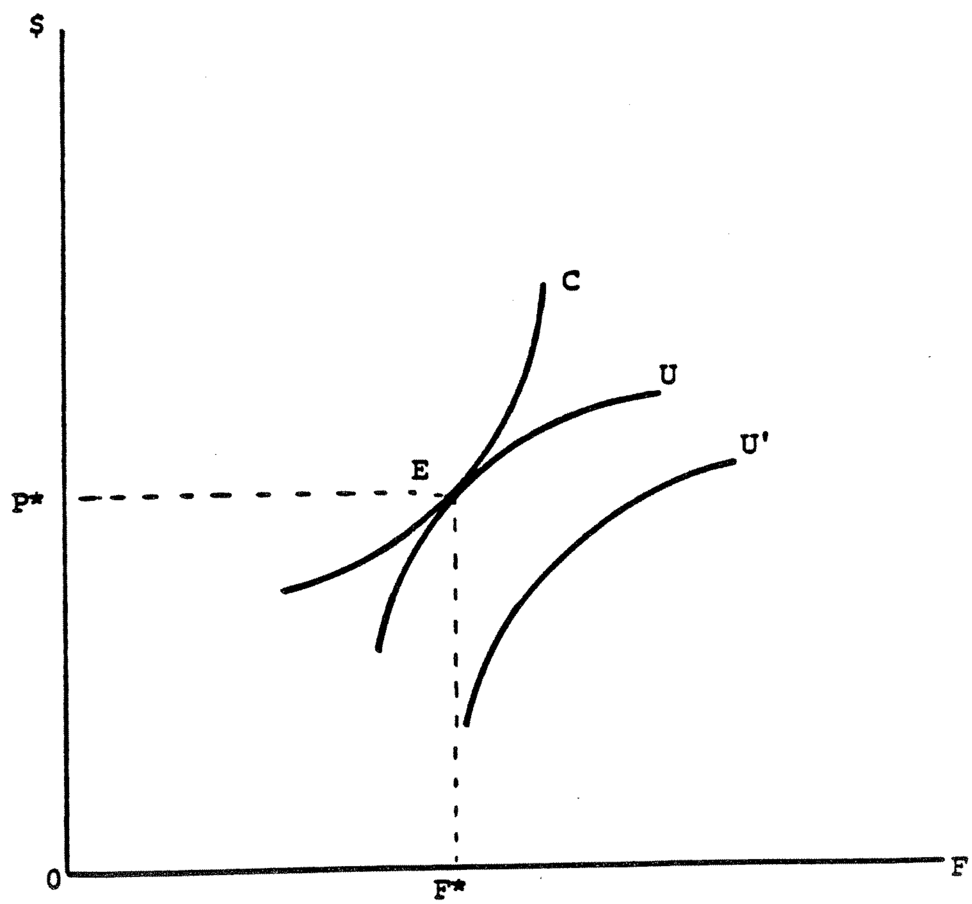
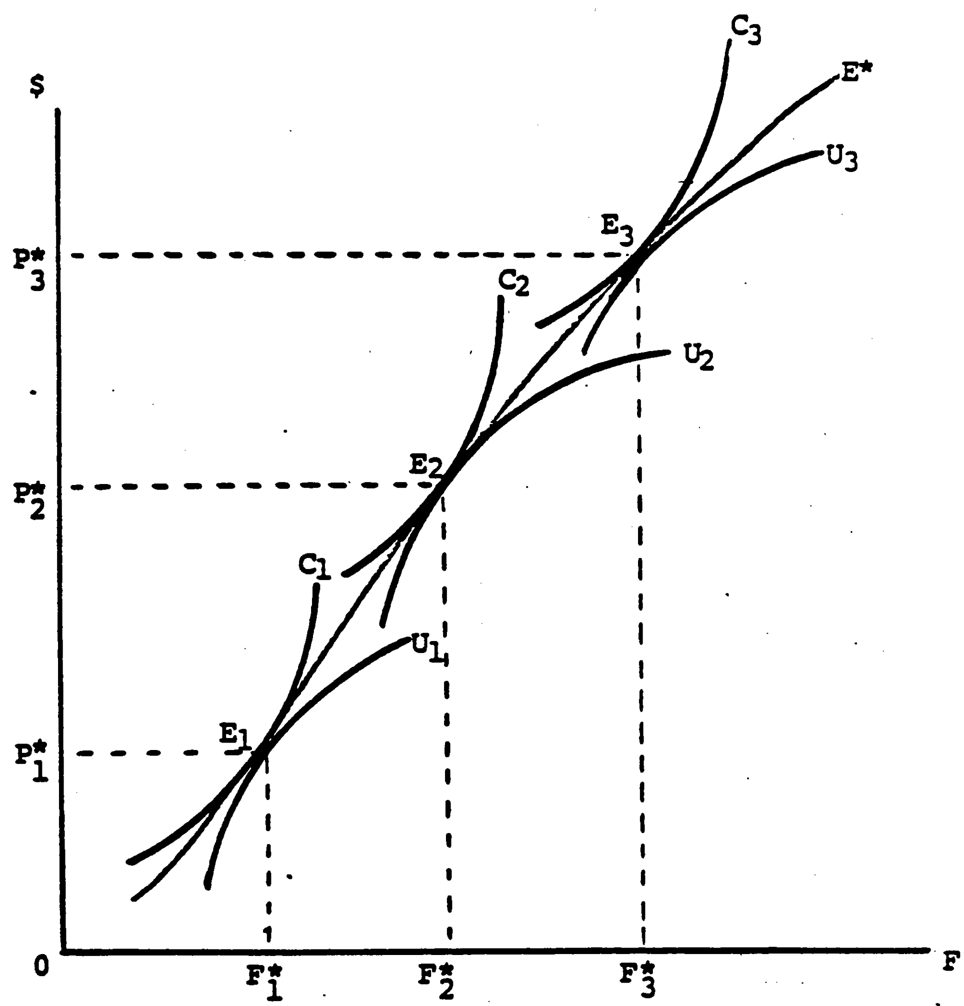


FIGURE 2



prefer high-price, high-quality service. Also, firms specialize in selling particular price-quality combinations, reflected in the fact that firms have different C loci. In a market with many companies and many consumers, we can think of E* as being continuous, though its exact shape may be difficult to specify.[5]

One observation to be made at this point is that market equilibrium for this single policy consists of a range of prices. We obtain this result even though we assume that all policies are identical and that there is perfect information, and even though the figure represents equilibrium for individuals in the same risk class and territory, with identical underwriting characteristics. The equilibrium price distribution results from differences among individuals in their tastes for service quality. We define the average price for this policy as total revenue divided by total quantity, in this case $(P_1 + P_2 + P_3)/3$.

Now let us use the model to interpret some concepts of non-price competition in the presence of collusion. The traditional model of non-price competition implicitly assumes that all individuals demand, and all firms produce, identical amounts of frills.[6] Thus, the situation in a competitive market is like that in Figure 1, except that each curve represents the iso-profit and iso-utility functions,

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[5]See Rosen for a discussion of the properties of E*.

[6]See Stigler, "Price and Non-Price Competition."

respectively, of several firms and consumers, and the equilibrium point represents the unique price-quality combination available in the market.[7] If collusion and/or regulation results in a price above the competitive price, equilibrium may initially occur at a point such as E_S in Figure 3, that lies on a higher iso-profit curve (such as C'). However, excess profits on each unit of output give firms an incentive to provide more frills in order to lure more customers. This process eventually consumes all excess profits, resulting in a new long-run equilibrium at point E_L. Note that consumers, while worse off than under competition, are better off than in the short-run equilibrium.

The concept of a supracompetitive price becomes far more complex, however, if we believe that the market starts from an equilibrium like that in Figure 2. How is the potential effect of collective pricing to be depicted here?

One possibility is that collective pricing allows all firms to agree to set their prices above the price they would charge under competition, moving, for instance, from the equilibrium price vector P_1-P_3 to the higher vector P_1'-P_3' (in Figure 4) while maintaining the original levels of quality. This solution would have the advantage of increasing profits, but it is doubtful that it would be maintained for

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[7]The assumption that the marginal cost of quantity is constant is important here. If cost were increasing in quantity, the equilibrium combination of price and quality would vary with the number of units produced.

FIGURE 3

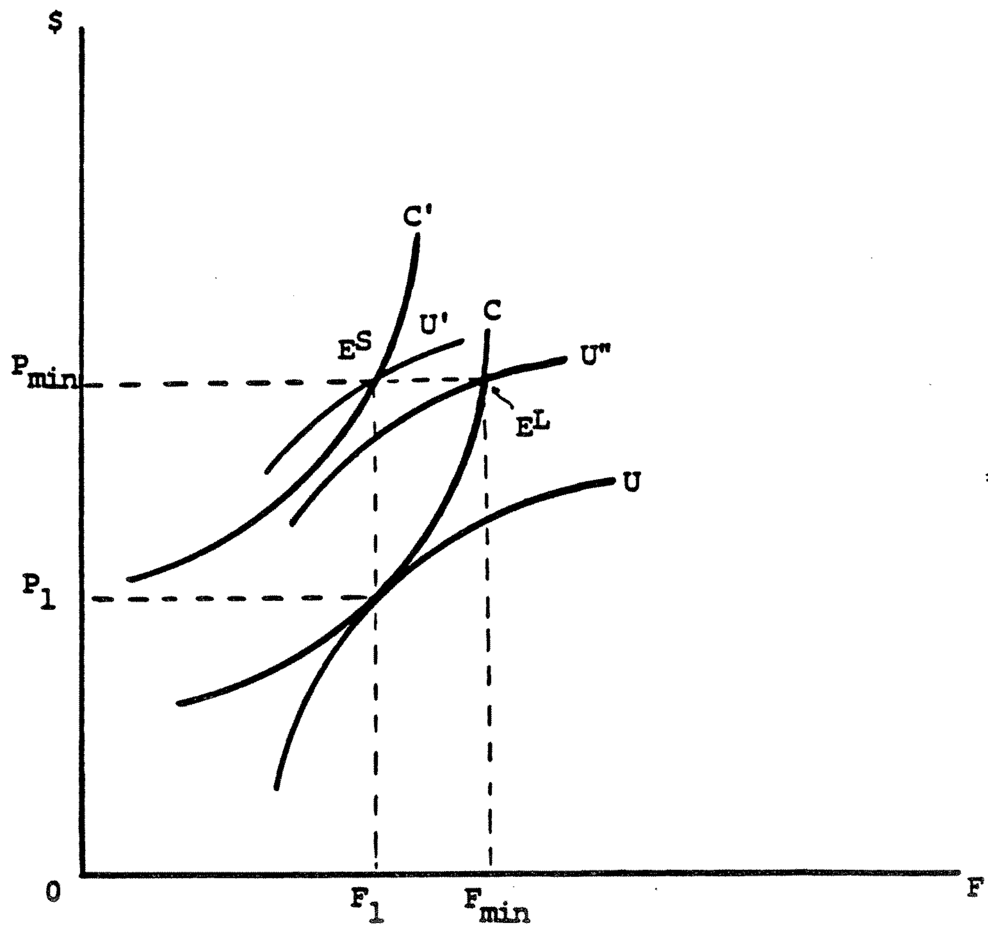
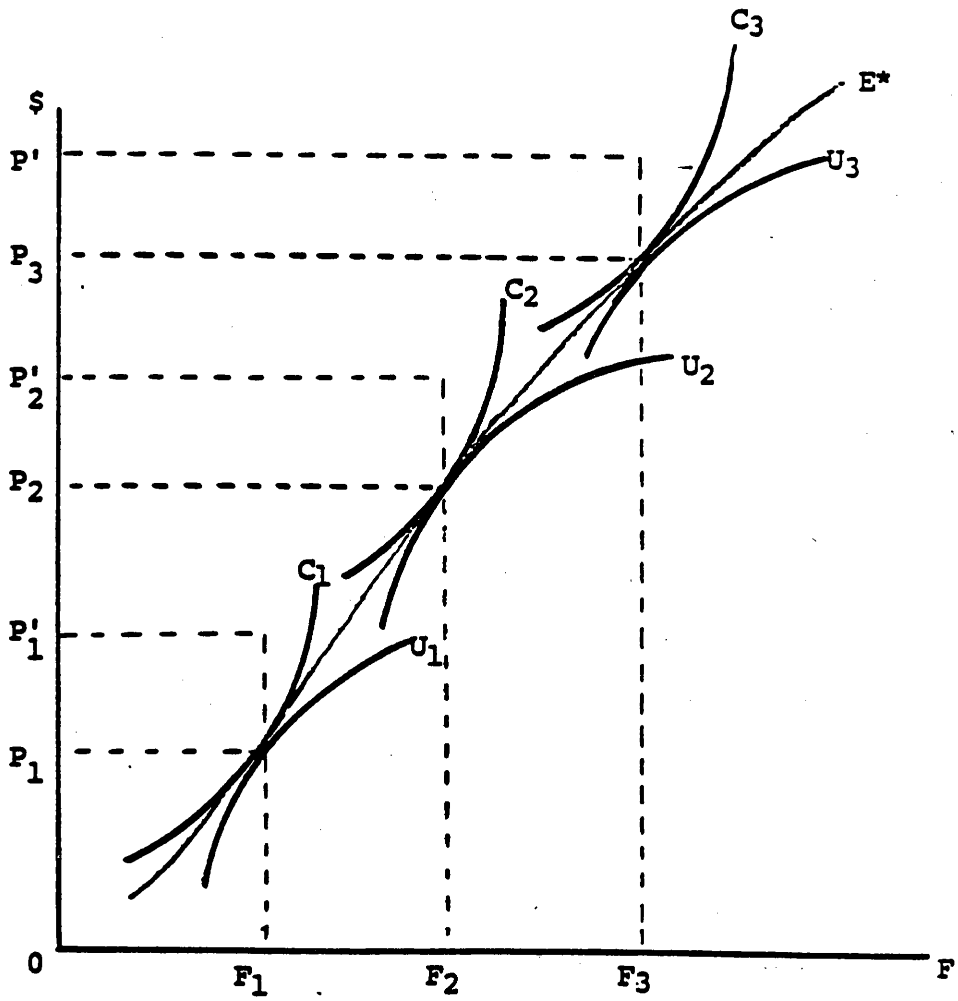


FIGURE 4

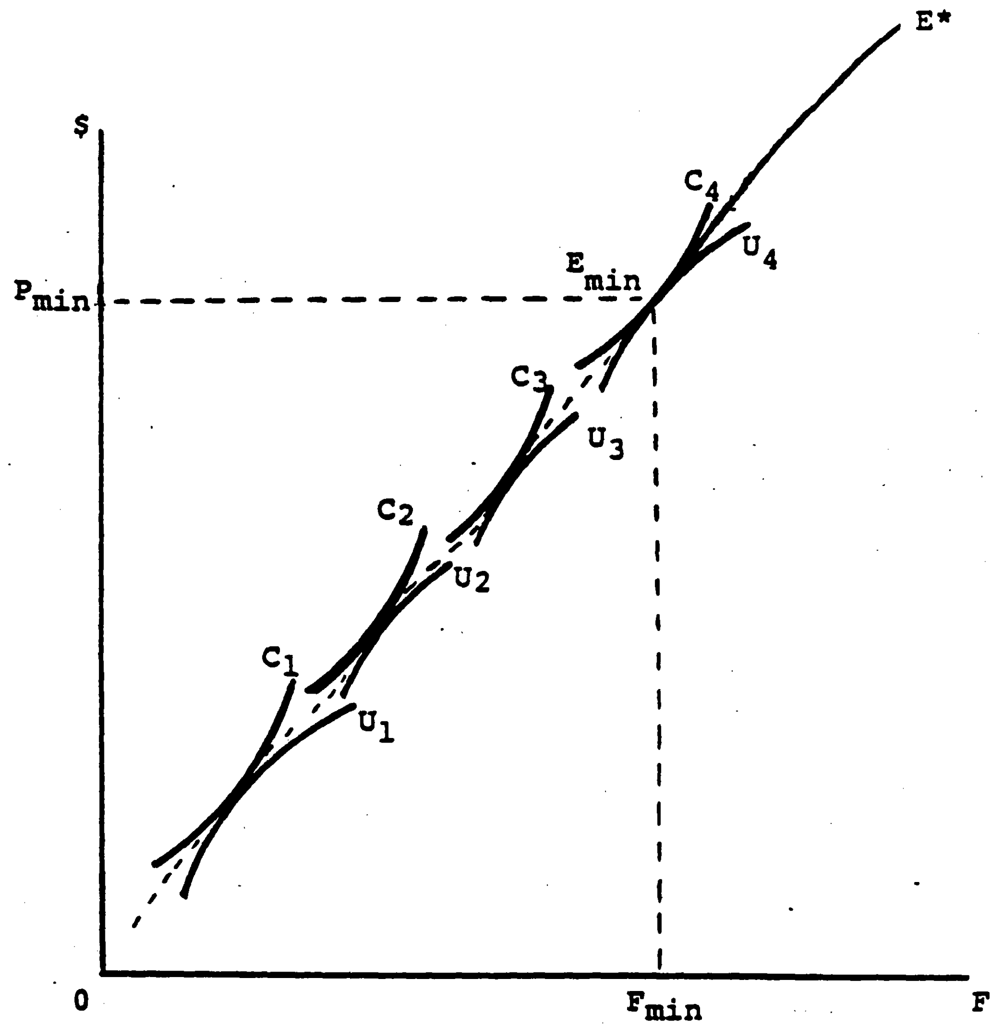


long. First, each company would have an incentive to cheat, by offering higher levels of quality. Such cheating, by assumption, is not observable. Second, even if existing companies did not cheat, new companies could easily enter and offer the original price-quality combinations, thereby undercutting the cartel. In either case, the effect is to restore the market to its original equilibrium.[8] Moreover, the difficulty of specifying (let alone monitoring) the level of service to be provided by each company suggests that no such agreement could be negotiated in the first place. These factors lead us to reject this scenario as a probable outcome of collective pricing.

A more likely outcome is that rating organizations arrive at a suggested minimum price to be charged. In Figure 5 we reproduce the curve E* from Figure 3, as well as some representative iso-utilty and iso-profit curves associated with equilibrium prices at and below an externally imposed price floor, P_{min}. The effect of the price floor is to make unavailable all points below and to the left of the point E_{min} on E*. Consumers associated with iso-utility curves U_1-U_3, if they continue to purchase insurance, must pay at least P_{min}; and, since all consumers are assumed to prefer more quality to

[8] If price can be monitored, then all cartel-members can be prevented from charging the cartel's minimum-frills price P_1'; thus, the very lowest level of frills would not be purchased, and average service quality would increase slightly. Of course, new entrants could still charge below p1'. See the discussion below for more on this point.

FIGURE 5



less, other things equal, none will elect to purchase less than F_{min}, the level of frills associated with P_{min} on E*. The result, depicted in Figure 6, is that consumers that initially paid below P_{min} now maximize their utility by purchasing the bundle (P_{min}, F_{min}). The effect of the price floor is identical, in this model, to the effect of a minimum quality standard setting F_{min} as the minimum level of quality that can be offered on the market.[9]

The effect of the price floor on companies depends on the nature of the technology used to produce frills. If companies that initially produced quality below F_{min} are also efficient producers of quality F_{min} and above, then these companies may simply adapt their product to the new situation and remain in the market. On the other hand, the nature of technology may force companies to specialize in producing a particular level of frills. The different iso-profit curves associated with these two characterizations are portrayed in Figure 7. The curve E* represents the envelope of the zero-profit curves associated with all possible technologies. The zero-profit curve C_1 represents the technology for a single company that can efficiently produce units of any quality between F_{min} and F_{max}. The curve C_2, by contrast, represents a technology that can efficiently produce only products of quality F*.

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[9]The minimum quality standards case is discussed by Rosen.

FIGURE 6

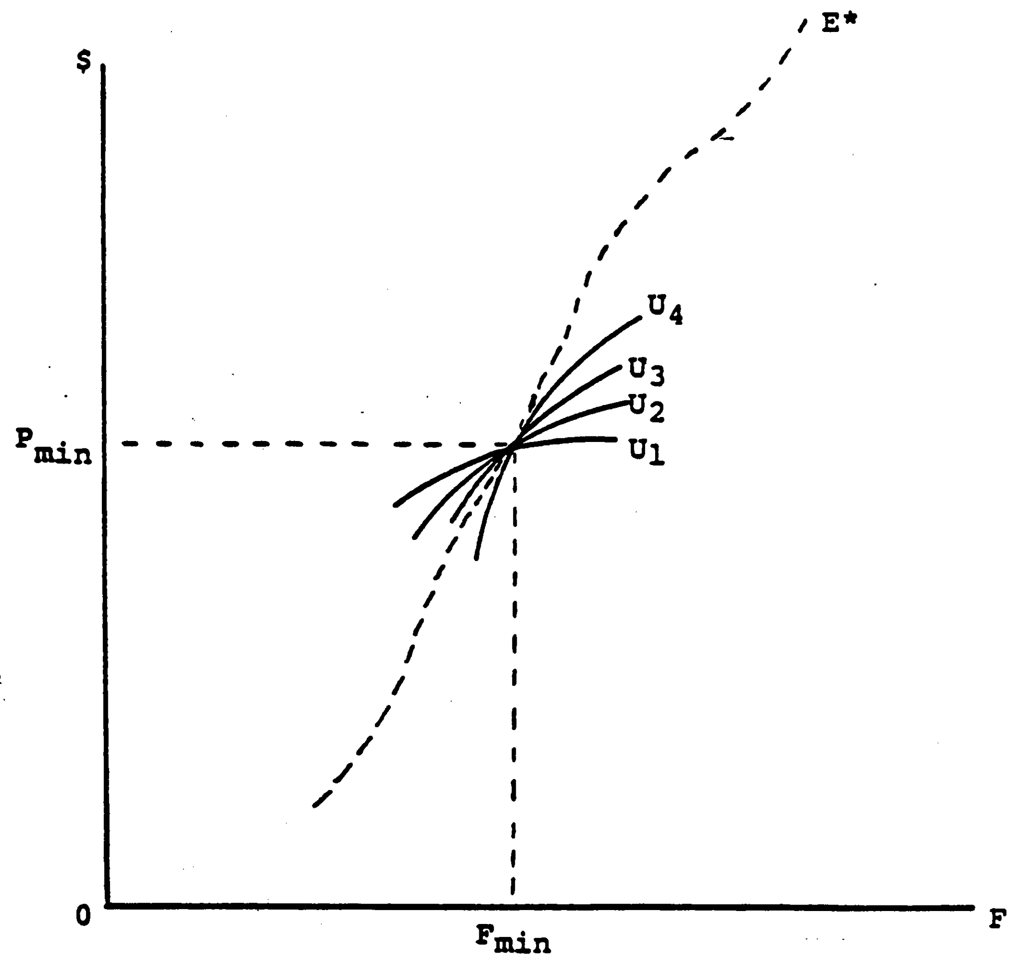
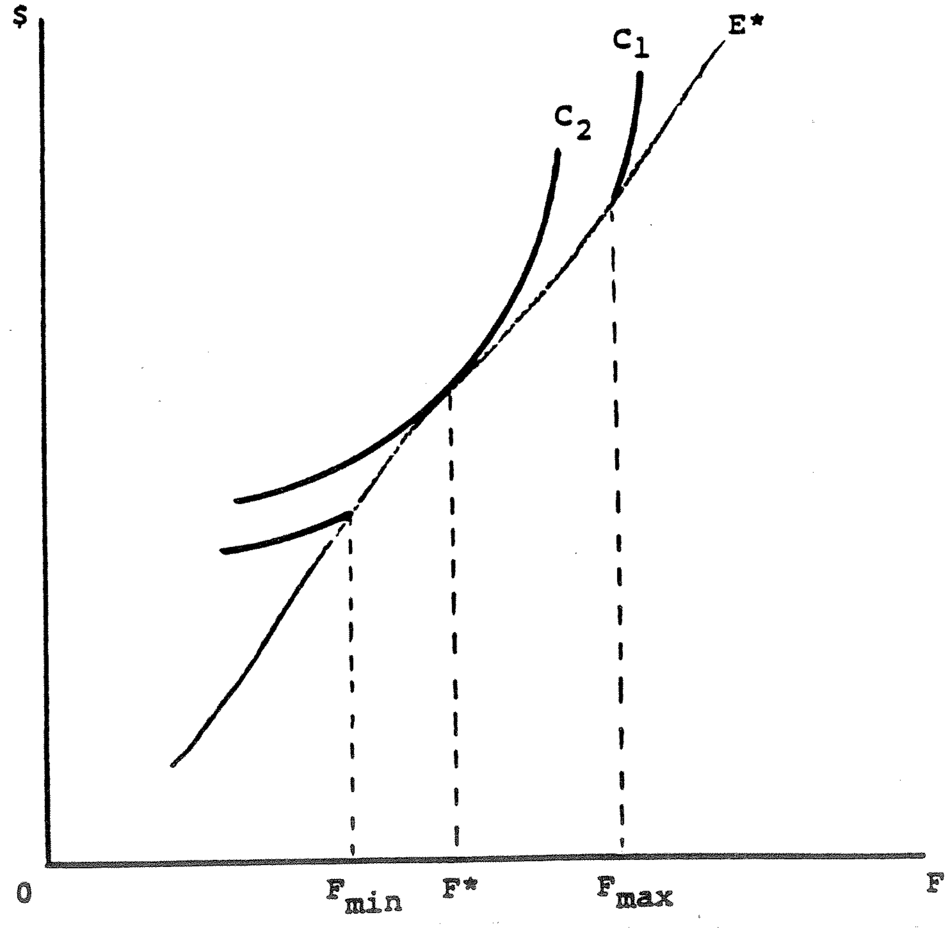


FIGURE 7



In the long-run, of course, we would expect technology itself to be variable, and firms could adjust to changes in regulatory structure or tastes. In the case of the insurance industry, however, collective pricing regimes may differ across states as well as across time. To the extent that different pricing structures imply different levels of service quality, companies may be faced with the task of adapting their technologies across states. (As noted above, only low-frills companies are likely to be affected by price floors; thus, it is these companies that would face this problem.)

Without question, some such adaptation is possible. Companies can adjust their loss adjustment policies to give more generous settlements, they can increase the number of their offices to increase customer convenience, etc. On the other hand, complete adaptability seems unlikely. Companies undertake national advertising strategies to establish their positions along the E* curve. They establish operating procedures and guidelines that are not likely to be easily adaptable across states. Most important, they choose their marketing systems on a national basis. As a result, collective pricing, if it indeed results in price floors, should affect the relative market shares of high-frills companies relative to low-frills companies. If, as we expect, direct writers often specialize in low-frills service, then we have produced both a theoretical basis for, and a more general version of, previous studies associating the proportion of business conducted by agency firms in a given state with the degree of "non-price competition" in that state.[10]

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[10] Pauly, *et al*, reach the same conclusion.

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