The Impact of Regulation on Customer Satisfaction: Evidence From the US Auto Insurance Industry

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Using data obtained from J.D. Power on automobile insurance satisfaction, we conduct a stud to examine the individual polic holder characteristics, insurance experience factors, and state regulator factors that affect an individual's overall satisfaction with their auto insurer, the price paid for auto insurance, and the claims experience. Prior research has examined the effects of customer satisfaction on insurer profitabilit and methods b which higher satisfaction is achieved. However, due to a lack of available data, little research has been done on which factors influence satisfaction. Studies of customer satisfaction t picall focus on the individual's interaction with the firm and cover a variet of industries. Insurance is unique because of the different la ers of regulator oversight affecting insurance firms. Regulators scrutini e the sales practices, rates, underwriting standards, and claims adjudication processes for insurers, and thus ma have a significant impact on consumers' interactions and satisfaction with their insurer. We consider how a state's insurance supervisor , rating, and fault s stems impact customer satisfaction with their auto insurer.

Our regulator findings indicate that customers in states with elected insurance supervisors, rather than appointed, are generall less satisfied with their auto insurance. Customers in states with prior approval and flex rating s stems are generall more satisfied with their auto insurance, relative to use-and-file or open rating states. In both cases, the results are not statisticall significant for individuals that did not experience a prior auto claim with their carrier, perhaps because the claims experience changes a customer's perception of value in the insurance relationship. We find that customers exhibit lower satisfaction in states with an add-on no-fault s stem and in states with higher average auto insurance premiums, regardless of claims histor . Numerous personal and experiential factors also impact satisfaction, as reported in our stud .

Introduction

The business of insurance is regulated to ensure that those purchasing coverage are compensated for covered losses if the occur. Regulations include requirements that insurers are properl licensed, that polic rates and forms ma require approval before going to market, that claims litigation ma be limited in some circumstances, and that the state insurance regulator oversees market conduct in their state.

There are both common elements to regulation across the states and differences. In the current stud , we consider regulation and its association with consumer satisfaction in automobile insurance. Despite the significant role that regulation pla s in insurance markets and the importance of customer satisfaction to the purchase of insurance, few prior studies directl examine the association between regulation and customer satisfaction.[1]

Customer satisfaction is important for both the insurer and the individual. For the insurer, satisfaction is a non-financial metric that leads to differences in financial performance, as more satisfied customers will likel remain with the insurer longer, accept higher prices for coverage, and refer others to the firm. Greater customer satisfaction is associated with significantl higher insurer profitabilit , both through a lower expense ratio, as shown b Pooser and Browne (   ), and via a lower loss ratio, which has been discussed in several studies.[2]

For the insured, satisfaction influences risk financing decisions, including the decision to adequatel insure against loss. In this stud , we examine factors that influence customers' satisfaction with their automobile insurance premium. These include individual demographic and financial factors. We also consider prior experiences that insureds have had with their insurer.

Roman (   ) and Chen et al. (   ) provide evidence of a link between consumers' satisfaction with their financial services providers and their trust in them. Courbage and Nicolas (   ) find that trust determines individuals' willingness to bu insurance. Customer satisfaction influences insurance purchase decisions, and their perception of their insurer impacts the economic welfare of consumers.

While there is a bod of existing literature on customer satisfaction, man of these studies examine multiple industries with small data sets; few focus on insurance. Little, if an , attention has been given to the effect regulation ma have on customer satisfaction. A customer's satisfaction with a business ma depend on price and product, as well as interactions with emplo ees, all of which, in the case of insurance, are regulated. Given the important role insurance pla s in securing financial well-being, as well as the significant and varied regulator oversight of the insurance marketplace, the satisfaction of insureds with their coverage merits stud .

. Studies have examined consumer complaints filed against insurers with a regulator (e.g., Doerpinghaus,   ; Carson et al.,   ) and studies b Wells and Stafford (,   9) that conduct surve research into insurer claims qualit , but we have found none that directl examine the impact of the regulator environment on consumers' reported satisfaction levels, and especiall on a large, nationwide scale.

. Customer retention is important in determining profitabilit , as renewal business is significantl more profitable than new business (Conning & Co.,   ; D'Arc & Dohert ,   ; Wu & Lin,   5). Renewal business is associated with a decrease in loss ratios. As a book of business ages, insurers can cherr -pick the risks the choose to retain as the gather more information on these insureds.

markets, the coverages and exclusions within an insurance contract and the price charged for coverage require regulator approval.

An elected supervisor may have a positive impact on consumer satisfaction if the regulator takes a pro-consumer stance, which is suggested by Besley and Coate (??) in a study comparing elected and appointed commissioners. Their finding is supported by the work of Fields et al. (??), who conducted a study focused on insurance regulation. Alternatively, elected commissioners may be swayed by special interest groups and lobbying efforts, both of which can be influenced by insurance companies and industry groups (see Grace & Phillips, ??).[3] In this case, an elected commissioner may feel pressure to take a more insurer-friendly approach to regulator issues. On the other hand, appointed commissioners may find that their public policy issues are bundled with other state policy issues by a governor, who it is reasonable to assume seeks constituent approval to achieve re-election.

Customer satisfaction may also be impacted by a regulator's ability to limit price changes by insurers. In regulatory jurisdictions with a prior approval rating law, the

mation on an insurance bu er's individual demographic characteristics, social and financial characteristics, and insurance experience. After removing respondents who provided incomplete surve responses and those who provided seemingl illogical responses, our dataset included ⅃ , ͞ observations.[4]

Additionall , state regulator data comes from the NAIC's website and the NAIC Auto Insurance Database Reports for ⦂ ͞ and ⦂ ⦂ , which contained information for the ears ⦂ ⍰ to ⦂ ⅃ . The political part of state governors and win percentage data were retrieved from Ballotpedia.

To test our h potheses, we emplo regression methods to estimate equations of the general form:

$$\text{Satisfaction}_i = f\big(\text{Regulator Variables}_s, \text{Demographic Factors}_i,$$
$$\text{Socioeconomic Factors}_i, \text{Insurance Experiential Factors}_{i}\big),$$

where i and s correspond to individual and state S0 residua 76.38 0-0.5 Tc -0.025 Tw 9.7938 0 0 10 66

| Tort State | Respondent s state has a tort auto liabilit s stem. | % | | | % |
| Democratic Governor | Respondent s state has a Democratic part governor. | % | | | |

No Income Disclosed	Household income not disclosed	%			
Education (No HS)	Respondent did not complete high school.	%			
Education (No College)	Respondent completed high school but did not complete college.	%			
Education (College)	Respondent has a four-year degree.	%			
Education (Grad)	Respondent has a graduate or advanced degree.	%			
Credit Cat (Exc)	Respondent identifies their credit history as excellent.	%			
Credit Cat (Good)	Respondent identifies their credit history as good.	%			
Credit Cat (Fair)	Respondent identifies their credit history as fair.	%			
Credit Cat (Poor)	Respondent identifies their credit history as poor.	%			
No Credit Reported	Credit history not disclosed.	%			
Rural Dweller	Respondent lives in a rural area.	%			
Suburban Dweller	Respondent lives in a suburban area.	%			
Urban Dweller	Respondent lives in an urban area.	%			
Home-Own	Respondent owns their home.	%			

Each satisfaction variable ranges from   . Mean values differ across our three metrics: CSAT mean is   , Price satisfaction mean is   , and Claims satisfaction is   . We separate control variables b categor and discuss each below.

Regulatory Variables: We observe the t pe of insurance supervisor, rating s stem, and fault s stem for each respondent. Elected supervisors represent about   % of our sample. About   % of our sample live in a prior approval rating state,   % in a   ex rating state, and onl   . % in an open rating state. The rest of our respondents live in a e-and-use, use-and- e, or mixed-rating state.[8] We observe that about   % of our sample live in a no-fault state,   % live in an add-on state, and just under half are governed b a tort fault s stem. Additionall , we separate no-fault respondents into dollar and verbal threshold s stems. A greater proportion of respondents live in verbal threshold states than dollar threshold states (% vs.   %).

We also measure some other state-speci c factors, including the governor's political part (% of our sample live in a state with a Democratic governor), an indicator variable for whether or not the governor won a large majorit of votes in the last election (% of our sample)[9], the state's average automobile insurance premium, and the insurance commissioner's length of service, which ranges from   to   ears.

In Table , we observe mean CSAT, Price, and Claims values conditional upon these regulator variables. The conditional mean values of the satisfaction variables do not var widel from the sample mean values.

Demographic Variables: J.D. Power collects information on respondents' personal and socioeconomic characteristics, which we emplo as control variables. About   % of our respondents are male. The average age is   (range   ).   % of the sample

Socioeconomic Variables: We control for respondents' income, education, credit score, and living status. Most of our respondents (about 2 %) have incomes below $ per ear. We also include a variable for individuals who do not disclose their income (% of the sample) because these individuals consistentl displa lower CSAT and Price satisfaction values than others. We separate educational status into four categories: no high school, high school diploma, four- ear degree, and graduate/ advanced degree.[10] We also include four credit rating categories self-reported b the respondent. Nearl two-thirds of our sample report that the have excellent credit, while less than % report poor credit. While mean Price satisfaction is roughl the same for all categories, CSAT and claims satisfaction fall as credit qualit declines. We include variables for respondents' living areas (rural, suburban, urban) and home ownership status. Most of our respondents are suburban homeowners.

Experiential Variables: Our nal control variables relate to insurance experience. We include four categories for length of time with the same auto insurer: individuals that switched within the last   ear, individuals that switched -   ears ago, individuals that switched -   ears ago, and individuals with their insurer for   + ears (this is generall how the data are reported b J.D. Power). Our univariate ndings show that Price satisfaction is highest for individuals who just switched insurers (likel the respondent switched to obtain a lower price) but that claims satisfaction is highest for those with their insurers the longest. The insurer ma devote more resources to their customers with the greatest longevit during the claims process. We also include controls for high-mile drivers (those that drive at least   miles per ear) and for those with a prior auto insurance claim with their current insurance carrier.

Univariate Results – Claims Only Sample

Table 2: Claims Onl Sample Variable Summar Values and Satisfaction Averages b Categorical Variable

Variable	Mean	CSAT	Price
Dependent Variables			
Customer Satisfaction Index			

Gov Win Pct	%		
State Average Premium			
Ins Cmsr Tenure			
Demographic Variables			
Gender (Male =)	%		
Age			
Married	%		
Single	%		
Widowed	%		
Divorced	%		
Partner	%		
Joint Purchase	%		
Minor Children[b]			
White / Caucasian	%		
Black / African American	%		
Hispanic / Latino	%		
Asian / Asian American	%		
All Other Races	%		
Socioeconomic Variables			
Income < k	%		
Income k- k	%		
Income k- k	%		
Income k- k	%		
Income > k	%		
No Income Disclosed	%		
Education (No HS)	%		
Education (No College)	%		
Education (College)	%		
Education (Grad)	%		0.847%

Joint PGr2Joi   2%

between CSAT and Price, % between CSAT and Claims, and % between Price and Claims. However, there is variation in some of the satisfaction index means across the independent variables, and there are some differences in our multivariate models, which we believe indicates that the variables do measure differences across aspects of the insurance experience.

Table 3: Multivariate Regression Anal sis: CSAT, Price, and Claims Satisfaction

Home-Own						
Home-Rent						
Years w Insurer ( )	***		***		***	
Years w Insurer (-)	***		***		***	
Years w Insurer (-)	***				***	
High Mile Driver (>)	***		***		***	
Prior Claim	***		***			
Observations						
R-squared						

a Fixed effects for the Study Year, the Census Region, and the respondent's automobile insurance carrier are included in the regression models but not reported. Robust standard errors are used in all regression models.
b ***, **, and * indicate statistical significance at the , , and levels, respectively.

Regulatory Variables: We observe a negative relationship between CSAT, Price satisfaction, and the elected supervisor variable. However, the prior approval rating system is positively associated with these values. The finding that elected insurance supervisors are associated with lower satisfaction values may be unexpected, given that the regulator should be beholden to voters, but it is consistent with findings by Grace and Phillips ( ) that elected supervisors can be influenced by special interest groups.[11] Additionally, the positive relationship between prior approval rating and satisfaction may indicate that regulation keeps prices low or at least more acceptable for consumers. Cummins and Harrington ( ) find a negative relation between prior approval rating and average prices, although Grace and Phillips ( ) do not find a significant relation between prior approval rating and prices.[12]

We find that CSAT and Price satisfaction values are higher in flex rating states relative to other rating variables. Flex rating systems allow an insurer to change rates within a certain percentage band without regulatory approval. Since this allows insurers to quickly respond to certain market conditions without a long approval process, perhaps consumers value a more risk-based rating versus some of the incentives from a more constrained process.[13]

The no-fault system is positively associated with Claims satisfaction, although the relationship is negative in no-fault states with a dollar threshold system. We find that add-on fault systems are negatively associated with all forms of satisfaction, which may

Price satisfaction are significantly greater in states with a large majority win for the governor. The coefficient is especially large for the Price satisfaction results, which may indicate that voters in these states hold more consistent political views, including the pricing of insurance. The state's average auto insurance premium is negatively associated with all satisfaction variables. Finally, the insurance commissioner's tenure is not significantly related to the satisfaction variables.

Demographic Variables: Male respondents are generally less satisfied with their insurance attributes than females. We include age-squared as an additional control variable in order to detect non-linearities in satisfaction by age. We find that the coefficient on age is negatively associated with all satisfaction values, but the coefficient is positive for age-squared. This indicates that satisfaction declines as individuals age but increases again at older ages. Relative to married respondents, all other respondents exhibit negative satisfaction across all values (those in a partnership exhibit lower Price and Claims satisfaction but do not exhibit a significant difference for CSAT). Respondents who make insurance decisions as a joint decision exhibit lower satisfaction than other households. Additionally, households with minor children are more satisfied with their insurer than those without, which differs from the univariate values in Tables and . We also observe differences across racial groups: White, Black, and Hispanic respondents demonstrate higher satisfaction values than all other racial groups.

Socioeconomic Variables: Income is associated with differences in Price and Claims satisfaction. We observe a positive Price satisfaction coefficient for all categories omcoefx 0 36ci

in urban areas (Insurance Information Institute,   ), fatal accident rates tend to be higher in rural areas (U.S. Department of Transportation,   ). Suburban drivers may experience some of the 'worst of both worlds'; drivers that commute from the suburbs to the city are exposed to denser traffic and more frequent claims, while suburbs tend to have higher speed limits that can cause more accidents (Noland,   ). Perhaps suburban respondents are less satisfied with their auto insurance experience based on prices they perceive as too high for their volume of claims. Homeownership or renting are not associated with significantly different satisfaction than those with living status other. [15]

Experiential Variables: We observe interesting results related to respondents' tenure with their insurance company. CSAT is highest for those who recently switched insurers, second highest for those with their insurer for one to two years, and lowest for those with their insurer for three to four years, relative to those with their insurer for five or more years. Price satisfaction is highest for those who recently switched insurers, next highest for those with their insurer for one to two years, and lowest for those with their insurer for three years or more. Claims satisfaction is lowest for those who recently switched but increases with insurance tenure.

We believe there is a logical explanation for these findings. Individuals shop for insurance based on price and are satisfied if they find a much lower price and switch insurers (hence the highest Price satisfaction coefficient for recent switchers). However, the insurer has an incentive to provide more value to individuals who remain with the company and create long-term relationships and is thus likely to provide a superior claims experience to longer-term customers.

We find that high-mile drivers are generally more satisfied with their insurers, perhaps because these individuals are more likely to have more interactions with their insurers. We also find that consistent with univariate findings, experiencing a prior claim with the insurer is positively related to CSAT and Price satisfaction.[16]

Fixed Effects: We include fixed effect controls for the response year, the respondent's census region, and the respondent's auto insurance carrier.[17, 18] There are four census region controls, which we believe might help control for large regional differences related to risk exposure (e.g., catastrophes), culture, and climate.

Multivariate Results – Prior Claim and No Prior Claim Subsamples

We provide further analysis of our satisfaction variables by testing for differences in satisfaction based on whether the respondent experienced a prior claim with their insureMultivariate Results ave more ins incluear:b and cl 10 udiftast4074 Tw 10.00 (tast.6u3po7

- $J_{\cdot,\cdot,\cdot}, I_{\cdot,\cdot,\cdot}, R_{\cdot,\cdot,\cdot}$

Table 4:

Rural Dweller	***		***	
Urban Dweller	***		***	
Home-Own				
Home-Rent			*	
Years w Insurer ( )	***		***	
Years w Insurer (-)	***		***	
Years w Insurer (-)				
High Mile Driver (>)	***		***	
Constant	***		***	
Observations				
R-squared				

[a] Fixed effects for the Stud Year, the Census Region, and the respondent's automobile insurance carrier are included in the regression models but not reported. Robust standard errors are used in all regression models.

[b] ***, **, and * indicate statistical signi cance at the   ,   , and   levels, respective .

Regulatory Variables: For prior claimants, the elected and prior approval ndings are consistent with the full sample results. However, there is no signi cance in these values for those without a claim. The result for   ex rating is also consistent between the full sample and prior claim sample, but there is no signi cance on the   ex rating variable in the no prior claim sample. No-fault is not signi cantl associated with satisfaction for prior claimants, although we observe a negative association between no-fault states and CSAT for non-claimants. Both subsamples also demonstrate signi cantl lower satisfaction related to the add-on fault variable.

Prior claimants exhibit lower satisfaction values in states with a Democratic governor. Both subsamples demonstrated consistent and positive satisfaction when the governor won b a large majorit . Both subsamples also demonstrate a consistent, negative nding between the state's average auto insurance premium and satisfaction values, consistent with the full sample. However, the positive association between the insurance commissioner's tenure and Price satisfaction is onl present for prior claimants.

Individuals t picall do not have man interactions with their auto insurance compan . For man individuals, interactions occur at polic inception, when modif ing coverage, at renewals, and when a claim occurs. The claims experience is also generall more involved than an of the other interactions. The differences in ndings based on claims for our regulator variables indicates that these experiences largel shape respondents' feelings toward their auto insurance companies.

Demographic Variables: We observe no major differences in demographic variables across our subsamples relative to the full sample results.

Socioeconomic Variables: In both the prior claim and no prior claim subsamples, socioeconomic results are largel consistent with the full sample. An exception in the prior claim pool is that the lowest education respondents exhibit no greater satisfaction than the highest education respondents.

Experiential Variables: We observe differences in our subsamples based on respondents' tenure with their auto insurer. For the prior claims subsample, those who switched insurers within the last four ears generall exhibit signi cantl less CSAT than others. However, Price satisfaction is highest for those who switched -

the respondent filed a prior claim with their auto insurance carrier. Our findings indicate that the regulator environment can impact consumers' satisfaction with their insurance transaction and that these regulator factors are generall more signi cant to satisfaction for respondents who filed a prior auto claim.

Some of our findings are that respondents are generall less satisfied in jurisdictions with an elected insurance commissioner and add-on fault s stems. Respondents are generall more satisfied in states with prior approval or ex rating. Additionall , satisfaction is generall higher in states where the governor won the last election b a large majorit and states with lower average automobile insurance premiums. There is limited evidence that the governor's part affects satisfaction.

Consumer satisfaction is tied to trust, and trust is associated with purchasing decisions. Insurance purchases are important to consumer and societal welfare, especiall in auto insurance.

A single auto accident can lead to financial distress for the driver and others involved in the crash. Auto insurance protects the first and third parties in a crash, so adequate insurance coverage helps ensure societal preparation for loss. Regulators should carefull consider the impact of their policies on insurance processes, which can ultimatel alter consumers' purchase decisions. While regulators are not tasked with improving consumer satisfaction, the impact of dissatisfaction ma lead to negative results in the insurance markets the regulate.

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