
Private Passenger Auto Premium Rating Error: Industry Estimates for 2005

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In 2005, the private passenger auto insurance industry lost \$16.2 billion because of premium rating error. This estimate is based on nationwide premium audits conducted by Quality Planning Corporation during 2005. Premium rating error represents 9.9 percent of a total \$163 billion in personal auto written premium.

This report aggregates and summarizes audit results of more than 18 million policies from 20 major carriers. The sample includes substandard to preferred books of business, all distribution channels, and national and regional carriers.¹ Sample results were weighted to reflect the total national private passenger auto line.

Types of Rating Error

The audits found substantial rating error exists in all common factors used to determine auto premium. The following table presents losses by rating factor.

| <i>Private Passenger Auto</i> | <i>Percent of Premium</i> | <i>Total Error Cost (\$ Billions)</i> |
|---|---------------------------|---------------------------------------|
| Vehicle Rating Factors | | |
| Commute | 1.10% | 1.8 |
| Annual Mileage | 0.95% | 1.5 |
| Vehicle Usage | 0.90% | 1.5 |
| Vehicle Characteristics, Discounts ² | 0.40% | 0.7 |
| Rated Territory | 0.95% | 1.5 |
| <i>Vehicle Subtotal</i> | 4.30% | 7.0 |
| Driver Rating Factors | | |
| Unrated Operators | 1.40% | 2.3 |
| Vehicle-Driver Assignment | 1.10% | 1.8 |
| Driver Characteristics, Discounts ³ | 1.40% | 2.3 |
| Violations/Accidents | 1.40% | 2.3 |
| <i>Driver Subtotal</i> | 5.30% | 8.7 |
| Other Rating Factors ⁴ | 0.30% | 0.5 |
| Total Rating Error | 9.90% | 16.2 |

¹ The sample was limited to audits where Quality Planning retained contractual rights to aggregate data for industry analysis.

² Includes symbol, safety discounts such as alarms, and vehicle body type discounts.

³ Includes years of driving experience, age, marital status, student discounts, affinity group membership, driver identification such as DL and SSN.

⁴ These factors vary greatly by carrier, including multi-car discounts, years insured, credit score, and multiple policy.

Rating error costs were found to vary greatly by individual insurer. The amount and kind of rating error vary by many factors, including characteristics of the book of business, geographic location, distribution channels, rating plan, systems history, regulatory environment, relations with sales agents, and underwriting standards.

Changes from 2004

The year 2005 saw a dramatic increase in the price of gasoline. Average cost per gallon rose from \$1.73 in 2004 to \$2.17 in 2005, spiking at almost \$3 in August 2005. Surprisingly, this increase does not appear to have translated into either lower annual mileage driving patterns nor lower associated rating errors. This finding is consistent with National Highway Administration findings of decreases in average annual mileage of less than two percent.

We found a small upward trend in the misreporting of address and youthful drivers. The trend was most striking in large urban areas where vehicle garaging location may dramatically affect premium.

Outlook for 2006 – 2007

Despite the dramatic run-up in gasoline prices, there is little evidence to suggest the miles consumers drive each year will decline any time soon. Americans continue to grouse about prices at the pump but have not yet been moved to alter their driving habits.

QPC has also observed continued lengthening of commute distances as new housing developments move farther from central city work hubs. With the Northeast a noted exception, mass transit systems are not keeping pace with these extended commutes. This continues a long-term trend of a more than 20 percent average increase in commute distances since 1969.

Unlisted operators will continue to plague auto insurers, as they have since this report was first published in 2001. Nationwide, one to two percent of all policies written include an unrated operator who is most often a high-premium younger driver. Rated properly, these policies account for over \$2 billion of annual premium leakage. Permissive-use policy language and general insurance company indifference suggest this trend will continue into the foreseeable future.

Costs of Rating Error

Direct Premium Losses

For individual carriers, opportunities for profit gains in rating error reduction are significant. In a good year, individual carriers can expect to realize average profits of five percent of premium. Under such circumstances, each one percent reduction in error results in a 20 percent profit gain.

Risk Management Costs

Rating error leads directly to failures in risk management. As an example, policies with unrated 16-year-old male drivers in the household experience an average loss-ratio of more than 200 percent.

Business Management Costs

The modern insurer relies on rating and underwriting data in all primary areas of corporate management. Policy data provides key inputs to marketing, sales, business segmentation, financial planning, corporate planning, and staff compensation, among others. Errors, or worse still, systematic biases in underwriting data deteriorate performance in all management functions because they are all subject to the same “iron law” of information—garbage in means garbage out.

Moral Hazard Costs

An often-overlooked cost of rating error is moral hazard. Our analyses have repeatedly demonstrated that individuals who misreport policy rating information are associated with high loss experience. For example, an individual driving 30,000 miles per year but reporting an annual mileage of 5,000 will, on the average, have higher claim costs than an individual driving 30,000 miles and correctly reporting that fact. Rating misreporting is indicative of high general risk.

Rating error causes honest insured drivers to subsidize dishonest insured drivers. Rating error results in low-risk drivers subsidizing high-risk drivers. It results in those who drive low mileages subsidizing those with high mileages.

Similarly, the majority of sales agents who work to determine premium accurately have a strong interest in rating integrity. In the absence of meaningful controls, the honest agent is placed at a competitive disadvantage by the minority of agents willing to rate a policy falsely in order to close a sale.

Causes of Rating Error

Rating error can be introduced at all stages of the underwriting cycle: sales, underwriting, policy servicing and renewal. We know that significant error occurs at initial application because annual mileage is systematically under-reported. This occurs first due to specific “mileage bands.” As a result of these “bands,” many policyholders are rated in a lower mileage band than they actually drive. Second, while 17% of vehicles are driven more than 20,000 miles per year, only 4% are actually rated in this category.

Americans lead dynamic lives. Every hour, 203 couples marry and 109 divorce. Every hour, 4,900 Americans move, and 7,100 change jobs. Every hour, 12,400 vehicles are registered, of which 2,200 are new. Every hour, 160 drivers are arrested for driving under the influence of alcohol or drugs, while five traffic fatalities occur, and more than 2,000 auto insurance claims are paid. Every hour, 550 new driver’s licenses are issued⁵.

All of this makes personal auto insurance risk management a rapidly moving target. The risk profile of auto policies is constantly changing. Consider job changes. The time is long passed when a worker got a job soon out of school and stayed with the same company throughout a career. In fact, the average worker has held ten jobs by the age of 36. Overall, 25 percent of

⁵ Marriage and divorce statistics from Census Bureau Current Population Reports, move estimates based on 2000 U.S. Census, job change estimates from the Bureau of Labor Statistics, drunk driving arrests from MADD website, traffic fatalities from Department of Transportation, and auto claims paid from National Association of Insurance Commissioners and National Association of Independent Insurers Fast Track.

workers change jobs each year. Individual job change is likely to be associated with changes in vehicle usage, commute distance, and annual mileage.

Unlike homeowners insurance, in personal auto the most basic facts of the policy change frequently. Each year, 52 percent of household auto policies experience a change of vehicles or drivers. Nearly one-third of households replace vehicles each year. These changes, in turn, are associated with changes in vehicle-driver assignment, annual mileage, commuting, and other rating factors.

Insurers provide their policyholders with multiple methods to report changes. Not surprisingly, many changes are not reported. Policyholders are significantly more likely to report life changes that reduce auto premium than report changes that increase their premium. For example, we have found policyholders are five times more likely to report midterm mileage changes that lower annual premium than to report mileage changes that raise premium. Every day, in the course of conducting premium audits, we find examples of younger drivers who retain a policy address of their parents in the suburbs long after they have moved to higher-rated territories in central cities.

About Quality Planning

Quality Planning Corporation, the rating integrity solutions company, was founded in 1985 and is headquartered in San Francisco. A member of the ISO family of companies, QPC is focused exclusively on providing decision integrity solutions to the insurance industry. QPC works with insurance companies to identify areas of significant premium leakage using sophisticated database management, statistical analysis and modeling, customized survey design, and highly targeted customer interaction. For more information, visit www.qualityplanning.com.

Appendix: Audit Methods

The 2005 Premium Rating Error Report aggregates and summarizes audit results of more than 18 million policies from 20 major carriers. The sample includes substandard to preferred books of business, all distribution channels, and national and regional carriers.⁶ Sample results were weighted to reflect the total national private passenger gross written premium.

Two primary methods were used to develop the estimates of rating error: statistical risk estimators and direct measures.

Statistical Risk Estimators: The first method we employ to estimate rating error is to compare the “expected distribution” of rating factors with the “rated distribution.” In the case of annual mileage, the “expected distribution” is the distribution given the characteristics of policies written. We “expect” the average new Ferrari to be driven an average of 3,500 miles per year and the average new Chevy cargo van to be driven more than 20,000 miles. Based on numerous studies of vehicle use patterns, we have estimated and validated equations that develop an “expected mileage” based on vehicle make, model, and year; number of vehicles in the household; garaging ZIP code; number of drivers in the household; age and occupation of driver; and so on. Actual odometer reading data from more than 80 million vehicles was used in developing the statistical models. For every vehicle insured, “expected mileage” is compared with “reported mileage” to detect any patterns of systematic error.

Direct Measures: The second method we use to estimate rating error is direct measurement. For more than one million vehicles in the sample, we had data for multiple odometer readings and were able to evaluate actual annual mileage. In addition, for multiple carriers, we interviewed more than one million policyholders concerning their vehicle usage patterns and annual mileage. Results of the odometer and interview data, in turn, were used to validate and refine the statistical models.

Statistical and direct measures were combined for each carrier in the sample and contrasted with rated values. These were then consolidated for this industry report.

⁶ The sample was limited to audits for which Quality Planning retained contractual rights to aggregate data for industry analysis.