

# **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 study to examine the individual policyholder characteristics, insurance experience factors, and state regulatory 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 profitability and methods by 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 typically focus on the individual's interaction with the firm and cover a variety of industries. Insurance is unique because of the different layers of regulatory oversight affecting insurance firms. Regulators scrutinize the sales practices, rates, underwriting standards, and claims adjudication processes for insurers, and thus may have a significant impact on consumers' interactions and satisfaction with their insurer. We consider how a state's insurance supervisory, rating, and fault systems impact customer satisfaction with their auto insurer.

Our regulatory findings indicate that customers in states with elected insurance supervisors, rather than appointed, are generally less satisfied with their auto insurance. Customers in states with prior approval and flex rating systems are generally more satisfied with their auto insurance, relative to use-and-file or open rating states. In both cases, the results are not statistically 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 system and in states with higher average auto insurance premiums, regardless of claims history. Numerous personal and experiential factors also impact satisfaction, as reported in our study.

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## **ABSTRACT**

Insurance is among the most heavily regulated industries. However, regulatory characteristics differ across each state, including the way an insurance supervisor is selected, how rates are set, and the fault system by which injured parties pursue damages. Employing a large dataset from J.D. Power, we examine how these regulatory characteristics, along with other state, demographic, socioeconomic, and experiential factors, impact consumers' satisfaction with their automobile insurance carriers. We find differences in the metrics—overall price, and claims satisfaction—based on certain regulatory attributes and also find that prior claims experience significantly impacts satisfaction. Prior claimants are generally more satisfied with their insurance carrier and exhibit greater significance in the impact of regulatory factors on their satisfaction.

Keywords: insurance regulation, customer satisfaction, automobile insurance

## **Introduction**

The business of insurance is regulated to ensure that those purchasing coverage are compensated for covered losses if they occur. Regulations include requirements that insurers are properly licensed, that policy rates and forms may require approval before going to market, that claims litigation may 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 study, we consider regulation and its association with consumer satisfaction in automobile insurance. Despite the significant role that regulation plays in insurance markets and the importance of customer satisfaction to the purchase of insurance, few prior studies directly examine the association between regulation and customer satisfaction.<sup>1</sup>

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 likely remain with the insurer longer, accept higher prices for coverage, and refer others to the firm. Greater customer satisfaction is associated with significantly higher insurer profitability, both through a lower expense ratio, as shown by Pooser and Browne (2018), and via a lower loss ratio, which has been discussed in several studies.<sup>2</sup>

For the insured, satisfaction influences risk financing decisions, including the decision to adequately insure against loss. In this study, 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 (2003) and Chen et al. (2012) provide evidence of a link between consumers' satisfaction with their financial services providers and their trust in them. Courbage and Nicolas (2021) find that trust determines individuals' willingness to buy insurance. Customer satisfaction influences insurance purchase decisions, and their perception of their insurer impacts the economic welfare of consumers.

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

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1. Studies have examined consumer complaints filed against insurers with a regulator (e.g., Doeringhaus, 1991; Carson et al., 2005) and studies by Wells and Stafford (1995, 1996) that conduct survey research into insurer claims quality, but we have found none that directly examine the impact of the regulatory environment on consumers' reported satisfaction levels, and especially on a large, nationwide scale.

2. Customer retention is important in determining profitability, as renewal business is significantly more profitable than new business (Conning & Co., 1998; D'Arcy & Doherty, 1990; Wu & Lin, 2009). Renewal business is associated with a decrease in loss ratios. As a book of business ages, insurers can cherry-pick the risks they choose to retain as they gather more information on these insureds.

## Prior Literature

### The Importance of Customer Satisfaction

At the firm level, customer satisfaction has been examined as both a driver of performance and an outcome of other actions. Much of the prior literature that examines the determinants of satisfaction is based on the customer's experience with the firm. Maddern et al. (2007) find that customer satisfaction in the UK banking industry is driven by technical service quality, which they describe as "doing things right," rather than functional service quality, which they describe as "doing things nicely." Siddiqui and Sharma (2010) also model customer satisfaction but find it is created through a combination of an individual's satisfaction with employees, satisfaction with the firm's product or service, and satisfaction with a firm's image. Insurance is a unique industry and product because most individuals' interactions with their insurers are at policy inception and when claims occur. The technical experience offered by the insurer in both underwriting and claims adjustment will influence the consumer's perception of their insurer, but the regulatory environment can also have an impact on satisfaction. Regulators often exert authority to regulate insurance prices but also regulate claims via consumer complaint investigations (Carson et al., 2005). Additionally, Grace and Phillips (2008) observe that regulators have different incentives in their personal goals (e.g., seeking higher office versus consumer advocate) and may attempt to manage insurance prices and practices. Finally, the state's auto insurance fault systems will lead to different experiences and outcomes for consumers after a loss.

Courbage and Nicolas (2021) study trust in insurance rather than satisfaction, using a sample of respondents across multiple countries. They find a positive link between 'good experience' and trust, although the 'good experience' variable can be a first- or second-hand experience. The concepts of customer satisfaction and trust in a business are interrelated. Roman (2003) surveys banking customers in Spain to study the relationship between the behavior of firm employees, customer satisfaction, and trust. Roman hypothesizes a link between satisfaction with an employee, satisfaction with the firm, greater trust, and increased customer loyalty. The study's results indicate that perceived ethical behavior by employees is associated with greater levels of customer satisfaction and trust. Chen et al. (2012) surveyed financial services customers in Taiwan on the concept of fairness. The authors find that fair service positively impacts customer satisfaction and creates trust in the firm.

These findings indicate that customers' experiences with the firm impact trust, which should drive customer satisfaction. In addition to experiential factors, however, Courbage and Nicolas (2021) find that many socioeconomic variables relate significantly to trust in insurance. In our analysis, we control for the effects of personal and socioeconomic characteristics, as well as experiential factors, in determining satisfaction with the price of insurance. Variable descriptions and mean values are reported in Table 1.

### Insurance Regulation and Satisfaction

The significant degree to which the insurance industry is regulated impacts the practices of companies more so than in many other industries. For example, in many insurance

markets, the coverages and exclusions within an insurance contract and the price charged for coverage require regulatory 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 (2003) in a study comparing elected and appointed commissioners. Their finding is supported by the work of Fields et al. (1997), 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, 2008).<sup>3</sup> In this case, an elected commissioner may feel pressure to take a more insurer-friendly approach to regulatory 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 insurance supervisor has considerable discretion over insurers’ ability to change the price of coverage. Cummins et al. (2001), Harrington (2004), and Regan et al. (2008) considered the association between prior approval rating laws and insurance prices. Their findings are mixed. Grace and Phillips (2008) find that prior approval rating laws may be positively or negatively related to price depending on the insurance supervisor’s future goals. A regulator’s goals could include, among others, aiding consumers; attaining a higher political office; or obtaining a position in the future in the private sector.

The fault system in a state will also govern aspects of the insurance transaction. States are generally separated into “tort,” “no-fault,” and “add-on no-fault” systems. Research has examined the impact of these fault systems on pricing and other driving behaviors. A well-designed no-fault system should lead to cost reductions for drivers (Cummins & Weiss, 1991; Cummins & Weiss, 1993), but also encourages moral hazard among dishonest drivers and has been associated with unwanted side effects, such as increases in auto fatality rates and more drunk driving (Cummins et al., 2001; Sloan et al., 1995). It is difficult to predict the impact of the fault system on automobile insurance satisfaction. Our current study considers the insurance supervisory, rating, and fault systems in a state and their impact on satisfaction.

## **Data and Methodology**

### **Dataset**

Our primary data are from the J.D. Power Auto Insurance Study. J.D. Power conducts this survey of auto insurance buyers annually in the U.S. During our sample period, 2016-2018, J.D. Power received about 45,000 annual responses. Our total sample contains 134,927 potential observations. The survey data is extensive, including infor-

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3. Grace and Phillips (2008) examine the political environment and the effect of the regulator on automobile insurance prices. Their findings indicate that automobile insurance prices are higher in the presence of a prior approval rating system with insurance supervisors who are elected or are likely to seek higher office, perhaps because these regulators are subject to special interest group influence (rather than voters).

mation on an insurance buyer's individual demographic characteristics, social and financial characteristics, and insurance experience. After removing respondents who provided incomplete survey responses and those who provided seemingly illogical responses, our dataset included 95,375 observations.<sup>4</sup>

Additionally, state regulatory data comes from the NAIC's website and the NAIC Auto Insurance Database Reports for 2017 and 2020, which contained information for the years 2016 to 2019. The political party of state governors and win percentage data were retrieved from Ballotpedia.

To test our hypotheses, we employ regression methods to estimate equations of the general form:

$$\text{Satisfaction}_i = f \{ \text{Regulatory Variables}_s, \text{Demographic Factors}_i, \text{Socioeconomic Factors}_i, \text{Insurance Experiential Factors}_{i,}, \}$$

where  $i$  and  $s$  correspond to individual and state factors.<sup>5</sup> We include three measures of satisfaction: overall customer satisfaction (CSAT), which is generated by J.D. Power by aggregating satisfaction responses to numerous aspects of an insurance transaction, Price satisfaction, and Claims satisfaction.<sup>6</sup> Our regression models include yearly and census region fixed effects to control for timewise or regional differences in satisfaction. Each of the dependent and independent variables we employ in this study are discussed in the subsequent section.

## Discussion of Results

### Dataset

We observe differences in three satisfaction variables: overall customer satisfaction (CSAT), price satisfaction, and claims satisfaction. The CSAT variable is created by J.D. Power and consists of responses to numerous satisfaction metrics for an individual's automobile insurance transaction. Price satisfaction is an individual's satisfaction with the price of their auto insurance coverage. Claims satisfaction is an individual's satisfaction with their auto claims process and only applies to individuals who have filed a claim with their current insurer. Roughly half of our respondents (50.42%) have filed a claim.

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4. We exclude individuals who do not disclose their gender, marital status, household size, education, or home living status. We also exclude individuals who list themselves as belonging to five or more races (as these respondents appear to select illogical values of many variables across the survey and may not report their true information) and individuals who list their age as 99 or 100 (for the same reason as above).

5. We employ ordinary least squares regression with year, census region, and insurer fixed effects and robust standard errors. Our dependent variables are continuous on a scale from 100 - 1,000, so we believe that OLS regression is appropriate for this analysis. Our diagnostic test shows no evidence of significant multicollinearity.

6. The satisfaction variables are created by J.D. Power, and their formulas are proprietary. However, we can observe many of the individual factors that go into the creation of the variables. For example, the CSAT Index is related to price, claims, non-claims interaction, agent, website, policy offerings, and more. Price satisfaction is related to the total payment to the insurer, how likely a respondent is to shop for new coverage, prior price changes, and more. Claims satisfaction is related to prior claim approval, time to settle the claim, whether the sales agent was involved in the claim and more.

We report mean values for all study variables, as well as the mean value of each satisfaction variable by each categorical variable, in Table 1. We also report mean values for the subsample of respondents who reported a prior claim with their current auto insurer in Table 2. Next, we conduct multivariate regression analyses employing our satisfaction variables as dependent variables. We present results for the full sample of respondents in Table 3, for those respondents with a prior claim in Table 4, and for respondents with no prior claim in Table 5. We also report findings for individuals with “high” and “low” satisfaction values using Tables 6 and 7.<sup>7</sup>

## Univariate Results - Full Sample

**Table 1:** Variable Descriptions, Summary Values, and Satisfaction Averages for Categorical Variable

Variable	Variable Description	Mean	CSAT	Price	Claims
Dependent Variables					
Customer Satisfaction Index (CSAT)	The overall measure of an individual's satisfaction with their auto insurance company and policy.	827			
Price Satisfaction	The value a respondent assigns to overall price satisfaction with their auto insurance policy	748			
Claims Satisfaction	The value a respondent assigns to overall claims satisfaction with their auto insurance company.	868			
Regulatory Variables					
Elected Ins Cmsr	Respondent's state has an elected insurance commissioner.	23.73%	824	751	861
Prior Approval Rating	Respondent's state uses a prior approval rating system for auto insurance.	37.87%	827	751	867
No File Rating	Respondent's state uses an open or no-file rating system for auto insurance.	0.18%	819	749	866
Flex Rating	Respondent's state uses a flex rating system for auto insurance.	10.40%	829	747	871
No-Fault State	Respondent's state has a no-fault auto liability system.	33.47%	825	743	869
No-Fault Dollar Threshold	Respondent's state has a no-fault dollar threshold system.	9.33%	823	746	861
No-Fault Verbal Threshold	Respondent's state has a no-fault verbal threshold system.	24.14%	826	742	873
Add-on Fault State	Respondent's state has an optional PIP auto liability system.	18.95%	827	749	866

7. We define “high” satisfaction values as > 900 for CSAT, Price, and Claims. We define “low” satisfaction values as < 750 for CSAT, and < 700 for Price and Claims. These values were selected based on logical breaks in the data distributions. Logistic regression analysis is conducted to examine the regulatory factors associated with high and low satisfaction levels. All other independent variables are included in these analyses, but the results are not reported for brevity and because they are consistent with the multivariate findings in Tables 3-5. Please contact the authors for a report of the full results.

Tort State	Respondent's state has a tort auto liability system.	47.58%	828	752	867
Democratic Governor	Respondent's state has a Democratic party governor.	39.86%	824	747	864
Gov Vote Safe	Indicates the governor's win percentage is in the upper 25th percentile of state voting results (>59.3%).	30.77%	830	757	866
Gov Win Pct	The governor's portion of the vote in the last election.	54.57%			
State Average Premium	The average automobile insurance premium in the state.	1027.75			
Ins Cmsr Tenure	The insurance commissioner's tenure in years.	4.75			
<b>Demographic Variables</b>					
Gender (Male = 1)	The respondent's identified gender.	42.97%	826	746	870
Age	The respondent's age in years.	54.92			
Married	Is the respondent married?	78.10%	830	750	873
Single	Is the respondent single (never married)?	8.05%	807	744	828
Widowed	Is the respondent widowed?	1.78%	829	739	869
Divorced	Is the respondent divorced?	5.97%	822	741	857
Partner	Is the respondent living with a domestic partner?	6.11%	821	747	851
Joint Purchase	Is auto insurance purchased in a joint household decision?	46.69%	828	746	870
Minor Children <sup>b</sup>	How many minor children are in the house?	0.45	818	745	854
White / Caucasian	The respondent self-identifies as White or Caucasian only.	86.21%	829	748	871
Black / African American	The respondent self-identifies as Black or African American only.	3.36%	835	769	862
Hispanic / Latino	The respondent self-identifies as Hispanic or Latino only.	2.37%	828	766	851
Asian / Asian American	The respondent self-identifies as Asian or Asian American only.	4.04%	785	725	812
All Other Races	The respondent self-identifies as a different race or two or more races.	4.03%	823	757	850
<b>Socioeconomic Variables</b>					
Income <40k	Household annual income <\$40,000	15.57%	825	753	858
Income 40k-70k	Household annual income \$40,000-\$69,999.	23.29%	831	753	871
Income 70k-100k	Household annual income \$70,000-\$99,999	21.74%	831	754	870
Income 100k-150k	Household annual income \$100,000-\$149,999.	19.86%	827	747	869
Income >150k	Household annual income >\$150,000	12.40%	821	738	865



No Income Disclosed	Household income not disclosed	7.14%	817	727	865
Education (No HS)	Respondent did not complete high school.	0.67%	828	763	848
Education (No College)	Respondent completed high school but did not complete college.	42.70%	835	756	873
Education (College)	Respondent has a four-year degree.	34.56%	822	744	863
Education (Grad)	Respondent has a graduate or advanced degree.	22.07%	821	740	866
Credit Cat 1 (Exc)	Respondent identifies their credit history as excellent.	65.94%	830	748	873
Credit Cat 2 (Good)	Respondent identifies their credit history as good.	22.63%	824	752	857
Credit Cat 3 (Fair)	Respondent identifies their credit history as fair.	7.25%	820	748	850
Credit Cat 4 (Poor)	Respondent identifies their credit history as poor.	2.85%	818	746	845
No Credit Reported	Credit history not disclosed.	1.35%	809	729	858
Rural Dweller	Respondent lives in a rural area.	24.27%	836	756	879
Suburban Dweller	Respondent lives in a suburban area.	58.48%	824	743	865
Urban Dweller	Respondent lives in an urban area.	17.26%	826	756	861
Home-Own	Respondent owns their home.	80.71%	829	747	871
Home-Rent	Respondent rents their home.	15.60%	821	756	850
Home-Other	Respondent's home status listed as 'other'.	3.69%	811	741	840
Experiential Variables					
Years w Insurer (0)	Respondent has switched auto insurance carriers within the past year.	3.14%	826	778	833
Years w Insurer (1-2)	Respondent switched auto insurance carriers 1-2 years ago.	23.56%	820	761	844
Years w Insurer (3-4)	Respondent switched auto insurance carriers 3-4 years ago.	12.15%	814	737	855
Years w Insurer (>4)	Respondent switched auto insurance carriers more than four years ago.	59.58%	833	743	874
High Mile Driver (>25000)	Respondent drives more than 25,000 miles per year.	11.32%	833	769	864
Prior Auto Claim	Respondent previously filed an auto claim with their current auto insurance carrier.	50.59%	842	750	--
<i>n</i> = 95,375					

<sup>a</sup> Variable minimum and maximum values are 0 / 1 for all categorical variables. Minimum and maximum for all satisfaction variables are 100 / 1000. Minimum and maximum values for the governor's win percentage are 40.7% / 76.5%. Minimum and maximum values for the state average auto premium are \$633.40 / \$1,549.98. Minimum and maximum values for the insurance commissioner's tenure are 1 / 16 years. Minimum and maximum values for the respondent's age are 18 / 98 years. Minimum and maximum values for the number of minor children in the household are 0 / 5.

<sup>b</sup> Satisfaction averages for the Minor Children variable are based on whether the respondent reports one or more minor children in the home. However, the variable represents a count of the number of minor children in the house (any number over five is reported as five).

Table 1 contains variable descriptions for our dependent and control variables, along with satisfaction variable means for each binary control variable (those with a 0/1 value).

Each satisfaction variable ranges from 100–1,000. Mean values differ across our three metrics: CSAT mean is 827, Price satisfaction mean is 748, and Claims satisfaction is 868. We separate control variables by category and discuss each below.

**Regulatory Variables:** We observe the type of insurance supervisor, rating system, and fault system for each respondent. Elected supervisors represent about 24% of our sample. About 38% of our sample live in a prior approval rating state, 10% in a flex rating state, and only 0.2% in an open rating state. The rest of our respondents live in a file-and-use, use-and-file, or mixed-rating state.<sup>8</sup> We observe that about 33% of our sample live in a no-fault state, 19% live in an add-on state, and just under half are governed by a tort fault system. Additionally, we separate no-fault respondents into dollar and verbal threshold systems. A greater proportion of respondents live in verbal threshold states than dollar threshold states (24% vs. 9%).

We also measure some other state-specific factors, including the governor's political party (40% of our sample live in a state with a Democratic governor), an indicator variable for whether or not the governor won a large majority of votes in the last election (31% of our sample)<sup>9</sup>, the state's average automobile insurance premium, and the insurance commissioner's length of service, which ranges from 1 to 16 years.

In Table 1, we observe mean CSAT, Price, and Claims values conditional upon these regulatory variables. The conditional mean values of the satisfaction variables do not vary widely from the sample mean values.

**Demographic Variables:** J.D. Power collects information on respondents' personal and socioeconomic characteristics, which we employ as control variables. About 43% of our respondents are male. The average age is 55 (range 18–98). 78% of the sample are married, 8% single, 2% widowed, 6% divorced, and 6% in a partner arrangement. We observe some differences in mean satisfaction across marital status. Married and widowed individuals display greater CSAT and Claims satisfaction, especially compared to single individuals. We also include variables that identify whether insurance decisions are made as a household joint decision (47%) and for the number of minor children present in the household. On average, there are 0.45 children present in a respondent household, which indicates a relatively large proportion of childless households in the sample.

We also observe the respondents' self-identified racial groups. 86% of our sample are White, which is considerably above the national average. Similarly, only 3.36% of our sample identify as Black, below the national average. Only 2.37% of the sample identify as Hispanic/Latino, although there may be some confusion around this question, as some surveys identify Hispanic/Latino as an ethnicity and not a race. About 4% of the sample identify as Asian, and 4% identify as a different race or two or more races. We observe that Black and Hispanic respondents display higher price satisfaction than other respondents. Asian respondents display lower mean satisfaction values for all satisfaction variables.

8. The rating categories are reported for private passenger automobile insurance. Information on rating systems, as well as other regulatory variables, is collected from the NAIC's "Auto Insurance Database Report."

9. A recent study in the *Journal of Marketing* found that political identity was significantly associated with differences in customer satisfaction and that different political ideologies reacted differently to positive and negative company interactions (Fernandes et al., 2022). Specifically, conservative respondents were associated with greater overall satisfaction. We control for the governor's party and whether the governor won their election by a large margin to control for the state's current political environment.

**Socioeconomic Variables:** We control for respondents' income, education, credit score, and living status. Most of our respondents (about 60%) have incomes below \$100,000 per year. We also include a variable for individuals who do not disclose their income (7% of the sample) because these individuals consistently display lower CSAT and Price satisfaction values than others. We separate educational status into four categories: no high school, high school diploma, four-year degree, and graduate/advanced degree.<sup>10</sup> We also include four credit rating categories self-reported by the respondent. Nearly two-thirds of our sample report that they have "excellent" credit, while less than 3% report "poor" credit. While mean Price satisfaction is roughly the same for all categories, CSAT and claims satisfaction fall as credit quality 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 final 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 year, individuals that switched 1-2 years ago, individuals that switched 3-4 years ago, and individuals with their insurer for 4+ years (this is generally how the data are reported by J.D. Power). Our univariate findings show that Price satisfaction is highest for individuals who just switched insurers (likely the respondent switched to obtain a lower price) but that claims satisfaction is highest for those with their insurers the longest. The insurer may devote more resources to their customers with the greatest longevity during the claims process. We also include controls for high-mile drivers (those that drive at least 25,000 miles per year) and for those with a prior auto insurance claim with their current insurance carrier.

## Univariate Results - Claims Only Sample

**Table 2:** Claims Only Sample - Variable Summary Values and Satisfaction Averages by Categorical Variable

Variable	Mean	CSAT	Price
Dependent Variables			
Customer Satisfaction Index	841.74		
Price Satisfaction	750.07		
Regulatory Variables			
Elected Ins Cmsr	24.80%	838	755
Prior Approval Rating	37.28%	843	755
No File Rating	0.18%	838	764
Flex Rating	10.64%	844	749
No-Fault State	32.71%	841	744
No-Fault Dollar Threshold	9.92%	841	744
No-Fault Verbal Threshold	22.79%	844	744
Add-on Fault State	19.76%	842	751
Tort State	47.53%	842	754
Democratic Governor	41.66%	838	748
Gov Vote Safe	32.00%	843	759

10. Individuals who completed a trade degree but no college are included in the high school category.

Gov Win Pct	54.70%		
State Average Premium	1023.07		
Ins Cmsr Tenure	4.75		
Demographic Variables			
Gender (Male = 1)	45.94%	842	749
Age	56.39		
Married	81.40%	846	753
Single	6.77%	812	739
Widowed	1.70%	842	736
Divorced	5.24%	831	736
Partner	4.89%	830	743
Joint Purchase	48.58%	842	747
Minor Children <sup>b</sup>	0.42	831	746
White / Caucasian	87.83%	844	750
Black / African American	2.85%	845	767
Hispanic / Latino	2.00%	837	761
Asian / Asian American	3.63%	795	725
All Other Races	3.69%	834	759
Socioeconomic Variables			
Income <40k	11.63%	836	752
Income 40k-70k	21.59%	846	754
Income 70k-100k	22.63%	845	755
Income 100k-150k	21.93%	842	750
Income >150k	14.50%	837	743
No Income Disclosed	7.72%	836	735
Education (No HS)	0.45%	835	763
Education (No College)	38.65%	849	756
Education (College)	35.61%	836	746
Education (Grad)	25.30%	839	747
Credit Cat 1 (Exc)	69.45%	845	751
Credit Cat 2 (Good)	21.32%	835	751
Credit Cat 3 (Fair)	5.99%	831	743
Credit Cat 4 (Poor)	2.07%	830	747
No Credit Reported	23.89%	828	732
Rural Dweller	59.51%	851	759
Suburban Dweller	16.60%	838	744
Urban Dweller	84.61%	840	759
Home-Own	12.22%	844	750
Home-Rent	3.17%	833	756
Home-Other	2.07%	821	741
Experiential Variables			
Years w Insurer (0)	1.96%	823	773
Years w Insurer (1-2)	11.63%	830	765
Years w Insurer (3-4)	8.70%	829	739

Years w Insurer (>4)	76.74%	845	748
High Mile Driver (>25000)	13.02%	844	772
<i>n</i> = 48,254			

<sup>a</sup>Variable minimum and maximum values are 0 / 1 for all categorical variables. Minimum and maximum for all satisfaction variables are 100 / 1000. Minimum and maximum values for the governor's win percentage are 40.7% / 76.5%. Minimum and maximum values for the state average auto premium are \$633.40 / \$1,549.98. Minimum and maximum values for the insurance commissioner's tenure are 1 / 16 years. Minimum and maximum values for the respondent's age are 18 / 98 years. Minimum and maximum values for the number of minor children in the household are 0 / 5.

<sup>b</sup>Satisfaction averages for the Minor Children variable are based on whether the respondent reports one or more minor children in the home. However, the variable represents a count of the number of minor children in the house (any number over five is reported as five).

We report variable means and CSAT and Price satisfaction means by variable for the subsample of respondents with a prior auto insurance claim in Table 2. The claims satisfaction data reported in the J.D. Power data relate specifically to claims filed with the respondent's insurer, although they may include collision, comprehensive, and injury claims. We discuss the notable differences from the full sample below. CSAT is higher (841 vs. 827) for those with a prior claim. Price satisfaction is 750 for the subsample versus 748 for the full sample.

For the regulatory variables, we do not observe significantly different mean values in the subsample than for our full sample. This does not seem to indicate that individuals are more likely to have an auto claim based on their regulatory environment. Generally, the conditional mean satisfaction values do not deviate much from the subsample mean. However, Price satisfaction is 764 in the no-file jurisdiction versus 755 in prior approval states and 749 in flex rating states.

Within our demographic variables, we observe that prior claimants - relative to the full sample of respondents - are slightly more often male, about 1.5 years older, and are a little more likely to be married. Within our socioeconomic variables, prior claimants tend slightly toward the upper-income brackets, are more educated, and appear more in the highest credit category. Prior claimants also have a higher tendency to be homeowners (rather than renters).

We note and emphasize that the prior claimant variable means that the respondent had a prior claim *with their current insurer*. Thus, there may be a sample bias toward individuals who stayed with their insurer versus those who switched after a claims experience. We cannot conclude from our data that individuals who are older, married, more educated, higher earners, own a home, and with good credit, are more likely to experience an insurance claim; rather, these individuals appear more likely to remain with their insurer after a claim.

The insurance experience variables support this notion. For prior claimants, 77% of respondents have been with their insurer for 4+ years. For the full sample, this value is only 60% - a difference in proportions of nearly 30 percent.

## Multivariate Results - Full Sample

We perform multivariate ordinary least squares (OLS) regression for the three satisfaction variables. Many of our results are consistent across the different dependent variables, which may lead to the question of whether the different satisfaction variables measure the same effects. Correlation is high among the dependent variables - 79.5%

between CSAT and Price, 88% between CSAT and Claims, and 54% 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 Analysis: CSAT, Price, and Claims Satisfaction

VARIABLES	CSAT Coef.	p-value	Price Coef.	p-value	Claims Coef.	p-value
Elected Cmsr	-4.304**	0.034	-5.279*	0.055	-4.503	0.182
Prior Approval Rating	5.384***	0.005	4.994*	0.052	3.906	0.222
No File Rating	-21.612*	0.064	-25.662*	0.076	-17.543	0.259
Flex Rating	6.198***	0.006	11.539***	<0.01	5.147	0.159
No-Fault State	-3.411	0.107	-0.713	0.802	6.527*	0.060
No-Fault (Dollar Threshold)	0.247	0.925	3.006	0.396	-9.217**	0.031
Add-on Fault State	-7.493***	<0.01	-7.925***	<0.01	-7.136***	0.005
Democratic Governor	-1.663	0.250	-3.328*	0.086	-4.060*	0.081
Gov Vote Safe	6.099***	<0.01	11.454***	<0.01	2.107	0.334
State Average Premium	-0.019***	<0.01	-0.050***	<0.01	-0.020***	0.002
Ins Cmsr Tenure	-0.133	0.559	0.463	0.126	0.043	0.908
Gender (Male = 1)	-8.781***	<0.01	-4.301***	0.002	-9.016***	<0.01
Age	-1.514***	<0.01	-3.273***	<0.01	-1.222***	0.002
Age Squared	0.023***	<0.01	0.032***	<0.01	0.024***	<0.01
Single	-9.047***	<0.01	-13.398***	<0.01	-16.054***	<0.01
Widowed	-12.269***	0.001	-15.198***	0.003	-15.322**	0.016
Divorced	-7.003***	0.002	-11.442***	<0.01	-9.632**	0.013
Partner	-1.389	0.507	-6.010**	0.033	-6.756*	0.078
Joint Purchase	-4.085***	<0.01	-3.890***	0.004	-4.097**	0.012
Minor Children	6.055***	<0.01	6.659***	<0.01	3.417***	0.001
White / Caucasian	14.575***	<0.01	8.542***	<0.01	22.978***	<0.01
Black / African American	25.889***	<0.01	26.173***	<0.01	30.376***	<0.01
Hispanic / Latino	23.896***	<0.01	20.300***	<0.01	28.183***	<0.01
Income <40k	2.014	0.337	8.781***	0.002	-2.050	0.558
Income 40k-70k	5.878***	0.001	9.292***	<0.01	4.012	0.141
Income 70k-100k	7.478***	<0.01	11.807***	<0.01	4.739*	0.065
Income 100k-150k	4.388***	0.008	6.066***	0.006	3.298	0.187
No Income Disclosed	-10.695***	<0.01	-11.777***	<0.01	-9.783***	0.004
Education (No HS)	22.176***	0.002	27.522***	0.003	1.975	0.886
Education (No College)	21.450***	<0.01	21.279***	<0.01	16.950***	<0.01
Education (College)	8.075***	<0.01	7.333***	<0.01	6.329***	0.001
Credit Cat 1 (Exc)	13.085***	<0.01	17.778***	<0.01	15.094***	0.003
Credit Cat 2 (Good)	7.944***	0.004	13.847***	<0.01	7.220	0.161
Credit Cat 3 (Fair)	2.429	0.434	3.854	0.355	2.591	0.658
Rural Dweller	8.074***	<0.01	7.980***	<0.01	11.066***	<0.01
Urban Dweller	5.874***	<0.01	9.385***	<0.01	5.903***	0.007

Home-Own	1.905	0.507	5.448	0.159	2.019	0.695
Home-Rent	4.415	0.133	6.422	0.105	1.619	0.763
Years w Insurer (0)	10.116***	0.001	33.404***	<0.01	-19.924***	0.003
Years w Insurer (1-2)	4.735***	<0.01	22.125***	<0.01	-12.138***	<0.01
Years w Insurer (3-4)	-4.573***	0.002	-0.302	0.880	-7.545***	0.006
High Mile Driver (>25000)	7.661***	<0.01	17.989***	<0.01	10.508***	<0.01
Prior Claim	24.719***	<0.01	3.569***	0.009		
Observations	95,375		95,375		48,254	
R-squared	0.054		0.047		0.047	

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 0.01, 0.05, and 0.10 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 (2008) that elected supervisors can be influenced by special interest groups.<sup>11</sup> 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 (1987) find a negative relation between prior approval rating and average prices, although Grace and Phillips (2008) do not find a significant relation between prior approval rating and prices.<sup>12</sup>

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.<sup>13</sup>

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 be a result of adverse selection among different driver classes (Cummins & Weiss, 1993). Additionally, add-on systems have been associated with the greatest total bodily injury costs (Johnson et al., 1992), although the authors caution that some states adopt a no-fault or add-on system to address high prices, which may bias results.

States with a Democratic governor exhibit lower Price and Claims satisfaction, although the finding is of marginal significance (p-values 8.6% and 8.1%). CSAT and

11. Grace and Phillips (2008) find this especially true for elected supervisors who seek *higher* political office or transfer into private industry after their regulatory tenure, which we do not control for or test.

12. Grace and Phillips (2008) find that prior approval rating leads to higher prices in some cases where the regulator is elected or likely to seek higher political office.

13. For example, if insurers are unlikely to obtain significant rate change approval via a prior approval, use and file, or file and use system, they may try to "average" some of the rate increases across all risk classes. This could lead to adverse selection problems in the pool and especially dissatisfaction among standard and low-risk types.

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 1 and 2. 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 of income below \$150,000, which indicates that the highest earners in our sample are generally less satisfied with how much they pay for auto insurance. CSAT values are greatest for those earning between \$40,000 and \$150,000. Additionally, we observe a large, significant negative coefficient for those that do not report their income.<sup>14</sup>

Related to education, satisfaction is generally higher for all respondents without a graduate degree than those with a graduate degree. However, the least educated respondents are not more claims-satisfied than those with an advanced degree. Many states allow premium reductions to drivers based on educational attainment, so the finding that the most educated respondents are generally less satisfied is somewhat surprising.

Respondents in the top credit category exhibit the greatest CSAT, Price, and Claims satisfaction. There is significant academic and trade press on credit rating and auto insurance, and generally, those with better credit pay less for their auto insurance. Perhaps these individuals also receive greater service during the claims process. CSAT and Price satisfaction are also significantly positive for those in the second credit category (good) relative to those in the lower categories but with lower coefficient values than those in the top category. Claims satisfaction is not significantly different for the bottom three credit categories.

We find rural drivers are the most satisfied across all satisfaction metrics, followed by urban drivers, relative to suburban drivers. While auto premiums tend to be higher

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14. We include the category for those who do not report income because this group is fairly large (over 7% of our sample) and because these individuals generally report the least satisfaction with all aspects of their insurance transaction. One potential explanation is that the respondents least satisfied with their insurance wish to report their dissatisfaction but want to limit their personal information.



in urban areas (Insurance Information Institute, 2023), fatal accident rates tend to be higher in rural areas (U.S. Department of Transportation, 2021). 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, 1995). 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.”<sup>15</sup>

**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.<sup>16</sup>

**Fixed Effects:** We include fixed effect controls for the response year, the respondent’s census region, and the respondent’s auto insurance carrier.<sup>17, 18</sup> 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 insurer. The subsample sizes are similar: 48,254 respondents report a prior claim, while 47,121 report no prior claim with their current insurer. The differences in findings are discussed below.

15. “Other” living conditions include living with family, roommates, and those between housing arrangements.

16. The prior claim variable specifically reports respondents who filed a claim with their *current* insurer and not a prior insurer or a third-party insurer.

17. We do not know if individuals were invited to take the survey in multiple years over the sample period (2016-2018) as this is not reported by J.D. Power, but the panel is not designed to be “balanced” across respondents. There is a roughly equivalent number of responses in each survey year.

18. J.D. Power provides a unique code for the auto insurance companies in their sample, but this is not the insurer’s NAIC company or group code.

**Table 4:** Prior Claim Sample – Multivariate Regression Analysis: CSAT and Price Satisfaction

VARIABLES	CSAT Coef.	p-value	Price Coef.	p-value
Elected Ins Cmsr	-5.730**	0.040	-7.738*	0.051
Prior Approval Rating	8.454***	0.001	8.274**	0.026
No File Rating	-23.143	0.105	-21.229	0.255
Flex Rating	9.999***	0.001	18.453***	<0.01
No-Fault State	1.670	0.560	4.530	0.263
No-Fault (Dollar Threshold)	-5.431	0.126	-3.037	0.542
Add-on Fault State	-6.286***	0.003	-7.838***	0.008
Democratic Governor	-6.177***	0.001	-8.862***	0.001
Gov Vote Safe	3.979**	0.028	10.260***	<0.01
State Average Premium	-0.025***	<0.01	-0.067***	<0.01
Ins Cmsr Tenure	0.074	0.809	0.934**	0.027
Gender (Male = 1)	-9.235***	<0.01	-4.725**	0.013
Age	-1.827***	<0.01	-4.333***	<0.01
Age Squared	0.026***	<0.01	0.041***	<0.01
Single	-17.360***	<0.01	-21.159***	<0.01
Widowed	-14.915***	0.005	-19.580***	0.009
Divorced	-12.491***	<0.01	-16.408***	<0.01
Partner	-7.169**	0.023	-10.482**	0.018
Joint Purchase	-5.500***	<0.01	-4.458**	0.018
Minor Children	3.893***	<0.01	4.369***	<0.01
White / Caucasian	17.973***	<0.01	11.284***	0.001
Black / African American	28.451***	<0.01	27.556***	<0.01
Hispanic / Latino	25.568***	<0.01	16.267**	0.024
Income <40k	0.305	0.918	9.613**	0.020
Income 40k-70k	5.837**	0.010	10.493***	0.001
Income 70k-100k	6.433***	0.003	11.405***	<0.01
Income 100k-150k	3.927*	0.058	6.418**	0.028
No Income Disclosed	-8.261***	0.004	-7.010*	0.074
Education (No HS)	11.534	0.324	24.680	0.131
Education (No College)	19.253***	<0.01	19.077***	<0.01
Education (College)	5.978***	<0.01	4.647**	0.039
Credit Cat 1 (Exc)	12.269***	0.003	15.288***	0.008
Credit Cat 2 (Good)	6.540	0.119	10.805*	0.062
Credit Cat 3 (Fair)	2.173	0.649	0.001	1.000
Rural Dweller	8.589***	<0.01	9.096***	<0.01
Urban Dweller	7.414***	<0.01	10.722***	<0.01
Home-Own	2.131	0.621	4.159	0.481
Home-Rent	2.065	0.644	2.753	0.653
Years w Insurer (0)	-10.706*	0.062	11.049	0.160
Years w Insurer (1-2)	-3.502	0.115	16.607***	<0.01
Years w Insurer (3-4)	-6.727***	0.003	-1.616	0.607

High Mile Driver (>25000)	11.305***	<0.01	22.308***	<0.01
Constant	831.140***	<0.01	887.093***	<0.01
Observations	48,254		48,254	
R-squared	0.063		0.063	

<sup>a</sup> 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.

<sup>b</sup>\*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

**Table 5:** No Prior Claim Sample - Multivariate Regression Analysis: CSAT and Price Satisfaction

VARIABLES	CSAT Coef.	p-value	Price Coef.	p-value
Elected Ins Cmsr	-3.771	0.198	-3.725	0.333
Prior Approval Rating	3.787	0.170	2.799	0.436
No File Rating	-21.246	0.251	-31.153	0.156
Flex Rating	2.711	0.412	5.002	0.245
No-Fault State	-7.724**	0.013	-5.029	0.211
No-Fault (Dollar Threshold)	5.133	0.189	9.083*	0.072
Add-on Fault State	-8.759***	<0.01	-8.194***	0.006
Democratic Governor	2.231	0.298	2.012	0.466
Gov Vote Safe	7.855***	<0.01	12.154***	<0.01
State Average Premium	-0.014**	0.019	-0.034***	<0.01
Ins Cmsr Tenure	-0.415	0.218	-0.109	0.803
Gender (Male = 1)	-8.250***	<0.01	-3.721*	0.056
Age	-1.222***	<0.01	-2.400***	<0.01
Age Squared	0.018***	<0.01	0.023***	<0.01
Single	-2.537	0.385	-7.035*	0.064
Widowed	-8.420	0.110	-10.286	0.146
Divorced	-2.332	0.447	-7.318*	0.070
Partner	3.054	0.275	-2.601	0.479
Joint Purchase	-2.752*	0.067	-2.816	0.144
Minor Children	8.004***	<0.01	8.500***	<0.01
White / Caucasian	11.175***	<0.01	5.559*	0.084
Black / African American	23.360***	<0.01	24.006***	<0.01
Hispanic / Latino	21.294***	<0.01	22.337***	<0.01
Income <40k	4.363	0.156	8.537**	0.030
Income 40k-70k	7.263***	0.007	8.827**	0.011
Income 70k-100k	9.838***	<0.01	12.968***	<0.01
Income 100k-150k	5.304**	0.050	5.668*	0.098
No Income Disclosed	-12.949***	<0.01	-17.167***	<0.01
Education (No HS)	29.140***	0.001	31.895***	0.005
Education (No College)	25.286***	<0.01	25.277***	<0.01
Education (College)	11.578***	<0.01	11.579***	<0.01
Credit Cat 1 (Exc)	15.053***	<0.01	19.869***	<0.01
Credit Cat 2 (Good)	10.314***	0.005	16.465***	0.001
Credit Cat 3 (Fair)	2.725	0.504	6.443	0.228

Rural Dweller	7.336***	<0.01	6.853***	0.002
Urban Dweller	5.320***	0.006	8.458***	0.001
Home-Own	1.837	0.633	6.733	0.190
Home-Rent	5.256	0.177	8.998*	0.083
Years w Insurer (0)	21.577***	<0.01	43.594***	<0.01
Years w Insurer (1-2)	10.314***	<0.01	25.112***	<0.01
Years w Insurer (3-4)	-0.184	0.928	2.336	0.374
High Mile Driver (>25000)	6.318***	0.008	14.548***	<0.01
Constant	776.157***	<0.01	766.880***	<0.01
Observations	47,121		47,121	
R-squared	0.033		0.036	

<sup>a</sup> 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.

<sup>b</sup> \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

**Regulatory Variables:** For prior claimants, the elected and prior approval findings are consistent with the full sample results. However, there is no significance in these values for those without a claim. The result for flex rating is also consistent between the full sample and prior claim sample, but there is no significance on the flex rating variable in the no prior claim sample. No-fault is not significantly 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 significantly 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 by a large majority. Both subsamples also demonstrate a consistent, negative finding 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 only present for prior claimants.

Individuals typically do not have many interactions with their auto insurance company. For many individuals, interactions occur at policy inception, when modifying coverage, at renewals, and when a claim occurs. The claims experience is also generally more involved than any of the other interactions. The differences in findings based on claims for our regulatory variables indicates that these experiences largely 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 largely 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 years generally exhibit significantly less CSAT than others. However, Price satisfaction is highest for those who switched 1-2

years ago relative to all other respondents. In the no prior claim subsample, CSAT and Price satisfaction are significantly higher for those who switched up to two years ago, with a very large Price satisfaction coefficient for recent switchers. In both subsamples, we again find a positive association between satisfaction and high-mile drivers.

Because those with a claim that switched insurers within the past four years are generally less satisfied than other insureds, our results may indicate that insurers provide greater service to consumers with more longevity. The positive relationship between non-claimants and satisfaction measures could also indicate that insureds dissatisfied by a claim are likely to switch carriers.

### Multivariate Results - Determinants of High and Low Satisfaction

We create categorical variables for high and low CSAT, Price, and Claims satisfaction and examine the determinants of a respondent falling into one of these categories. The regulatory results from these analyses are discussed below. The same controls are used in these analyses as prior models, but the results are generally directionally similar and are excluded for brevity.

**Table 6:** Logistic Regression Analysis: High Satisfaction Determinants

VARIABLES	CSAT Coef.	p-value	Price Coef.	p-value	Claims Coef.	p-value
Elected Cmsr	-0.048	0.113	-0.034	0.268	-0.051	0.247
Prior Approval Rating	0.051*	0.075	0.013	0.651	<0.01	0.991
No File Rating	-0.306*	0.072	-0.547***	0.003	-0.169	0.469
Flex Rating	0.085**	0.012	0.082**	0.017	0.031	0.525
No-Fault State	-0.041	0.196	-0.001	0.970	0.087*	0.057
No-Fault (Dollar Threshold)	-0.040	0.316	-0.029	0.479	-0.116**	0.041
Add-on Fault State	-0.087***	<0.01	-0.075***	0.001	-0.076**	0.021
Democratic Governor	-0.054**	0.013	-0.077***	0.001	-0.046	0.136
Gov Vote Safe	0.046**	0.019	0.093***	<0.01	0.050*	0.081
State Average Premium	-0.0003***	<0.01	-0.0004***	<0.01	-0.0002***	0.009
Ins Cmsr Tenure	0.003	0.440	0.006*	0.062	0.007	0.174

<sup>a</sup> Dependent Variable = 1 if CSAT, Price, and Claims Satisfaction are  $\geq 900$ , respectively. Prior model control variables are included in this analysis but not reported for brevity. Control variables results are directionally similar to OLS results.

<sup>b</sup> 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.

<sup>c</sup> \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Elected insurance commissioners are not significantly associated with high satisfaction. Prior approval is positively associated with high CSAT, although significance is marginal. No file rating is negatively associated with high CSAT and Price satisfaction. Additionally, the flex rating is positively associated with the same, which is consistent with our OLS findings.

No-fault is positively associated with high Claims satisfaction, but no-fault with a dollar threshold is negatively associated with high Claims satisfaction, consistent with OLS results. Add-on fault is negatively associated with all of the high satisfaction variables.

Respondents with Democratic governors are less likely to exhibit high CSAT and Price satisfaction, but respondents in states where the governor won by a large margin are more likely to exhibit high satisfaction values. A lower average state auto insurance premium is positively associated with high satisfaction scores.

**Table 7:** Logistic Regression Analysis: Low Satisfaction Determinants

VARIABLES	CSAT Coef.	p-value	Price Coef.	p-value	Claims Coef.	p-value
Elected Cmsr	0.095***	0.005	0.106***	0.001	0.067	0.295
Prior Approval Rating	-0.087***	0.007	-0.077**	0.013	-0.075	0.210
No File Rating	0.111	0.550	0.128	0.480	0.116	0.721
Flex Rating	-0.078**	0.041	-0.164***	<0.01	-0.154**	0.030
No-Fault State	0.059	0.101	0.043	0.204	-0.036	0.587
No-Fault (Dollar Threshold)	-0.055	0.221	-0.129***	0.003	0.044	0.587
Add-on Fault State	0.094***	<0.01	0.070***	0.005	0.140***	0.002
Democratic Governor	0.007	0.763	0.008	0.736	0.026	0.557
Gov Vote Safe	-0.082***	<0.01	-0.115***	<0.01	-0.023	0.575
State Average Premium	0.0002***	0.002	0.0004***	<0.01	0.0003**	0.030
Ins Cmsr Tenure	0.001	0.811	-0.006*	0.079	0.003	0.651

<sup>a</sup> Dependent Variable = 1 if CSAT < 750 and Price and Claims Satisfaction are < 700, respectively. Prior model control variables are included in this analysis but not reported for brevity. Control variables results are directionally similar to OLS results.

<sup>b</sup> 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.

<sup>c</sup> \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Elected commissioners are positively related to low CSAT and Price satisfaction. Additionally, prior approval rating is negatively related to low CSAT and Price satisfaction (meaning respondents in prior approval states are *less likely* to report low satisfaction values). Flex rating is also negatively related to the low satisfaction variables.

The no-fault variables generally exhibit no significance with the low satisfaction variables, although no-fault states with a dollar threshold are less likely to be associated with low Price satisfaction. Add-on fault states are positively associated with low satisfaction variables.

There is no significant relationship between the governor's party and low satisfaction variables, but respondents in states with a large governor win are less likely to exhibit low CSAT and Price satisfaction. The average state auto insurance premium is positively associated with low satisfaction.

## Conclusion

We obtain data from J.D. Power on automobile insurance satisfaction responses, which include numerous individual respondent characteristics. We add state-level data on political and insurance regulatory factors and relate respondents' satisfaction to regulatory regime and personal factors.

Most individuals are aware of their auto insurance provider during the shopping and claims experience. We individually examine each of these satisfaction attributes (Price and Claims satisfaction) and further separate our sample based on whether

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

Some of our findings are that respondents are generally less satisfied in jurisdictions with an elected insurance commissioner and add-on fault systems. Respondents are generally more satisfied in states with prior approval or flex rating. Additionally, satisfaction is generally higher in states where the governor won the last election by a large majority and states with lower average automobile insurance premiums. There is limited evidence that the governor's party affects satisfaction.

Consumer satisfaction is tied to trust, and trust is associated with purchasing decisions. Insurance purchases are important to consumer and societal welfare, especially 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 carefully consider the impact of their policies on insurance processes, which can ultimately alter consumers' purchase decisions. While regulators are not tasked with improving consumer satisfaction, the impact of dissatisfaction may lead to negative results in the insurance markets they regulate.

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