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# Exposure Measures for Pricing and Analyzing the Risks in Cyber Insurance

By Brian Fannin

*Editor's note: This article is adapted from the executive summary to the Casualty Actuarial Society (CAS) report Exposure Measures for Pricing and Analyzing the Risks in Cyber Insurance. Research material can be found on the [CAS website](#).*

The ubiquity of cyber risk and the sober attention it has garnered from our industry has been self-evident for a number of years. There is an awareness of the sums at risk and the new threats that our policyholders are exposed to. However, the conversation often overlooks the most basic of insurance questions: What exposure base makes the most sense for assessing the risk? For exposures like property or auto, that is a question with a clear answer. But for cyber, the science is not yet settled. To explore that question, the CAS has engaged Michael A. Bean, who is the managing director of modeling and mortgage insurance, Capital Division, Office of the Superintendent of Financial Institutions.

Bean's report identifies and makes recommendations regarding possible exposure measures for pricing and analyzing the risks



in cyber insurance. Cyber insurance is an insurance product that is designed to provide protection against the financial consequences of a failure or compromise of an organization's information system as a result of a cyber event. A cyber event is an event that compromises the availability, integrity or confidentiality of an organization's information system or electronic data in some way. Examples of cyber events are a cyberattack on an information system or the unintentional disclosure of electronic medical records due to human error.

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Cyber insurance has been available in various forms since the 1990s but is still a relatively new product and continues to evolve. Most carriers of cyber insurance offer a core set of coverages, either as a package or as part of a modular policy, as well as a number of supplementary coverages, which can vary from one carrier to another. Core coverages include the following:

- privacy liability,
- network security liability,
- cyber event response,
- network interruption,
- recovery and restoration of digital assets,
- regulatory actions,
- fines and penalties, and
- payment card industry assessments.

Supplementary coverages include these areas:

- cyber extortion,
- cybercrime,
- media content liability,
- technology errors and omissions, and
- bodily injury and property damage that results directly or indirectly from a cyber event.

The report uses a conceptual rather than an empirical approach to identify and evaluate potential exposure measures for cyber insurance. In particular, it considers the losses that can arise with each cyber insurance coverage, identifies potential exposure measures that are related to these losses, and then evaluates these potential exposure measures based on a set of criteria.



- stability over the period of insurance coverage, and
- extent to which the candidate measure can legally be determined and shared with insurers or other third parties without violating privacy laws or regulatory requirements.

An empirical approach to identifying and evaluating potential exposure measures is not feasible due to the current scarcity of reliable, representative and publicly available loss experience for cyber insurance.

Although we cannot say that the research provides definitive conclusions for every situation one might encounter, we hope that we can highlight the most fundamental element of pricing any insurance product: What exposure base makes the most sense for the risk? ■

The following criteria are used to evaluate potential exposure measures:

- ease of calculation,
- ability to audit the calculation,
- strength of relationship to losses,



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