

# Rules of The Road

Predictive modeling can help commercial insurers set premiums.

by Robert J. Walling



► **The News:** Commercial auto insurers gain a competitive edge by adopting the underwriting techniques used by personal lines writers.

► **The Background:** Commercial auto pricing has been based on factors that are arbitrary or difficult to verify.

► **The Payoff:** With new, objective information, underwriters can better determine risk selection and pricing.

**T**he time has come for commercial auto insurance to benefit from the same predictive modeling techniques and strategies that have been a boon to personal-line insurance products.

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Personal auto insurance rating has been revolutionized by decades of enhancements, such as independent vehicle symbols, liability symbols, ZIP code territory rating, motor vehicle record scoring and credit scoring. Now, commercial auto rating plans can enjoy greater predictive risk accuracy as well.

Insurers already pursuing such sophisticated rating plans are realizing the advantages. By taking a closer look at the risks themselves, insurers

are able to determine more accurate “walk-away” prices and more detailed price points. One national commercial insurer, for instance, began using vehicle identification numbers to improve commercial auto classification, much as it does for personal auto.

## Illustrative SIC Rate Relativities



Data shown is for illustrative purposes only. Results have been modified to preserve client confidentiality. Essential details of SIC relativities from commercial auto predictive modeling applications also have been modified or hidden.

SIC	Factors	Descriptions
171X	1.10	Plumbing/HVAC
173X	0.85	Electrical Contractors
175X	1.00	Carpentry
179X	0.95	Misc. Contractors
27XX	0.85	Printing/Publishing
35XX	0.90	Industrial Machinery
507X	0.95	Hardware Wholesaler
514X	1.10	Grocery Wholesaler
571X	0.85	Home Furnishings
581X	0.95	Restaurants
59XX	1.10	Misc. Retail
64XX	0.85	Insurance Agents
65XX	1.05	Real Estate
721X	1.25	Laundry/Dry Cleaning
734X	1.20	Building Services
737X	1.10	Computer Services
76XX	1.05	Misc. Repair Services
80XX	1.00	Health Services
87XX	0.90	Eng. & Mgt. Services

Source: Robert J. Walling

The insurer implemented this new policy after discovering that Peterbilt tractor-trailers were being misclassified as light trucks. Pricing was adjusted accordingly.

Another company found that commercial auto policies charged between 25% and 40% of personal auto rates when it compared commercial auto rates for private passenger-type vehicles to personal auto rates for similar drivers and vehicles. The percentage differences were mainly due to the personal auto rating plan's pricing of vehicle characteristics, such as luxury and sports cars, as well as driver age and moving violations.

### Building a Better Plan

An actuarially sound rate is required to be "not excessive, not inadequate, and not unfairly discriminatory." Classification plays an important role in commercial auto rating because it is the primary means of measuring differences in expected losses between risks based on "fair" criteria. Desirable rating characteristics are:

- **objective**—they aren't subject

to personal judgment

- **verifiable**—they can be validated from a reliable source
- **cost effective**—they are accessible at an economically viable cost
- **predictive**—they accurately differentiate loss potential

The problem is that several commercial auto rating factors do not fully satisfy these criteria. For example, vehicle use can be quite subjective. Vehicle weights, ages, purchase price and radius of operations frequently are not verified. It can be cost-prohibitive to acquire driver motor vehicle records.

The most abused elements of most commercial auto rating plans are the vehicle use and industry classification codes assigned. An ISO-based rating has three vehicle use categories: service (drive to job site only); retail (delivery to homes); and commercial (all other).

These categories create at least two problems.

For starters, since they are not verifiable, these risks are rated as "service" when more competitive pricing is needed and "commercial" when premiums are increasing. Secondly, they are not homogeneous. "Commercial," for example, contains so many different underlying uses that it does not effectively differentiate risk. And while secondary classification codes do show differences by insured industry, they are often underutilized because secondary class often is not verified, resulting in higher rates.

There are alternatives. Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS) codes offer readily available and verifiable solutions to both

vehicle use and secondary classification. Every U.S. company is assigned a single, verifiable SIC and NAICS code. Commercial auto analyses suggest materially different loss expectations by industry class. (See "Illustrative SIC Rate Relativities," left.)

### It Ain't Heavy, It's Extra-Heavy

Other rating factors are being refined as well. Consideration of vehicle weight can be improved for the level of refinement and verifiability. ISO's class plan has four vehicle weight classes: light, medium, heavy and extra-heavy. Alternatively, the Interstate Commerce Commission developed eight weight classes that do a much better job of grouping similar vehicles that are readily verifiable using vehicle identification numbers.

This verifiable approach to vehicle weight also addresses popular misconceptions regarding specific vehicle types. The most common misperception is that all pickup trucks are "light." In truth, most large pickup trucks have gross vehicle weights well in excess of the "light" limit of 10,000 pounds.

VIN decoding software for commercial autos can validate VINs and provide correct ICC weight class. VIN decoding also provides verifiable vehicle age and original price estimates. VIN-based pricing estimates, however, do not include vehicle modifications made post-production, such as cranes, mobile equipment, refrigeration or specialized containers.

For private passenger vehicles, characteristics can be better reflected by using personal auto insurance product vehicle symbol relativities or simplified vehicle characteristic

## Credit Scoring as Part of an Underwriting Scorecard

How five bands of credit scores could be incorporated into a predictive model to develop rating relativities. In this example, the indicated relativities have been scaled so they can be included in an underwriting scorecard.

Credit Score	Exposure	Indicated Relativity	On Balance Indicated	Score Points
Adequate	503,000	1.000	1.002	49
Borderline	215,000	1.060	1.062	11
No Score	127,000	1.030	1.032	19
Preferred	149,000	0.850	0.852	74
Deficient	37,000	1.100	1.102	0
	1,031,000	0.998	1.000	

Source: Robert J. Walling



factors. These factors include: model year; vehicle segment such as compact, midsize, full size or luxury; high performance surcharges; and protective device credits.

The radius of operations rating characteristic often presents difficult challenges. First, radius is as hard to verify in commercial auto as personal auto. Second, ISO's price breaks at 50 and 200 miles appear arbitrary and do not suit all states equally well. Is driving within a 50-mile radius in Rhode Island comparable to the same radius of operations in Montana?

For insureds specializing in trucking, data on miles driven annually may present a replacement that is actually available and verifiable. Unfortunately, a broadly applicable, readily available and verifiable tool to improve radius-of-operations ratings does not exist yet.

Another challenge in commercial auto rating is reflecting differences in premium due to the number of insured vehicles. In most states, "fleet" is defined as insureds with five or more powered units. Smaller risks are "non-fleet." While differences in expected loss costs between small and large risks are intuitive, why make a distinction only at five vehicles? It seems to be a somewhat arbitrary and simplistic approximation of a more complex relationship. Predictive modeling results suggest a more sophisticated approach (see "Commercial Auto Pure Premium Relativities by Fleet Size," page 54).

### Not What, But Who

Commercial auto pricing also can be improved by using underwriting scorecards that focus on "who" the insured is, and not "what" is being insured. Using this approach, both driver and owner characteristics are being incorporated into these plans.

Commercial auto pricing for driver characteristics has borrowed liberally from personal auto rating refinements, such as driver age and driving record. Reflecting these characteristics in commercial auto can present challenges such as:

- **Drivers vs. vehicles:** Commercial auto risks often have more drivers than vehicles.
- **Periodic vs. dedicated driv-**

**ers:** Motor vehicle records of dedicated drivers are more predictive than those of occasional drivers.

- **MVR ordering criteria:** Annual record searches on all drivers may be cost prohibitive.

A common approach to the driver/vehicle mismatch considers overall driver averages (see "Average Driver Age Pure Premium Relativities" on page 54.)

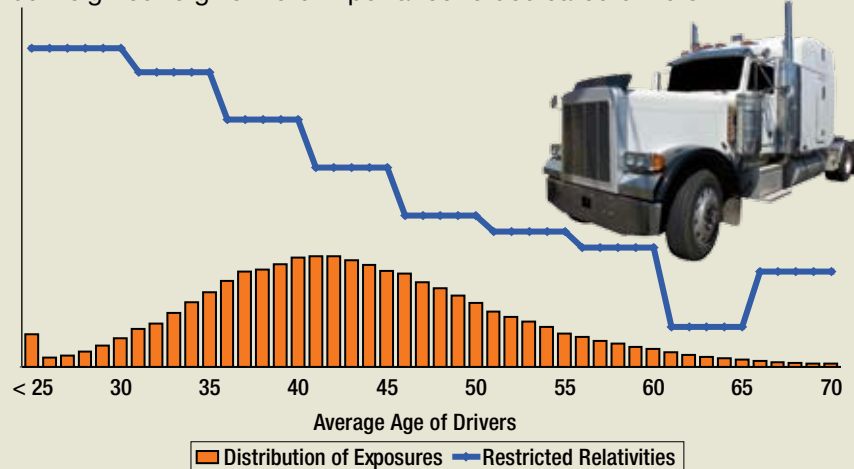
Predictive models also can help with developing MVR reordering criteria based on driver age (for example, all drivers under 25); current score (perhaps all drivers with more than 2 points

against their licenses); and/or tenure (ordering MVRs on all new drivers). These criteria can enhance cost-effectiveness without materially impacting accuracy.

Credit scoring is another approach from personal lines insurers that is being successfully adopted by commercial auto insurers. Applying credit to commercial auto insurance faced several challenges. Initially, getting a high enough "hit rate" of credit scores for small-business commercial auto policies was challenging. Vendors have significantly reduced the number of small business "no hit" and "thin" files by blending commercial credit data with

### Average Driver Age Pure Premium Relativities

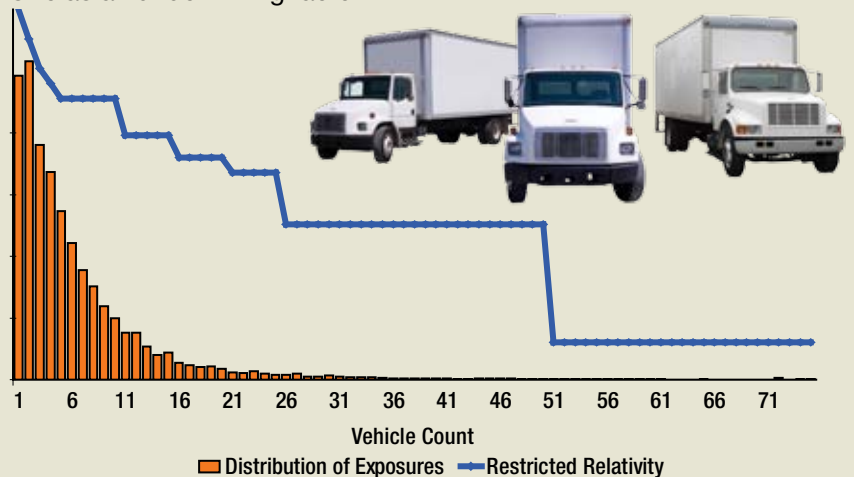
Shows model output demonstrating the impact of average driver ages on pure premiums. This approach of using averages can also be weighted to give more importance to dedicated drivers.



Source: Robert J. Walling

### Commercial Auto Pure Premium Relativities By Fleet Size

Predictive modeling can more accurately determine fleet size as an underwriting factor.



Source: Robert J. Walling

## Property/Casualty

personal credit scores of small-business owners. This approach works well when a business has a small number of primary owners (see "Credit Scoring as Part of an Underwriting Scorecard," page 52).

Using scores that blend personal and commercial data introduces additional regulatory scrutiny. As a result, some commercial-lines insurers are using an alternative approach that incorporates specific credit information, rather than a score, into their underwriting scorecards. Examples include: number of transactions; total balance overdue; number of public records/collections; average number of days in which balances are overdue; and number of inquiries.

Insurers are finding that internal financial information captured over the course of an insured relationship can be used on renewal policies. Internal data, such as premium financing experience, which can range from late payments to payment "in full" at inception, and difficulty recovering deductibles all have potential as rating characteristics.

"Who" characteristics beyond driv-

ing record, driver age and credit are being incorporated in commercial auto rating plans. Factors such as years of risk, years in business, hours of operation, on-site ownership, mandatory drug screening and employee turnover rates have been included in analyses.

The new "who" characteristics are often implemented using an underwriting scorecard. These scorecards are either filed as an addition to the rating plan or treated as tiering criteria within underwriting guidelines. This second approach takes advantage of the flexibility created by multiple company rating tiers and schedule rating plans. Typically, this results in a recommended tier (e.g. -15% deviation company) and a suggested schedule rating modification (e.g. -10%).

Underwriting scorecards have several advantages. They consider multiple factors at once. Implementation of a scorecard within underwriting guidelines allows a company to preserve its competitive advantage longer. Scorecards serve as the basis for a feed-

back loop to underwriters, agents and insureds, providing information on the basis for the pricing decision.

For example, it might be communicated by the insurer that average driver age and MVR points resulted in a higher premium. This can increase underwriter and agent confidence in the scorecard and provide insureds with characteristics they can control to reduce future premiums. For example, they might exclude drivers with poor driving records.

Predictive modeling applications for commercial auto insurance allow insurers to take advantage of the innovations developed by Progressive Corp. and other personal auto insurers. But this is only the beginning. Insurers that incorporate a variety of vehicle, driver and owner characteristics into rating plans significantly improve their understanding of expected losses.

Underwriters who use new objective information and more accurate manual premiums will be empowered to determine better risk selection and