On the validation of internal models

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The development of risk models for managing portfolios of financial institutions and insurance companies requires, both from the regulatory and management points of view, a strong validation of the quality of the results provided by internal risk models. In Solvency II for instance, regulators ask for independent validation reports from companies who apply for the approval of their internal models. Unfortunately, the usual statistical techniques do not work for the validation of risk models as we lack sufficient data to significantly test the results of the models. Indeed, we will never have enough data to statistically estimate the significance of the VaR at a probability of 1 over 200 years, which is the risk measure required by Solvency II. Instead, we need to develop various indirect strategies to test the relevance of the model. These indirect methods comprise various steps that we list and discuss. In this presentation, we analyze various ways to enable management and regulators to gain confidence in the quality of models. It all starts by ensuring a good calibration of the risk models and the dependencies between the various risk drivers. Then by applying stress tests to the model and various empirical analysis, in particular the probability integral transform, we can build a full and credible framework to validate risk models.