

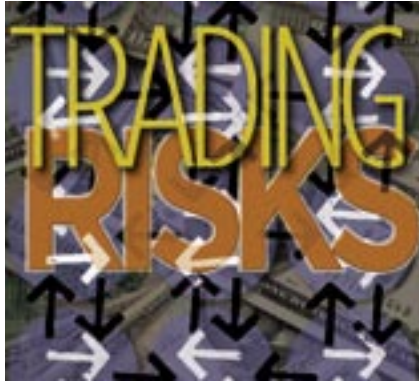
Risky Business

The title was catchy: "Trading Risks in the 21st Century" (November/December 2003) dealing with risk as a standardized and tradable commodity.

However, it didn't discuss the history of futures contracts on insurance risks. There was a health insurance loss ratio futures contract that quickly died. More viable was the futures contract on per capita employee health costs. This contract was very thinly traded by large employers and not insurance companies. New futures contracts to be traded on futures exchanges require product development and marketing skill.

I have studied and traded in futures markets for the past 15 years.

Petroleum energy contracts—crude, unleaded, heating oil, and natural gas—are very successful. There are two electricity futures contracts that are not doing so well. It has to do with industry support.



The producers and users of petroleum participate in their contracts, but electric utilities don't support the electricity contracts because of regulation or whatever.

Until buyers and sellers of employee health care costs are willing to support a futures contract, it won't be successful.

Perhaps there's a strategic problem, that insurance problems such as health care costs, asbestosis, and black mold are

long-term problems, not like shorter-term supply/demand imbalances in copper or coffee. On the other side, catastrophe risks such as hurricane and earthquake may be too sudden for a tradable futures market (i.e., minimum exchange margins would be very high to cover overnight risk).

Private non-standardized, non-tradable products will prevail, until suitable tradable products are supported by the insurance industry and insurance buyers.

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Actuarial Challenge

Thanks to the authors of "A Credible Theory of Credibility" (September/October 2003) for bringing the important subject of credibility to the attention of *Contingencies* readers.

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■ Actuarial/statistical modeling is highly subjective.

■ Bayesian credibility yields the optimal solution (i.e., it's the most accurate), although it may require the most work. It also requires the analyst to make all of his/her assumptions explicit.

■ Buhlmann credibility yields the "best" linear approximation to the point estimate derived from Bayesian credibility (at least under a squared loss function).

■ The limited fluctuation approach, as the authors state, "isn't theoretically sound" but is sometimes the easiest to obtain.

Four other disadvantages of the limited fluctuation approach are the following:

■ The same weight, $1-Z$, is given to the prior mean, H , regardless of the analyst's view of the accuracy of H .

■ According to Sundt [1991], there's an internal inconsistency in the limited fluctuation approach to credibility. He notes that the criterion for replacing the old premium rate is based on the assumption that the old premium rate is correct. This leads to the following conundrum: If the old rate is correct, why replace it?

■ No weight is given to the prior mean, H , and all the weight is given to the observed data, R , in the case of full credibility. This raises the philosophical question of whether it makes sense to talk about full (i.e., 100 percent) credibility because more data can always be obtained. Some actuaries believe that no data are entitled to full credibility, so that credibility should approach 1 asymptotically but never reach it.

■ It's not clear as to how one should obtain the two parameters of the limited fluctuation model. Moreover, unlike the Bayesian credibility approach, the limited fluctuation approach allows the analyst to hide all of the model's assumptions.

In the article, the authors propose a crude scheme for estimating human mortality rates. These rates are then employed to obtain point estimates of deficiency reserves. Presumably, these estimated deficiency reserves are also rather crude, although I suspect the authors would contend that the scheme they're proposing is superior to the previous

methods used to obtain such estimates. Unfortunately, it's also not at all clear how to estimate the precision (i.e., the standard error) of these estimates.

I have two other minor issues with this article. First, the authors use "bias" as a synonym for "subjective." This conflicts with the definition of "bias" employed in all modern statistics textbooks. Second, on Page 46, the authors state that the Bayesian credibility approach is "impractical to apply in practice because the distribution assumptions needed aren't straightforward and require a lot of judgment." But isn't this just the type of challenge that makes actuarial work so interesting?

I welcome the authors' response to my comments.

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Accident in Waiting

PAYD insurance ("Changing Insurance One Mile at a Time," November/December 2003) is an intriguing idea, but the suggestion that it could be introduced as a voluntary option doesn't stand up to close scrutiny.

First, since only low-mileage drivers would take the PAYD option, the result for the insurer would simply be lower total premiums for the same amount of risk. If the insurer compensated by raising premiums for non-PAYD policies, it would become less competitive in that much larger market segment.

Second, if the authors are right about the sensitivity of most drivers to small variations in the per mile cost of driv-

ing, the expense of a new car would be too great to spread over a relatively small number of annual driving miles. Therefore, only drivers of older cars would take the PAYD option.

Third, since highway miles add up quickly, only drivers using predominantly local roads, i.e., those living in urban or semi-urban areas, would take the PAYD option. The result for the insurer: urban drivers of older cars paying reduced premiums—not a promising business model. The authors should have included an actuary in their number.

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Winners and Losers

Something seems to be missing from the article on Pay-As-You-Drive (PAYD) ("Changing Insurance One Mile at a Time," November/December 2003). Suppose you have a group paying a fair premium to cover a certain risk and divide it into a low-risk group and a high-risk group. If you charge less for the low-risk group, then surely you must charge more for the other group.

In PAYD, those who drive less than, say, 10,000 miles a year and join the system expect to pay less than before. This means that the others will have to pay higher premiums. It's true that PAYD may be an incentive for some people to drive less and thus incur fewer claims. However, it's unlikely that this will significantly lower the risks for those who drive too much to qualify or who cannot be bothered to enroll in PAYD. One group gains, the other loses.

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