

Surviving the meltdown

Rotberg on risk

What has ex-World Bank vice president and treasurer *Eugene Rotberg* been up to since he left that venerable institution to join **Merrill Lynch** last spring? Putting together what he calls, with characteristic modesty, "the most sophisticated group of men and women, I think, in the world." From his office just above Merrill's huge trading floor in the posh World Financial Center, Rotberg, an executive vice president at Merrill, has for the past three to four months been mapping out a risk management strategy for the firm's fixed-income products which has just this month reached completion.

Clearly, *Rotberg's* timing is right; the area of "risk management" is downright trendy on Wall Street, as firms are made painfully aware, in bearish times, of how risky it is to let "star" performers go unchecked.

(His hiring ostensibly came in the nick of time at Merrill, not long after it suffered a horrendous \$275m trading loss in mortgage-backed securities; he claims, however, he'd been chatting with Merrill two weeks before the loss even occurred.) In an effort to instil greater controls, most major securities firms are now putting in place or improving internal systems to protect against huge losses. Here, he details for IFR how the Merrill system works.

Merrill's system doesn't promise that fixed-income losses won't occur. It simply makes sure the firm knows what risks it has, a startlingly simple concept, despite all the graphs and charts.

"The heart of evaluating risk is not, as most people think, knowing how much you should take. That's child's play. The heart of risk management is knowing how much you have. Most institutions do not know how much they have. My initial responsibility was to develop a system which identified, on line and on time, precisely what the risks were in each product," *Rotberg* says.

Merrill, he explains, has about 30 fixed-income related products whose prices obviously fluctuate with changing interest rates. These include government, corporate and municipal bonds, commercial paper, currency and interest rate swaps, and derivative instruments such as bond futures. To evaluate the risk for each, he said, it was necessary first to evaluate spread relationships between the cash and futures market, between one security and another, between one maturity and another, and to evaluate event and liquidity risks. Next, the yield curve was divided into five or six different maturity brackets, with the appropriate data adjustments to determine the quality and character of the

hedges for each instrument in each maturity. The project, he says, took about 30 people from within the firm a month to prepare.

Sensitivity analysis

"We next did a series of sensitivity analyses where we created perhaps a half a dozen different changes in the yield curve to determine how for each maturity range and product, individually and in aggregate, any shift in any part of the yield curve would affect immediately the firm's profit and loss statement."

"Then we created a reporting system which enabled that information to be displayed quickly. That involved a great deal of computer software, which broke down each of the products in each part of the yield curve, and hypothesized how different changes in the market would affect the firm's profit and loss statement. That report has been quite useful, both for the trader, the manager, and the senior officers of the firm."

Rotberg makes the point that no risk system, and no report, is better than the management which receives the information. Merrill therefore appointed Daniel Napoli as senior v.p. in charge of risk management, giving him the authority to change any position at any time. Although traders at Merrill continue to report to their individual business managers, Napoli has the authority to require any change in position as a matter of risk control.

"Dan, in turn, reports only to me and the president of the firm, Daniel Tully ... (Napoli) was given responsibility equal to most senior business managers in the firm," says *Rotberg*, who believes Napoli's success in controlling trades lies in the fact that he himself was a government bond trader at Merrill for many years. "Keep in mind that he's been on that floor for over 15 years, so his relationships are superb. He's highly respected." *Rotberg* adds. If at-

tempted by someone who hadn't been a trader, he notes, the person would either take too much or too little risk.

Quant team

With the team leader in place, *Rotberg* and his colleagues then assigned to each trading desk one of the best "quants" or financial engineer experts, to assist the trader in constructing hedges. He then assigned to Dan Napoli a core of five highly sophisticated quantitative types, who in turn, would interact with these quant specialists from the trading desk. "This relationship of having specialists working for traders, and specialists working for Dan Napoli, assures a very high quality control," claims *Rotberg*. In sum: "We did both quantitative work, to know what the hedges were and how they were functioning. Second, software work to produce synthetic potential P&L effects, and third, a very clear management system, staffed by those who knew precisely what the word volatility means."

New client group

Rotberg tends to wax lyrical about his rocket scientists. "We have in place a superb core of perhaps 100 quantitative specialists ... in different parts of the firm. We had hired in the order of something like 350 MBAs in the last several years, and PhDs. Merrills is shortly to announce the formation of some of these "quants" into a new group that will report to John Richards, newly appointed chief for financial restructuring at Merrill.

"We took those who were not involved in the risk project and put them together into a new unit prepared to do the same kinds of things for Merrill's client base, giving clients sophisticated advice on how they should handle their interest and exchange rate risk...its very obvious that the risk that a firm faces is the same risk that anyone has who either invests or issues interest-bearing paper." says *Rotberg*.

There is the portfolio manager, who has the same risk as Merrill has. Second, there is the liability manager — the issuer — who has a wide proliferation of techniques to hedge or defer or shift risk. The group will be a major unit servicing Merrill's client base and will also be responsible for developing new hedging products.

How it works

What Merrill's software produces is the ability to see, at 8.51am, or nearly any given moment, a chart by computer or hard-print, detailing each product's long or short position, as well as its hedge, or lack of hedge. Rotberg explains: "These factors are all data-adjusted. That is, after considering the volatility between the cash market and the futures, between one maturity and a second, between security A and security B, it's clear that the net position, perhaps, is, say, \$65m long in this instrument, plus or minus \$13.7m, so we even measure the degree, after three standard deviations of volatility or uncertainty. For example, if the market moves 20 basis points up, it tells for each security, how much we make or lose. So I know immediately, for example, that if the yield curve steepens, we lose \$5m and that if it flattens, we gain \$5m. It tells us along a whole display of potential changes what we make or lose."

For more detail, there is also a P&L statement of where the firm makes money in each maturity range. "Say, we make money in one to three years but lose it in 10 to 20 years. You know exactly where you are vulnerable, precisely where the risks are. Therefore you can look at it horizontally — the change in the yield curve in total — or you can see what happens to the firm in each maturity range, across all instruments," Rotberg says.

The next step is to take each security. One chart, a matrix of 42 cells, tells Merrill how any change in the yield curve for, say, the government securities desk, produces what kind of P&L statement in any given maturity range. They can look at the chart and see at a glance where the firm is. It might show very little exposure short-term, a bit more exposure in five to 10 years, but offset by a short position in 20 to 30 years. That could be considered a natural hedge, or it could mean the trader believes one market will move up in one maturity range and move down in another, Rotberg says. This is done for each

Perfection in a Japanese garden

Basically, the system is a more complex variation of the set-up Rotberg had at the World Bank. "At the World Bank, we dealt with much fewer instruments. We had a \$20 billion cash position, and did not have any corporate bonds, high-yield bonds, mortgage-backed, or commercial paper. Nor did we take foreign exchange risk. Nonetheless, the principles remain the same — know the character and quality of the hedges. And understand that the only perfect hedge is in a Japanese garden."

What will Gene do next?

What will Eugene Rotberg do now that the task of installing risk management techniques at Merrill's is through? He's just finished an analysis of what to do about the LDC debt crisis, for one, but that is a personal interest. Now, Rotberg will apply himself to the task of asset and liability management for government and corporate clients.

"Many of the major borrowers I have worked with very closely as well as with the central banks.

What I would hope to do is much along the lines of what I was doing at the World Bank; share with them the potential range of ways to hedge interest rate risk, currency risk, insure against volatility, provide portfolio insurance, and guarantee access to funding. That, in short, is what is known as financial engineering."

It is a wonder that Wall Street firms for so long omitted risk systems which seem, in a way, so basic. Rotberg denies that Merrill had no system to manage risk in place before he arrived.

"But I don't think any firm can have less than what we have now and know what's going on," he concedes. "We didn't know how much risk we had...The key is to know how much risk one has at any moment in time." He's not promising no losses in the future. "We may make money, we may lose money. Hopefully, we will make much more than lose. But we will not do it unknowingly." He won't specify how the firm has fared in these trying times, but adds, "Let's just say (the system) held us in good stead...We think the system has produced good results."

Bias towards risk

Rotberg says he's not sure what of major firms have developed in comparison to Merrill's new system. But he does have strong feelings on where the problems in some firms. "There is clearly a gap between other firms," he argues, "between technical sophistication of the trader and senior management. There is no substitute for the most senior management understanding the most technical operation that his institution is taking. That, in turn, is made difficult in some institutions, in this one, by an insecurity felt by senior management over their inability to understand the technical operations by physicists and mathematicians. Comb that with a bit of resentment — who are you to earn this compensation at 30 years old — and the third pressure — how can I increase my profit margins off balance sheet — and you have a potential environment for inadequate risk management."

Rotberg makes a shrewd point that one of the biggest problems on Wall Street is innate bias in the system to reward risk taking. "If someone makes \$10m, the system pays him \$5m. But if everybody else loses their shirts and the trader merely breaks even, the system does not compensate him." If traders were compensated for avoiding losses, he says, at least then we would know that his risk taking is based on his view of interest rates. Risk management is also telling the truth and sharing the uncertainty with your colleagues." ifr

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