Applying Actuarial Techniques in Operational Risk Modeling

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Abstract

Motivation. There is a growing need for effective, practical methods of operational risk analysis in all industries. Risk professionals are learning to develop business-unit-level risk distributions, combine those distributions into an aggregate risk model, and use that aggregate risk model to either assign risk charges back to the business units, or to evaluate cost-benefit of mitigation strategies. Operational risk modeling is structurally similar to actuarial risk modeling. The operational risk community will benefit from learning actuarial techniques that can be applied to operational risk modeling.

Method. First, the paper will outline how operational risk management is similar to an internal insurance program. Second, it will discuss an internal risk modeling framework that ties together risk exposure, likelihood, severity, and correlation into an aggregate loss model. Finally, using the model output, it will present several methods to transparently reward risk mitigation efforts and attribute risk costs to their sources.

Conclusions. This paper will demonstrate the potential synergies from applying actuarial techniques to operational risk analysis. It will also demonstrate practical techniques, grounded in actuarial science, to solve operational risk management problems such as risk cost allocation and risk mitigation cost-benefit analysis.