

An Analysis of Complaint Data in the Automobile Insurance Industry

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Abstract

Cross-firm policy service quality differences are investigated in the automobile insurance market through empirical testing of firm-specific complaint data. The data used here are publicly available complaint ratios which are collected by regulators in some states to assist consumers in service quality discrimination. Previous studies have shown independent agency firms to have larger expense ratios than direct writers, but empirical evidence here does not suggest that direct writers provide lower service quality than do independent agency companies. The evidence suggests that firms specializing in high risk drivers receive relatively more complaints.

Evidence of cross-firm price variation for homogeneous automobile insurance contracts has been documented by Jung (1978), Dahlby and West (1986), and Berger, Kleindorfer and Kunreuther (1989). Smallwood (1975) suggests that service quality differences across insurers may explain price dispersion.¹ Investigation of quality differences across insurers has been limited, largely due to difficulty in identifying empirical measures of service quality.²

This study uses state insurance department firm complaint ratios from California, Illinois, and New York, as an empirical measure of firm service quality. The California ratio equals the number of complaints received per 1,000 covered automobiles, and the Illinois and New York ratios equal the number of complaints received divided by written premiums. A relatively large complaint ratio suggests that the insurer provides poor service quality.

The complaint ratio is an imperfect measure of firm service quality, since complaints result from disappointed expectations of the insured which may or

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¹ Service includes assistance with risk analysis when purchasing or renewing insurance coverage, assistance in locating insurance markets, and assistance in claims handling (Etgar, 1976).

² For example, Joskow (1973), Cummins and VanDerhei (1979), Pauly, Kunreuther, and Kleindorfer (1986), and Grabowski, Viscusi, and Evans (1989) discuss aspects of insurance service quality determination and point to the need for empirical measures of quality.

may not be strictly due to poor service. However, the complaint ratio is what state regulators collect and use to measure consumer satisfaction with policy service quality, and use of the ratio here allows a first step toward empirical investigation of possible cross-firm quality differences. Following survey results in *Consumer Reports* (1988) and a Gallup poll conducted for *Best's Review* (1989), results here suggest that service quality differences exist across automobile insurers.

The Economics of Quality Determination

Evidence supports characterization of the property-liability insurance market as competitive.³ In a competitive market, buyers make price-quality tradeoffs when choosing insurance coverage. Buyers purchase coverage based on expected full price, which equals premium plus complaint price, where complaint price is the loss in value to the insured of not receiving expected service.

Based on work by DeVany and Savings (1983), an economic model describes firm service quality determination in a competitive market. Full price is specified as follows:

$$P = p^* + \alpha$$

and $\alpha = \alpha(v, o, c)$,

where P is full price, p^* is the premium, and α is the complaint cost to the insured. Complaint cost can include implicit and nonpecuniary costs to the insured of not receiving good service. The variable, α , is a function of v , the marginal value of policy service to the insured; o , the total output of service provided to all policyholders; and c , the capacity of the firm to provide service.

The function α is assumed to be increasing in v since expected complaint cost increases with the insured's marginal value of customer service. The function α may be increasing in o and decreasing in c : if an insurer with fixed service capacity provides increased output of policy service, increased complaint costs may result. That is, if the firm's resources are limited and the frequency and severity of claims increase, the quality of service may decrease, leading to increased complaint costs.⁴ However, the function α is not necessarily increasing in o and decreasing in c : if service economies of scale exist, then increased output and fixed capacity would not result in greater complaint costs. Firm premium growth would be consistent with complaint-free service.

³See, for example, Joskow (1973) and Winter (1988).

⁴Only after the buyer completes the purchase, either at the end of the policy period or upon closure of a claim covered under the contract, whichever is last, is the actual full price revealed since the actual complaint cost is not known earlier. At that time the insured may simply renew the policy or look for a new insurer, depending on whether actual full price is less than or equal to the insured's expected full price.

The property-liability market, although highly competitive, is not perfectly competitive. Information asymmetries exist, distribution systems are not perfect substitutes, and market partitioning occurs. No evidence exists on search for service quality information, but previous work suggests that consumers do not search for insurance premium information.⁵ Information asymmetries limit the consumer's ability to make price-quality tradeoffs.

Automobile insurance is distributed primarily through direct writers (salaried representatives and exclusive agents) and independent agencies. Studies indicate that independent agency companies have higher expense ratios than direct writers, but the evidence is mixed as to whether this difference is attributable to better non-claims service.⁶ Claims practices also differ across firms with different distribution systems. Direct writing insurers often settle claims at drive-in assessment centers whereas independent agency companies let insureds shop at local repair garages. Due to differences in non-claim and claim service practices, the distribution system of the insurer is expected to affect firm service quality (and thus price) choices.

Market partitioning occurs in the automobile insurance market since some firms specialize in covering high risk drivers and some target preferred (or lower) risk drivers. Drivers with higher than average claim rates are expected to file more claim complaints and receive relatively more cancellation and non-renewal notices. Thus insurers specializing in writing high risk drivers may receive more complaints. Anecdotal evidence suggests that direct writers may practice selection of preferred risks; given lower risk drivers with fewer claims and cancellations, direct writers would receive fewer complaints.

This study provides preliminary evidence of possible cross-firm service quality differences, as well as a base for future investigation of price-quality tradeoffs in the automobile insurance market. Based on the economic model of determination of service quality, two hypotheses are tested:

- (1) As firm service output increases relative to firm capacity for paying claims, service quality falls and complaints increase.
- (2) Independent agency companies provide better policy service and receive fewer complaints than direct writers.

Econometric Model and Data

A linear model is assumed to explain cross-firm service quality level. The model is specified as

$$Y_i^j = \beta_0 + \beta_1 \text{NPWS} + \beta_2 \text{DW} + \beta_3 \text{SUBST} + \epsilon_i \text{ for } j=1,2,3$$

where

Y_i^1 = the number of complaints per 1,000 automobiles written by the i th insurer in California,

⁵See, for example, Berger, Kleindorfer, and Kunreuther (1989).

⁶See Joskow (1973); Etgar (1976); Cummins and VanDerhei (1979); and Pauly, Kunreuther, and Kleindorfer (1986).

Y_i^2 = the total number of complaints per \$1 million in written premium for the i th insurer in Illinois,

Y_i^3 = the total number of complaints per \$1 million in written premium for the i th insurer in New York,

$\beta_0, \dots, \beta_3$ are regression coefficients,

NPWS = the ratio of net premiums written to surplus for the i th insurer,

DW = an indicator variable where DW=1 if the insurer is a direct writer or direct solicitation firm and DW=0 for independent agency companies,

SUBST = an indicator variable where SUBST=1 if the insurer writes substandard risks and SUBST=0 otherwise, and

ϵ_i = a random error term assumed to be distributed $N(0, \sigma^2)$.

Net premiums written to surplus, NPWS, is used as a proxy for output to financial capacity, or the ability to pay claims.⁷ A positive coefficient is consistent with poor service and increased complaints resulting from output straining financial capacity for paying claims. A negative coefficient is consistent with premium growth resulting from good policy service and service economies of scale.

DW is an indicator variable equal to one for direct writers and zero for independent agency companies. A positive coefficient is consistent with independent agency companies receiving fewer complaints about policy service quality. A negative sign is consistent with selection of preferred risks by direct writers.

SUBST is an indicator variable which equals one if the company identifies itself in *Best's Insurance Reports* as writing high risk or "substandard" drivers, and zero otherwise. The expected sign of the coefficient estimate is positive due to the higher claim, cancellation, and non-renewal rates of higher risk drivers. Data for all three independent variables were obtained from *Best's Aggregates and Averages* and *Best's Insurance Reports*.

Complaint data were obtained from three states known to collect firm-specific complaint counts. Data from the 1987 California Personal Lines Automobile Complaint Ratio Study cover 32 participating insurers which underwrite a majority of the personal automobile insurance business in the state. Unlike the other states, California provides three ratios: the number of claim, non-claim, and total complaints per 1,000 covered automobiles. Three

⁷ Written premiums are summed across all lines, and surplus is total surplus for the insurer or insurance group where appropriate.

regression equations are estimated with ordinary least squares using the three ratios as dependent variables.

The Illinois data cover 54 insurers, and include only firms receiving ten or more complaints. Thus firms with the highest service quality (fewer than 10 complaints) are not included in the data set. The New York data cover 69 insurers and include all companies (or groups of companies) writing at least \$5 million in average annual commercial or personal automobile insurance premiums. Both Illinois and New York complaint ratios equal complaints per \$1 million of written premium, which controls to a degree the bias in the California complaint ratio against firms writing higher risk drivers: claims would be greater for firms specializing in higher risk drivers but premiums would be priced to reflect the greater risk.

Empirical Results

Results of the estimation of the three regression equations using California data appear in Table 1. There is some evidence of cross-firm quality variation.⁸

Table 1
Regression Results Using California Data:
Complaints Per Thousand Automobiles Written

Independent Variables	Coefficient Estimates and t-ratios *		
	Total Complaints	Claim Complaints	Non-Claim Complaints
Intercept	0.806 (4.896)	0.294 (4.624)	0.512 (4.531)
NPWS	-0.116 (-1.949)	-0.033 (-1.592)	-0.083 (-2.057)
DW	-0.129 (-1.723)	-0.055 (-1.765)	-0.074 (-1.328)
SUBST	0.328 (2.597)	0.098 (1.905)	0.231 (2.705)
R ²	.37	.31	.36

* N = 32. The t-ratios are in parentheses.

Across all three estimations, the sign of the estimated coefficient for NPWS is negative. There is no evidence of a positive relationship between complaint rates and strained financial capacity, as measured here by NPWS. The evidence is consistent with firm premium growth and complaint-free policy service.

The estimated coefficients for DW, where the dependent variables are claim complaints and total complaints, are negative and statistically significant at

⁸ Regression results are corrected for heteroscedasticity.

the .05 level. Although claim settlement practices of direct writers are more restrictive, there is no evidence that their claim service is worse than that of independent agency firms. Similarly, there is no evidence that direct writers provide lower overall service quality.

However, if direct writers practice risk selection, then they would be expected to pay fewer claims and receive fewer claim complaints, all else equal. If quality and financial strength for paying claims were constant across distribution systems, coefficient estimates would suggest differences in risk selection across distribution systems. Independent agency companies have about 35 percent more claims per 1000 covered automobiles than direct writers.⁹ This conditional result offers an approximate upper bound on the effect of possible risk selection on claims frequency.

Across all three dependent variables the estimated coefficients for SUBST are positive and statistically significant (at the .05 level), thus the evidence suggests that firms specializing in high risk drivers receive relatively more complaints. Conditional on constant quality and financial strength across firms, insurers writing higher risk drivers have approximately 46 percent more claims than firms not writing higher risks.¹⁰ This conditional approximation does not seem unreasonable.

Results suggest a positive and statistically significant relationship between non-claim complaints and firms writing higher risk drivers. This may be due to cross-firm service quality differences or possibly to higher rates of cancellation for higher risk drivers, resulting in higher non-claim complaint rates. Conditional on quality and NPWS being held constant, cancellation and non-renewals for firms writing higher risk drivers are about 76 percent greater than for other firms.¹¹

Results of the regression estimations using Illinois and New York data are presented in Table 2. Using Illinois data, the coefficient estimates for NPWS and DW are not statistically significant at any reasonable level. The variable, NPWS, may not adequately measure the effect of firm cash flow on service quality, and lagging the variable over a five year period might allow a more refined output-capacity measure. Using Illinois data, the estimated coefficient for SUBST is positive and statistically significant (at the .01 level), which is consistent with the results obtained using California data.

Little is found using New York data. Only the constant term is statistically significant at the .05 level. Note the R^2 of .05. The results may be due in part

⁹Consider the identity:

$\#Complaints/1,000 \text{ Autos} = \#Complaints/Claim \times Claims/1,000 \text{ Autos}$. Conditional on $(\#Complaints/Claim)$ being constant across firms, and holding quality and NPWS constant, the coefficient estimate from the regression equation approximates the difference in $Claims/1,000 \text{ Autos}$. The percentage difference is calculated as follows: $(\beta_0 + \beta_1 NPWS) / (\beta_0 + \beta_1 NPWS + \beta_2)$ assuming SUBST = 0 and NPWS is the sample average of NPWS.

¹⁰ $(\beta_0 + \beta_1 NPWS + \beta_3) / (\beta_0 + \beta_1 NPWS)$, assuming DW = 0.

¹¹ $(\beta_0 + \beta_1 NPWS + \beta_3) / (\beta_0 + \beta_1 NPWS)$, assuming DW = 0.

to New York's practice of including commercial with private passenger automobile coverage in compiling complaint data for 1987.¹²

Table 2
Regression Results Using Illinois and New York Data:
Complaints Per \$1 Million Written Premiums

Independent Variables	Coefficient Estimates and t-ratios *	
	Illinois Complaint Ratio	New York Complaint Ratio
Intercept	1.403 (1.643)	2.230 (3.596)
NPWS	0.302 (0.830)	0.412 (1.385)
DW	0.781 (0.999)	-0.259 (-0.518)
SUBST	4.100 (2.392)	0.607 (1.074)
R ²	.29	.05

* N = 54 for Illinois and 68 for New York, respectively. The t-ratios are in parentheses.

Conclusion

Results here suggest that cross-firm service quality differences exist across automobile insurers. There is no evidence that direct writers provide lower service quality than do independent agency firms. Evidence suggests that firms specializing in high risk drivers receive relatively more complaints. Results should be interpreted with caution since the data do not control for cross-firm claim rate variation. Future analysis could be improved if alternative complaint ratios, such as the number of complaints divided by the number of claims paid, were collected and published by state regulators.

¹²The department plans to collect private passenger automobile complaints separately as of 1989.

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