What Good Can Come from a Bad Bank?

RISK PROFESSIONAL

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DESPERATELY SEEKING SOLUTIONS

The economic slowdown has brought a boom in risk management systems, as crisis-battered firms resolve never again to be caught napping

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Damian Handzy
CEO, Investor Analytics

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Tools of Intelligence

Damian Handzy of Investor Analytics brings behavioral science into his risk software.

After living through the financial crisis with their embattled customers, suppliers of risk management technologies know better than to promise panaceas. But they are reveling in attention and countercyclical demand from companies resolving not to repeat past missteps.

By Katherine Heires

Few sectors have been spared the pain of the global financial crisis and economic slowdown. Cutbacks in capital spending have had ripple effects throughout private industry, hurting many segments of the technology market, for example. But the business of risk management technology is not one of them.

Times of crises and their aftermath can be very good for those with products that address causes or effects – that can be labeled as solutions. In the wake of the greatest financial cataclysm of the computer age, the timing for risk systems – ranging from analytical algorithms to compliance-monitoring software to "dashboards" that promise a consolidated view of enterprise-wide exposures – could hardly be better. RiskMetrics Group, a marquee name in the field, went public in January 2008 and has grown despite the troubles in its core financial markets. Although its share price is several dollars below its summer 2008 high of $26.43, RiskMetrics boosted first-quarter revenues 9% (to $77 million) and earnings before interest, taxes, depreciation and amortization 27% (to $29 million), and its $1 billion market capitalization has enabled it to add muscle through acquisitions and enhance its talent base. In April it opened an office in Beijing, its 20th overall and "a must for a global company like RiskMetrics," proclaimed CEO Ethan Berman.

Such suppliers have truly come in from the cold. Though they may never have been completely isolated or marginalized, their business and their offerings are more central to their clients' thinking and planning than ever before, according them a status that technology vendors ordinarily find difficult if not impossible to achieve. It stands to reason; the risk management profession as a whole has moved up the corporate ladder. It needs more robust tools to step up to challenges after the crisis and, everyone hopes, to prevent anything like it from happening again.

The technologists' ascent, industry players say, has less to do with the technologies themselves than with a changed state of mind. A far broader spectrum of people who are not risk managers per se – CEOs, COOs and CIOs, to begin with – are depending on chief risk officers and their teams to communicate more information than before in clear, concise, understandable terms and formats.

"We have found in our research a profound connection between the supply of credit, market volatility and emergence of long-standing operational risk frauds and market events," notes Penny Cagan, managing director of credit and operational risk content with Algorithmics, a Toronto, Canada-based risk solutions company founded in 1989 and owned since 2005 by the Fitch Group. "What this suggests is that it is important to manage risk across all risk silos and to finally stop thinking about types of risk in isolation to each other." In other words, the ultimate context is now enterprise-wide, and that becomes a general management concern.

To be sure, technology providers are happy to promote their wares with dazzling technical detail – new offerings that take into account fat-tail, counterparty and liquidity risk; that apply the latest behavioral science findings to markets, or up the ante in terms of stress tests and what-if scenarios; or that integrate with the latest high-frequency trading platforms and grid computers to dramatically reduce the time it takes to complete value-at-risk (VaR) calculations or Monte Carlo simulations. After all, better-faster-cheaper is what sells computers and software.

The context is enterprise-wide, a management concern.

But what truly excites these suppliers is the buyers' attitudes, described variously as "questioning," "inquisitive" and "far more open to new models and technologies." It's a far cry from the predictable "checklist" or "just give me what everybody else has" mentality that resulted in complacency and familiarity with out-of-date models that failed to take into account so-called black swan events.

"People are looking for new tools that capture what the old risk tools failed to measure," says Damian Handzy, chairman and CEO of Investor Analytics. His 10-year-old New York- and Berkeley Heights, New Jersey-based provider of risk analysis and management solutions for hedge funds is one that has sought to break the old mold of risk technology.

A nuclear physicist by training, Handzy is a believer in bringing findings from other disciplines – evolution, cognitive science, complexity theory – into an understanding of economics, markets and risk. Last November his firm announced a partnership with Professor Andrew Lo of the Massachusetts

Institute of Technology's Sloan School of Management. In February, Handzy announced the release jointly with Alpha Simplex Group, of which Lo is chief scientist, of a risk analytics suite called AlphaSimplex Analytics Array, or A^3, that incorporates Lo's studies in behavioral economics.

The system takes an adaptive approach, assessing and taking into account individuals' not-always-rational actions and their effects on markets. A^3 is said to give risk managers more detailed and sophisticated insights than would conventional rational-expectations-based models. Investor Analytics says that it could have been used to flag the fraudulent reporting that eventually exposed Bernard Madoff's Ponzi scheme in 2008 and the Bayou Group hedge fund scandal in 2005. "The last 18 months should convince even the most hardened skeptic that a new generation of risk analytics is needed in the hedge fund industry," Lo said when A^3 came out.

Explains Handzy, "Behavioral economics does not rely on the traditional math that established economics is built upon." That's a controversial stance, but Handzy is confident that a breakthrough approach in today's marketplace will attract a following.

"People are much more receptive to trying new things," says Boryana Racheva-Iotova, president of FinAnalytica, a risk and portfolio management software company of which her father, Zari Rachev, founder of the PhD program in mathematical and empirical finance at the University of California at Santa Barbara, is chief scientist. Racheva-Iotova cautions, though, that "this can be a double-edged sword if they are only interested in trying new things that are quick and easy."

The New York-based company's more advanced risk methodology is anything but simple, she adds. FinAnalytica, launched in 2003, says that its methodology had taken extreme fat-tailed risks into account long before much of the financial world woke up to them – in addition to a "normal" or Gaussian risk model. The fat-tailed model, developed over a 10-year period, is "very complicated," says Racheva-Iotova, but the company says it has sold systems to major buy- and sell-side firms and has about 50 organizations, which it declines to identify, evaluating its software.

David Merrill, FinAnalytica's new CEO, who brings experience from such financial technology outfits as Omgeo and Moody's KMV to accelerate the company's sales efforts, observes that customers' and prospects' "attention span is very long now" – portfolio managers, research directors and other non-quants who used to tune out now sit through one- or two-hour presentations and ask probing questions.

"For some time, many have been content to simply be able to say that they have a risk management application or a VaR number," says Andrew Aziz, executive vice president of risk solutions at Algorithmics. "There was definitely a segment of the user population that viewed the choice of risk management tools as simply a check-the-box process, just to be able to say they have it."

Gregg Berman, head of RiskMetrics' risk business, agrees that "folks are starting to ask the right questions about what risk management tools can do." Many firms are only now upgrading risk management programs from the mid-1990s, he says, and those with a sense of urgency are fueling growth for RiskMetrics and others.

"Instead of the concept of seeking out one number to understand their entire risk, they are starting to say, 'I need lots of numbers and multiple reports, and I need to understand where these numbers are coming from – let's look at the new stress tests and compare and contrast the difference,'" says Berman, whose company was spun out of JPMorgan & Co. in 1998 and whose software is standard equipment at many of the biggest financial institutions in the world. "Over the last six months we have seen the tide turn," adds Berman, resulting in a healthy and growing interest in state-of-the-art risk management.

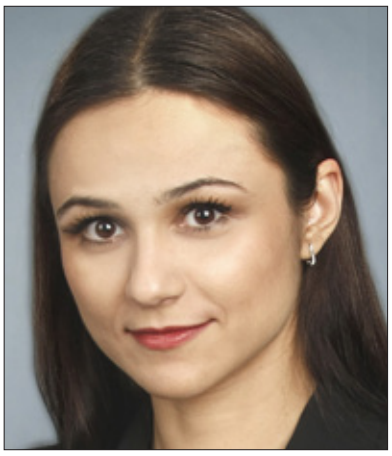
Folks are asking the right questions about risk tools.

Some of what makes the state of the art possible comes out of the technology labs and the sheer power of high-performance computing. FinAnalytica's Racheva-Iotova says that many of the theories, including those of fat-tailed risks, can be traced back several decades to the likes of Yale University mathematician Benoit Mandelbrot, economist Eugene Fama at the University of Chicago and the efficient market hypothesis. But only in recent years have computer capacities and speeds brought sophisticated mathematics within reach of quantitative market players who need to manage positions, model scenarios and crunch risk factors by the thousands. FinAnalytica relies on a research and development center in Sofia, Bulgaria,

Photos by Ben Ferrari

to keep its systems in tune with technological capabilities.

Fincad, an 18-year-old financial analytics company in British Columbia, Canada, with a diverse mix of customers in 80 countries and a habit of plowing 30 percent of its revenues back into R&D, will roll out this summer a new technology platform that has been more than four years in the making, says president and CEO Robert Park. It draws on the latest in grid computing and object-oriented programming, and as a framework for valuation and risk assessment it will "bring significant innovation to the marketplace," says Park. Fincad is also joining the software-as-a-service bandwagon, a variation on hosting that is designed to make users more agile and flexible while reducing operational and maintenance costs.



FinAnalytica has been working on fat-tailed models for 10 years, says Boryana Racheva-Iotova.

John Jay, senior analyst at Aite Group, sees last year's collapse of Bear Stearns Cos. and Lehman Brothers as a catalyst for buy-side firms in particular to upgrade counterparty and credit risk assessment. Algorithmics, for one, has updated its risk platform to cover both counterparty and liquidity risk. "They have an appreciation of the real-world risks that are plaguing the financial markets today," Jay says of the Canadian vendor.

"If enterprises had been more aware of the status of Lehman credit, they could have taken steps early on to mitigate positions where Lehman was a counterparty," says Jay. Instead, they were lulled into complacency by an extended period of low market volatility.

"Counterparty risk is now foremost in many people's minds. The rapid growth in the use of credit derivatives and the impact of the Lehman and AIG debacles have certainly increased people's preoccupation with counterparty risk," notes Park of Fincad, whose products include Fincad Analytics for cross-asset-class risk management and derivatives valuation, Fincad Analytics Suite for Excel, Auditor Insight, the Perfect Hedge and, as of June 1, the Web-based Fair Value Insight service.

Gregg Berman says that counterparty risk is likewise "a hot topic" among buy-side customers of RiskMetrics. David Wong, senior marketing specialist at cross-asset trading and risk management systems company Calypso Technology of San Francisco, expects that as part of this trend, more users will want to drill down to see precisely who are the issuers in a transaction, as well as their credit ratings and other granular detail. The firm offers and continues to develop such capabilities; one that is coming will let buy-side users value collateral on an internal basis, rather than seeking a valuation from the sell side. They will be able to "take a counterparty valuation from an outside source, rank it and then make use of dispute resolution tools if necessary," says Wong.

Also generating new interest, says Dushyant Shahrawat, senior analyst at TowerGroup in Needham, Massachusetts, is liquidity risk. "It's a work in progress at this point, but a number of risk platform providers are now factoring liquidity risk into their models," he notes, adding that it is not easy to do because of the need for access to real-time market data and conditions affecting specific securities. Chicago-based Aleri, which sells high-capacity complex event processing systems to leading trading firms, in May released its Liqudity Risk Manager, allowing for dynamic modeling of liquidity and funding requirements and "stress testing to a deeper level" in anticipation of new regulatory requirements.

A number of platform providers are now factoring liquidity

In April, Algorithmics issued guidance for its bank customers on complying with the U.K. Financial Services Authority's liquidity risk requirements that take effect in October. According to Aziz, firms will need to show the FSA that they have technical frameworks in place that can run relevant risk scenarios, stress tests and dynamic simulations, and that they can access information across the enterprise in a timely manner.

"Financial institutions will be under increasing pressure from regulators to demonstrate they are measuring and managing their liquidity risk," says the Algorithmics executive. "For many institutions, this will be an opportunity not just to comply with the requirements, but also to use this a starting point to take a

much more holistic view of the risk across the entire balance sheet, integrating market, credit and liquidity risk."

Handzy of Investor Analytics insists that his firm's behavioral approach to liquidity analysis would have raised critical questions in the Madoff affair because of its ability to show mathematically if there is correlation or dependency between monthly and quarterly returns. If there is, there can only be two explanations: the fund is not actually trading liquid securities, or the manager of the fund is smoothing out the returns. "Our techniques – which we've tested using numbers from Madoff's fund – clearly show that Madoff was in the red zone," Handzy says, meaning that the reported returns to investors were questionable.

The ability to handle an ever broader array of models, stress tests and scenarios is yet another trend cited by analysts and industry participants. Paul Compton, head of product management, alternative investment group, for Wayne, Pennsylvania-based SunGard Data Systems, says that SunGard, with the Advanced Portfolio Technologies (APT) risk modeling and portfolio analytics business it acquired in March 2008, has low-

risk into their models.

ered the cost of a range of risk methodologies.

"People are saying that VaR has not performed very well," Compton notes, and as a result, SunGard has been pushing to "get behind patterns and movements of asset prices and correlations without imposing assumptions" in new risk models and tools. Indeed, Aite analyst Jay views APT's Tracking-at-Risk function and Factor Monte Carlo simulations as breaks from tradition, with distinctive capabilities that "do not presuppose factors to explain portfolio risk."

New stress tests and scenario analyses have been high on the agenda at RiskMetrics in the past year. Brian Schmid, head of the company's alternative investment group, says this entails providing more fine-tuning capabilities and a composite stress test, which allows for combining stress tests or applying different ones to different parts of a portfolio.

Olivier Le Marois, chairman of Paris-based, risk analytics company RiskData, stresses the importance of systems that help users size up their extreme risks while identifying their main sources of risk. "Our platform has been doing this since 2003, and we have been working on the best way to communicate the results of these sophisticated models to our investor

Backtest: Avoiding Future Madoffs

By Maureen Nevin Duffy

Quantitative investing and risk management emerged from the market depths of 2008 with their reputations tattered. But there is no shortage of true believers who are combining lessons from the experience with technological improvements to make their advanced techniques and analytics more effective and resilient.

Some are looking back and arguing that their quantitative systems are good enough to have caught frauds and other bad behaviors before it got to be too late – the Bernard Madoff scandal being the benchmark for such events. Investor Analytics chairman and CEO Damian Handzy, for example, uses the detection of "glaring inconsistencies" in Madoff's investor reporting as a selling point for the A^3 risk analytics system that he unveiled in February (see the accompanying cover story).

RiskData's Adlerberg

And then there is Adil Abdulali, a masters in mathematics graduate of the Massachusetts Institute of Technology who, as a trader of mortgage-backed securities for his own hedge fund in 2002-'03, developed an interest in the way assets were priced. He created a tool, Bias Ratio, to gauge valuations and their accuracy against objective norms.

Later applying his tool to hedge funds while he was working for the advisory firm Capital Market Risk Advisors, Abdulali found that the pattern was much like it was in MBS: In normal market conditions, fluctuations would include occasional outperformance and under-performance. If over a reasonable time a fund lacks those peaks and valleys, while other funds with similar strategies have them, he would suspect bias – that the fund might be smoothing its returns.

"Hedge fund clients like to see consistent, positive returns," says Abdulali. But that only happens in the long run

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if biased or subjective reporting is tolerated.

Now managing director of risk measurement for New York fund of hedge funds Protégé Partners, Abdulali collaborates with new hedge funds. "They have the talent, we have the money," he says. Along the way he licensed his Bias Ratio tool to Paris-based risk systems specialist RiskData. In return, Abdulali gets RiskData's suite of tools and quantitative software. So armed, he has steered clients away from such high-profile debacles as Beacon Hill Asset Management, which the Securities and Exchange Commission charged in October 2004 with losing $300 million for its clients after alleged value-inflation in its reports. Protégé also avoided Bayou Group, whose founder, Samuel Israel, pleaded guilty to securities fraud last July, and which reportedly lost more than $400 million.

Madoff set off similar alarms. It wasn't just the Bias Ratio: "The main reason was we don't invest in anything we don't completely understand," says Abdulali. He is still amazed by the "incredibly long time the fraud was allowed to continue and the astonishing size of investments it attracted."

RiskData CEO and founder Ingmar Adlerberg says the Bias Ratio raised one of two red flags that would have exposed Madoff through quantitative risk analysis. Riskdata spelled it out in a paper early this year.

A lack of transparency made it difficult to analyze Madoff's main funds, but Fairfield Sentry, a feeder fund managed by Fairfield Greenwich Group, provided reports to Hedge Fund Research in the Equity Hedge class. This class normally registered between 1 and 3 in the Bias Ratio. Fairfield ranged between 6 and 7. Madoff claimed that he traded stocks from the S&P 100 and index options, highly liquid securities that should have been no higher than 3 on the bias scale.

The other red flag was inconsistent risk profiles. RiskData says that Madoff gave "a very precise description of his strategy," called split strike conversion, which should have allowed researchers to simulate his returns. But outsiders "couldn't even come close to his advertised returns."

Adlerberg believes the SEC can use tools like the Bias Ratio to help "spot and prioritize research problems." He concedes that a regulator "cannot recommend specific tools [for industry participants], but certain types of controls and processes and reporting requirements can influence the way decisions may be taken in a fund."

clients. This involves turning complex, quantitative analysis into simple and immediately readable risk reports."

Le Marois believes that a good risk system should never focus on one number such as VaR, but should aim to provide a full picture of the multidimensional aspects of a firm's or fund's risk position, so that managers can make better decisions in a timely way. Adds Fincad's Park, "You have to use multiple methods and models – even old models can provide a sanity check."

Schmid of RiskMetrics notes that among hedge funds there is considerable interest in improved, state-of-the-art transparency tools. The RiskMetrics platform has therefore been updated to enable managers to more easily and dynamically set and modulate the level of granularity about their investment activities that they wish to share with investors.

"In the past, investors would get one-size-fits-all monthly reports, but now many investors are using our interactive applications to design their own reports and receive them as frequently as they wish – daily, weekly or monthly," Schmid says.

Investor Analytics says it goes out of its way to display the performance-quality and confidence levels of the various risk models offered. "We are the only risk firm I know of that actively shows users this type of information," says CEO Handzy, though others stress some degree of transparency in how their software and algorithms work. "We feel it's a more accurate and sophisticated way to view risk models, and it's a feature we offer that our partner, Professor Lo, approves of as well," adds Handzy.

On the pure technology front, Eric Benhamou, CEO of Pricing Partners, a Paris- and London-based provider of derivatives pricing tools, services and risk analytics, says that his firm and some of his customers have started to investigate the use of hardware acceleration to shorten processing times. In April, for example, BNP Paribas ran some risk calculations using graphical processing units (GPUs) supplied by Nvidia instead of conventional central processing units. The technology promises to reduce run times as well as the number of servers employed, which lowers data-center energy costs.

GPU "is still in a prototype stage, but people are very keen on using this new technology to update their risk management efforts," says Benhamou, adding that the downside is the degree of reprogramming that needs to be done to take advantage of the faster speeds. BNP Paribas took six months to complete the conversion process for 5% of its global equity

derivatives portfolio.

Others remain intent on making familiar processes faster. Nigel Woodward, global director, financial services for Intel Corp., says that many financial services companies seek better risk simulation performance on existing grid computing configurations. Intel, in partnership with Sun Microsystems of Silicon Valley and GigaSpaces of New York, announced in April new benchmark results for the GigaSpaces XAP platform using Intel-based Sun Fire X4450 servers. "All banks are looking to understand their risks and exposures within a couple of hours, and real-time is the ultimate objective. These benchmarks demonstrate that customers can cost-effectively perform full risk simulations for their trading portfolios in minutes instead of hours, and pre-trade what-ifs in milliseconds," says Woodward. He adds that "we continue to see our customers, particularly in the risk management space, focus on speed of performance."

Tools are only as good as the people using them, says Fincad's Robert Park.

Much of this type of improvement could have been achieved as recently as two to three years ago and might have helped more firms anticipate the economic meltdown. But, says FinAnalytica's Racheva-Iotova, "during normal or boom market times, no one is interested in risk, and so it is part of human nature not to think about negative outcomes." Even a year ago, she found it difficult to get a hearing for a presentation on fat-tail methodologies.

Thus, in apportioning blame for not seeing the financial crisis coming, available technologies may not have helped – but mainly because they were not optimally used, or even fully understood. As MIT's Lo said in testimony last year to a House Oversight and Government Reform Committee hearing on hedge funds, "All technology-focused industries run the risk of technological innovations temporarily exceeding our ability to use those technologies wisely." Among his proposed post-crisis remedies: expanding degree programs in financial technology and developing a new professional services branch of "risk accounting."

FinAnalytica's Racheva-Iotova concedes that "something was lacking" in risk management, and the technology didn't make up for the deficit. Says her colleague Merrill, "Technology can provide insight, but it has to be implemented, and the people making decisions have to be empowered."

From his vantage point as a supplier to many top asset managers and hedge funds, investment and commercial banks, central banks and nonfinancial corporations, Fincad's Park says there is always room for improvement in tools and methodologies, but in many instances, the recent financial crisis was a case of misapplying the available tools, along with "not enough judgment" and "too much faith in models."

"Financial institutions haven't done a good job of assessing credit risk. Risk management departments were not well equipped to deal with the risks of credit derivatives. They were managing credit risk with market-risk tools, which was doomed to failure . . . And insufficient attention was paid to liquidity risk," says Park.

"We provide the tools and software, which reflect models developed in academia and on Wall Street, but we don't use them, and as purveyors of tools, we recognize their limitations," the Fincad CEO adds. "Tools are only as good as the people who use them."

Says Gregg Berman of RiskMetrics, "There is no magic solution in risk where you press a button and get a number; Risk is both an art and science, and to assess risk properly requires time and effort. Many financial institutions did not want to spend a lot of time on this, even though the tools were there."

Customers can perform full risk simulations in minutes.

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