

## Understanding Insurance, Part II

### Premiums, Rates, and Exposures

**COSMO:** Hey, George, I got two tickets for *The Producers* tonight. Want to come?

**GEORGE:** Wow! How'd you get those? That show's been sold out for months.

**COSMO:** I've got a friend, who knows this family, and there's a cousin ... Let's just say I got connections. And guess what! They're only 25 bucks a pop.

**GEORGE:** That's amazing! Last I heard, the cheapest price was over \$200.

**COSMO:** So, you up for it?

**GEORGE:** You bet! I'll even pick up the cab fare.

*Later that night ...*

**USHER:** May I see your tickets please? Right this way, gentlemen.

*And five minutes later ...*

**USHER:** Seats 24 and 26 is that row. Enjoy the show.

**GEORGE:** Hey, wait a minute, I can't see a thing from here. Cosmo, let me see those tickets. What on earth does "NB" mean?

**COSMO:** Oh, didn't I tell you? These seats are in the nosebleed section. Hey, the actors may look like ants from here, but the sound system is great!

Sound familiar? Have you ever found a car for a better price than a previous dealer's, only to find out that the current dealer forgot to include your favorite options (CD player, heated seats, maybe even the engine)? Have you ever tried to comparison-shop for televisions, manufactured by 10 different companies with 20 models each? Have you ever found an insurance policy for a price that looked too

good to be true, only to realize that the deductible is \$5,000 or the cost of repairing your own vehicle isn't included?

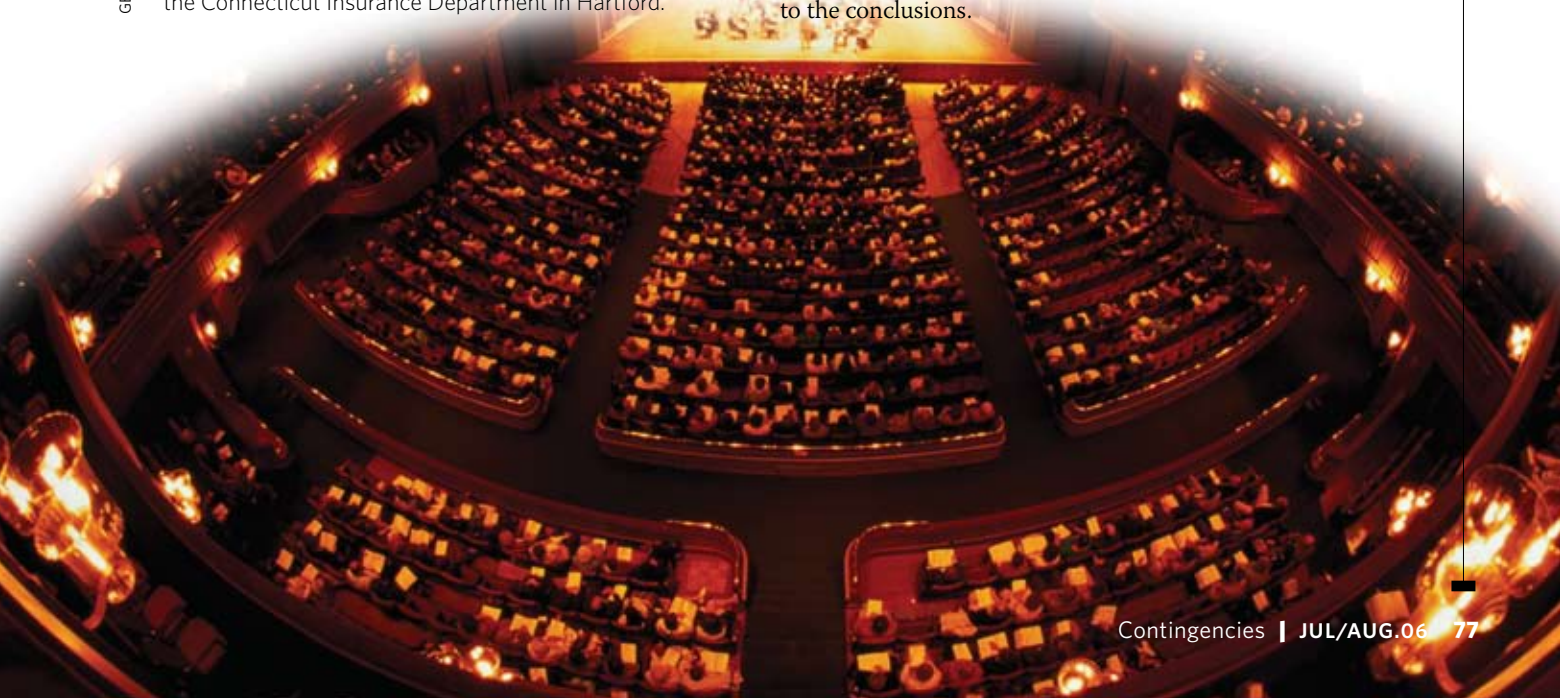
In life's daily endeavors, and especially in George's case, the lesson learned is *pay attention to the details*.

When evaluating insurance information, attention to the details is especially important. It's often difficult to understand some of the intricacies of property/casualty insurance premium and loss data, and it can be challenging to interpret the value of ratios and other comparisons. Before reaching a conclusion, or before accepting a conclusion presented in another's analysis, one should be comfortable with the meaning and value of the information that leads to the conclusions.

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COMPANY A		COMPANY B	
YEAR	PREMIUM	YEAR	PREMIUM
2000	\$1,000,000	2000	\$1,000,000
2001	\$1,100,000	2001	\$1,010,000
2002	\$1,210,000	2002	\$1,020,100
2003	\$1,331,000	2003	\$1,030,301
2004	\$1,464,100	2004	\$1,040,604

In the November/December 2005 edition of *Contingencies*, we discussed whether it's appropriate to compare written premiums and paid losses. In this article, we take a closer look at premium.

Written premium represents the amount of money insurance companies collect in exchange for covering future insured events (e.g., auto accident, worker injury, hurricane damage to a home, a failure to diagnose cancer, etc.). For example, a homeowner pays a premium based on the size, location, and type of construction to protect against the financial impact of damage from fire, theft, hurricane, or other perils. A manufacturing company pays a premium based on its employees' various job classifications and past loss experience in order to protect the company against the costs of workplace injuries.

**Insurance Consumer Example**

From an insurance consumer's perspective, it's relatively easy to understand why your automobile premium changes over time. When the annual bill comes in the mail, it's pretty clear if the check you have to write is bigger, smaller, or the same as last year. This simple task becomes much more complicated if we ask a complete stranger to look at just your insurance premium for a gut reaction.

Let's assume, for argument's sake, that the stranger gasps and says: "My goodness, how can you afford such a large increase in premium? This is unacceptable. I'd call the insurance company right now and demand

a refund. They're gouging you!"

Would it be appropriate to ask some additional questions in this scenario? How about:

- Did the consumer switch from driving a 1987 Chevy Chevette to driving a 2005 Chevy Corvette?
- Did the consumer get three speeding tickets and a DWI citation in the past year?
- Did the consumer move farther away from work?
- Did the consumer add another car to the policy for his 16-year-old son?

Only when questions such as these have been answered (i.e., the details) can a complete stranger determine if the premiums charged by the insurance company have actually gone up or if there has been a change in the underlying risk exposure.

Likewise, a researcher relying on premium figures from insurance company financial statements must ask some questions and understand the details behind the numbers.

**Insurance Company Example**

On a broader scale, data are often used to compare companies by size or to evaluate premium growth or financial performance over time. Financial information in the company's statutory annual statement can be used for such comparisons. Schedule P is a convenient source because it presents a 10-year history by line of business. It's also a public document that should be available for inspection at a state insurance department for companies licensed in a given

state. Some publicly traded insurance companies also make this information available on their websites.

Let's look at an example of what one might see in Schedule P of an annual statement. For simplification, we'll illustrate only five years of data.

Easy, isn't it? Isn't it pretty clear that both companies are growing and that Company A is growing faster than Company B? Is that all we need to know to make an educated conclusion? What does it mean to say a company is growing? Are there subtle but important differences between fast growth and slow growth? And what exactly is growing—the number of insured vehicles, the rate per policy, the shift toward urban drivers?

This is where it's extremely important to understand the details, or what's missing from just reviewing the aggregate information. Premium has two elements: an exposure component and a rate component. The three items are related by a simple equation.

**Premium = Exposure x Rate**

This equation shows that premium growth can be the result of exposure growth, rate growth, or a combination of the two. Conclusions based on an evaluation of premium growth by itself have limited value if the influence of changes in the exposure or rate structure isn't addressed. A conclusion, or even the inference, that premium growth equates to growth in either exposures or rates is invalid and should be questioned unless the proper research has been done to verify the statement.

**Exposure**

The exposure component can be understood by using a weather analogy. On a cold day, we put on a hat, coat, and gloves. If we forget something, then our head, hands, or body is exposed to the elements.

In an insurance setting, we try to identify the item exposed to loss, the item we

COMPANY A				COMPANY B			
YEAR	EXPOSURE	RATE	PREMIUM	YEAR	EXPOSURE	RATE	PREMIUM
2000	10,000	\$100	\$1,000,000	2000	10,000	\$100	\$1,000,000

COMPANY A (EXPOSURE GROWTH)				COMPANY B (EXPOSURE GROWTH)			
YEAR	EXPOSURE	RATE	PREMIUM	YEAR	EXPOSURE	RATE	PREMIUM
2000	10,000	\$100	\$1,000,000	2000	10,000	\$100	\$1,000,000
2001	11,000	\$100	\$1,100,000	2001	10,000	\$110	\$1,010,000
2002	12,100	\$100	\$1,210,000	2002	10,000	\$121	\$1,020,100
2003	13,310	\$100	\$1,331,000	2003	10,000	\$133	\$1,030,301
2004	14,641	\$100	\$1,464,100	2004	10,000	\$146	\$1,040,604

want to protect. With insurance coverage for property, as opposed to liability, it's generally easier to visualize an exposure unit that makes sense. A car, a house, or a diamond bracelet can be identified and valued with limited dispute.

Liability policies can be more complex. Damages can be more subjective. Since our purpose here is to illustrate the Premium = Exposure x Rate relationship, we'll stick with the property example.

### Rate

The rate component is less tangible than the exposure component, even when we limit the discussion to property coverage. An insurance rate is an estimate of the expected value of future costs to replace the value of a specified insured item.

Two primary factors can influence a rate. The first factor is the probability that the insured item will need to be replaced or repaired. An item that's less likely to suffer damage can have a lower rate (think brick walls vs. wood frame). The second factor comes into play only if an accident occurs. What will it cost to fix it? A less expensive item can have a lower rate (think Chevette vs. Corvette). These two factors act together to produce a rate.

### Company A vs. Company B

Let's suppose that both Company A and Company B had identical business (both exposures and rates) in year 2000. The table would look like this:

In both cases, the rate of \$100 per exposure unit is applied to the 10,000 exposure units, to produce the \$1 million premium. Now let's look at how Company A achieves its 10 percent premium growth over the next four years. It can do this in different ways.

In the scenario on the left, Company A is expanding its business by attracting more exposures. Stated another way, using our automobile example, Company A is insuring more drivers. The rate charged to each policyholder has stayed the same over the five-year period.

The scenario on the right shows that the same premium growth can be achieved by increasing the rate charged to each policyholder. In this scenario, the number of drivers insured by the company remains constant. There is a range of scenarios in between, with a mixture of exposure and rate growth that can produce the same outcome in premium growth. The point here is that, without more complete information, premium information alone

can't tell the whole story. One shouldn't accept implications or conclusions that go beyond the information provided.

If we go back to the insurance consumer example, it's easy to see that we need to understand more than just the change in premium. If a 16-year-old child were added to the policy along with another car, then exposure has definitely changed and premiums should go up. Likewise, a researcher relying on premium figures from insurance company financial statements must understand changes in the rates and exposures before making any conclusions about trends.

If a company's exposure changes because of an acquisition that doubles its premium volume, one must be careful not to gasp the way our perfect stranger did and make statements based on aggregate premium information alone or one might end up with an improper comparison.

The basic equation of Premium = Exposure x Rate remains the foundation for thinking about premium growth. So we return to the purpose of our series: to help a broad public audience understand some of the intricacies, complexities, and finer details of property/casualty insurance premium and loss data.