

The Risk Manager of the Future: Scientist or *Poef*?

by Eric Falkenstein

Quants alone do not represent the future. There is no single deep field of knowledge that is sufficient for competence in the real-world field of risk management. The successful risk managers of today and tomorrow are synthetizers and applied problem-solvers, who focus on loss and capital estimation that is integrated within pricing models and profitability reporting.

In the midst of the industrial revolution, English philosopher John Stuart Mill noted that the technology which had so changed the world did not lighten man's toil: if anything, there appeared to be more work. Similarly, we should expect the recent advances in risk management thought and technology to make a risk manager's job more hectic, in that both risk and risk management can be judged. Such is the price of moving from record-keeping to affecting the bottom line. The following are thoughts on where risk management is going, and what it's leaving behind.

Why Change?

The current pace of change is driven by data. For a long time data wasn't warehoused in a usable way, making potentially useful theories useless in practice. Additionally, rating agencies didn't publish anything on default rates by grade, so there was little data for the credit risk manager to benchmark against. Banks now have archival, transaction-level data in large relational databases and can apply quantitative techniques to products that previously were only the subject of anecdotes. Moody's and S&P have published historical data on default rates for commercial cred-

its, and Fair, Isaac and others have extensively tested statistical models for evaluating consumer credits.

Think about the following constraints for all previous and many current risk managers:

- A/L management risk was based on a few different 12-month earnings simulations.
- Loan performance data was not archived.
- Loan application information was not linked to account information.
- Risk management could only be judged by top-down charge-off levels.
- Business line performance

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could only be judged by return on assets.

In such a scenario it was difficult if not impossible to demonstrably improve risk management techniques, since there was no way to compare the alternative risk metrics and strategies. Being a good risk manager was like being a good LAN administrator—hardly worth the effort given the lack of appreciation. The reputation of risk management as a science was such that previous regulatory or business line experience trumped previous risk management experience when qualifying as senior risk managers. This was similar to the way education majors are presumed to know less about education than those who learn about education indirectly through physics or English literature. Luckily for shareholders and regulators, things have started to change. This means that although risk management had been evaluated solely by top-of-the-house data, such as total charge-offs, the risk managers of the future will be evaluated by more exacting standards, such as distribution of losses by original credit grade.

Next Areas of Focus

As opposed to mentioning ultimate objectives, such as estimating enterprise-wide RAROC by relationship and line of business, it is more useful to think in terms of lower-level tactics. While RAROC applied everywhere is a good thing, it leaves a lot of ambiguity as to method, sort of like a manager telling his boxer to knock the other guy out.

The first task of any senior

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risk manager is finding out the essential product characteristics that help one measure and manage that risk; invariably, such items are idiosyncratic to different markets and product types. For example, essential factors in residential mortgages include the amount of purchased mortgage insurance, LTV, maturity, and bureau scores, while for asset-based commercial lending, various types of covenants and collateral types are most relevant. It has been said that science is a collection of the best recipes—the rest is literature. Risk, too, is a collection of recipes, indexed by product type. Deriving an institution's list of necessary and sufficient risk measures, by product, is the most important and most elementary step in risk measurement.

Secondly, once the essential data has been identified, an effort must be made to bring such information into a centralized place on a timely basis. A risk manager needs to know his institution's current information architecture as well as what's available.

Enterprise-wide data capture is more of a political problem than a technology problem, and setting up task forces or specialized database groups usually creates more problems than it solves. Efficiency can be enhanced by having those who understand the data and what it is used for directing data collection; inevitably, however, an oversupply of middle-

management will muscle into this area.

Third, one must figure out how to turn this information into the most basic lending risk characteristic, which is loss forecasts. Taking this to the next level involves the generation of unexpected losses (a loss probability distribution function or histogram), but it should be remembered that this is a secondary consideration—second-order in importance and second in calculation.

Lastly, risk managers should strive to make sure their output, expected losses, and capital are consistently applied to underwriting, portfolio management, marketing, planning, provisioning, and incentive compensation. New risk metrics are usually implemented piecemeal and not automatically enmeshed in all the corporate decisions that could use such information. There's a lengthy period of implementation and experimentation as abstract formulas are reconciled with the hard facts such as market prices, data limitations, and the current status quo.

In sum, the primary job of risk management is to identify, gather, and interpret information relating to future losses and to ensure that untamed parts of the corporate information system, if not consistent with the other parts, are at least moving that way. Gathering necessitates knowledge of informa-

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tion systems and project management. It also requires the wisdom of knowing what's needed. Identifying and interpreting data may seem like two opposite ends of the risk management spectrum—one an input and one an output—but there is a necessary push-pull dynamic such that ideally both are determined simultaneously by one person or unified team. The data collected should be a listing of exposure amounts, grouped within product types; these risk buckets would then be translated into expected losses and capital amounts. They represent a hard set of information as a point of focus.

In the early days of the automobile, the consumer had to be a good mechanic and a good driver. Similarly, a good risk manager needs to understand the practicalities of data and bureaucracies as well as the theories as to how to evaluate that data. Risk managers can't avoid the dirty dealings of data and politics if they want to make a real impact.

What Not to Do

Much of what risk managers do is so unfocused that the results are ambiguous, at best; therein lies the primary inadequacy of risk management. Sometimes it seems that both the reviewer and the reviewed prefer making the simple and straightforward seem as complicated as possible. Volume and lack of

clarity impress and repel a sufficient number of meddlers who might second-guess the status quo and prevent any unambiguous findings. For example, if policy instructs one to observe 20 different factors, most factors will be subjective and, invariably, some will be above average and some below. The aggregation is unavoidably subjective as well, and the business line will always be able to argue that any below-average controls or above-average risks are mitigated by below-average risks or above-average controls. In practice, this means that any business line with a modicum of political clout will be able to refute or ignore any review that claims the business line is operating in a substandard fashion and that certain material changes should be made. That risk reviewers—internal or external—are able to pile on weak (that is, unprofitable) lines of business should comfort no one.

The importance of emphasis as opposed to scope is key in effective risk management. A good example of the deficiency of the audit approach comes from the Challenger space shuttle disaster of 1986. Although faulty O-rings were identified before the fatal flight as a “mission-critical risk,” it was one of more than 100 such risks. When exceptions are the rule, the entire risk management process is undermined. With this many risks, one had to make such judgments; oth-

erwise, the shuttle would never fly. This was classic risk enumeration, useful for explanation but not prediction. The difference between knowing many different facts in an unrelated way and knowing a subset of those facts in an organized, useful way is the difference between a “Jeopardy!” champion and a good businessman.

Rocket Scientists?

Risk management is an analytical field, requiring the ability and patience to understand complex relationships. The most common substandard senior risk manager has a topical familiarity with the pertinent issues, but whose boredom or incomprehension of essential details makes his guidance useless and his vision arbitrary. These managers are common enough to make Dilbert a mainstay of cubicles everywhere, and no one champions them in practice or theory.

The notion that risk is synonymous with “risk capital,” which equals a mathematical function similar in concept to Value-at-Risk, is highly misleading. While a basic knowledge of statistics will be essential, requisite knowledge can be obtained in undergraduate courses—one does not, nor will ever, need a Ph.D.

VaR and capital. It took a year or two for many risk experts to realize that validating credit VaR (Value-at-Risk) is substantially different from validating market VaR. It is still relatively unappreciated that credit VaR as applied to a portfolio of rated corporate bonds is not easily applied to a bank whose portfolio includes home-equity loans, asset-based lending, credit cards, fiduciary services, and

deposits. Nonetheless, if this were the only limitation of VaR as applied to the entire corporate book, the future would look very much like a relatively straightforward mathematical problem and the future would belong to hard-core quants.

Yet while equity capital is a function of risk, this does not mean equity capital or risk is a strict function of a firm's current VaR. The only theory that links VaR to capital is the Merton model, which applies to the volatility of the firm's asset value and which includes the current and future positions of the firm. VaR as generally calculated is for a current portfolio; VaR relevant to capital needs to be applied to the current and *future* portfolios (that is, franchise value). One is a narrow math problem; the other almost a *weltanschauung*¹

Reasoning. In contrast to the academic approach, where the parameters and objective of the problem are completely defined, real-life problems are presented totally without context. Invariably, analogies are used to figure out what approach is most appropriate: Is this lending program more like consumer, commercial, or asset-backed lending? Is this trader more like a speculator or market-maker? Is a swap exposure like a loan? Nothing crystallizes a problem like a good analogy, nothing highlights a miscomprehension like a bad analogy.

Estimating an imprecisely defined problem like the value of a firm's franchise value, or the risk in cross-border leases, involves a high degree of qualitative reasoning. A senior risk manager is faced with precisely

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defined math problems only a few times a year. Yet on a daily basis, risk managers must wrestle with poorly defined problems, new products, and new interrelationships. The latter problems require not only an encyclopedia of risk tools but also an ability to find the most relevant comparable—or even the right metaphor.

While Wordsworth is unlikely to beat Markowitz in solving pressing problems, the subtle reasoning in classical literature is clearly a stronger foundation for competent risk management than a narrow understanding of algorithms. It is easier to look up a formula than to figure out which formula is most appropriate. Currently, there are more lawyers and MBAs heading up risk management divisions than scientists and mathematicians. That will probably not change in the future, though lawyers would be well served by taking more statistics courses.

Prudent Incrementalism

Risk management's new bevy of tools has not been without problems of its own creation. We are in a dangerous period in which quantitative ideas abound but it is difficult to distinguish wheat from chaff—there are lots of less-than-useful tools mixed with the good ones. This has created frustration

on both sides. To those impatient for change, the old school wouldn't know a standard deviation from an extreme outlier. To those dreading change, the quants seem to have as much common sense as a computer. Both camps have plenty of anecdotal support for their view.

Models go through a life cycle in implementation—they first are used to rationalize decisions and then are used to make them. Unfortunately, most models stay forever in the rationalization mode and fade away as people and projects change. Usually the problem isn't as obvious as a wrong model; rather, it's an irrelevant or intractable model. Many ideas that are both new and true are also uninteresting and unimportant—this latter distinction being decided by real data. For example, GARCH, the curvature factor within yield curves, and business cycle forecasts all add great value in theory; in practice, however, they are dominated by much simpler models, if not ignoring these complications altogether.²

The transition to a different-looking system will be long and hard precisely because the current system works reasonably well. The economy has been in good shape, and part of the credit undoubtedly goes to the credit professionals who underwrite,

monitor, and otherwise manage our system of assets and liabilities. We must recognize this, as it forms the base of an optimal, prudent incrementalism: We should adopt well-tested tools, one at a time, that help us manage risk better. The result will be a slow but inevitable move toward a very different form of risk management, one that focuses less on individual transactions and policy manuals and more on information systems and statistics.

An Outline for Risk Management

The current situation for most risk management departments is reactive, almost audit-like. A successful risk management system will be relied upon heavily for decisions made in real-time, and focus upon leading, not lagging, indicators. (See chart below.) The amount of work won't change, but its relevance will, and that's progress.

Risk management has become trendy—like planning and forecasting in previous

decades. Those latter trends produced some permanent insights but basically represented the triumph of fads dressed up with heavy mathematics. In the long run, good ideas win out, so there isn't anything we must do for risk management to survive as a vibrant, important part of the corporate strategy. If it works, it will prosper; if it just makes for neat discussion, it won't. Odds are that risk management—incorporating validated loss or volatility benchmarks into everything lenders do—will be an important part of the future. The ideal risk manager of the future will need a combined knowledge of the technical tools used in risk analytics, data integration skills, and an understanding of how risk measures relate to strategic and tactical business decisions. □

Suboptimal, Yet Common Situation	Risk Management of the Future
Risk reports are everywhere, but the line rarely uses them to make decisions.	Risk management information is integrated within pricing models, incentive compensation and profitability reporting.
Charge-offs and criticized assets are the primary measures of asset quality.	Internal grade composition is the primary measure of asset quality
Quantitative modeling is used mainly for back-end analysis to help understand the implications of current policies.	Quantitative modeling is used at the front-end to affect the spread, volume, and credit quality of the portfolio
When a lending unit experiences high losses, the business strategy is reevaluated.	An unexpectedly adverse composition of internal risk grades prompt initiatives to rethink strategy even though overall charge-off rates are still below average. High charge-offs are an anticlimactic end to a failed business strategy.
Quants are hired primarily based on having advanced degrees or experience in quantitative fields.	Quants are hired based on their ability to explain complex risk measures to senior management.

Notes

1 Merriam-Webster defines weltanschauung as "a comprehensive conception or apprehension of the world especially from a specific standpoint."

2 Specifically, GARCH can be replicated sufficiently well with a simpler exponentially weighted moving average; the curvature factor in yield curves is too unweildly to make hedging worthwhile, and given the inability, after 130 years of trying, of economists to predict recessions, adjustments to default prediction based on macro forecasting is counterproductive.

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