

POINTING THE FINGER

The financial industry stands accused of failing to measure credit risk properly and a fair amount of the blame is being leveled at risk models, particularly those used to predict subprime default and loss rates and measure the risk of residential mortgage-backed securitizations.

But it's easy to point the fingers at models – they don't have any fingers to point back! The real problem lies with how the financial industry uses and abuses its risk models and their results.

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At the moment, rating agencies are taking considerable flak from investors who accuse them of 'getting it wrong on subprime'. But if we view investors as the users of modeling results supplied by rating agencies – albeit mediated by rating committees¹ – we can draw out three wider lessons on the correct use of models.

OVER-RELIANCE

The first lesson is to avoid the problem of over-reliance. Professional investors allowed themselves to become far too reliant on a narrow set of risk modeling results, when this information should have been only one component of investor decision-making.

Over-reliance is a particular problem in relatively new areas of lending, such as subprime. The nature of risk means that immature risk models often give seemingly robust results for an extended period of time before breaking down just when you need them to be sound.

This is not to let the rating agencies off the hook: it suggests that investors are better advised to downgrade the importance of model-based rating agency

opinions – making them one source of information among many or, at least, more – rather than trying to 'mend' them.

Preventing over-reliance is not simply a question of diversifying the sources of modeling expertise. It also means that model-based recommendations must always be questioned and supplemented by human expert judgment at the point that the investment or risk-management decision is taken.

In the banking context, this means drawing on both the 'grey haired' type of judgment at the top of a banking organization and on specialist knowledge in particular lines. This comes back to a topic we've talked about elsewhere at length:² the proper role of risk management science is to support and enhance, rather than replace, management judgment.

MIS-INTERPRETATION

In the case of subprime, the models used by the rating agencies to gauge the risk of subprime investments tend to focus on default risk and loss rates and on the seniority of cashflows within the securitization instrument. But investors used the results as if they also offered assurance about market price risk and liquidity risk.

We'll sidestep the difficult issue of rating agency communication responsibilities here,³ and move quickly to our wider point. Even the most sophisticated models are dumb tools – they can't tell us we are misapplying models or misinterpreting results any more than a chisel can complain when it's used as a screwdriver. It's the user's responsibility to find out what the model results mean in the context of the problem at hand.

There is no quick fix. If risk model results are going to be used to make critical decisions, then investors (and senior management in the banking context)

must make the time to understand the principles on which the model is founded and which give meaning to its results.

This does not mean that decision makers have to understand the math. If you ask a bank model auditor rather than an academic what causes large-scale model disasters they'll never point to errors in the equations; it's always a more basic problem such as mis-application, mis-implementation, over-reliance, mis-interpretation, fraud, or fundamental data/data feeds.

DATA, DATA AND DATA

The third key problem we can see emerging in the subprime debacle concerns the relationship between risk modeling and risk data. Investors failed to notice a huge gap developing between their dependence on subprime risk modeling, and the limited efforts made by some originators and others to validate the fundamental credit information fed into those models.

Model builders are usually well aware of their dependence on data quality, summed up in the saying 'rubbish in, rubbish out', but it's less often pointed out that the relationship between data gatherers and risk modelers should be a two-way street. Once a model has been carefully built, risk modelers can help business lines and compliance functions to re-focus on the most important bits of risk information that lenders gather during the origination process.

For example, the weighting of risk variables in a carefully built credit scoring model gives a strong indication of which

bits of origination data the bank must verify and audit with special care – and which bits are largely redundant in risk terms.

Likewise, sensitivity testing of a risk model, such as an economic capital model, can help identify the model's key risk variables, highlighting the risk data and risk parameters that should attract the most attention and investment.

LET'S HEAR IT FOR RISK MODELS

After all this criticism of risk models, let's remind ourselves what models are good at.

They are good at helping us to describe a problem in a clear-headed way. They help us to systematize how we look at risk, i.e., to make sure we approach problems consistently, and to think about a problem objectively rather than jumping to biased conclusions. Computerized models save us time by conducting complex calculations in seconds that would take a human many hours. They compute the outcome of complex scenarios where the human brain would find it difficult to keep track of all the interacting factors.

None of this, however, suggests that we should turn our brains off when we turn the calculation engine on – quite the reverse. Models are a tool for leveraging human intelligence and, occasionally, the lack of it.

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Footnotes:

¹ For a summary of the process at Standard & Poor's, see Testimony of Vickie A. Tillman Before the US Senate Committee On Banking, Housing, and Urban Affairs, 26 September, 2007; available at: http://banking.senate.gov/public/_files/ACF75B8.pdf

² 'Judgement Versus Risk Management Science: Are We Getting the Balance Right?', Risk Management Association Journal, May 2006

³ The agencies argue they have made considerable efforts to communicate what a rating is, and what it is not.

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