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Putting A Price on 'What Ifs'

Actuaries Lack Figures To Fix Premiums for Terrorism Insurance

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BY MICHAEL LUTZKY—THE WASHINGTON POST

John Purple, chief actuary in the Connecticut Department of Insurance, says the industry cannot calculate the risk of terrorism based on the examples of Sept. 11.

HARTFORD, Conn.

For as long as he can remember, John Purple has loved numbers.

They are his means to finding answers to great questions, to solving riddles and making sense of the world.

As an actuary, Purple has spent two decades using numbers to calculate the cost of hypothetical future events such as a tornado sweeping through Kentucky or a hurricane charging up the Atlantic coast.

Numbers build the "what if" into a complex statistical model, factoring in probability. The model does not consider the unimaginable.

In the insurance business, the calculations put a price on risk. So it is not hard to see how a man who loves numbers and relies on them to make calculations about the future could be stumped by the events of Sept. 11.

"The modeling process is based on some known things," said Purple, the chief actuary at the Connecticut Department of Insurance. "We model for catastrophes, but my guess is nobody ever modeled for a 767 full of fuel crashing into the World Trade Center. I doubt that anyone ever thought that was a possibility."

Actuaries need more than a single event to create a model. They need a string of events that can be turned into data and stretched over years to reveal a pattern.

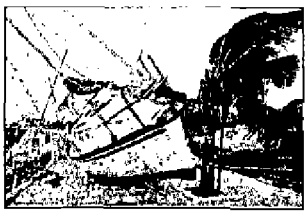
Sept. 11 was not a pattern. It was a starting point. Or it was an ending point. Nobody knows. Not knowing—the heart of the actuarial conundrum—has turned the property and casualty insurance industry upside down.

Many insurance companies have already told their policyholders that they will no longer be covered for terrorism. Some are waiting to see whether the government will step in to back the industry up.

"Right now we're giving a lot of thought to what we do as a company," said Wayne H. Fisher, chief actuary for insurance company Zurich North America. "In our mind, this is an unknown area. As an individual company, our resources are finite, and the liability here could be infinite."

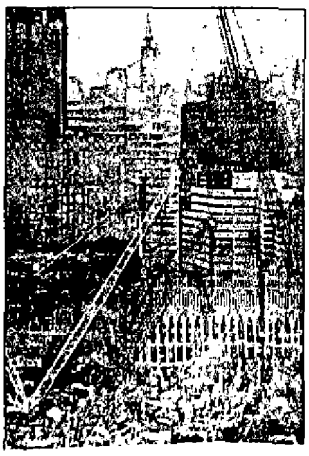
This is not the first time the insurance industry has been confronted with an ac-

See INSURANCE, *E5, Col. 1*



HURRICANE ANDREW
South Florida, 1992
Insured losses:
$19.6 billion

TERRORIST ATTACKS
World Trade Center and Pentagon, 2001
Estimated property losses:
$30 billion-$50 billion





NORTHRIDGE EARTHQUAKE
Southern California, 1994
Insured losses:
$16.2 billion

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Terrorism Coverage's Cost Hard to Figure

INSURANCE, *From E1*

tuarial challenge.

Purple, 54, whose first job out of college was working as an actuary for Aetna Inc., has been trying to solve the riddle of asbestos exposure for much of his career.

"You don't know how many people are sick or how many were exposed," he said. "You don't know what's covered, who's covered, how many claims. I've been trying to model the future, and it's very difficult."

But it is not impossible, said J. Robert Hunter, director of insurance for the Consumer Federation of America, who helped set up the federal Riot Reinsurance Program in the 1960s. "There's a difference between actuarial soundness and precision. Even insurance companies with big databases don't hit it right on the nose."

Ideally, an insurance company would use an actuarial model to predict how many claims it could expect to pay out at any given time. Based on that information, the company would set aside enough money in its reserves to cover the benefits.

"The industry as a whole has come to the conclusion that the risk of terrorism is uninsurable," said David B. Mathis, chairman and chief executive of Kemper Insurance Cos. "That could change down the road, but it's a long way down the road because there's no actuarial way to say there's going to be another event."

The property and casualty insurance industry is pushing Congress to limit future liability by establishing a system for the private sector to pool premiums and buy reinsurance from the federal government. The Bush administration proposes to share the cost of a future attack with insurers without creating a pool.

The political viability of the proposals hinges on the ability of insurers to convince lawmakers that they will not cover terrorism risk because they cannot model it. Without coverage for terrorism, they say, much of the U.S. economy could be disrupted, including real estate, banking and manufacturing. That issue will be one topic during a series of congressional hearings scheduled to start today.

Although federal action would not resolve the actuarial issue, companies would be more likely to assume the risk of terrorism with a federal backstop, said Constantine "Dinos" Iordanou, senior executive vice president for group operations and business development at Zurich Financial Services Group.

"It's this unpredictability that is causing this," he said. "It's not lack or unwillingness for people to take risk. It's uncertainty about how to price risk. . . . If we get it wrong, then the federal government will need to step in. If we get it right, they won't."

In actuarial terms, a catastrophe is defined as an infrequent event that causes severe loss, injury or property damage that can add up to large losses for insurance companies.

Until Sept. 11, natural disasters—floods, hurricanes, earthquakes—as opposed to those caused by man—fires, explosions, pollution or nuclear fallout—have been the most catastrophic. Hurricane Andrew, which devastated South Florida in 1992, resulted in insurance losses of $19.6 billion in today's dollars, making it the most costly disaster in U.S. history before the Sept. 11 terrorist attacks. The Northridge earthquake in California, another expensive disaster, caused $16.2 billion in insured losses.

Although no one forecast the hurricane or the earthquake, they were, in a sense, predictable. Scientists know that hurricanes and earthquakes happen because they have happened.

"Life insurance companies have life expectancy tables," said Andrew G. Cassidy, principal at Washington insurance brokerage Early, Cassidy & Shilling. "They can tell you how many people are going to die in any given year. Insurance companies don't go out on a limb if they can't get their finger around something."

Actuaries have created powerful computer models based on tens of thousands of potential combinations of variables to estimate the impact of a future hurricane or other natural disaster on insurance companies.

"The basic principle of modeling is you have to have some basis of experience," said Purple, who is chairman of a catastrophe insurance committee with the American Academy of Actuaries. "With Andrew, it was coverage that the industry expected to provide. It was just a lot more of it."

The models for natural disasters are complex, and by changing certain variables, the actuaries can create different outcomes, depending on the place the disaster strikes, the intensity of the storm or earthquake, whether it hits in a major city, what time of day it occurs, what year.

Models also can be constructed for man-made disasters such as fire. The insurance companies that write the policies for the Sears Tower, for example, have models that take into account the number of people working in the building, the way the building is constructed, and the nature of fire and how it spreads.

Purple said that at its simplest, a model multiplies the probability of an event happening by the probability of how big it might be to determine the probable financial cost. That cost can then be translated into the price charged for insurance.

But what is the probability of a terrorist act? Even assuming the future is going to repeat the past, how will it be repeated? Will a hijacked plane hit another skyscraper in New York? Or will it be in Cleveland? Or perhaps it will be a dam the next time, and the "bomb" will be a boat? Or maybe nothing like it will happen again.

"When you can't rely on things happening by accident, the entire pricing process falls apart," said Laureen Regan, an associate professor of risk management and insurance at Temple University. "We have to be able to estimate how often this will happen."

Nearly all U.S. insurance policies covered terrorism as a matter of course before Sept. 11. So companies never collected specific premiums that would deal with the estimated $30 billion to $50 billion in property losses from the events of Sept. 11.

Going forward, actuaries said they merely need time to develop a history that can tell them if terrorism will be part of the future.

Once that happens, the market will adjust as it always has, Cassidy said.

"If an insurance company feels they can price a product to make a profit they will do it, almost always," he said. "At the end of the day, they want to make a dollar just like the companies they cover."

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