Now that a new winter season is upon us, we thought it would be enlightening to discuss the effects of winter weather on personal automobile insurance. This analysis shows that the impact of winter varies significantly by region and state, with New England clearly leading the nation as the region most affected by winter. (This is measured by comparing the first-quarter pure premium to the total year’s pure premium.) New England truly deserves this title with three of its states occupying the top three spots; all six states make the top eight (Minnesota and Alaska snuck in at numbers four and five respectively). In addition, we will put the past two winters into perspective against the long-term average, as they were markedly different from others previously recorded, and impacted certain regions in unique ways.

Last year we distributed an analysis of the effects of the mild winter of 2001-2002 as pure premiums were favorably impacted in those areas that experienced abnormally mild temperatures combined with less-than-normal precipitation. For the winter of 2002-2003, we can see that the majority of the areas that experienced the most favorable effects last year have returned to a more normal basis. However, the Western and Upper Midwest regions, along with several New England states and Alaska, experienced better-than-average pure premiums. This corresponds directly with the meteorological data which indicates that these areas had below-average precipitation and – specifically with respect to the Western states – record warmth.

Regionality and Long-Term Averages

Exhibits 1 and 2 set forth the historic relationship of first-quarter pure premiums relative to the comparable year-ending pure premium for the past 28 years.
Data are displayed for Collision and Property Damage Liability coverages, as these coverages are the quickest-settling coverages. Thus, they would be the most indicative of the true effect of the weather on first quarter pure premiums.

As these exhibits clearly reveal, the first-quarter results for all states are higher than comparable results for the rest of the year with the colder, snowier states displaying the greatest effects. However, other factors such as topographical differences, road construction and population density may have an impact. In the more Northern states these differences are in excess of 40% for the Collision coverage and greater than 20% for Property Damage Liability.

Thus, over the long term, observers can expect the first-quarter results for these Northern states to be significantly worse than comparable results in the less winter-weather-prone states.

However, not all winters are the same and the effects can vary significantly from year to year. The analysis we distributed last year showed that the winter of 2001-2002 was relatively mild, with the most winter-prone states experiencing record warmth and below-normal-to-normal precipitation levels. This resulted in more favorable insurance results for those states, although they still performed relatively poorly in comparison to states that are less influenced by weather patterns. For example, although Maine, Vermont and New Hampshire (the worst three states for Collision coverage, historically) experienced a mild winter, resulting in pure premiums that were 6.0%, 7.1% and 8.3% lower respectively than their long-term averages, they were still the first, second and seventh worst states for Collision coverage pure premium relativities. The fact is, some of these states are so negatively impacted that even a mild winter for them still results in pure premium relativities worse than other states that may experience a normal or even bad winter. However, relative to their own historic norms, they are indeed significantly better.

A better way to demonstrate the relative effect of the winter weather on the individual states from year to year would be to compare their deviations from their long-term means. For example, the long-term mean relationship of the first-quarter pure premium to the year-ending pure premium for Maine is 1.434. For 2001-2002, this ratio was 1.35; it was 1.37 for 2002-2003. Therefore, both years were better than the long term, with results for 2002-2003 marginally worse than 2001-2002. Given that the average ratios for all states is 1.158, this ratio would still indicate that Maine is much worse at 1.37 (hence its well-deserved Number 1 ranking), although it was 5% better than the long term.
Differences between the winters of 2001-2002 and 2002-2003

The past two winters were dramatically different, as cited above. Exhibits 3 and 4 show the temperature departure from average by state over the past two winters, as compared to climatological data for the time period 1971 - 2000; Exhibits 5 and 6 display comparable data for precipitation levels.

As these charts reveal, the most recent winter was colder and wetter in the Middle Atlantic and Eastern states. However, the West and Central U.S. enjoyed above-normal temperatures with about normal precipitation. Also, Maine, Vermont and New Hampshire were returning to more normal temperatures, although still enjoying significantly less precipitation than normal.

Historic Insurance Results

Exhibits 7 and 8 set forth the historic relationship of first-quarter pure premiums for the last two winters relative to the comparable year-ending pure premium for the past 27 and 28 years. For reasons noted earlier, data is again displayed for the Collision coverages.

Last year, in comparing the first quarter 2002 pure premiums to the historic first-quarter averages, it is clear that the mild winter produced very favorable results for insurers. For Collision coverage, which is the most indicative of the immediate effects, the Midwestern, New England and Middle Atlantic states had pure premiums significantly below their average. This can be seen graphically on the next page in Exhibit 7.
Conversely, the same analysis comparing the first quarter 2003 data to the historic norms in Exhibit 8 yields the following:

For the winter of 2002-2003, it is evident that most of the areas that experienced the most favorable effects last year have, indeed, returned to a more normal basis. However, the Western and Upper Midwest, plus several New England states and Alaska, experienced better-than-average pure premiums. This corresponds directly to the meteorological data as cited above, which indicates that these areas had below-average precipitation and – specifically regarding the Western states – record warmth.

For collision and property damage liability coverages, it is prudent to review not only pure premium trends, but also the latest weather patterns, when projecting what we expect to occur over the next 12 months.

Conclusion

This study demonstrates the influence of winter weather on automobile pure premiums. While it is no surprise that the effects of winter are most dramatic on the Northern states, the effects are most severe in New England, closely followed by Alaska and the Upper Midwest.

It confirms our earlier claim that the record-breaking warm temperatures, coupled with below-normal precipitation for the winter of 2001-2002, resulted in extremely favorable first-quarter insurance results in those states that are most influenced by winter weather. In addition, a very similar pattern of near-record warmth and normal precipitation for the West, Upper Midwest and Alaska produced favorable insurance results for the winter of 2002-2003. Also, although the New England states of Maine, Vermont and New Hampshire experienced more traditional temperatures this past winter, the fact that precipitation levels were significantly below average resulted in another relatively good winter - although these states are still much worse than the more Southern, temperate states.

Care must be given in the use of experience for this period in ratemaking, as trend projections and base experience years that include these periods should be reviewed carefully and possibly adjusted, since the data for these periods are not necessarily typical of what would be reasonably anticipated. We can probably go one step further. For Collision and Property Damage Liability

About this study

A 28-year data base of Fast Track Personal Automobile experience for all states was used as the basis for this study. If you are interested in individual state graphs, or have any questions or suggestions regarding future analyses of this type, please contact LeRoy Boison at lboison@pinnacleactuaries.com or Ph. (516) 746-7149.