



## Validating AMA

### Summary

Developing an AMA model is hard enough, but validating it is far harder. All AMA models contain a large portion of subjective, qualitative and highly volatile data which makes the model dependent on best effort opinions which may appear to be impossible to validate. Also, the models contain a large number of poorly understood free variables making the choice of parameters difficult to justify. However, the validation of AMA models can be a great help in getting a better insight in the workings of ORM and the effort is well worth it.

### Dear reader,

Despite all the numbers, formulas and special symbols, measuring risk is an art rather than a science, as any risk manager will tell you. And although no single number can do justice to the intricacies of the risk environment, there is often a need for a simple, single number that tells us the credit worthiness of a client, the robustness of a company or the level of risk in a process. For risk, the amount of capital required is such a number. It is appealing because since it is measured in monetary terms, it is easily comparable across time, across companies and, within companies, between business units.

For OpRisk, the most risk sensitive capital calculation under Basel II is the Advanced Measurement Approach, which allows the use of scenarios and assessments regarding the quality of the internal control environment as part of the capital calculation. One of the Basel requirements is, of course, that such AMA models must be validated<sup>1</sup>. But since the AMA models contain a lot subjective inputs and qualitative data, this validation is not the standard set of back-testing, analysis of error terms and independent re-calculation. There is often not enough loss data to allow proper back-testing. Error terms show highly erratic patterns and the inputs are such that no independent re-calculation can properly be performed since they are qualitative opinions rather than quantitative facts. AMA validation focuses, rather, on three main elements: the integrity of the inputs, the consistency of the model (including the assumptions made, basic sensitivity analysis and stress tests) and the use made of the outputs in the day to day running of the bank. These three elements will be reviewed briefly.

### Integrity of the inputs

The basic requirements for the inputs in AMA models are that they must be comprehensive, appropriate, and accurate. That concerns both direct observations (e.g. events and losses), risk and control factors (covering risk registers and assessments) as well as highly constructed data (such as data from scenario analysis). If ORM is set up correctly, i.e. as an independent unit, then some

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<sup>1</sup> See a) CEBS *Guidelines on the validation and assessment of the Advanced Measurement (AMA) and Internal Ratings Based (IRB) Approaches GL10*, April 2006, paragraph 583-595. With the renaming of CEBS to EBA, it can now be retrieved through <http://www.eba.europa.eu/getdoc/5b3ff026-4232-4644-b593-d652fa6ed1ec/GL10.aspx>  
b) BIS Operational Risk – *Supervisory Guidelines for the Advanced Measurement Approaches*, December 2010 at <http://www.bis.org/publ/bcbs184.pdf>  
Also useful is the BIS publication of December 2010, *Operational Risk - Supervisory Guidelines for the Advanced Measurement Approaches* which can be found at <http://www.bis.org/publ/bcbs184.pdf>



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level of assurance over completeness and accuracy of the data can be obtained from Finance (regarding losses), Internal Control (regarding the risk register), Compliance (regarding regulatory requirements) and Audit (regarding assessments). For the scenarios, it is important that the assumptions should be unbiased. The Basel guidelines further stipulate that the results of scenario analysis should also be realistic. In fact, this 'realism requirement' seems to take the sting out of scenarios. How realistic would we have judged a scenario of massive earthquakes followed by a tsunami that wipes out infrastructure and entire communities and affects 4 nuclear plants which are beyond control for prolonged periods? These kinds of supposedly extreme scenarios are actually made in industry but are far less common in the AMA practice. But since AMA should have a confidence level of 99.95% over a one year holding period, this requirement of realism does not do justice to the confidence interval.

### Consistency of the model

The model developers have devoted much research on the sparse OpRisk data and have made remarkable advancements given the scarcity of data. This scarcity is, in fact, reducing and some studies that rigorously validate their results have shown that for some datasets, there is even data redundancy, which is the first step to deriving models that are not over-engineered<sup>2</sup>.

In terms of consistency of the models, reference is often made to the Basel line of business line beta's as used in the standardised approach (TSA). The AMA outcomes are then justified by benchmarking them against the TSA. That does beg the question, for if the model consistency is made dependent on the less rigorous approaches, one wonders how strong these models are. Also, it is still open for debate what type of model is suitable for OpRisk. The enthusiastic use of actuarial models for AMA still goes hand in hand with calls for extreme value theory (EVT). For the moment, it is probably best for any institution to keep an open mind and put all its available data in a simple model that is not inconsistent with the beta's and make actuarial sense while recognising EVT.

### Use made of the outputs

The so-called use test is actually a great help in promoting ORM. Requiring AMA to be applied to all levels and in all subsidiaries and demanding its use in everyday risk management should be a welcome boost for anybody interested in risk management. The complications start where the model works at the bank wide level, but fails to apply to lower levels of granularity. The AMA approach should be developed keeping these operational granularity levels in sharp focus. Failing to do so may create a model that does not pass the use test since it cannot accommodate a less diverse portfolio of data.

The use test requirement does offer a way out of applying the model only. It also required a full validation of the Risk Management Processes itself. By analysing that process, banks can show

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<sup>2</sup> See e.g. *A dynamical approach to Operational Risk Measurement*, M. Bardocia and R. Bellotti, in *The Journal of Operational Risk* (3-19), vol 6, no 1, Spring 2011.



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that they have implemented a robust way of measuring and managing risk that goes beyond, and can in part even override, the AMA outcomes.

As long as institutions properly assess the appropriateness of their approach, can provide assurances that the framework is still 'fit for purpose' and operates as management would expect it to, that counts towards a proper use test. They can show this by verifying that:

- ✓ Risk management documentation is complete;
- ✓ Management information reporting procedures are followed;
- ✓ Captured loss data meet the required data standards;
- ✓ Follow up actions are carried out in an effective and timely manner;
- ✓ Procedures to review and update the operational risk management framework are followed;
- ✓ KRI's / loss data /compliance reports and risk estimates are in line with the results of qualitative (self) assessments.

### **Conclusion**

Validating AMA is a huge challenge for both banks and regulators. But in fact, the validation requirement as described in the Basel papers is not as rigid and quantitative as may be suspected. It appears quite flexible and reasonable and should, if anything, assist the professional risk managers in their task of promoting sound risk management.