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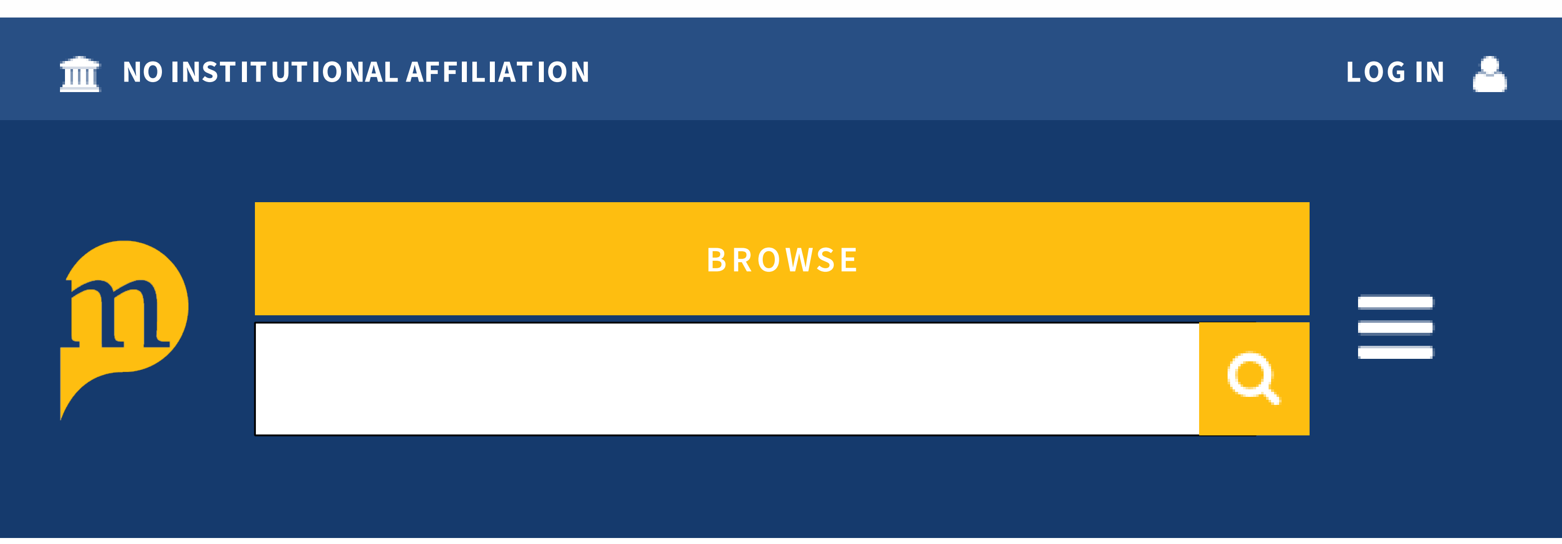

Extending the Theory to Meet the Practice of Insurance

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Extending the Theory to Meet the Practice of Insurance

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Richard Zeckhauser

[Discussion]

> Doth not the wise merchant in every adventure of danger give part to have the rest assured?

Nicholas Bacon, to the Opening of Parliament, 1559

Formal insurance arrangements date back at least to ancient Greece. Marine loans in that era advanced money on a ship or cargo that would be repaid with substantial interest if the voyage succeeded but forfeited if the ship were lost, much like the structure of contemporary catastrophe bonds. The interest rate covered both the cost of capital and the risk of loss.[1] Direct insurance of sea risks, using premiums, probably started around 1300 in Belgium. The first known life insurance policy was written in 1583. By the end of the seventeenth century, sea risk insurance had evolved to a competitive process between underwriters **[End Page 1]** evaluating risks in meetings at Lloyd's coffee house, the precursor to Lloyds of London.

Today, insurance is a major worldwide industry. It moves progressively into new fields. For example, health insurance was virtually unknown in the United States prior to 1929 and now pays for more than 10 percent of the U.S. GDP. Risks ranging from a camcorder breaking down to being sued for sexual harassment are all insurable events.

In recent decades, economic attention has caught up with the remarkable burgeoning of the insurance industry. This is largely attributable to the explosion in attention being paid to information in economics. Indeed, insurance so well illustrates this area that it is a major topic of introductory discussions about the role of information in economics. Moreover, the core insurance topics of moral hazard and adverse selection have been transplanted to fields such as labor economics and finance.

This sounds like a happy confluence of theory and practice growing up alongside one another: theory improves by studying practice, and practice effectively draws on the results of theory. Yet a principal theme of this paper is that perception is fundamentally wrong. We believe that there is an increasing divergence between the theory and practice of insurance. Consider the following quiz about optimal insurance.

> Suppose that a risk goes from negligible to possible—for example, the increased probability of a terrorist accident on U.S. soil after September 11, 2001. Would you expect the private market to provide (a) more insurance or (b) less insurance?
>
> A seventy-year-old unmarried woman has three children, all of whom are comfortably middle class. Would you expect her to be more likely to hold (a) an annuity or (b) life insurance?
>
> A consumer buys a $620 camcorder and is offered insurance in case it breaks. The insurance is for three years and costs $120, supplementing the one-year warranty on parts and labor that comes with the camcorder. The probability of a camcorder needing a repair over three years is 8 percent (mostly in the first year), with average repair costs of $125. Would you expect the person to (a) decline the insurance or (b) accept the insurance?[2]

In each case, optimal insurance principles suggest that (a) is the right answer. But (b) is the answer we often see in the world. Coverage for terrorism risk plummeted after the attacks in September 2001, despite greater demand. About seven times more elderly people have life insurance than **[End Page 2]** annuities, in spite of the fact that the incomes of their children are rising over time. And insurance against small-cost consumer durables is among the most profitable items sold by commercial electronics stores. For almost all products, one in five customers purchases the insurance; for some products, four in five do so.

We argue in this paper that these examples are not minor anomalies but reflect a systematic tendency for insurance in practice to differ from insurance in theory. We discuss and grade a number of insurance settings: (a) mortality, health, and property risk for individuals and (b) property, liability, environmental...

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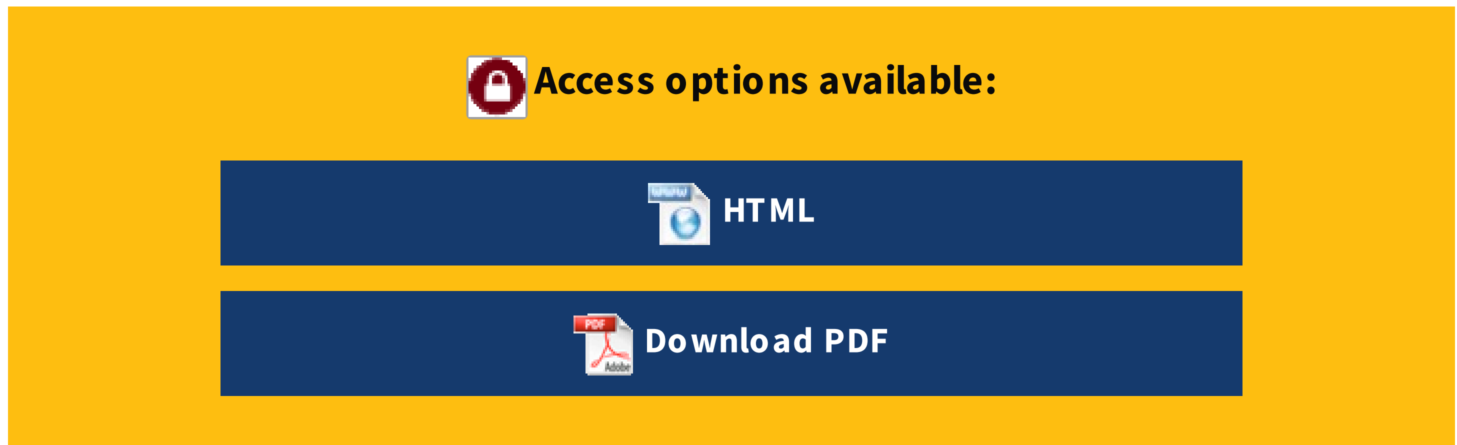
1. Such arrangements are known as bottomry or respondentia bonds. Early insurance arrangements reflected poor understanding of insurance theory. For example, in 1692, England offered life annuities for sale at a fixed price, independent of age. Not surprising, healthy young people bought the policies, and the treasury lost heavily. Mortality tables had not yet been conceived. Indeed, Edmond Halley (from Halley's comet) produced the first life table in response to this event. Still, many of the modern problems had been anticipated. Understanding of moral hazard dates back to second-century Roman Palestine. For more on this and a detailed description of insurance as understood 100 years ago, see the famed eleventh edition of the *Encyclopaedia Britannica* (1910).



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