

## **Rating Bureaus in U.S. Property Liability Insurance Markets : Anti or Pro-competitive ? \***

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### **1. Introduction**

Under the U.S. federal anti-trust law, horizontal price fixing is per se illegal. In 1945 the McCarran-Ferguson Act granted the insurance industry exemption from federal anti-trust law, provided that it is subject to state regulation.<sup>1</sup> Subsequently, all states enacted some form of rate regulation, in order to qualify for the exemption.<sup>2</sup> The anti-trust immunity has come under attack from several sources and repeal has been advocated by the Department of Justice [1977], the National Commission for the Review of Antitrust Laws and Procedures (National Commission, 1978) and was embodied in the proposed Insurance Competition Improvement Act of 1979. The attack on the antitrust immunity is premised on the belief that competition is the most efficient regulator of resource use and the accumulation of evidence from other industries that substitution of regulation for competition has reduced rather than enhanced efficiency, contributed to higher prices and wasteful "service" competition.

There have been no studies that directly estimate the cost of the insurance exemption. However it is observed that the industry engages in certain collective activities that are potentially non-competitive, in particular, the use of rating bureaus to pool loss and expense data and publish recommended rates. Prior approval rate regulation is said to discourage departure from these rates. The National Commission [1978] states the problem :

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<sup>1</sup> Public Law 15, 79th Congress ; 59 Stat. 33-34 [1945].

<sup>2</sup> Initially, all states enacted regulations requiring that rates be approved by the Insurance Commissioner before they could be implemented. Some states have since replaced these "prior approval" laws with an "open competition" law, which dispenses with the requirement of approval prior to use but may still require that rates be filed.

“Essentially under McCarran-Ferguson, competing insurers are able to collectively publish industry rates for future periods based on industry average costs, often without effective governmental supervision and under regulatory mechanisms that, in many states, discourage independent pricing behavior. Our study of the trucking industry, for example, demonstrates that such an environment creates a strong upward pressure on rates. There is no evidence that insurance premiums are not similarly affected.”

Critics of McCarran-Ferguson thus view the purpose and result of rating bureaus as cartelization.<sup>3</sup> An alternative view is that because the industry is structurally competitive, an attempt to cartelize would be unrealistic in most states and lines of insurance. Although these concerted activities may have been used for non-competitive purposes historically, they continue to survive only to the extent they are efficient, i.e., they reduce the cost of performing certain functions for certain types of firms.

The purpose of this paper is to attempt to apply empirical evidence to discriminate between these two views of the role of rating bureaus, which will be referred to as the cartel model and the service model respectively. To do this I use both direct and indirect evidence. The direct evidence is drawn from the pattern of adherence to rates published by the Insurance Services Office (ISO), which is the leading bureau for the property-casualty industry. The indirect evidence applies tests suggested by the National Commission [1978] for detecting the existence of cartelization due to anti-trust immunities or regulatory controls. The suggested tests are:<sup>4</sup>

1. capitalization of the monopoly value of anti-trust immunity or regulatory restraints into a high cost of entry licenses ;
2. inflation of input prices ;
3. attempts by customers of the industry to circumvent the regulation ;
4. exclusion of innovators and innovations ;
5. superior performance in a comparable unregulated or more competitive market.

Because of the availability of data, this study follows most previous studies in focusing on private passenger automobile insurance. The conclusions can be generalized to other lines only to the extent that they exhibit characteristics similar to automobile insurance.<sup>5</sup>

In Part 2 of this paper, section 1 reviews the cartel and service views of the rating bureaus, to generate predictions which permit discrimination between them on the basis of evidence. Sections 2 and 3 test these predictions against the evidence. In Part 3 the tests for cartelization are applied. Section 1 discusses evidence of entry restrictions ; section 2 reviews the evidence on profits and discusses the question of above competitive returns to labor. Sections 3 and 4 briefly address the questions of attempts

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<sup>3</sup> “Cartelization” is used loosely to denote collusion to raise prices, restrict output and hence increase profits above competitive levels.

<sup>4</sup> As is well known, there are no simple, unambiguous tests for the existence of competition. The traditional structure and performance tests applied by the National Association of Insurance Commissioners (NAIC) in their program to monitor competition are discussed in Munch (1979).

<sup>5</sup> In particular, the conclusions reached here may not apply where adherence to bureau rates is mandatory, as in workers’ compensation in some states.

by customers to circumvent the allegedly cartelized section of the market and obstacles to innovation. The fifth test, comparison of the allegedly cartelized market to a comparable, more competitive market cannot be applied to the McCarran-Ferguson exemption which applies across the board to all lines of insurance and all states. However the extent of rate regulation does vary across states. Throughout the paper I attempt to distinguish any non-competitive effects due to rate regulation as opposed to the anti-trust immunity per se. The services and assessment procedures of ISO are described in the Appendix.

## 2. Cartel vs. service models of insurance rating bureaus

### 2.1. Theoretical models

(a) *The cartel model.* Standard economic theory implies that the firms in any industry maximize their joint profits if they collude and act as would a monopolist. This implies restricting output below the competitive level in order to maintain prices above the competitive level. For any single firm, however, its individual profits are maximized if it cuts price unilaterally while the other firms adhere to the joint profit maximizing, monopoly price. The incentive to cut price unilaterally is inversely related to the firm's market share.<sup>6</sup>

Because of this conflict of interest between the individual firm and the group as a whole, cartels are inherently unstable. Stigler [1968] has developed a theory of oligopoly or collusive pricing which identifies the characteristics of an industry which facilitate collusion. The underlying premise of the theory is that a firm's decision to collude is made by balancing the potential gains from adhering to the cartel price against the costs, which depend on the potential profits from "cheating". Characteristics which imply large gains from collusion, relative to independent pricing, and hence which facilitate collusion include the following:

- small number of firms in the industry;
- inelastic market demand for the product;

<sup>6</sup> If a single firm cuts price unilaterally, it can achieve a given increase in output by means of a smaller reduction in price than if all firms in the industry simultaneously cut price. This is because the firm that cuts price unilaterally increases its demand in two ways: it obtains the full increase in market demand at the lower price and it attracts customers from its rivals that continue to charge the higher price. This increment in demand is larger, relative to the firm's initial output, the smaller its initial market share.

Formally, let  $q$  be the output of the  $i^{\text{th}}$  firm,  $Q$  the output of other firms in the industry. Then

$$(1) \quad \varepsilon_i = \left[ \frac{Q+q}{q} \right] \varepsilon_{Q+q,p} - \frac{Q}{q} \varepsilon_{Q,p},$$

where  $\varepsilon_i$  is the demand elasticity of the  $i^{\text{th}}$  firm,  $\varepsilon_{Q+q,p}$  is the market demand elasticity. If all firms cut price together,  $\varepsilon_{Q,p}$  is the demand elasticity of the other firms and is negative; if market shares are maintained,  $\varepsilon_i \approx \varepsilon_{Q+q,p}$ . If one firm cuts price unilaterally, the last term in eq. (1) must be interpreted as the elasticity of other firm's output with respect to the price of the  $i^{\text{th}}$  firm, and is positive.

The firm's demand elasticity is thus inversely related to  $\frac{q}{Q+q}$ , the firm's market share.

- a relatively large market share of the colluding sellers ;
- inelastic supply from alternative sources. This requires diseconomies of scale of firms outside the cartel and barriers to entry of new firms ;<sup>7</sup>
- easy detection of “cheating”. If detection is prompt, the optimum strategy for other firms is to match the cheater’s price reduction which nullifies his advantage and hence the incentive to cheat ;
- a homogeneous product. This facilitates agreement as to the joint profit maximizing price ;
- limited potential for competition on dimensions of the product other than price, such as services, quality, etc. Since non-price competition is typically more difficult to monitor, restrictions on price competition are only worthwhile if the expected gains will not simply be competed away by non-price competition.

In light of these conditions favorable to collusion, the U.S. property-casualty insurance industry appears structurally unsuited for cartelization in the absence of some institutionalized framework for enforcing adherence. There are over 1,000 companies in the industry. There is no evidence of serious diseconomies of scale or natural barriers to entry.<sup>8</sup> Cheating on price is hard to detect, because the full price is often multi-dimensional, and depends on underwriting criteria, dividends, rebates and surcharges depending on the policyholder’s claim record. There is also considerable scope for non-price competition on the service features of the policy.

It has been argued (Joskow [1973], Ippolito [1979]) that although the basic characteristics of the insurance industry do not themselves facilitate collusion, 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.

The cartel model of the bureaus yields the following testable predictions :

- (i) large firms are less likely to deviate from the cartel rate than small firms, assuming common supply elasticities. This follows from the fact that the gains from deviating, relative to adhering to the cartel price are less, the larger the firm’s market share ;
- (ii) the bureau will seek to enforce bureau rates ;

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<sup>7</sup> If firms outside the cartel can increase their output without incurring increasing costs, they can rapidly expand to replace the output restrictions of the cartel and hence nullify the effect of the cartel on market price.

<sup>8</sup> The continued survival of very small and very large firms in the industry suggests constant returns to scale over a large range. The network of independent agents, who market insurance for multiple insurers, facilitates entry of new firms. Joskow [1973] concludes that “there has been continuous and substantial entry” for the period 1960-71, but argues that the cost of obtaining consumer recognition and establishing a marketing network constitutes a significant barrier to entry for direct writers, who market through exclusive agents or employees. However, the entry of Allstate and State Farm, and, more recently, Metropolitan and Prudential Life, using existing contacts to market a new insurance product, suggest that the cost of large scale entry is not prohibitive. Moreover, the survival of many small direct writers implies that entry at a small scale is feasible.

- (iii) deviations from the bureau rate will be downward, because the unilateral profit maximizing price is always below the joint profit maximizing price. This prediction presupposes that all firms supply a uniform product and have uniform cost conditions. If products are heterogeneous, for example because different firms select different types of policyholder, the conclusion with respect to the direction of deviations from bureau rates does not hold ;
- (iv) adherence to bureau rates will be greater in prior approval states, since prior approval raises the cost of deviating ;<sup>9</sup>
- (v) bureaus will only survive if a sufficient fraction of the market is written at bureau rates to convey market power.

(b) *Service model.* The service model of the rating bureaus acknowledges the original cartelizing power of the bureaus, but argues that this power has been eroded to negligible levels over time. Although the original prior approval laws placed severe obstacles to deviating from bureau rates, these obstacles have been reduced over time, such that deviations are now common. The cost of deviating tends to be a fixed cost that does not vary with premium volume. In the absence of scale diseconomies or regulatory impediments to the growth of firms that do not adhere to the cartel rates, the elasticity of demand of firms that do adhere is likely to be too high to offer large profits from attempts at cartelization.

The service model argues that bureaus continue to survive only to the extent they perform useful services for their members. The insurance firm performs diverse operations. These include the actuarial functions of estimating claim costs and formulating rates ; publishing rates and policy forms and distributing them to sales personnel and agents ; selection of policyholders ; claims handling ; filing rates and meeting other requirements of regulation. The optimum scale for performing these several functions varies. In particular there are significant economies of scale in rate making, production of rate manuals and forms, and dealing with regulators. On the other hand the optimum scale for dealing with policyholders may be quite small. Moreover the firm that is large in absolute size may nevertheless write relatively small premium volume in many lines and states, in order to offer policyholders complete coverage of their various needs. Such diversification across lines and states also reduces the total risk borne by the firm.

Because the optimum scale for different functions varies, it is efficient for firms to pool those functions which are subject to economies of scale while retaining individual autonomy over the other functions, and to diversify across lines and states. Bureaus provide those services which are performed at lower unit cost if pooled. These include ratemaking, design and reproduction of policy forms, and dealing with regulators, since the bureau may act on behalf of all the firms it represents. The rate-making function of bureaus is particularly valuable to firms entering a market for the first time, before they accumulate experience on which to base rates.

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<sup>9</sup> The dichotomy made here and throughout this paper between prior approval and competitive rating laws ignores the variation that exists among states within these two broad categories.

The service model does not deny that in setting recommended rates the bureau will set those rates that maximize the expected profits of its members. However, it argues that the profit maximizing price will not differ significantly from the competitive price because the demand facing bureau firms is highly elastic as long as the costs of deviating from bureau rates are low.

The service model of bureaus yields the following testable predictions :

- (i) users of bureau rates will typically be small firms. Large firms will use bureau rates only in lines or states where they have relatively small premium volume ;
- (ii) no effort will be made to enforce bureau rates. Competing bureaus may co-exist ;
- (iii) deviations from bureau rates may be upward or downward ;
- (iv) adherence to bureau rates will be greater in prior approval states because one of the functions performed efficiently by bureaus is dealing with regulators ;
- (v) bureaus survive even though their market share is insufficient to convey market power.

Thus the primary distinguishing features of the cartel and the service models of rating bureaus are with respect to the size of firms that will write at bureau rates and the market share necessary for survival. Both models predict greater adherence to bureau rates in prior approval states. The cartel model predicts only downward deviations, but only under the assumption of product homogeneity. The cartel model predicts that bureaus will attempt to enforce adherence to bureau rates, whereas the service model does not. This prediction cannot be used to discriminate between the models because access to bureau services and adherence to bureau rates is regulated.<sup>10</sup> The next sections examines the evidence to see which of these two alternative models better fits the data.

## 2.2. Evidence of adherence to ISO rates

(a) *Joskow [1973]*. Joskow reports two sets of evidence which show greater adherence to bureau rates under prior approval than open competition rating laws. Comparing the percentage of premiums written at bureau rates in California, with open competition, and in New York, with prior approval in 1967, the percentage written at bureau is higher in New York in all four lines compared (See Table 1). Second, using data confined to the top 30 firms, the number writing off bureau and the percentage of premiums written off bureau in New York increased following the introduction of open competition in January 1970 (See Table 2).

Joskow acknowledges the competitive structure of the industry and low barriers to entry (at least for agency firms), but argues that bureaus have cartelizing power because prior approval regulation enforces adherence to the cartel rates.<sup>11</sup> This cartel view of the bureau cannot readily account for the fact that in California, even absent this enforcement mechanism, only 32 % of fire, 50 % of auto liability, 46 % auto physical damage and 68 % of homeowners premium were written off bureau in 1967.

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<sup>10</sup> Currently, insurers may purchase ISO services on a piece-meal basis, for any subset of states or lines (see Appendix).

<sup>11</sup> "The rating bureaus with the knowing or unknowing help of regulators had managed to maintain at least moderate cartel control of insurance prices." Joskow [1973], p. 398.

*Table 1: Percentage of direct premiums written at off-bureau rates*

	New York (1967)	California (1966 or 1967)
Fire	8.9	32.3
Homeowners	22.5	67.7
Auto Liability	22.6	49.9
Auto Property Damage	24.7	45.9

Source: New York State Insurance Department (cited in Joskow [1973]).

*Table 2: Deviations from bureau rates by the top 30 insurers in New York under prior approval (pre 1970) and open competition (post 1970). Includes assigned risk plan.*

	% of Premiums Off Bureau	No. of Companies Off Bureau Rates
<b>Auto Liability</b>		
1967	38.2	8
1968	38.7	8
1969	38.3	7
<hr/>		
1970	33.2	7
1971	33.3	6
1972	50.6	12
<hr/>		
<b>Homeowners</b>		
1967	22.8	6
1968	22.1	6
1969	24.7	6
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1970	30.9	7
1971	57.2	10
1972	78.9	17

Source: Joskow [1973]).

Similarly in New York in 1972 49 % of the auto liability premiums written by the top 30 firms were still written at bureau. Thus prior approval is neither a necessary nor a sufficient condition for adherence to bureau rates, contrary to the view of the bureau as a cartel enforced by regulation. On the other hand the evidence that something less than 100 % of the market is written at bureau in both prior approval and open competition states is consistent with the service model.

(b) *The Department of Justice (DOJ) Report [1977]*. The DOJ Report examines the dispersion of prices quoted by 25 companies for 9 standardized automobile policies in four territories in one open competition state (California) and two prior approval states (Pennsylvania and New Jersey) in January 1976. The Report concludes :

“ A substantially larger share of the automobile insurance market is priced independent of the bureau in California than in New Jersey or Pennsylvania... There appear to be meaningful price differentials between bureau and off-bureau companies in all three states... California appears to have a more consistent pattern of substantial price differentials (10 % or more) below the bureau rates than exists in either New Jersey or Pennsylvania. ”

First it must be noted that the DOJ definition of a deviation from bureau rates leads to an underestimate of economically relevant deviations and possibly a bias in the comparison of prior approval and open competition states. “ A company that simply deviates from the bureau rates by a fixed or varying percentage is not considered an independent insurer for the purpose of this study. ” (DOJ, p. 40). This is a misclassification for purposes of testing the cartel hypothesis. A cartel will be undermined by any pricing below the cartel price, regardless of whether the price cutter develops a totally independent pricing structure or follows the basic structure set by the cartel. If filing a percentage deviation is cheaper than filing an independent rate structure then the price cutter can offer a larger average percentage price cut if it does not incur the cost of developing and filing an independent structure. Furthermore, if the relative cost of filing a totally independent structure is higher in prior approval states, this study underreports deviations more in prior approval than in open competition states.

Ignoring this possible bias, the data do suggest that prior approval encourages adherence to bureau rates. Counting each territory/coverage as a separate observation, 98 % of the price quotes are off bureau in California, compared to 55 % in New Jersey and 62 % in Pennsylvania.

However, both the extent and pattern of deviations (see Table 3) are inconsistent with the simple cartel hypothesis. First, in every territory/coverage market, over 50 % of the firms in the sample are writing off bureau but they account for over 75 % of the premium written. Thus larger firms are more likely to deviate, contrary to the necessary conditions for a successful cartel. Second, even if all other firms in the industry wrote at bureau rates, less than 50 % of total premium volume is written at bureau even in the prior approval states. Less than 50 % of the market is unlikely to constitute a viable cartel in the absence of obstacles to the expansion of the deviating firms. Third, a substantial fraction of the deviations from the bureau rates are upward, in both open competition and prior approval states (34 % in California, 40 % in New Jersey and 41 % in Pennsylvania). Since the profit maximizing price for a cartel exceeds the individual profit maximizing price for a price cutter, the substantial percentage (over 40 %) of deviations *above* the bureau price is inconsistent with the cartel hypothesis.

Some of the observed dispersion of prices charged by different firms for a standard ISO territory/coverage no doubt reflects product heterogeneity and therefore overestimates the dispersion of prices for a homogeneous product. Far from invalidating



Table 3: Dispersion of price quotations for automobile liability and physical damage policies. January 1976.

	Total	# Off Bureau	# Above Bureau	# Below Bureau	% Off Bureau	% of Deviations above Bureau	% of Deviations below Bureau
California	864	848	290	558	.98	.34	.66
New Jersey	900	497	197	300	.55	.40	.60
Pennsylvania	898	555	226	327	.62	.41	.59

Source: DOJ [1977], p. 39 ff.

the conclusion that price dispersion indicates competition, price differences that reflect product differences indicate competition on other dimensions in addition to price. This is evidence of the enforcement problems that would confront a cartel attempting to eliminate competition in a multidimensional product such as insurance.<sup>12</sup>

It is interesting to note that the percentage of deviations which are above bureau is higher in prior approval states (40 % in New Jersey, 41 % in Pennsylvania) than under open competition (34 % in California). One hypothesis to account for this difference is that prior approval regulation may be used to hold ISO rates *below* the level desired by the bureau and possibly below the competitive level.<sup>13</sup> This hypothesis is supported by the evidence cited elsewhere in the DOJ Report that average loss ratios for the period 1966-75 were higher in New Jersey and Pennsylvania than in California.<sup>14</sup>

(c) *Independent Insurance Agents of America (IIAA) Study [1978]*.<sup>15</sup> The data from Joskow and the DOJ Report are the only readily available evidence on the percentage of the market actually written at bureau rates. The disadvantage of these data is that they are confined to a total of four, possibly atypical states. The IIAA study covers all states in 1974, 1975 and 1976 but does not report the fraction of the market actually written at ISO rates. It does, however, give the number of top ten companies writing at, above and below ISO rates ; the percentage of total market premium volume written by the top ten companies ; the percentage of total market volume reported to

<sup>12</sup> Note that there is no presumption that competition on quality dimensions of a product is inefficient if it is accompanied by price differences. By contrast there is a presumption that competition on dimensions other than price is inefficient if it is a substitute for price competition.

<sup>13</sup> The rates finally approved by regulators are frequently below the level initially filed by ISO. Rates can be held consistently below cost in one line, only if they exceed costs in other lines and entry to profitable lines is made conditional on writing the unprofitable lines.

<sup>14</sup> See Part 3 below.

<sup>15</sup> Most stock companies sell insurance through the American Agency System of independent agents who represent several insurers.

ISO ; and the percentage of top ten volume reported to ISO. These data are summarized in Table 4.

*Table 4 : Mean, minimum and maximum use of ISO rates, by State, 1974-76*

	Automobile			Homeowners		
	Mean	Min.	Max.	Mean	Min.	Max.
% of Total Premium Written by Top Ten Firms	65.9	54.3	83.3	58.3	54.3	88.3
# of Top Ten Firms Using ISO Rates	.8	0	3	1.3	0	9
# of Top Ten Firms Over ISO Rates	1.5	0	5	.6	0	4
% of Top Ten Premium Reported to ISO	22.1	0	61.5	34.7	0	75.7
% of Total Premium Reported to ISO	34.3	4.8	67.9	44.1	14.8	74.4

Source : Independent Insurance Agents of America [1978].

The patterns that emerge are similar to those in the four states discussed above : the majority of firms, particularly large firms, do not use ISO rates, even in prior approval states and deviations above ISO rates are common. In the case of automobile, of the top ten firms in each state, the mean number using ISO rates is only .8, the minimum is zero and the maximum is 3. These top ten firms account for over 50 % of the total premium volume in all states, with a mean of 66 %. Although most deviations are below ISO rates, on average .5 of the top ten firms in each state charge above ISO rates, with a maximum of 5.

In the case of homeowners, which is a smaller line, the top ten firms account for a slightly smaller fraction of the market on average (58.3 %) and there is more adherence to ISO rates. The average number of firms using ISO rates is 1.5, with a minimum of zero and a maximum of 9. Deviation above ISO rates is less common than in automobile (mean .6, maximum 4 firms).

The IIAA also reports the percentage of premium reported to ISO by the top ten firms and the total market. It must be emphasized that reporting statistics to ISO is neither a necessary nor a sufficient condition for using ISO rates. It is widely believed that the percentage reported to ISO overstates the percentage written at ISO rates, but data are not readily available to substantiate this. Assuming that the percentage of premium reported to and written at ISO rates are positively correlated, with the former an upper bound on the latter, the IIAA data provide a rough indicator of the influence of ISO countrywide. The pattern is consistent. For both homeowners and automobile, the large firms are less likely to report to ISO than small firms and the percentage of premium reported by both small and large firms is greater for home-

owners than automobile. Thus the pattern by size of firm within lines and across lines is consistent with the view of ISO as a service organization providing services the value of which is greater, the smaller the premium volume of the firm.

The mean percentage of the market written at ISO rates is significantly higher in prior approval states (35.3 %) than in open competition states (24.9 %). As noted above this is consistent with both the cartel and the service models of the role of ISO.

(d) *National Industry Committee (NIC) Data.* All companies are required by law to report premium and loss data to a statistical agent. Of the three major statistical agents, the National Association of Independent Insurers (NAII) and National Insurance Statistical Service (NISS) only make pure loss data available to their member companies, whereas ISO also furnishes recommended rates.<sup>16</sup>

The National Industry Committee (NIC) reports the distribution of private passenger auto liability voluntary car years, by statistical agent, for 1975 and 1977 (See Table 5). It must be emphasized that these data are at best a rough indicator of the extent of the market written at ISO rates because many firms reporting statistics to ISO do not use ISO rates and conversely some non-members may use ISO rates in some territories. On balance the ISO share probably overstates the percentage actually written at ISO rates. The mean ISO share countrywide decreased from 32.76 in 1975 to 29.75 in 1977 while the NAII shares increased from 50.1 % in 1975 to 52.5 % in 1977. In only 17 states in 1977 did the ISO share exceed 30 %.

The regional patterns revealed by these data imply that studies based on a small number of states may be seriously biased. Of the 17 states with ISO shares above 30 %, twelve are in the northeast (Zones 1 and 2). This suggests that studies such as Joskow (1973) or DOJ (1977), which base conclusions on adherence to ISO rates under prior approval on one or two northeastern states, may present an upward biased estimate of the situation nationwide. Furthermore, it suggests that regional factors may be at least as important as prior approval in determining the extent of adherence to ISO rates. One factor already discussed is more stringent rate control in the northeast, due possibly to the influence of urban consumer groups. Another factor is that the two largest independent writers, State Farm and Allstate, originated in Illinois and have grown most rapidly in the mid-west. An analysis of the causes of regional differences in use of ISO is beyond the scope of this paper.

### 2.3. *Changes in market shares*

As noted above, the incentive to collude is inversely related to the speed with which firms outside the cartel can expand to nullify any restriction on output by colluding firms. Significant changes in market shares indicate the absence of effective obstacles to growth. Moreover since cartels often attempt to stabilize market shares, changes in market shares are suggestive of lack of effective collusion.

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<sup>16</sup> Companies using NAII include the largest direct writers, State Farm and Allstate, as well as many smaller "specialty" companies, that write atypical policyholders.

Table 5 : ISO market share, by region (NIC)

PRIVATE PASSENGER AUTOMOBILE LIABILITY INSURANCE  
 PENETRATION OF VOLUNTARY MARKET BY STATE AND STATISTICAL AGENT  
 BY ZONE - CALENDAR YEAR 1977

State	ISO			NAII			NISS			Other			State Total			NAII %	NISS %	Other %
	Cos. No.	Car Years		Cos. No.	Car Years		Cos. No.	Car Years		Cos. No.	Car Years		Cos. No.	Car Years				
Connecticut	106	965,486		29	423,270		0	0	0	0	1,338,755		135	1,338,755	30.48	0	0	
Maine	93	334,342		34	96,562		1	0	0	0	430,905		128	430,905	22.41	0	0	
Massachusetts	0	0		0	0		0	0	0	1,895,931		89	1,895,931	0	0	100.00		
New Hampshire	94	287,839		21	113,563		1	0	0	0	401,402		116	401,402	28.29	0	0	
New Jersey	121	1,563,863		33	1,033,310		0	0	0	0	2,598,941		154	2,598,941	60.17	0	0	
New York	133	3,063,741		27	2,049,128		0	0	0	0	5,112,918		160	5,112,918	59.92	0	0	
Rhode Island	71	231,769		26	120,981		1	0	0	0	352,755		98	352,755	65.70	0	0	
Vermont	92	131,326		24	74,492		0	0	0	0	205,818		116	205,818	26.19	0	0	
Total Zone 1		6,578,366			3,911,306		0	0	0	1,895,931		12,387,425		12,387,425	31.57	0	15.31	
Delaware	92	97,642		34	177,801		0	0	0	0	275,447		126	275,447	64.55	0	0	
Dist. of Columbia	84	34,372		31	106,002		3	0	0	0	140,377		118	140,377	75.51	0	0	
Maryland																		
North Carolina	115	1,553,897		38	1,409,242		0	0	0	0	2,963,139		153	2,963,139	47.56	0	0	
Ohio	122	1,572,468		76	3,085,045		18	333,138	1	1,639	4,992,294		217	4,992,294	61.80	6.67	.03	
Pennsylvania	124	2,086,650		50	2,968,435		5	37,482	0	0	5,092,617		179	5,092,617	58.29	.74	0	
South Carolina	0	0		0	0		0	0	0	1,358,436		212	1,358,436	0	0	100.00		
Virginia	119	783,541		49	1,480,456		0	0	0	0	2,264,006		168	2,264,006	65.39	0	0	
West Virginia	86	159,498		66	616,083		4	5,300	0	0	780,881		134	780,881	78.90	.68	0	
Total Zone 2		6,288,068			9,843,064		4	375,920	0	1,360,075	17,867,197		17,867,197	35.19	55.09	2.10	7.61	
Alabama	118	311,688		72	1,059,569		4	319	0	0	1,371,648		194	1,371,648	77.25	.02	0	
Florida	129	974,561		62	2,283,277		5	27,587	0	0	3,285,479		196	3,285,479	69.50	.84	0	
Georgia	128	661,572		68	1,620,534		4	4,657	0	0	2,280,347		200	2,280,347	71.07	.20	0	
Kentucky	112	524,334		184	1,006,294		10	44,069	1	2,608	1,564,745		184	1,564,745	64.31	2.82	.17	
Louisiana	99	514,727		51	703,507		1	0	0	0	1,218,467		151	1,218,467	57.74	0	0	
Mississippi	101	241,535		59	545,950		2	0	0	0	787,476		162	787,476	69.33	0	0	
Missouri	112	301,637		87	1,528,057		17	356,535	1	373	2,186,676		217	2,186,676	69.88	16.30	.02	
Tennessee	123	584,904		76	1,191,475		4	4,496	0	0	1,780,886		203	1,780,886	66.90	.25	0	
Total Zone 3		4,114,958			9,938,663		4	437,663	0	2,981	14,475,724		14,475,724	28.43	68.66	3.02	.02	

Table 5 : ISO market share, by region (NIC) (continued)

State	ISO		NAII		NISS		Other		State Total		ISO %	NAII %	NISS %	Other %
	Cos. No.	Car Years	Cos. No.	Car Years	Cos. No.	Car Years	Cos. No.	Car Years	Cos. No.	Car Years				
Illinois	121	929,689	97	2,613,629	29	736,704	10	530,406	257	4,810,315	19.33	54.33	15.32	11.03
Indiana	116	418,073	90	1,647,698	25	385,732	2	8,830	233	2,460,299	16.99	66.97	15.68	.36
Iowa	102	224,040	95	1,108,928	22	214,309	2	11,223	221	1,558,501	14.38	71.15	13.75	.72
Michigan	108	807,584	64	3,028,137	18	342,863	3	193,218	196	4,388,184	18.40	69.01	7.81	4.40
Minnesota	105	428,219	90	1,099,475	15	489,167	1	32,774	212	2,089,957	20.49	52.61	23.41	1.57
North Dakota	86	51,330	64	233,701	14	85,480	1	22,657	165	392,187	13.09	59.59	21.80	5.78
South Dakota	98	52,611	65	215,187	19	87,647	3	22,591	177	277,768	13.93	59.96	23.20	5.98
Wisconsin	106	385,378	82	1,493,053	20	235,233	3	4,774	211	2,118,441	18.19	70.48	11.10	.23
Total Zone 4		3,245,594		11,439,808		2,577,135		826,473		18,195,652	17.84	62.87	14.16	4.54
Arkansas	99	205,502	67	664,177	4	2,536	0	0	170	874,246	23.51	75.97	.29	0
Colorado	113	296,941	80	837,650	10	290,265	0	0	203	1,420,574	20.90	58.97	20.43	0
Kansas	105	271,937	73	801,164	14	245,728	0	0	192	1,310,490	20.75	61.13	18.75	0
Nebraska	96	114,860	72	612,174	17	123,381	0	0	185	850,417	13.51	71.99	14.51	0
New Mexico	98	119,478	62	366,471	4	1,888	0	0	164	487,799	24.49	75.13	.39	0
Oklahoma	99	302,400	71	1,093,142	4	6,080	4	50,019	178	1,451,739	20.83	75.30	.42	3.45
Texas	118	2,012,020	73	2,694,189	0	0	0	0	191	4,706,209	42.75	57.25	0	0
Wyoming	81	39,070	49	120,102	10	53,096	1	20,649	141	232,925	16.77	51.56	22.80	8.87
Total Zone 5		3,362,208		7,233,421		722,974		70,668		11,334,399	29.66	63.82	6.38	.62
Alaska	62	38,793	28	73,934	1	0	0	0	91	112,288	34.55	65.84	0	0
Arizona	105	236,441	66	760,476	3	2,159	1	10,047	175	1,008,646	23.44	75.40	.21	1.00
California	117	1,795,182	58	795,528	6	1,321,030	17	5,734,759	198	9,540,039	18.82	8.34	13.85	60.11
Hawaii	59	249,506	17	155,614	0	0	0	0	76	405,127	61.59	38.41	0	0
Idaho	98	78,698	62	279,081	4	16,167	4	137,728	168	483,656	16.27	57.70	3.34	28.48
Montana	80	78,015	54	183,468	5	27,279	3	110,778	142	399,542	19.53	45.92	6.83	27.73
Nevada	83	47,440	52	247,639	3	1,067	3	38,853	141	335,174	14.15	73.88	.32	11.59
Oregon	102	249,467	68	975,893	4	27,845	3	46,092	177	1,285,661	19.40	75.91	2.17	3.59
Utah	85	114,942	60	456,422	4	15,562	1	28,810	155	615,919	18.66	74.10	2.53	4.68
Washington	105	389,331	64	1,145,639	4	49,049	5	291,900	178	1,874,752	20.77	61.11	2.62	15.57
Total Zone 6		3,277,815		5,073,694		1,460,158		6,398,967		16,060,804	20.41	31.59	9.09	39.84
Countrywide		26,867,009		47,439,936		5,573,850		10,555,095		90,321,201	29.75	52.52	6.17	11.69

Table 6 provides some measures of changes in market shares, between 1973 and 1978, of the top 20 writers of automobile insurance in 4 states with open competition rating laws and 9 states with some variant of prior approval. Statistics reported are rank correlation coefficients, the mean absolute change in rank and the number of companies whose rank changed 5 positions or more. Companies which were not among the top twenty in both years are omitted from the first two measures which imparts a downward bias to these measures of mobility.

*Table 6 : Changes in market positions of top twenty firms,  
private passenger auto, 1973-1978*

	Rank Correlation	Mean Absolute Change in Rank	# Firms Changing 5 Places
<i>Competitive</i>			
California	.148	6.3	10
Colorado	.525	4.9	7
Illinois	.258	10.6	15
Wyoming	.647	4.0	8
<i>Prior Approval</i>			
Arizona	.412	7.2	10
Florida	.281	8.6	11
Louisiana	.578	5.2	8
Michigan	.636	3.5	4
New Jersey	.886	2.7	5
New York	.837	2.8	2
Pennsylvania	.835	2.6	4
Tennessee	.817	3.1	5
Washington	.440	3.7	5

Source : Best's Executive Data Service.

Without some a prior standard of a competitive norm, it is not possible to apply any precise statistical tests for presence or lack of competition. However it is clear that there is substantial mobility of firms.

### **3. Tests for the existence of a cartel**

#### *3.1. Barriers to entry*

The first proposed test for cartelization by means of regulation and/or anti-trust immunity is evidence of the capitalization of the resulting excess profits into a high cost of entry. The logic for this test is simple : if above competitive returns can be earned in an industry, in the absence of restrictions on entry, new firms will enter,

supply will increase and prices will fall until excess profits are eliminated. Above-competitive returns can only persist if there are restrictions on entry, unless the industry is a "natural monopoly", i.e., exhibits increasing returns to scale throughout the relevant range. Restrictions on entry to an industry that is structurally competitive and willingness of would-be entrants to pay for the right of entry are therefore suggestive of above-competitive returns.

Measurement of capitalized excess profits is simplest if the right of entry is marketed, as in the case of taxi medallions in some cities or seats on the New York Stock Exchange. The price a would-be entrant is willing to pay for the license to enter a restricted occupation is his expected income in that occupation over and above what he could earn in his next best alternative employment. Thus the price of the license is a measure of the (discounted present value of) excess returns on operating costs after entry.<sup>17</sup>

If the right of entry to the restricted occupation is not freely marketed but rationed by some other means, such as queues, the existence of an entry restriction and hence of above-competitive returns may still be inferred but the precise value is harder to quantify. If the right of entry is rationed solely by waiting, then the length of the wait is an indicator of the value of the excess profits. The precise value can be computed, given the cost per period of time spent waiting.<sup>18</sup> With competition for entry, the length of the queue should adjust to the point where the cost of the wait (for the marginal applicant) is equal to the discounted present value of excess profits, as in the case of the marketed entry license.

Measurement of excess profits is more difficult in the case of mixed rationing devices, where entry can be achieved by some combination of dollar outlay and waiting. If the length of the wait can be reduced by increased dollar outlay, e.g., hiring more or better quality lawyers, then measurement of the total cost of entry (and hence the value of excess profits) requires information on both the dollar outlay and the implicit cost of delay. If only one of the two components is observable it may provide a biased and misleading indicator of the value of excess profits. Insurance falls into this mixed category, with both dollar and delay costs of entry, and some possibility of substitution between the two. Measurement is therefore hazardous.<sup>19</sup>

Even if the cost of entry could be measured, there is an ambiguity of interpretation, in the case of insurance. In most industries the sole purpose of entry costs is to ration access to monopoly profits. Such barriers to entry are necessarily inefficient.

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<sup>17</sup> With competition *for* entry, returns on total costs, gross of the cost of obtaining the license are normal.

<sup>18</sup> For example, if filing an entry application requires an outlay of \$100, and the opportunity cost of capital is 1 % per month, then the cost of waiting is \$10 per month. The rational entrant would be willing to wait one year if the discounted present value of excess profits is at least \$120.

<sup>19</sup> This paper is concerned solely with regulatory or "artificial" barriers to entry. In practice the rate of growth of new entrants may be slow because of the need to establish agent and consumer confidence. This source of delay, common to industries where consumer confidence is important, is for the most part intrinsic to the nature of the insurance product and is in no sense evidence of cartelization or excess profits. However, to the extent growth is delayed by laws such as regulation of agents' commissions the barrier is artificial.

However, in the case of insurance and other financial services, some control over entry may be efficient. Because of the nature of the insurance product, that the premium is collected before the services — payment of claims — are provided, the potential for fraud is greater than in most service or manufacturing industries where the product can be inspected prior to purchase. Some control on entry, such as minimum capitalization requirements, may be justified to protect consumers.<sup>20</sup> In those lines of insurance where the liabilities of an insolvent firms are transferred to other firms through the intermediation of a guaranty fund, solvency regulation may be justified to protect the interests of other firms. Any form of entry control tends to imply dollar costs and delay between the application for a license and granting of authority to operate. Thus the existence of both dollar costs and delay in obtaining an insurance license is not necessarily indicative of an inefficient level of operating profits. In theory, the efficient level of operating profit is just sufficient to yield a competitive return on operating costs plus the efficient level of entry costs. In practice, what constitutes an efficient level of entry costs is extremely hard to determine. With these caveats on the interpretation of entry costs, let us turn to the evidence.

Entry is restricted by licensure requirements in all states. Licensure requirements include fairly trivial filing fees (typically \$500) and more substantial minimum capital requirements. These vary by line and state, and range (for a multiple lines license) from \$150,000 in Washington, D.C. to \$5,000,000 in New York. It would be erroneous to interpret capital requirements as an indicator of the value of monopoly profits, for the reason noted above and because the capital deposits are not an out-of-pocket expense, since the depositor retains ownership. The only cost involved is any difference between the returns on the funds in this use and the most valuable alternative.<sup>21</sup>

Even more difficult to quantify are the other costs of entry, such as filing requirements, interviews, etc., which entail personnel and other direct costs, and costs due to delay between filing and issuance of a certificate of authority to operate. The only data available on filing costs is from one company, which filed licensure applications in 48 states over the space of three years. A rough estimate of the total personnel cost involved (at 1975-78 wage rates) is as follows :

3 attorney years	\$ 72,000
2.5 secretary years	\$ 20,000
0.5 law clerk years	\$ 8,000
	<u>\$100,000</u>

The implied average personnel cost per state is trivial.

Data on delay between filing and issuance of the certificate are available for two companies. One subsequently changed its state of domicile and had to refile in some states. The mean delay (in months) and standard deviations are as follows :

<sup>20</sup> Munch and Smallwood [1979] show that minimum capital requirements reduce entry. Such restrictions are efficient only if the value to consumers of insolvencies deterred exceeds any cost in terms of reduced competition.

<sup>21</sup> Since the deposits are usually required to be held in some widely marketable security, the cost of minimum capital requirements is probably trivial for established firms with low borrowing costs but may be significant for new entrants which are not established credit risks.



	Mean	Standard Deviation	States
Company X	9.7	14.9	50
Company Y	5.8	5.1	48
Company Y (Redomicile)	2.4	1.2	49

The mean delay of less than a year for both companies does not suggest large costs on average. However, delays of up to two years in 12 states and over two years in 5 states (for company X) can surely not be rationalized in terms of efficient solvency regulation. To test the hypothesis that entry restrictions are designed to protect excess profits, at least in states with abnormally long delay, and to identify the source of these excess profits, I estimated the relation between entry delay and three possible indicators of excess profits : (i) some measure of the ISO share of the market ; (ii) prior approval regulation ; (iii) the four firm concentration ratio.

For Company X, the following regression was estimated :

$$\text{DELAY} (\ln_e) = 1.58 + .72 \text{ PRIOR} - .009 \text{ ISOBIG} - .012 \text{ ISOSMALL} + .013 \text{ C4}$$

(2.55)
(1.17)
(1.95)
(.6)

$$R^2 = .216$$

$$n = 48$$

*t* statistic in parentheses.

where

DELAY = months from filing to issuance of certificate

PRIOR = 1 if prior approval regulation (NAIC, 1974)  
0 otherwise

ISOBIG = % of automobile premium of top ten companies which is reported to ISO

ISOSMALL = % of automobile premium of remainder of companies which is reported to ISO (IAA, 1978)

C4 = automobile 4-firm concentration ratio in 1971 (NAIC, 1974).

These estimates imply that delay is significantly longer in prior approval states — roughly twice as long, on average, as in open competition states.<sup>22</sup> Delay is negatively related to the share of the market reported to ISO, which is a crude upper bound on the fraction of the market written at ISO rates. Delay is unrelated to the four firm concentration ratio. Thus if delay is an indicator of the relative profitability of writing in different states, these estimates imply that profits are higher in prior approval states but are negatively related to the ISO share of the market and are unrelated to the market share of the top four firms.<sup>23</sup>

<sup>22</sup>  $e^{.72} = 2.05$ .

<sup>23</sup> The simple correlation between DELAY ( $\log_e$ ) and ISOBIG is  $-.25$ , ISOSMALL is  $-.28$ , PRIOR is  $.22$ .

The same equation was estimated for company *Y*, for both the delay in first licensure and delay at relicensure after changing state of domicile. All coefficients were statistically insignificant, in both cases. This does not necessarily indicate that this company perceived no difference in expected profits among states. As discussed above, if a firm can accelerate entry by increasing its dollar outlay, then delay is only one component of the total cost of entry and may be a misleading indicator of the total cost. Specifically if dollar outlay is negatively correlated with delay (i.e., delay is shorter in precisely those states where more was spent to accelerate entry) then valid conclusions cannot be based on the delay component alone. Thus the limited data available only support the weak conclusion that there is no evidence to support the hypothesis that ISO has a significant effect on the level of profits.

### 3.2. Above-competitive factor returns

Since the objective of a cartel is to generate above-competitive returns to one or more factors of production, inflated input prices are evidence of successful cartelization. Assuming a competitive supply of factors to the industry, above-competitive returns can be maintained only if there are controls on entry. In the case of insurance, capital and agents are potential candidates, because of entry controls in both cases. Excess profits to capital and returns to agents are discussed in turn.

(a) *Profits.* Measuring profits in the insurance industry is even more problematic than in other industries for several reasons. First, if regulation is the means of controlling entry, excess profits — if they exist at all — are likely to be concentrated in particular lines and states. However, most firms are multi-line, multi-state firms. Thus even if the true rate of return on capital could be observed, it would be an average return over lines and states, making attribution of any observed excess profits to regulatory or bureau activities that are state or line specific very difficult. If operation in certain profitable lines is tied, through regulatory fiat, to operation in other unprofitable lines, then the average return may be normal, concealing the existence of excess profits in some areas.

Second, the great majority of insurance firms are not the prototypical, publicly traded stock firm, with an observable market value. Many stock insurance firms are members of holding companies with other non-insurance interests and over half the firms in the industry are either mutuals or reciprocal exchanges and hence have no observable market price. Thus there is only a small number of firms with observable market data on profits derived exclusively from insurance operations.<sup>24</sup>

There have been two main types of analysis of insurance industry profits. The first (for example, Saba [1978], Ippolito [1979]) analyses loss ratios, on the assumption that the underwriting profit margin — the difference between claims plus expenses and premiums — is some indicator of overall profitability. The second approach

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<sup>24</sup> The fact that a market valuation of profits cannot be observed for the large, non-traded segment of the industry does not mean that conclusions based on the observed sector cannot be generalized to the unobserved sector, provided that the observed sector is representative of the industry as a whole in terms of size of firm, lines and types of product written, and the sample is large enough to yield accurate estimates.

recognizes that the underwriting profit margin is only one component of the rate of return on capital and attempts a more complete measure of the latter, using accounting data on both underwriting and investment income, relative to same measure of net worth. This approach is exemplified by Arthur L. Little [1970], Joskow [1973], Fairley [1979], Hill [1979]. A third approach (Walters [1979]) compares market to book value as a measure of excess profits.

Before reviewing the evidence from these different approaches the limitations of each must be emphasized. Underwriting profit margins bear no necessary relation to the rate of return on capital since they are only one component of that return. Other necessary inputs are expenses, investment income, taxes and the premium-capital ratio. These defects are avoided in principle by studies that measure the net rate of return on capital directly but this approach has other limitations. First there is the problem of attribution of any observed excess profits to particular lines or states, which is the level at which bureau or regulatory restrictions operate. Second, even if the actual rate of return is accurately measured, the question remains whether the observed rate is "normal" or "excessive" relative to comparable industries. Third, even if it could be shown that only competitive returns to capital were being earned, it does not follow that premium rates are at competitive levels. It has been argued (Joskow [1973], Frech and Samprone [1980]) that rates are set above competitive levels in states with prior approval regulation but the potential excess profits are competed away either by non-price competition or by excessive capitalization.

Most of these studies have focused on the question of whether profits are higher in states with prior approval rating laws, not directly on the question of whether anti-trust immunity and the operation of rating bureaus permit excess profits in the industry overall. However, they are relevant to the latter question, which is the focus of our inquiry here. There is general consensus that any cartelizing intentions of the rating bureaus depend on implementation by prior approval regulations, because of the competitive structure of the industry. Thus, if profits are not higher in prior approval than in competitive states, there is little basis for concern over the anti-competitive potential of the rating bureaus. With these caveats, let us turn to the evidence.

#### *Loss Ratio Studies*

Of the many loss ratio studies that have been undertaken, the three reviewed here are selected in part to demonstrate the lack of consensus and dependence of the conclusion reached upon the sample and methodology used. Saba [1978] regresses 1970 earned premium per car for property damage liability on incurred loss per car in 1969, using ISO data for all territories for 46 states. In order to test whether prior approval regulation leads to a larger mark-up of premium over losses (which he takes as indicative of profits) he includes a dummy variable for open competition states, both alone and interacted with loss per car. The data are limited to property damage. The following equation is estimated :

$$\text{Premium}_{70} = 17.93 + 6.95 \text{ OC} + .58 \text{ Loss}_{69} - .39 (\text{Loss}_{69} \times \text{OC}) - 8.26 \text{ Rural}$$

(1.27)      (4.28)      (.046)      (.18)      (1.88)

where OC = 1 if state is competitive  
 = 0 if state is regulated.

Rural = % of non-farm rural + farm population in the state

$N = 602$

$R^2 = .27$

Standard errors in parentheses.

Saba concludes that "the average rate per level (sic) of incurred losses is greater in the regulated states".<sup>25</sup> This conclusion is based on the significant negative coefficient of the interaction between Loss and the dummy variable for open competition (Loss<sub>69</sub> × OC). However, it is erroneous to infer from this study that regulation permits higher underwriting profits for several reasons. First, as noted above, net underwriting profit depends on expenses as well as losses, for both the voluntary and the assigned risk markets. These data include only the voluntary market. Since the assigned risk market tends to be larger in prior approval states and is typically operated at a loss (Ippolito [1979]), profit margins in the voluntary market must be higher to permit the same overall margin. Second, it is highly likely that both the coefficient and its standard error are biased. The sample consists of a single year of data from 46 states, which include only 4 perhaps atypical open competition states: Montana, Missouri, Idaho and Georgia. If residuals on territories in the same state are correlated this leads to a downward biased estimate of the standard error of the coefficient and hence an upward bias in the estimate of statistical significance.<sup>26</sup> The coefficient itself may be biased due to omission of variables which are correlated with the regulation dummy. Thus the effect attributed to regulation may in fact be due to other unmeasured characteristics. Third, evidence from the DOJ report suggests that loss ratios show greater year to year variation under prior approval, due to regulatory lag. A single year of data is therefore insufficient to measure long run effects.

Ippolito [1979] performs a similar analysis but corrects for these potential sources of bias. His sample of 49 states includes a larger, more representative group of competitive states. To reduce the effect of transitory fluctuations, he used two samples of the average loss ratio over two three-year periods, 1971-73 and 1973-75. His measure of the loss ratio is the statewide average, aggregated over the voluntary and assigned risk segments over the market. Separate regressions are run for auto liability and property damage, using a slightly different functional form from that used by Saba and including several other variables.<sup>27</sup> Ippolito concludes:

"The effect of regulation is insignificant in the liability and property damage equations for the periods 1971-73 and 1973-75. While regulatory lag may affect levels of loss ratios in any particular state over short periods of time, our findings suggest that it has no impact when several years are combined."

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<sup>25</sup> He does not infer that excess profits are realized in prior approval states, arguing that the *potential* excess profits are bid away by non-price competition and/or excessive capitalization. No evidence on this point is presented.

<sup>26</sup> Theil [1971].

<sup>27</sup> Other explanatory variables are a cost of living index, the size of the assigned risk pool, income per capita and a measure of traffic density.

Recognizing that underwriting profits depend on expenses as well as claim costs, Ippolito performs the same analysis with expense ratios and combined ratios. Due to lack of state-specific expense data for multi-state firms, the analysis is confined to firms that operate exclusively in one state, which is not a representative sample of firms. The evidence supports the conclusion of no effect of regulation on underwriting profit margins.

The Department of Justice (DOJ) Report [1977] presents data on mean loss ratios over the periods 1966-75 for eleven large insurers in two prior approval states (Pennsylvania and New Jersey) and one open competition state (California). The average (unweighted) loss ratio of the eleven companies was 13 % higher in New Jersey than in California, 9 % higher in Pennsylvania than in California. Year to year volatility of both the loss ratios and combined ratios was also higher in the two prior approval states. This evidence tends to refute the hypothesis that regulation is used to enforce a bureau cartel.

The Report notes that any conclusion from these data must be tentative because of the small sample involved. Furthermore,

“ the higher average combined ratios do not necessarily indicate that consumers pay lower prices in the regulated states for the *same* services received in the deregulated states... While it is conceivable that consumers pay somewhat lower prices for similar insurance coverage, it may also be true that they receive less service or that the service is less available to a larger proportion of drivers in the regulated states ”.

Logical consistency requires that the same reasoning be applied if combined ratios are found to be *lower* in prior approval states. On the contrary, studies that have purported to find such evidence have not considered any explanation other than the enforcement-of-the-cartel hypothesis.

#### *Studies of the Rate of Return on Capital*

The studies by Hill [1979] and Fairley [1979] are similar in intent and methodology. Both depart from the observation that the traditional statutory profit margins built into the rate making process are arbitrary, both conceptually and in the actual margins selected. There is no theoretical reason why the traditional 5 % underwriting profit<sup>28</sup> for automobile liability or 2.5 % for workers compensation should yield a competitive return on capital, since the rate of return on capital depends additionally on investment income, taxes and the premium/capital ratio. The purpose of both studies is to determine “ target ” underwriting profit margins by line of insurance, necessary to ensure a competitive return on capital, taking into account these other factors. These estimates of competitive underwriting profit margins are then compared with traditional regulatory margins and actual realized margins. Although conceptually similar, these two studies come to significantly different conclusions as to benchmark competitive margins and hence of whether actual margins have been excessive.

One major issue in determining what constitutes a competitive rate of return for any industry is the appropriate premium for risk. Hill and Fairley both adopt the

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<sup>28</sup> Or equivalently, a 95 % combined ratio.

capital asset pricing model (CAPM) which concludes that the only risk which commands a positive (negative) premium is that which is positively (negatively) correlated with return on the market portfolio and hence cannot be eliminated by diversification. The "beta" or nondiversifiable risk of a security is determined by the correlation between its returns and returns on the market portfolio.<sup>29</sup>

Despite the theoretical elegance of CAPM, there are serious objections to its use for judging whether past returns have been excessive and, a fortiori, for computing "fair" margins for future rates.<sup>30</sup> Some of the assumptions on which the model is premised are clearly violated in practice, in particular: zero transactions costs; unlimited, risk-free borrowing and lending; unlimited liability (zero risk of bankruptcy); homogeneous expectations among investors as to the mean, variance and covariance of security returns; quadratic utility functions. Empirical evidence on the structure of security returns from several studies is inconsistent with the simple version of the model.<sup>31</sup>

Application of the CAPM in the insurance context to obtain estimates of competitive underwriting profit margins is undermined by data deficiencies. The formula for computing the competitive margin requires empirical estimates of the underwriting beta, the riskless rate of interest, the premium/capital ratio and the effective tax rate. The data necessary to estimate these parameters are not readily available, and the actual values chosen are at best rough estimates. Effective tax rates and premium/capital ratios vary across companies and over time. Most problematic is estimating a value of the underwriting betas by line of insurance, because the theory implies that the requisite  $\beta$  is not the  $\beta$  for the firm's equity as a whole, which is observable for a few firms, but the  $\beta$  of underwriting losses, by individual line of insurance, which is not directly observable.

There are two possible approaches to estimating underwriting betas. The first, adopted by Hill, computes accounting betas by line by regressing accounting underwriting profit rates on the logarithm of the return on the market portfolio. However, as Hill recognizes, accounting losses incurred are likely to be a poor measure of the underwriting losses expected by the market. The results are not convincing if judged

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<sup>29</sup> See, for example, Sharpe [1964], Lintner [1965], and Mossin [1966]. The market portfolio holds all assets in proportion to their market value. Formally,

$$\bar{R}_i = R + \beta_i(\bar{R}_m - R) \quad \text{and}$$

$$\beta_i = \frac{\text{cov}(\bar{R}_m, R_i)}{\text{var}(\bar{R}_m)}$$

where  $\bar{R}_i$  is the expected return on the *i*th security,  $R$  is the riskless rate of interest, and  $\bar{R}_m$  is the expected return on the market portfolio. All returns have the dimension  $1 + r$ . The logic underlying this model is that investors are concerned with the risk on their total portfolio. Hence, assets must yield a premium in proportion to their contribution to total market risk.

<sup>30</sup> Margins derived from CAPM have been used by the Massachusetts Commissioner of Insurance in rate reviews for all major property-liability lines. To the extent the variability of past returns depends on past regulatory action, there is circularity in using any empirically based estimate of a fair risk premium as a guide to future regulatory action.

<sup>31</sup> The empirical evidence on the validity of the model and the implications of modifying the basic assumptions are reviewed in Jensen [1973], Levy [1980].

by their statistical significance and internal consistency.<sup>32</sup> The second approach, used by Hill and Fairley, uses market data to compute an underwriting return to all lines as the difference between the total return on the firm's equity and the return on its investment portfolio. Using this technique, Hill computes an alternate underwriting beta based on the average results over all lines for a sample of six companies for the period 1951-65. The fact that the estimated underwriting betas for the individual companies range from  $-1.03$  to  $.85$  for companies writing a similar mix of lines illustrates the potential error in these estimates. Hill takes the mean ( $-.2$ ) over these companies and applies it uniformly to all lines to obtain his second set of estimates of target profit margins by line.<sup>33</sup> Fairly obtains a similar estimate from a sample of nine companies for the period 1971-75.

Differences in estimates of beta and of other parameters significantly affect target margins and hence conclusions as to whether past profits have been excessive. Table 7 shows the sensitivity of target margins to the selection of particular parameter values. A difference of  $.1$  in the choice of beta implies a difference of approximately one percentage point in the target profit rate, which is large relative to the range of historic profits. Similarly, target margins are sensitive to the capital/premium ratio. The use of book values of surplus, which typically understates market equity, therefore leads to an underestimate of the fair profit margin.

Hill's target and historic profit margins are shown in Table 8, for different types of company. Table 9 shows Fairley's estimates of target, historic and statutory margins. Because of the use of different parameter values for beta, tax rates and premium capital ratios, Hill and Fairley differ in their estimates of competitive profit margins for automobile liability, the only line where even rough comparison is possible. The values they report for historical margins also differ, due to use of different samples. Not surprisingly, therefore, their measures of excess profits — the differences between historical and target returns — differ. Fairley's evidence suggests that, for the period 1956-75, realized profit margins were roughly competitive for auto bodily injury, less than competitive for auto physical damage and homeowners, and above competitive for workers compensation. Hill, by contrast, finds positive excess profits for all types of companies except two (stock fire companies that use standard rates, and stock marine companies). His conclusion is that

“although the evidence is weak, it suggests that historical profit rates have exceeded fair profit rates ; and the structure of profits by line and by type of firm suggests that regulation may be responsible for profits above the level which would be earned in a fully competitive market.”

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<sup>32</sup> Walter [1978] reports a regression of market betas ( $\beta_m$ ) for total equity on book betas ( $\beta_b$ ) for a sample of 25 companies with the following result :

$$\beta_m = .88 + .41\beta_b, \quad R^2 = .13$$

(5.60) (2.15)

(*t*-statistics in parentheses).

Since only 13 % of the variation in market betas is “explained” by variation in book betas, the choice between market and book betas materially affects the estimates of the competitive return.

<sup>33</sup> A negative underwriting  $\beta$  is comparable to a positive profit  $\beta$ .

Table 7: Sensivity of target profit margins to choice of parameters

q	Capital + Premiums	Underwriting Tax Rate	p* (%)		
			Beta = 0	Beta = - 0.2	Beta = 0.5
1.2	2.0	.5	.81	-2.08	8.09
		.3	-	-1.47	-
		0	-	-1.02	-
1.2	1.0	.5	-1.37	-4.26	5.90
		.3	-.97	-3.01	-
		0	-.67	-2.09	-
1.2	0.5	.5	-2.47	-5.36	4.80
		.3	-1.75	-3.79	-
		0	-1.21	-2.63	-
.5	2.0	.5	.39	-2.37	7.61
		.3	-	-1.62	-
		0	-	-1.13	-
.5	1.0	.5	-.51	-3.16	6.71
		.3	-.37	-2.25	-
		0	-.25	-1.57	-
.5	0.5	.5	-.97	-3.63	6.25
		.3	-.69	-2.58	-
		0	.48	-1.80	-

Source : Hill [1979].

$q = (\text{loss} + \text{unearned premium reserves})/\text{premiums}$

$p^* = \text{competitive underwriting profit margin}$

Even this tentative conclusion seems strong, given the nature of the evidence. The attribution of excess profits to regulation is based on the finding that stock marine companies, which are unregulated, show negative excess profits, whereas automobile and accident and health insurance, which are alleged to be relatively tightly regulated, have relatively high excess profit rates. In fact, most health insurance rates are not tightly regulated (Mehr and Commack [1976]).

#### *Comparison of Market and Book Values*

Walter [1979] presents a theoretical and empirical analysis of the ratio of stock price to book value per share for a sample of 25 property liability insurance companies during the decade ending in 1976. He concludes :

“The model developed portrays the ratio of stock price to book value per share as a valid measure of the excess value (departure from the competitive



Table 8: Mean actual and CAPM target profit margins by types of firm : 1955-1974

	(1) Mean Profit Rate	(2) $p^*$	(3) Excess Profit (1)-(2)	(4) Mean (Surplus ÷ Premiums)	(5) Mean (Reserves ÷ Premiums)
1. <i>Beta = .20</i>					
All stock	.005	.006	.001	.88	1.19
Stock auto	.045	-.002	.043	.52	1.06
Stock fire (standard rate)	-.004	.025	-.029	1.78	1.20
Stock fire (rate deviating)	.027	.018	.009	1.07	1.00
Stock casualty (standard rate)	.006	.002	.004	.81	1.34
Stock casualty (rate deviating)	.022	.016	.006	1.02	1.36
Stock marine	-.006	.029	-.035	1.94	1.16
Stock accident & health	.063	.016	.047	.86	0.52
All mutuals	.058	-.001	.059	.55	1.04
Mutual auto	.077	.005	.072	.84	1.05
Mutual standard rate	.053	-.004	.057	.47	1.22
Mutual direct writers	.081	-.016	.097	.36	1.33
II. <i>Profits calculated with accounting betas :</i>					
Stock fire (standard rate)	-.004	.002	-.006		
Stock fire (rate deviating)	-.027	-.004	.023		
Stock auto	-.045	-.022	.023		
Mutual auto	.058	-.017	.075		
Stock assident & health	.063	-.006	.069		
Stock marine	-.006	-.010	-.004		

Source : Hill [1979].

norm) attributable to regulation, including the anti-trust exemption. The empirical analysis lends plausibility to the underlying model and suggests that, despite the ravages of inflation, state regulation of property and liability insurers has not been unduly restrictive.”

This conclusion is based on the assumption that

“ The relation between stock value in the marketplace and net asset book value reflects the net shareholder benefit attributable to the umbrella of regulation (including immunity from anti-trust). ”

The empirical evidence cited is that : (i) for this sample of companies the median ratio of market value to book value for the decade was 1.36 and (ii) market value for the

median company appreciated at 6.2 % p.a., compared to 2 % p.a. rate of change for the Standard and Poor's Index of 500 common stocks.

*Table 9: Mean actual, CAPM target and traditional profit margins by line*

Line of insurance	(1) CAPM required margins (1977)	(2) Traditional "Target" margins (Massachusetts)	(3) Historical * margins (1956-1975)	(4) Historical * margins (1971-1975)
Auto bodily injury	-6.0	1.0**	-5.6	-5.3
Auto property damage	-0.1	5.0	-1.6	-1.2
Homeowners	-0.3	6.0	-9.7	-0.4
Workers' compensation ***	-6.3	2.5	-2.3	-6.4
Weighted average	-2.9	3.7	-4.0	-3.2

\* Best (1976) for years 1966-1975; auto lines' margins adjusted to Massachusetts categories and U.S. Department of Commerce, *Historical Statistics of the United States*, 1975, for years 1956-1965, adjusted.  
 \*\* A 5-percent margin is customary in most states.  
 \*\*\* Profit or loss as a percent of earned premiums is less estimated dividends of participating companies.

Source: Fairley [1979].

The presumption, that a mark-up of market over book value reflects excess profits protected by regulation and anti-trust immunity, ignores several other factors.<sup>34</sup> Insurance loss reserves are carried at undiscounted values, whereas the market value of the firm reflects the present discounted value of future net income streams.<sup>35</sup> Second, the market value of a firm includes the value of "intangible" capital or good will, which in insurance reflects such items as an experienced sales force and an established book of business, which are not reflected in book value. The value of this intangible capital relative to measurable capital may be larger in insurance than in other industries because of the nature of the insurance product. On the firm's side, the cost of the product is not known before the price is set and that cost depends crucially on the underwriting experience of the firm and its agents. On the consumer's side, the product cannot be inspected prior to purchase, so the consumer relies heavily on the firm's reputation for good claim handling, service and insolvency risk. These factors suggest a higher average ratio of market to book value for insurance than other industries and, within the insurance industry, a higher ratio for large, well-established firms than small, new firms. All the firms in Walter's sample are relatively large and well-

<sup>34</sup> No attempt is made to distinguish the effect of regulation from the effect of anti-trust immunity.

<sup>35</sup> The accounting practice of carrying bonds at par or amortized value may also contribute to the discrepancy between book and market values. This is discussed but it is unclear whether the book values used correct for this.

established. Thus the ratio of market to book value for this sample may be atypical of the industry-wide average, which in any case may reasonably be expected to exceed that in other industries, in the absence of monopoly profits. Data on market-to-book ratios for other industries are not reported.

In analyzing the variation *among* insurance firms in the ratio of market to book value, explanatory variables include the rate of growth of book value, market or book beta, the dividend pay out ratio (percent of current earnings paid out as dividends) and a measure of leverage (net worth divided by total assets). The distribution of the firm's business between highly and less regulated lines and states is not included, although regulation is allegedly the major cause of *inter*-industry differences in market/book ratios, and the sample includes two predominantly reinsurance firms and five life-oriented firms which are less subject to regulation. If excess of market over book value is the result of regulation and the anti-trust immunity, then firms subject to similar regulation should average the same ratio of market to book value. In fact the median values for individual firms in the sample over the decade range from 5.02 to .76 and in 1976 they range from 4.41 to .68. If differences in the market to book ratio between firms *within* the insurance industry are to be attributed to factors other than regulation, then presumably these same factors may contribute to differences *among* industries in market to book ratios. Thus it is inconsistent to attribute all the inter-industry difference to regulation and all the intra-industry difference to non-regulatory variables.

The magnitude of the effect Walter attributes to regulation is surely unrealistic. While it is conceivable that regulation and anti-trust immunity could protect a modest level of above competitive profits, 36 % is implausibly large. Similarly, the 47 percentage point reduction from the median of + 36 % for the decade as a whole to - 10 % in 1976 seems an implausibly large measure of decrease in regulatory protection.

Finally, the evidence presented tends to refute the underlying presumption of a close correlation between market and book value. If the underlying model is correct, changes in market and book values over time for firms within the insurance industry should track each other very closely.<sup>36</sup> In fact, on average over 17 companies, year to year changes in book values "explain" only 21 % of year-to-year variation in stock price.

(b) *Returns to Agents.* In principle, the anti-trust immunity and operation of bureaus may generate above-competitive returns to any factor which is not in perfectly elastic supply. There are licensure and other controls on entry which may protect non-competitive returns to agents. But since barriers to entry of agents are not only a necessary condition but also a sufficient condition for above-competitive returns to agents, it would be erroneous to attribute any excessive returns that may exist (and there is no evidence for or against) solely to the anti-trust immunity or regulation of the insurance industry. The anti-trust immunity of insurance might reinforce the effects of restrictions on entry of agents. But to use the earnings of agents as a test for the effects of the anti-trust immunity, in principle one should measure the *marginal* effect

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<sup>36</sup> The difference in levels would be picked up by the constant term in the regressions.

of the anti-trust immunity, net of the effect due to entry restrictions. Since this is not feasible with the data available, this test is not pursued further here.

### *3.3. Attempts by customers to circumvent the cartel*

Part 2 of this paper has presented detailed evidence of the fact that the ISO share of the automobile market (crudely measured by percent of premium volume reported to ISO) is typically less than one-third. Thus, customers have been very successful in circumventing what may once have been a cartel. Precisely because they have been so successful, the market share and market power of ISO have been reduced to a negligible degree.

### *3.4. Innovation*

The fourth proposed test of monopolistic restrictions is evidence of obstacles to innovation. "Innovation" in insurance could include new types of coverage, new territorial or other classification criteria, new policy forms, new marketing techniques, etc. Historically, rating bureaus have resisted innovation in all these areas. ISO continues to provide a standard with respect to type of coverage, classification system, forms, etc., in addition to recommending rates. However, these are dimensions of the product that must be defined before a price can be defined: they are an integral part of the price. Development of new product dimensions is a function which entails primarily fixed costs, independent of the number of firms served, so is a function which may be efficiently performed by a bureau. Other firms are free to develop alternative products, subject to the additional costs of obtaining regulatory approval. Thus the analysis of barriers to innovation, i.e., competition on dimensions other than price, is exactly analogous to the analysis of competition on price: ISO provides a standardized product but other firms are free to compete. The only obstacle to competition with the ISO product is the additional cost of development and of obtaining regulatory approval for a non-ISO product. Provided this additional cost is low, barriers to innovation are low.

To the extent there are restrictions on product innovation, they appear to be due to regulation, not to the anti-trust immunity and resulting operations of the bureaus. There is increasing regulatory intervention in classification criteria. Rating automobile insurance on the basis of sex, territory, and marital status has been challenged in several states. Regulatory requirements on the provision of information to consumers also raises costs and hence reduces innovation. The case for and against these restrictions is not addressed here. They are mentioned only to point out that existing obstacles to innovation derive from regulation, not from the anti-trust immunity per se.

## **4. Conclusion**

This paper has applied empirical evidence to test between the cartel and service models of rating bureaus and examined evidence of barriers to entry and excess profits. Evidence from different lines and different time periods and states consistently shows that the percentage of firms and premium volume written at ISO rates is larger in prior approval states. However, this is consistent with both the cartel model and the service

model of ISO. Other evidence is more consistent with the service model. Even in prior approval states, less than 50 % of the market is written at ISO rates. Thus the ISO share is insufficient to convey substantial market power. The fact that small rather than large firms are more likely to use ISO rates is inconsistent with the cartel view but consistent with the view that ISO provides services which are subject to economies of scale beyond the scale of many small firms in the industry. The fact that even in prior approval states deviations from ISO rates are often in an upward direction is inconsistent with the view that ISO attempts to establish a cartel price, unless these upward deviations can be attributed to product differences.

Identification of excess profits capitalized into a high cost of entry is not a simple matter, in the case of insurance. At the theoretical level, some control of entry may be justified in terms of efficient control of fiduciary risk. Only costs in excess of this efficient level are potential evidence of pure monopoly profits. Accurate measurement of the cost of entry due to regulation requires data on dollar outlay (including the opportunity cost of capitalization requirement) and cost of delay, which are generally not available. The limited data available from two companies indicates trivial dollar outlay and delay of less than a year in most states. However, in a few states delay of over a year is suggestive of entry barriers which cannot be rationalized in terms of efficient solvency regulation. To the extent abnormally long delay is indicative of excess profits, there is no evidence that excess profits are correlated with the share of the market reported to the ISO. The review of three different approaches to measurement of profits concludes that although theoretically appealing, this is not a useful test of monopolistic restrictions, due to the fundamental problems of measuring actual profits and defining a competitive standard of comparison. The lack of consensus among the studies reviewed supports this conclusion.

In summary, although all the evidence on the influence of ISO is of necessity indirect, there is no evidence that ISO exerts a significant cartelizing influence, considerable evidence that it does not and considerable evidence for the alternative hypothesis that ISO provides valuable services. The evidence on which these conclusions are based is derived almost entirely from private passenger automobile. To the extent the pattern is similar in other lines — small ISO market share, primarily composed of small firms, no adherence requirements and significant deviations by large firms above and below the ISO rate — the conclusions may be generalized to other lines.

To the extent that bureaus reduce costs for small firms and facilitate entry, but lack the means to enforce adherence to their rates and lack the market power to significantly raise the mean level of rates, they may be viewed as pro- rather than anti-competitive. Posner [1979] has argued that the exchange of price information which narrows the dispersion of prices without raising the mean price level should be allowed since it promotes rather than reduces social welfare. Unfortunately this test is hard to apply in the case of insurance rating bureaus, because of the nature of the insurance product. The claims cost and therefore the competitive price of even a standardized policy varies by state, making it difficult to distinguish the effect of ISO from the effect of other territorial variables.

One must therefore look to indirect evidence of the effect of ISO on price levels. The simplest indirect test is derived from the survivorship principle. If ISO system-

atically set prices above competitive levels, but enforcement and barriers to entry were imperfect, then one would expect the market share of ISO firms to diminish over time, which it has. This finding is not inconsistent, however, with the alternative view that ISO performs services at lower cost. One of the costly functions undertaken by ISO is the filing of rates and other dealings with regulators. The costs of independent filing diminished over time (DOJ Report) which has reduced the relative cost advantage of filing ISO rates. Thus even if ISO rates were set at competitive levels, one would expect the share of the market written at ISO rates to have diminished over time. However, I do not wish to argue that ISO did not originally have significant power as a cartelizing force. The current policy issue is whether that power remains.

Bork [1978] argues that concerted action, including horizontal price fixing, may be socially efficient if it is ancillary to some other purpose (in this case, cost reduction). He points out that it is inconsistent for anti-trust policy to outlaw limited action in concert by two or more firms if the same activities would be legal if the firms were to merge totally : the same principles should apply to concerted action among separate firms as apply to horizontal mergers. The test should be one of market power. Bork suggests 30-40 % as a market share below which market power is negligible. The evidence suggests that the market share of ISO firms is typically less than 30 %. Thus the potential for significant cartelization due to the operation of ISO is surely trivial.

## **Appendix**

### **ISO Services and Charges**

ISO performs two types of service : (a) information gathering that would be of value to insurers even in the absence of regulation ; and (b) interaction with regulators.

Specifically, the services available include the following :

#### *Actuarial :*

- ratemaking data by line and territory ;
- studies of specific issues, such as loss development, review of expenses, excess limit factors, and territorial relativities.

#### *Rates :*

In most states :

- review of statewide and territory rate levels annually in each line;
- advisory rates or loss costs ;
- comparison of competitors' rate levels ;

In addition, in prior approval states :

- act as filing agent.

#### *Forms :*

- development and filing of policy forms ;

- copyright permission to adapt ISO forms for company use ;
- availability of ISO printing and mailing capability to supply company with forms.

*Statistical service :*

- filing of statistical plan and aggregate company data to insurance department.

Bureaus are required to make their services available to members and subscribers on a non-discriminatory basis.<sup>37</sup> Under current ISO assessment schedules, insurers are free to purchase as many or as few services as they wish and may purchase for a subset of lines or states or for all. If the statistical filing service is purchased, the charge is the same whether ISO rates or deviated company rates are filed. The price for each service involves a flat rate per state and a variable charge based on premium volume, with credits for full affiliation and volume beyond a certain size. Full affiliation discounts are consistent with inducements to adhere. However charges based on volume are not consistent with maximizing market share of the bureau which requires providing special inducements to large firms to adhere.

In order to determine whether the pricing structure for different services is designed to encourage adherence (for example, by selling rates service below cost and actuarial service above cost) one would need much more information on the costs of providing the various services.<sup>38</sup> However, it is clear that ISO cannot enforce adherence to ISO rates, punish deviations, restrict output, share territories or profits, which are common features of successful cartels. The only penalty for deviating from ISO rates is the additional cost of making an independent filing. Thus if regulation is designed to keep this cost low, ISO rates will only be used where it is cost-effective to do so.

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<sup>37</sup> The fact that ISO assessment procedures have changed over time to allow insurers increased selectivity (ISO, 1979) suggests that ISO in fact has considerable discretion in pricing its services.

<sup>38</sup> Marginal cost pricing theory implies that if some of the services have costs that are common to different products or different users, the efficient pricing schedule also depends on demand conditions.

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