By Eric Nordman, Director of Regulatory Services and CIPR

The traditional insurance company is viewed as slow to change its ways. However, in this evolving technological world, those who operate at a snail’s pace will likely be left behind.

The Age of Big Data is upon us—and regulators, insurers, businesses and individuals need to be mindful of the potentially disruptive effect big data can have on our lives. These disruptive effects can be beneficial and detrimental at the same time.

◆ The Good News About Big Data

As more and more functions become automated, the data collected electronically and stored can lead to some amazing insights—provided it is stored in ways that are useful for analysis. Having a lot of data does not automatically mean an enterprise is able to effectively use the massive amount of data to convert it to useful information. However, big data, properly managed, can improve how an insurer does business. This can be beneficial for the insurer and its customers. It does have the potential to be disruptive and may not be beneficial for each of its current policyholders.

In essence, what big data provides an insurer is analytical information that may allow the insurer to distinguish itself from its competitors. What big data does is add precision to the information an insurer maintains about its customers. In theory, the insurer can use this information to more accurately determine a price to charge its customers. This creates an opportunity for insurers to implement risk-based pricing based on the most accurate information obtainable. It also presents an opportunity for an insurer to engage with its customers in ways not possible before. The question remains whether insurers will take advantage of the customer engagement and educational opportunities big data presents.

Telematics is one area with tremendous potential. The ability to use customer information for pricing based on actual driving abilities should allow insurers to abandon some of the risk proxies used in the past. Customer relations should improve, as consumers will understand that an objective evaluation of their risk is fairer than some of the less intuitive measures of risk used in the past. Further, if insurers take advantage of the opportunity presented, they can share information with drivers so consumers can actually improve their driving abilities and potentially reduce the future cost of insurance. This would provide a tremendous public relations boost to the insurance industry, if properly employed.

Telematics can also be used to reduce insurance fraud. The event data recorder (EDR) is a device, similar to a black box found on an aircraft, which records information about the movements of a car. It is triggered by a sudden change in wheel speed. The sudden change directs the EDR to retain the geocoded information immediately before the sudden change occurs. The information might include whether brakes were applied, the position of the vehicle, the speed the vehicle was traveling, whether air bags were activated and whether seat belts were buckled. Claims adjusters with access to EDR information from both cars involved in an accident can determine who was at fault in an accident. The determination will be based on the computer-generated information instead of having to rely on observations by drivers, passengers and other eye witnesses. The result could be a more accurate assessment of responsibility and less fraud, which could result in lower insurance prices.

Benefits of telematics to drivers generally include the potential for a reduction in accident frequency and severity from driver improvements after receiving feedback from telematics devices. Costs are also constrained by providing rapid emergency response time following an accident. Accident victims can be located and transported to medical facilities quickly, saving lives and reducing recovery time, which reduces costs. Vehicle theft costs can be reduced by using telematics devices to track and recover stolen vehicles. There are also benefits to society in general from reductions in driving as consumers choose to limit miles driven to reduce gas consumption and lower insurance costs. This helps create less traffic congestion and results in less pollution from reduced energy consumption.

Telematics offers opportunities for businesses, too. Perhaps the greatest opportunity exists in the commercial trucking arena. A commercial fleet insurer may be able to offer enhanced risk-management services to fleet operators. They can use actual data derived from telematic devices in vehicles to provide driver tracking and current location, as well as monitor where the truck has been. It may also prove helpful to schedule and expedite loads so there is less down time, allowing the business to use the fleet of trucks more efficiently. Of course, it is also helpful in underwriting and pricing the policy. Merging traffic flow information with the current location of a truck should allow efficient rerouting to avoid bottlenecks. The risk-management and efficiency opportunities are endless.

The volume of data and its complexity has helped create a cottage industry of vendors willing to help insurers turn data into insight. The largest insurers seem to be able to handle

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the conversion of data to useful information on their own. However, many midsize and smaller insurers lack the capacity to do this by themselves. This provides an opportunity for businesses willing to supply the expertise to assemble big data, much of it unstructured, into useful information to benefit businesses, individuals and insurers.

Some of these entities are the usual suspects, such as IBM and the large insurance consulting firms. However, advisory organizations have also been interested in providing these services. Insurance Services Office (ISO) and the America Association of Insurance Services (AAIS) offer assistance to their members. In addition, there is a new entrant into the advisory organization space: Towers Watson.

Towers Watson has become a licensed advisory organization in several states. Towers Watson collects loss data from participating insurers, aggregates it and files a predictive score in states where it is licensed as an advisory organization. Insurers use the filed predictive score by simply informing the regulator as part of a normal rate filing. This provides a way for midsize and smaller insurers to offer a usage-based insurance product without all the costs of collecting, analyzing and maintaining the big data set behind the predictive score.

The AAIS has produced an article called, Changing Paradigms in Personal Lines Ratemaking. It suggests insurers are shifting from a “policy view” of risk to a “household view” of risk. This paradigm shift uses big data to look at risks in ways not possible in the past. In the article, the AAIS states: “Consumers can now affect their rate classification by decisions they make at the time of application...there is a growing trend to balance consideration of short-term profitability with consideration of an account’s lifetime value based on projections of an insured’s likelihood to remain with a carrier.”

Big data also offers opportunities to capture information to inform enterprise risk management (ERM) processes. With the Own Risk and Solvency Assessment (ORSA) on the horizon for major insurers, big data can be helpful in completing the ORSA Summary Report. Big data can be used to optimize the evaluation of risks in an ERM capacity. Better identification and quantification of risks allow optimal deployment of capital and superior matching of risks and assets.

Big data can be helpful in new product design. If an insurer is better able to understand what consumers want, it can be more successful in developing insurance products to meet the consumer’s needs. The more an insurer knows about its customers, the more likely it will be successful over the long term. For example, a computer-savvy consumer might want to have direct access to enter change of vehicle or driver information, saving administrative staff time and expense for the insurer.

Big data can be helpful in managing various distribution channels for insurers. With data coming from insurance producers, call centers and online services, making sure the data coming from various sources ends up in one place and in a consistent format, can be a challenge for insurers. Proper management of big data is a must for continued success.

**Some Cautions About Big Data**

Consumers have some reservations about the use of big data. Consumer and environmental organizations generally support pay-by-the-mile and usage-priced insurance, because these programs allow consumers to reduce the cost of insurance by driving fewer miles. However, some consumers believe the telematics-based auto insurance programs are not transparent, so the consumer has no idea how the programs quantify risk or what the consumer can do to lower the price for auto insurance. Consumers would benefit from greater transparency and proactive feedback to empower the consumer to modify driving behavior to reduce premium costs. Some consumer advocates maintain the telematics programs fail to achieve the critical loss-mitigation role of insurance pricing because of the opaque nature of the scoring models.

There are also consumer concerns about the type of information being collected and, with recent data breaches, how collected data is safeguarded. Maintenance of consumer privacy is a primary concern.

Consumers recognize the possibilities offered by EDRs, but realize the information flow needs to go in both directions. Some consumers distrust insurers and fear EDRs will be used unfairly. They fear the insurer will use the information from EDRs when it is beneficial to the insurer, but not when it benefits the claimant.

Some consumer advocates maintain that insurers’ use of big data results in unfair discrimination against consumers in low-income communities. They encourage the use of a disparate impact standard to measure the potentially discriminatory effects. They maintain that insurers’ use of big data penalizes low-income consumers because of where they live and when they need to drive. Low-income consumers with older vehicles may not own a vehicle capable of deploying an EDR.

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Footnote:

dongle or other telematics device. Thus, these consumers cannot take advantage of telematics offerings from insurers. Further common occupations among lower-income consumers may require them to travel at night because of their jobs, rather than for entertainment.

Some consumer advocates believe insurer claims that usage-based insurance products provide a “discount only” are misleading. They point out that insurers must raise base rates to make up for the premium shortfall when discounts are offered to some, but not all, consumers. The consumer advocates see this as hiding the true effect of usage-based auto insurance. They note that insurers are missing an opportunity to connect with customers and help them become better drivers. Consumer advocates tend to favor rating plans that use risk-based factors that encourage loss mitigation.

**Complexity and Its Impact on Regulation**

With the increased use of big data by insurers, the job of reviewing rate filings and monitoring competition has become more complex for insurance regulators. Rate filings by insurers today are much more complicated than they used to be. Regulatory actuaries and rate reviewers are challenged by the vast number of risk-classification factors being used and the interconnectivity of the rate factors to each other. In the past, a review of statistical information supporting a filing and the rating algorithms used by insurers would be easy to understand. The insurer would establish a base rate, a set of increased limit factors and various rate relativity factors applied in a multiplicative manner to arrive at a premium to charge an individual consumer. In contrast, today’s rate filings require the actuary or reviewer to work with the insurer to understand how each risk classification factor interacts with other risk classification factors in a complex matrix of data cells. This approach is only possible because of big data.

The concept of price optimization has been a controversial topic at recent NAIC national meetings. The Casualty Actuarial and Statistical (C) Task Force has been drafting a paper on price optimization. The first issue is to agree upon a precise definition of “price optimization,” as there seem to be a variety of opinions about it (see article on page five for more on price optimization). In the past, the concept of judgment has been used by insurer actuaries to adjust rates for a number of factors, such as smoothing increased limits factors, when use of actual data would suggest anomalies in pricing. For example, actual data might suggest the premium for a policy with a $100,000 limit might be more than one with a $125,000 limit. Judgment would be used to smooth the overall increased limit factor table. It would not be prudent to have a factor encouraging consumers to buy the policy with $125,000 limit because it was cheaper this year, only to have the premium double next year. Judgment is also used to reflect the prices charged by competitors.

Today, insurers are beginning to use big data to develop quantitative information using sophisticated data-mining tools and modeling techniques. They want to use this new information to replace the judgmental aspects of the rate-making process.

Others believe price optimization is simply the use of a factor to measure a consumer’s propensity to shop for coverage. It is this one component of price optimization that is responsible for much of the controversy on the topic. The regulatory actuaries are working to build consensus on a definition and provide some guidance to regulators on how price optimization should be treated in rate filings. Several states have issued opinions on the use of price optimization in rate filings.

**Summary**

Big data is here to stay. It offers some amazing possibilities for consumers. There are also some drawbacks needing attention. Big data can make life better for some and worse for others. It is incumbent upon regulators to develop techniques to look inside of complex rating systems and understand how insurers are using big data to impact consumers. Pushing for more transparency and encouraging insurers to offer consumer benefits to improve driving and better protect homes and business should be part of the plan. It would be a shame to lose the loss-mitigation opportunities big data can offer.

### About the Director

Eric Nordman, CPCU, CIE, is the director of the NAIC Regulatory Services Division and the CIPR. He directs the Regulatory Services Division staff in a wide range of insurance research, financial and market regulatory activities, supporting NAIC committees, task forces, and working groups. He has been with the NAIC since 1991. Prior to his appointment as director of the Regulatory Services Division, Nordman was director of the Research Division and, before that, the NAIC senior regulatory specialist. Before joining the NAIC, he was with the Michigan Insurance Bureau for 13 years. Nordman earned a bachelor’s degree in mathematics from Michigan State University. He is a member of the CPCU Society and the Insurance Regulatory Examiners Society.
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