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**Oxford University's Department of Computer Science Publishes AXIS
Insurance-Sponsored White Paper on Supplementary Cyberrisk
Quantification Approach**

PEMBROKE, Bermuda-- The Department of Computer Science at Oxford University and AXIS Insurance, a business segment of AXIS Capital Holdings Limited (NYSE:AXS), today announced the publication of a white paper titled "Calculating residual cyberrisk" which explores alternative methods of quantifying cyberrisk. With the publication of this study, Oxford and AXIS invest in the advancement of cyberrisk modeling across cyberthreats to better anticipate, prepare and improve overall cyber resilience.

The research was conducted by Oxford's Professor Sadie Creese and Professor Michael Goldsmith and sponsored by AXIS. The full white paper, which identifies a preliminary Cyber Value-at-Risk (CVaR) model and articulates key insights from the Department's preliminary research, can be found [here](#).

Professor Sadie Creese, Department of Computer Science at Oxford University, said: "All organizations face cyberthreats today, and the proposed CVaR helps estimate cyberrisk and allocate resources toward optimal control configuration. The proposed CVaR model is an analytical milestone in research on the quantification of cyberrisk, and we are very pleased to present our early insights today."

The Department's research proposes the **CVaR model**, an evolution of the traditional Value at Risk ("VaR") methodology which takes into account potential losses, probability of losses, and timeframe.

The CVaR model augments existing analytical solutions by:

- Articulating cyberrisk in financial terms, supporting commercial decision making, and helping create balance between protecting an organization and operating a business;
- Generating data that allows businesses to make decisions about their risk appetite, cybersecurity investments, and other risk mitigation and transfer strategies more confidently;
- Predicting the potential losses arising from cyberattacks and illustrating the pros and cons of control-mitigation strategies and configurations; and

- Identifying and quantifying residual risk, helping calculate insurance limits and coverages.

The proposed CVaR model builds upon VaR with three additional variables: control effectiveness, control dependencies and harm propagation. The Department has created an algorithm for calculating CVaR for an organization.

Dan Trueman, Global Head of Cyber and Technology at AXIS, added: "Our team at AXIS is proud to continue our longstanding partnership and support of Oxford's Department of Computer Science in publishing critical research to help improve understanding of cyberrisk quantification and mitigation. Through this partnership and the efforts we are leading through the AXIS Cyber Center of Excellence, we are committed to helping combat the significant threats posed by cyberrisk."

Launched in 2018, the AXIS Cyber Center of Excellence offers protection and mitigation solutions to counter global cyberthreats and attacks through education and awareness training. For more information, please click [here](#).

About Oxford University Department of Computer Science

Founded in 1957, Oxford University has one of the longest-established Computer Science departments in the country. Formerly known as the Oxford University Computing Laboratory, it is home to a community of world-class research and teaching. Research activities encompass core Computer Science, as well as computational biology, quantum computing, computational linguistics, information systems, cyber security, software verification and software engineering.

About AXIS Capital

AXIS Capital, through its operating subsidiaries, is a global provider of specialty lines insurance and treaty reinsurance with shareholders' equity at March 31, 2020 of \$4.8 billion and locations in Bermuda, the United States, Europe, Singapore, Canada and the Middle East. Its operating subsidiaries have been assigned a rating of "A+" ("Strong") by Standard & Poor's and "A" ("Excellent") by A.M. Best. For more information about AXIS Capital, visit our website at www.axiscapital.com. Follow AXIS Capital on [LinkedIn](#) and [Twitter](#).

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