

the **Risk** DESK

Volume VIII

Number 3

What's Wrong With Risk Management?

We Hooked Up with Uber Risk Guy James Lam Recently to discuss a topic that seems to be on everybody's mind these days. Given all the blow-ups lately involving some extremely sophisticated banks and funds, observers from Capitol Hill to Wall Street to Main Street are asking the question, "What's the heck is wrong with risk management these days?" Lam, the noted author of the book *Enterprise Risk Management*

(John Wiley & Sons, 2003) and scads of papers on related risk topics, was only too happy to help us negotiate this metaphoric minefield. "What's wrong with risk management?" Lam mused, "Plenty."

In the past couple months, we've lost count on the number of stories we've written that include the phrase "these are crazy times..." Crazy indeed; books are blowing up all over Wall Street and environs these days, and it doesn't look like the trend is easing in the slightest.

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CCRO's Risk Radar Screen

The CCRO Tried Something New at its Monthly Meeting we thought was worth mentioning. Committee of Chief Risk Officers chief Bob Anderson premiered an open forum with the group that's more or less off the record, but that didn't stop him from providing us the highlights of this new session called the Radar Screen. We think it's significant because the informal roundtable taps into what risk folks are thinking beyond the usual best practices white paper stuff. What's keeping risk managers up at night? Read on.

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ROME: Credit Risk on Demand

Getting Energy Traders and Risk Managers Out of the Spreadsheet Ghetto has become a constant theme around the risk management quad. Now the folks at ROME Corp. have made another step in that direction with CreditRisk OnDemand, a subscription-based, standardized version of their Web-based credit risk management solution. If you're a small to mid-sized energy company, you may be able to kiss Excel goodbye without breaking the bank, according to ROME chief marketing officer Dan Reid.

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Financial Objects Hits its Stride

This Month Marks the Second Anniversary of Financial Objects' Acquisition of Raft International. A veteran risk systems provider in financial services, Financial Objects might be the new kid on the energy risk block, but in the last 24 months the company has picked up serious momentum, from building a strong energy-related staff to overhauling the original Raft software solution to gathering an expanding stable of top-tier energy clients. Ian Sloggett just

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Demystifying Liquidity Risk

How to Measure and Avoid It in a Commodity Portfolio

By Moazzam Khoja, CFA, vice president product sales, SunGard Kiodex

It took only three days of trading for the \$9 billion Amaranth hedge fund to go into bankruptcy in September 2006. The fund's natural gas book took highly leveraged positions in NYMEX HH contracts, and the firm's precipitous downfall is presumed to be the result of its inability to unwind highly leveraged large contract positions. To meet margin calls, the fund had to offload many of its small cap positions, causing a bit of mayhem in

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Around the Risk Desk

This Month's Avian Flu Outbreak in Indonesia has Reminded Us Again of Pandemic Risk, and we're not alone. At last report, the FAO said it was gravely concerned at the high mortality rate from this H5N1 outbreak. At 107 deaths, it's the highest in the world, and the widespread contagion of the virus among that country's bird population, which "could create conditions for the virus to mutate and to finally cause a human influenza pandemic." The bird flu is endemic throughout Indonesia, and since it's common to keep backyard chickens there, even major control efforts haven't stopped the flu from spreading among the poultry populations. "Indonesia is facing an uphill battle against a virus that is dif-

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Climate Risk Desk

Doom or Boom?

Does a national emissions cap-and-trade program spell economic doom? Since the Senate recently scheduled the Lieberman-Warner climate change bill for floor debate in June, the statistics are flying. Within a day of each other this month, the US Environmental Protection Agency (EPA) and the National Association of Manufacturers (NAM) issued economic projections on the bill's impact. The NAM study's co-author, the industry-backed American Council for Capital Formation (ACCF),

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NatGas Desk

OK, so Production Might be Up, but LNG Flows are Awful. Storage levels right now are a bit marginal, but not horrible. The weather is warming up, but very few are holding their breath on that score. Prices are oddly high and fundamentals appear to be on holiday. The real question is, "Will prices collapse anytime soon?" Leading analyst Andy Weissman offered us a few clues on the subject recently. We noted that a week or so ago he hinted at a possible softening of the current gas price regime. And today? All bets are off.

Over the past few weeks, he says
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difficult to contain. Major human and financial resources, stronger political commitment and strengthened coordination between the central, province and district authorities are required to improve surveillance and control measures,” the FAO said. In his latest pandemic update this month, US Health and Human Services chief Michael Leavitt noted that in five short years, the bird flu has spread from animals in just one country to 67 countries today. HHS has created enough vaccine for 40 million Americans and put about \$1 billion into vaccine production technology. “Preparedness is a process – learning, adapting, and growing,” Leavitt said. “The media buzz has died down, but the bird flu virus has not. Avian influenza is still highly pathogenic, inflicting a heavy toll on domestic and wild bird populations in Asia, Europe and Africa and, from time to time, infecting humans. To date, some

370 people have contracted the disease, largely through exposure to sick or dead birds; 235 of them have died. We don’t know if the H5N1 virus will spark the next pandemic, but we know that it’s just a matter of time before something does. There is simply no reason to believe that this century will be different than any past century. The difference now is that we better understand the threat, so we can increase our preparedness for a pandemic before it comes, in order to diminish its potential impact.” It may sometimes seem like science fiction, but the potential for a vast and deadly flu pandemic is a risk that must be measured, monitored and controlled like any other business risk, especially in a staff-intensive industry like energy. There are several courses and conferences out there about how to create a business continuity plan that’s unique to the pandemic risk. Here’s the link to the government’s most current pandemic checklist for large businesses. Might be a good one to e-mail around: <http://www.pandemicflu.gov/plan/pdf/businesschecklist.pdf>... Another macro risk on our minds this month, natch, is the credit crunch so you’ll see a lot about credit risk elsewhere in this issue. Speaking at this month’s Pace Global forum, the firm’s energy markets EVP, Bo Poats, said folks looking to finance new energy infrastructure projects in 2008 will face “conservative provisioning and structuring, cost cutting and rigid adherence to credit limits” despite the intense and growing demand for new energy projects. “Developers are proceeding with caution in the face of financial uncertainty and the need for viable renewable energy, increased reliance on gas-fired generation and transmission projects needed to close the clean generation and fuel infrastructure capacity gaps,” Poats said. “The yield curve on debt continues to point to a worsening economic downturn, given the premiums existing in a credit market whose overnight rates have been driven down by the Federal Reserve in recent months. The situation is not likely to approach the level of liquidity concerns associated with the savings and loan crisis of the 1980s, but a more subtle government response will be needed with the prospect of political and economic uncertainty that is likely to characterize the US economy throughout 2008. Markets do not like political uncertainty. Fortunately, however, the global economy remains relatively buoyant and the appetite for high grade investments and value in a US market downturn will assist in sustaining private liquidity in the financial system...” The key to recovery in energy project finance, Poats said, is the ability to rely on strong long-term fundamentals and “structure energy projects around short-term concerns.” Energy project finance should rebound soon and its emergence should act as a lead-in the banking sector’s recovery “well before the dust can settle on 2008,” he said... In the risk systems sector, the good news continues. The latest UtiliPoint survey indicates that last year kept the upswing in energy trading risk management system purchases going. It’s been steadily rising since 2004 and in 2007 the rising tide lifted all boats, according to the survey. Allegro, OATI, OpenLink, Solarc, SunGard and Triple Point were neck and neck as a group, accounting for some 85 percent of the new product sales in the North American market. Product prices are rising, the survey says, but vendors are heavily competing on features and functionality. Forty percent of new sales were for multiple commodities, the majority for power (53 percent of all deals) and gas (49 percent of all deals). That’s about the same as the previous year, although UtiliPoint noted an increase in interest in crude-capable systems. No surprise there. Utilities were

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The Risk Desk

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the major buyers, and other buyers include merchant trading companies, banks and hedge funds, refiners and E&P companies. But the survey also uncovered a growing trend in that 25 percent of ETRM system sales last year were to commercial and industrial customers, gas processors, energy retailers, LNG importers and other fuel end-users. Looking ahead for 2008, the survey found no reason to think the ETRM system sales trend would slow, although the overseas markets (Europe and Asia) may be the most

fertile this year. "Based on our conversations with the vendors, we may see significant new markets emerging in South America and, to a lesser extent, Africa." UtiliPoint predicts about 6 to 8 percent growth this year, with a lot of interest from large trading firms looking to integrate diverse legacy systems... And lastly, we'll be seeing you in June in Houston for the Energy Risk conference. If you're interested in a one-on-one, briefing or software demo during the show, please contact Editor Ian Jones at ianj@scudderpublishing.com or call 410/668-1664.

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has taken the show on the road with a 17-state tour. NAM's report states that if the bill, America's Climate Security Act of 2007 (S. 2191), proceeds with its mission to cut US greenhouse gas emissions 63 percent below 2005 levels by 2050, the nation will face "a profound economic impact."

NAM makes a dire prediction of GDP losses of up to \$669 billion in 2030. But a look at the statistics shows that's a loss against sizeable economic growth. The NAM worst-case scenario is a 2.5 percent loss against a GDP that will almost double over the next two decades. EPA's worst-case scenario estimates 2030 GDP losses of 0.8 to 3.8 percent against 97 percent growth. In hard terms, using NAM's own figures, without the cap-and-trade program baseline GDP would grow to \$24.674 trillion in 2030 (up from \$13.794 trillion in 2007 and \$16.419 trillion in 2014). In NAM's worst-case scenario, the legislative mandate would cut GDP in 2030 to \$24,005 billion.

No one wants to see US economic growth slow, but keep in mind that US GDP increased by 4.9 percent in third

quarter 2007, but by only 0.6 in the fourth quarter, according to the most recent Bureau of Economic Analysis estimates. In other words, real GDP growth saw a greater loss in the second half of last year than it is predicted to see over the next 22 years if a national cap-and-trade system is implemented.

Similarly, NAM says that the legislation will lead to "employment losses of 1.2 million to 1.8 million jobs in 2020 and 3 million to 4 million jobs in 2030." According to NAM's stats, 2030 employment would be 166.96 million baseline and only 162.90 million worst-case, meaning a 2.4 percent increase in 2030 job losses. That's the same amount of unemployment increase between 2001 and 2004.

"Overall impacts are moderated by CO2 allowance revenues assumed to flow to the US Treasury to increase the tax base," the NAM study says.

Electricity prices would bump up around 30 percent by 2020 and over 100 percent by 2030, NAM says. The EPA figures that electricity prices will rise 44 percent in 2030 and 26 percent in 2050. Here in Maryland, electricity prices increased 50 to 72 percent in the last year.

The problem with these economic projections is no different than the problem with climate change models: The assumptions you put in determine the projections that come out. A Yale professor has his own way of looking at the impact of emission reductions on the US economy, and he's invited us all to play along on a Web site where you can punch in your own stats and see how the results vary.

"Predictions, both optimistic and pessimistic, are all based on simulations performed using macro-economic models that attempt to show how the US economy works... Because the various models differ in their assumptions, they project different economic impacts even for the same targets and time-tables of emissions reductions," economics professor Robert Repetto of Yale's Environment School says in the introduction to his "See For Yourself" scenario-building Web site.

"A 'meta-analysis' synthesizing all the available models reveals what the crucial assumptions are and how changing those assumptions affects the predicted economic costs of reducing greenhouse gas emissions," he says. "Surprisingly, only a handful of key assumptions account for most of the differences among model predictions of the economic costs of reducing emissions." Repetto did just that, presenting the 25 main economic models for economic impacts of emission reductions and allowing visitors to his Web site to judge the validity of seven main assumptions, then run a scenario and see how their weighting of assumptions can affect the economic outcome. See for yourself at <http://www.climate.yale.edu/seeoryourself/index.php>.

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The upshot of Repetto's Web site is that, worst case, the US GDP will continue to grow at 2.4 percent under an emissions reduction scheme, down from the recent historical average of 3 percent annual GDP growth. If all goes well, meaning renewable energy technology takes off, high fossil fuel prices create demand for more energy-efficient technology, US emission reductions offset economic damages related to climate change and the US gets involved in emissions trading on a global level, then Repetto's analyses suggest GDP could grow faster than 3 percent a year in the best-case scenario.

And what are we buying for our \$669 billion? According to the EPA analysis, a reduction of emissions that's 11 percent below 1990 levels by 2030. Both studies predict a renaissance in US nuclear power to facilitate these reductions, not to mention the predicted trillion-dollar emissions trading market. All indicators suggest it's too late to stop the momentum on some kind of climate change legislation on the federal level. We may not see carbon legislation during this election year, which makes the congressional schedule short. But 2008 is the year to go to battle over the many and critical details in the proposed federal carbon program. Cap-and-trade seems to offer the best model for the industry to add some upside to balance the cost of emissions reductions that will largely fall on the energy business.

Then there's the potential economic upside of the domestic "green collar" sector. A recent New Energy Finance survey found that new clean-tech investment in 2007 leapt past its original estimates to hit \$148.4 billion -- that's up 60 percent since 2006 and 41 percent above New Energy Finance's estimates. The researchers said it's clear that, despite the credit crunch, "there was a very busy end to the year" in 2007. New Energy Finance honcho Michael Liebreich said the firm always keeps its projections on the conservative side, but 41 percent? "Even the total investment figure is a conservative one," Liebreich said.

So here's what the new clean-energy investment trend line looks like, setting aside M&A and buy-outs:

2004	\$33.4 billion
2005	\$58.7 billion
2006	\$92.6 billion
2007	\$148.4 billion

New Energy Finance found that for 2007, VC and private equity investment is up 34 percent over 2006, reaching \$9.8 billion; equity funding from public market investors rose 123 percent to \$23.4 billion (although that figure is skewed by Iberdrola Renovables' insane \$6.9 billion-ish IPO, the second-largest IPO of the year in any industry); and asset financing for wind farms, biofuel plants and the like jumped 68 percent to \$84.5 billion.

And still they clamor for those renewable energy production tax credits... The reality is those tax credits and other pro-clean power government policies worldwide are a major reason for the investment boom. New Energy Finance lists that as the top motivator, but adds that other investment drivers include "rising corporate and investor awareness of the opportunities in clean energy" and of course "oil prices approaching \$100 a barrel." The clean energy investment activity

is also spreading around the globe, from the financing centers in North America and Western Europe to Eastern Europe and Australia. "Even more significant was the pick-up in activity in emerging economies, with China moving strongly ahead with projects in wind, biomass and energy efficiency, Brazil seeing huge investment interest in its sugar-based ethanol sector and Africa starting to see renewable energy and efficiency as partial answers to its power shortages," the survey says.

Sure, this looks like a clean energy investment gold rush and when the bubble bursts, the market will settle out the keepers from the ideas that couldn't go the distance. But the ever-growing level of investment over the last five years is good news when you consider the projections for future clean energy requirements.

New Energy Finance's Liebreich noted that fundamentals continue to look good for another banner investment year in 2008, but he also cited recent New Energy Finance research that shows clean energy investment needs to triple over the next five years in order to meet targets set under various greenhouse gas emissions reduction schemes.

Similarly, the 2008 Organization for Economic Cooperation and Development (OECD) Environmental Outlook released this month says a large-scale shift to a sustainable, low-carbon economy is part of a successful climate solution. Announcing the report in Oslo, OECD Secretary General Angel Gurría said "restructuring" – meaning more emission reductions and clean energy tech – is affordable "when compared to the expected economic growth and the costs and consequences of inaction." He said, "The costs of this restructuring are affordable, but the transition will need to be managed carefully to address social and competitiveness impacts, and to take advantage of new opportunities."

The report, which focuses on "urgent action" areas of climate change, biodiversity loss, water scarcity and human health impacts from pollution, projects that GHG emissions will increase by 37 percent by 2030 and 52 percent by 2050 if no new policies are enacted. Meeting increases in demand for food and biofuels will mean using an additional 10 percent of available land for agriculture. Deaths from ground-level ozone will increase four-fold by 2030 and the number of people who live in areas of "severe water stress" will grow by 1 billion.

Meanwhile, the OECD predicts that the world GDP will nearly double by 2030. Sacrificing only 1 percent of that growth under emission reductions policies could cut GHG emissions down from 37 percent to 12 percent by 2030 and reduce key air pollutants by one-third.

"To keep the costs of action low, these (policies) should be heavily based on economic and market-based instruments," the report says. That means emissions trading, carbon taxes and some recommendations are bound for strong opposition, such as "eliminating environmentally harmful subsidies for fossil fuels and agriculture."

But the report also recommends tougher standards for construction and transportation, voluntary approaches, increased R&D, eco-labeling and new technology. "Technological developments will also contribute to the solution, but the generalized application of breakthrough technologies poses important challenges in the area of intellectual property rights which will have to be confronted," the OECD said.

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Most interestingly for the emissions trading debate, the OECD projects that, while today's developed nations have generated most of the existing GHGs in the atmosphere, the developing world is going to quickly trump that. "Rapid economic growth in emerging economies - particularly Brazil, Russia, India and China - means that by 2030 the annual emissions of these four countries together will exceed those of the 30 OECD countries combined," the report says. "Fair burden-sharing and distributional aspects will be as important as technological progress and the choice of policy instruments."

Closer to home, Energy Secretary Sam Bodman also touted the value of renewable energy and energy efficiency technologies to shift to a less carbon-intensive economy. It's going to take a global, multibillion dollar annual investment on a multi-decade scale to meet the estimated 50 percent growth in worldwide energy demand by 2030, he said in a speech this month.

"In this country, there is an appropriately high level of attention on the impact of energy prices on our economy, our families and the health of our businesses... And this is yet another reason why renewable energy is so critical. Because each megawatt of renewable energy brought on line not only reduces our dependence on fossil fuels, it reduces the price volatility of those conventional fuels as well," he said. Bodman

also said the commercialization of renewable energy technology can help developing nations to "leapfrog" over some of the "dirtiest but most rudimentary and prevalent" fossil fuel-fired power sources.

While he touted the advances that are being made in clean tech through government-sponsored R&D and commercialization efforts, Bodman also said this: "Having spent a fair amount of my career in the financial sector, I can honestly say that for the first time in my life we are seeing the venture capital community put increasingly sizeable amounts of money into entrepreneurial companies in the alternative energy business... The clean-energy market is not just viable, it is thriving, and particularly in places where innovation and investment is valued and enabled by clear, simple, transparent and enforceable commercial and legal frameworks. After all, we know that investors did not enter this field for purely altruistic reasons, though the importance of the mission may inspire your success. You need a market. And you now have one, and it will grow even more robust with time. The private sector recognizes that there is an opportunity here, one that can favorably impact balance sheets as well as our global energy security and environmental health."

That doesn't sound like economic doom and gloom to us.

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"I've been in risk management for over 20 years and I consider myself a proponent if not an evangelist of risk management. Nonetheless, this is the first time I've become more of a critic in asking that question," Lam says. Certainly he's asked the question a thousand times in the past, but more in the context of what opportunities are out there for improving a particular element in risk management, whether market risk, credit risk, ops risk management or what have you.

Take the sub-prime mess, which Lam views as the most pervasive and wide-reaching financial crisis that most if not all of us has seen in our lifetime. Look at the SocGen rogue trader episode. "These are wake-up calls. In the SocGen case, it's shocking not so much that the losses were five times bigger than Nick Leeson's Barings losses. It's shocking because it (SocGen) happened over 10 years after the lessons were learned from Barings! We should know better by now. So 'what's wrong with risk management?' is an appropriate question right now. It's the right question for risk professionals to be asking themselves, to self-inspect..."

To that end, Lam offers three big ideas he thinks would do well to get the risk management profession back on an even keel.

"One key issue today is that there is simply too much complexity and lack of focus on the most important issues facing a company." Think about all the resources and effort that business has had to put into Sarbanes-Oxley (SarBox) compliance, he says, "a focus on accounting controls, documentation, testing of accounting controls, etc. It requires a lot of effort. In my mind, accounting control issues fall under operational risk, which is a subset of enterprise-wide risk. This of course is important in the overall scheme of things, but should only be taking up around 10 percent of your risk management time

and resources - not 60 percent, which is sometimes the norm among some companies."

SarBox has been misplaced, in terms of its material importance, in the context of enterprise-wide risk. There has been too much emphasis on looking back, instead of looking forward, which is the chief role of the risk manager, Lam says. "SarBox is directionally incorrect. Because risk management is about the future and accounting statements reflect results of the past. So if we focus too much time and attention on controls around financial statements, then we're not really looking at the right place in terms of the most important risks facing the company. The balance sheet will not tell you what your most critical risks are. A risk committee would be much more effective if it takes decisive actions on a few critical risks rather than reviewing hundreds of risk assessments and doing nothing."

Other things that risk professionals are dealing with right now, initiatives which may not quite be in balance with risk management's primary role - such as COSO control self-assessment initiatives - have placed too much emphasis on qualitative analysis. "I mean this in terms of identifying risks, ranking each risk's probability and severity and producing reports that contain hundreds if not thousands of risk assessments without some level of prioritization," he says. "I know some companies where control self-assessment represents 80 or even 100 percent of their enterprise risk management efforts. This is way too much emphasis on qualitative analysis."

On the other hand, banks and insurance companies may be putting too much emphasis on quantitative analysis, like Basel II or Solvency II. These firms end up focusing too much attention and too many resources on their economic capital models, and try to quantify all of their risks in capital

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terms. "Don't get me wrong, I'm a big fan of economic capital models and earnings at risk models, but it shouldn't be 100 percent of your effort. You need to have a balance between quantitative and qualitative analysis. At the end of the day, the job of the risk manager is to identify the most critical risk factors for the board and senior management. Because at any one point in time, at any risk committee meeting, you can address less than a handful of risks. You can monitor all of your major risks, but you really need to focus management and board attention and decision-making time on the most critical risks."

Issue one: One of the most important issues facing risk professionals today is that they have way too much complexity to manage.

"We are too focused on the past. We need to stop being so focused on putting out the last fire. In the early 1990's, derivatives was the big issue of the day. The D word. Then we had Barings, Kidder and Diawa. The next risk frontier became operational risk, and everybody was putting in operational risk controls and middle offices. Next, in the wake of the Enron and WorldCom disasters and the other craziness of the time, SarBox was born. Now risk managers spend half their time with SarBox-related issues."

This year he calls a "major wake-up call." Derivatives came back to bite us, again. Operational risk came back to bite us, again. "What all of this should tell us is not to focus entirely on what just happened, but rather think about what the critical risks are going forward. And the capabilities of the risk management function. What are we doing right versus what we are doing wrong? How effective is the risk management function

in addressing the issues of the future as opposed to the past?"

All companies, large and small, have limited time, resources and attention. And if time, resources and attention are channeled in the wrong direction – like accounting controls – then they're not going to be focused on the most critical issues. Look at the overall costs for SarBox or Basel II – they both started out as good ideas, he says, but in time became so complex and so granular that regulations became no longer principle-based, they became prescriptive or rules-based. "Whole staffs are now dedicated to compliance," he says. "This has to change."

What else is wrong with risk management? The second issue Lam identified is the lack of true independence and power in the risk management function. When you look back on the past 10 years, he says, you can argue that risk managers have had a sort of a free pass, that is, they were rarely held accountable for risk incidents, mostly because they didn't have much power and risk authorities were delegated to the business units. In the early days, the risk folks mostly reported to the trading desk or line units. Then risk reported to the CFO. Then over time they reported to the CEO and on to the board. You can argue that the risk group's independence and power has indeed increased. "And with this increase in power and status," Lam says, "comes accountability. In companies that were directly involved and were hurt by the sub-prime crisis, because they were originating or packaging sub-prime credits, then I think the risk professionals have to be held accountable. A logical question is, where was the chorus? Where was the outcry from the risk professionals? Why didn't they speak up to the boards of these companies? Why didn't risk managers quit over a lack of action by management over this coming storm? We need to see more of that."

Lam says he couldn't cite a single example in the past 20 years where the CRO or the chief credit officer may have resigned out of principle at some major firm. The point is, some companies host a strongly independent risk function, but in most this relationship is still evolving. He says that infusing the risk function with more independence will improve the markets tremendously. "I think the board of directors has, in my mind, an obligation to insure the risk management function is effective. And part of this effectiveness comes by way of independence and power."

Attached to the question of independence and power, the question of compensation for risk chiefs also came up in our discussion. Lam says it's critical that the performance measurement and incentives for risk professionals are aligned with the key objectives for the overall risk function. Lam has a couple possible solutions to this dilemma: "Perhaps risk officers can or should be compensated directly by the board or the risk committee. That would be somewhat draconian, but it's also the direction we need to look to, to ensure some level of independence and power for the risk function. At a minimum, the board, or the board risk committee should have a significant say in the hiring, compensation structure and firing decisions for the risk chief."

"Risk officers need cover, just like any other oversight executive. I think most risk professionals don't speak up because they feel too vulnerable. In theory, they should feel comfortable

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(WHAT'S WRONG WITH RISK MANAGEMENT from page 6) going to the board's audit committee with problems and not have to worry about their job security or compensation."

So, the second big problem with risk management today: lack of independence and power. This is clearly seen in the sub-prime crisis. The profit motive was so powerful, "it was like a tidal wave that risk officers could not battle," he says.

"We have seen an enormous turnover in the top risk echelons that we have not seen in the past. It's 'put up or shut up' time for the risk group. After all this money and time has been invested in systems and procedures and staff, it's time to see the payback. This can only come with more power and independence."

Finally, the third big problem with risk management, he says, is that we need to be able to measure the success of the risk management function in very tangible, explicit ways. "Here, I'm not talking about how well you comply with Sar-Box, Basel II or other regulatory requirements. I'm talking about the results of the organization. I believe risk management should be forward-looking, so what better measure of the success of a risk group than measuring to what degree, and at what level of accuracy, risk management has quantified future earnings volatility? And what strategies has it implemented to manage that volatility?"

Say for example you're a publicly traded company that releases a \$3 per share earnings guidance at the beginning of the year. Lam thinks a risk manager's job is to ask what external and internal risk drivers could throw the company off those earnings projections. "Let's say the risk group has to define the five top factors that could result in making \$1 per share instead of \$3. These factors might be the price of oil, weather,

the price of real estate, whatever. You have to define the factors as well as the earnings' sensitivity to these factors. If oil goes up \$10 a barrel, what is the impact on earnings? If interest rates go up 2 percent, what is the impact on earnings? And finally, once you've defined the earnings sensitivities, what are the strategies to get you through it all?"

In other words, Lam is saying that the risk group should perform an earnings at risk analysis at the beginning of the year and an earnings attribution analysis at the end of the year. If you projected \$3 per share but only made \$2 per share, the attribution analysis should identify the actual factors that threw off your earnings projections. "How well did the risk group identify these factors? How accurate was the sensitivity analysis relative to the earnings, and how well was this managed? The true test is: to what degree have we identified our true risk exposure and to what degree did we minimize unexpected earnings volatility?"

Lam says the job of risk management isn't actually to minimize risk, after all, because you need to accept risk to generate growth and profitability, right? He says that risk management isn't just about minimizing earnings volatility either, "in the absolute sense." "What you really want to minimize," he says, "is unexpected earnings volatility."

And this, he says, may be the ideal litmus test for how well your risk group performs throughout the year. Says Lam, "I see this as one possible measure of success."

More specifically, he says, how well a risk manager smoothes out the bumps in the road he identifies at the beginning of the year is possibly a good measure for the risk group's end-of-year compensation. Hmm. Never heard that one before. "Neither have I," Lam says. "But it makes sense. It's basic. I think this is another area where we might have gotten lost. Compensation for the risk group doesn't have to be complicated, and neither does the role have to be complicated. Everybody is asking the question, what is wrong with risk management? I think the logical answer is to look at what they should be doing, and that is looking ahead, not behind, for the answers."

Circling back to the current sub-prime crisis, he says it's pretty obvious that in the companies who have taken the biggest hits, risk management was completely ineffective. But, he adds, these numerous companies also fall into one of two camps. One camp he calls "risk ignorance" – these companies didn't have the right risk information or analytics to get the job done correctly. "For example, a lot of the sub-prime credit models that companies and the rating agencies used were based on seven years of largely benign credit data; default rates were low and quite stable. So models produced analysis that grossly understated the true risk of the exposure. If you didn't have the right information to base your decisions on, this is risk ignorance.

"On the other hand," he says, "I can't imagine that some of the more sophisticated banks, hedge funds and mortgage companies didn't have the right analytics and models. Or that stress testing wasn't done. However, if you have the right information but make the wrong deci-

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(WHAT'S WRONG WITH RISK MANAGEMENT from page 7)

sions in terms of risk mitigation, largely because of the company's heavy profit motive or because the risk professionals didn't have adequate independence and power, or because there was so much complexity in terms of compliance that they were focused on the wrong thing, then I would call this camp 'risk incompetence.'"

If risk management fails, he says, there are only two camps or "states" of failure: ignorance or incompetence. "There is no third state."

He says one can argue that SocGen may be another good example of the second state of risk failure, as the company had allegedly 90-plus indications well ahead of time that something was amiss.

But there is an upside to all this. The role of the risk chief is evolving at a fairly rapid pace these days, such that many of these issues will be largely reexamined by a great host of companies throughout the various industry sectors in the near to mid-term. "At least that's the hope," Lam says. "The problems we see today are fixable." Once that's done, he says, we will do a much better job at addressing future risk management issues, "before they become serious issues..."

In future articles, we'll be hearing again from Lam on issues related to strategic risk management and the role of the corporate board in ERM.

James Lam is the president of MA-based James Lam & Associates, recognized as one of the world's leading risk management consultancies. For more information, go to jameslam.com or email Lam at james@jameslam.com.

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(ROME: CREDIT RISK ON DEMAND from page 1)

The reality, Reid tells us, is that the market is outgrowing spreadsheets. As new entrants proliferate in the energy markets, many of these relatively unknown counterparties don't have a long track record to help traders score their credit risk or set limits. "Margining is a way to control some of the risk around those new entries. If you collateralize their exposure as it happens, you don't have to worry as much about their track record," he says. "That's almost impossible to do in the old-style, manual spreadsheet-based path. Not only is it not audited and may not follow all of your standards and policies, you just can't do it in the timelines that are necessary in margining and making collateral calls."

Those trends, he says, "are really causing people to look at credit risk at an enterprise level and a departmental level, and try to find ways to automate what has been that kind of 'Excel ghetto.'"

CreditRisk OnDemand grew out of ROME's existing on-demand offering for credit scoring, which was launched a couple years ago. But the incentive behind the offering is the growing number of small to mid-sized energy firms contacting ROME about credit risk management solutions. "The smaller, more standardized energy companies don't have the IT or the budget to support the kind of controls they fundamentally need," Reid says.

"Smaller companies have the challenges of their executives requesting and requiring all the same things as a big

company, but they don't have the resources or infrastructure to support it. We're excited about the ability to address this market and hopefully help out those companies that have wanted and needed this, but haven't had the wherewithal to do it in the past."

ROME's technology was built from the ground up for Web-based delivery, and its subscription-based credit-scoring package enabled the company to test and refine the on-demand delivery system. So it wasn't a huge leap to extend that delivery system to a more comprehensive package that offers preconfigured templates, based on industry best practices for legal agreements, exposure calculation formulas and portfolio/concentration. While limited relative to the capabilities of ROME's big enterprise credit risk solution, OnDemand features counterparty data management, credit scoring, credit limit management, standard exposure and collateral management views, and a set of standard workflows and reports. The service uses a simple, Excel-based data loader and includes built-in security management for users and groups.

"Everyone's excited about SaaS (Software as a Service) and on-demand models, especially in the investment community... The reality is there are still a lot of security constraints and concerns," he says. So ROME offers two models of the on-demand credit tool: a traditional hosted service at ROME's data center that customers can access to upload their data, or the same package as a managed service deployed into the customer's

(Click to continue on page 9)

(ROME: CREDIT RISK ON DEMAND from page 8)

data center. To the user it's all the same – they are uploading data over a VPN into the Internet cloud someplace. But for a Global 2000 companies with more security concerns, the ability to host the product behind their firewall lowers the anxiety level considerably.

One technical aspect that's key to the lower-cost subscription service is the use of virtualization technology, which allows any hardware to physically host a fully self-contained, identical mirror image of the system that ROME is supporting, which means the product can be deployed at the same time across a multiplicity of servers but managed at the enterprise level. "From a technical perspective, our support and service people would access (the customer's machine) just like our machines in our data center. Its Web-based nature means that nothing has to be installed in the client, or updated or migrated – it's all just browser-based," he says.

"One of the reasons we can target the smaller players with smaller budgets and more standardization is that we can standardize and preconfigure the offering, then deploy, maintain, upgrade and support it remotely. It's all kind of a shrink-wrapped turnkey solution."

On-demand services like this aren't the unique inspiration of ROME Corp, but Reid says the firm does have an advantage -- its competitors in this space weren't Web-based from the ground up, so they haven't been testing the support, maintenance and management issues of pure Web-based offerings.

So who's buying? A subscription-based, preconfigured system like this isn't for your multilocation, multicommodity global traders. The bigger players want their gear on premise and they want real-time tools that can tie into fully integrated systems, data warehousing, corporate-level security and other big IT projects. Those folks go for the enterprise offering. Smaller companies are more likely to go for a hosted service to spare their budget the physical infrastructure costs. "There's significant limitations in the on-demand model. We're not hooking up real-time in an automated fashion to legacy systems. We have a more standardized upload capability, which is fine for small and mid-sized companies," he says. "A more standardized, less complex entity can get the value out of this preconfigured offering."

Smaller companies come in two stripes. They might be a single-commodity or a growing energy company with revenues around the \$1 billion mark that can't afford a fully customized enterprise system. They're looking for a lightweight system that gives them the auditing, controls and reporting functions they need to work with their small number of counterparties. As their business expands, the thinking goes, these companies will gradually have the need and the budget to transition off the subscription model to the enterprise system.

Or they might not be a company at all -- they might be a unit of a larger company. Think of a huge global bank that has a small energy book or a small financial services credit risk operation and wants some more sophisticated tools to manage credit risk at the departmental level. "As financial services enter the energy market, they want to manage their small or growing energy book with all the same kind of controls they are used to, but they don't have the business plan yet to invest in a huge enterprise software model yet."

Today things like Sarbox, Basel II, S&P's PIM approach and liquidity analysis, new compliance and regulatory pressures "are really waking people up," Reid says. "We're doing less education and responding more to RFPs these days. There's a pretty well-established need. Also, the growth of ERM and more focus on not just market risk but also now credit risk and ops risks, a lot more companies are starting to understand that they can't just manage something on a spreadsheet, roll it up and expect to get sign-off from their CFO and not have them stay up at night."

ROME launched a training and certification program last year that offers courses in credit risk management and its own products. "You may have been lucky enough not to get hit, but it's not necessarily because you were doing things in a risk-adverse or controlled way. We do a lot of education around the 'gotchas' that you may not even know," he says. The other side of the coin is optimization: how to do more effective netting and collateralization so you can go after more new business. "You've allocated your capital correctly, you've set your limits correctly and margined everything you can and you've got your cash flow optimized to the point where you can go after new business. It's not just the risk, exposure and the downside -- it's also the upside. If you do this more effectively, you can actually go after more business and make more."

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(CCRO'S RISK RADAR SCREEN from page 1)

New Frontiers in Risk Management

The open format already looks like a success – the first session yielded a host of concerns that dig deep into what risk managers do and why they do it. One topic of particular interest was exploring new frontiers of risk management: How does an enterprise risk management (ERM) function evolve at a firm, and can it overreach? Should its purpose be to simply collect data or should it extend to oversight of affiliates or even to the point of impacting strategy? Does the evolution and maturity of an ERM function depend on an individual company's management culture, or are there overriding trends that apply across the board?

Can ERM help with complex layering of risks and is double-counting of risk an issue? The group considered whether the key was the best-practice use of risk taxonomy. Other members asked how ERM can really reveal the risks inherent in the launch of new products. Think of a new offshore wind farm, for example.) Can the project approval process itself be influenced by forward consideration of risk?

The policies, infrastructure and management (PIM) approach to assessing risk management was all about measures and controls, but the new view seems to be more focused on the strategy role, the involvement of senior management and "actionability." Some members at the meeting pondered how ERM could be integrated under the new view that focuses on integrating the management of governance, risk and compliance (GRC), and the group considered whether the CCRO's existing governance white paper should be updated to accommodate these changing views.

Measuring Performance of an ERM Function

Here's a crucial question that's overlooked in evaluating best practices: How do you know if an ERM function is performing well? Is the key performance metric ERM's success at assisting the board in their risk oversight duty?

Even more fundamental: What does ERM actually do for a company? Does it affect outcomes or the decisions that create those outcomes? Consider risk management's impact if it's used as pure hedge/exposure management as opposed to playing roles in strategic involvement and project approval. This would obviously affect performance measurement.

Should those activities be viewed in terms of their impact on the rest of the company? Anderson said some answers could be found if the CCRO performed a benchmarking exercise – beyond a survey – by interviewing key personnel in CCRO member companies.

ERM as Communicator to the Board

It's no secret that risk managers can have a hard time getting attention in the C-suite. But does the dominance of senior management block communication of ERM to the board of directors? Does the board understand ERM, or have a reasonable expectation of what they should see? Members suggested looking at the external information available on this topic from CICA, AICPA, NACD or CFO Magazine.

One key difference between senior management and the board is that management's horizon is annual (bonuses, reporting) whereas the board has a three- to five-year hori-

zon. Can ERM see things more like the board? Can ERM help board members to be aware of the gaps in their knowledge – to "know what they don't know?"

The 'Emerging' Risks

The risk governance role is very important to some. But what are the key risk indicators? How should strategic planning address risk factors – notionally via qualitative scenarios or directly in a quantitative sense?

Standard & Poor's has chosen to take a broader view of the role of ERM that includes:

- **Emerging Risks:** How can they be measured and quantified? What are the best scenario analysis practices?
- **Operational Risks:** How should hard assets be handled? Should risk managers use NERC's Generating Availability Data System (GADS), the power industry's standard unit availability and outage data reporting system?
- **Insurance:** Generic insurance is available, but there's a lack of energy-specific insurance programs. What should be insured and what shouldn't be, and why?

Specific Measurements of Risk Appetite, Risk Tolerance

Does the industry need explicit measures to gauge risk appetite and risk tolerance? Some kind of "user manual" is needed, even if it's just a decision tree that suggests options of which measures to use. CCRO members suggested considering public documents that help evaluate personal risk tolerance, as well as decision-making heuristics: How does human nature influence risk-taking? What factors should be considered in the process?

Implications of Auditing Value-at-Risk (VaR)

If IFCR is going to replace FASB in the US, some are concerned about the intent to audit value-at-risk (VaR) in the reporting section rather than in management's discussion and analysis (MD&A). How can this be avoided? The worry is that an audit is unstopable, flawed and expensive.

CCRO members suggest that the industry needs to get the word out about problems that arise from comparisons with others and audits of the model – you can't say much beyond that a model is clearly not broken. The best you can get now is an "opinion" of VaR for consistency and back-testing.

What is the view of the Big Four on this? Does it create liability?

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(FINANCIAL OBJECTS HITS ITS STRIDE from page 1)

joined the company after a decade at SunGard, so we called up to find out what's next.

"This is a groundbreaking month for us," says Sloggett, Financial Objects' new sales director for Europe, Middle East and Asia (EMEA) for its flagship energycredit solution. "We were voted the best credit risk management software provider for the third year in a row in the Energy Risk software rankings. Not only have we extended the portfolio of clients with new tier-one organizations like Statoil, FPL and Calpine, but we also realized a step change in technology by implementing energycredit on the latest Microsoft .Net platform. That was a big change for us. We implemented a major new release of energycredit Version 2 at multiple customers both in Europe and the US. This re-engineering of the product on Microsoft .Net was a 40 man-year effort for our product development team in Bangalore.

"That overseas development center has grown from 14 people to over 100 in the past 18 months, so you can see a lot of effort by a large number of people has gone into this new version of energycredit... It's a lot smoother, it's faster, it's quite a slick Web-user experience, and we've enhanced the general reporting workflow and collateral, contract management and credit scoring as well." He says we'll see another major release of energycredit later in the year.

Last year was a great year for many risk management solutions providers, and Financial Objects is no exception. Its just-released financials show that 2007 was the third year of continuous growth in revenues – profits up by 30 percent to 3 million pounds on an annual revenue of 21 million. The energy division increased its revenue by 200 percent and profit by 400 percent, making it the second-largest revenue generator in the

group. "We had a pretty good year," he says.

Sloggett says Financial Objects will continue to be a pioneer in credit risk management. "We're bringing unique functional capabilities to market first - that's our significant proposition," he says, citing the 2006 introduction of potential future exposure (PFE) in its analytics model. "Most recently, we're going to be the first to bring to market a single, integrated solution that supports all the physical commodities, including oil, which has differences in the way you manage your credit risk compared to other commodity types. Now we can support oil, power, gas, coal and carbon product types and all the derivatives," he says. "Shell is close to going live with that solution to support their global oil business as well as their other trading business."

As much as the current gloomy headlines may be driving companies to take a closer look at credit risk management software, in the trenches Sloggett sees instead that the desire for technology that can assist rapid growth is a more powerful driver for customers. "Companies want to expand their trading activities into different commodities and new markets and geographies. They need to assess those new counterparties, contract these master agreements with them and then maintain the cash and margining processes that they have in place with the counterparties," he says.

Risk mitigation remains a key business driver for customers, not only on the credit side, but legal, operational and reputational risks remain priorities for customers. Customers are focused on business control and operational efficiency, he says. "That isn't so much how much you might save by centralizing your credit risk, it's really about doing more with less and more efficient use of working capital. That plays into some of the Basel II initiatives about capital adequacy and so on that's starting to be a business driver on the customer side," he says.

Sloggett considers the equation that the current credit crunch equals an easy sell for credit risk management solutions to be a bit of hype -- an enterprise technology investment of this scale is never an easy sell. But he acknowledges that it's a bit easier to justify at the board level if an organization has suffered a default loss or missed a margin call and their counterparty went bankrupt. The business case for a credit risk solution is also easy to articulate to the board of mature energy market participants, those who haven't had that default loss but have actually adopted a preventative approach. But closing the deal isn't as easy, because these mature, proactive companies haven't experienced such a loss.

For those who haven't suffered a loss or don't already take a proactive approach to risk management, "the credit crunch itself and this continuous press coverage does help to educate them that this is a critical business risk and it needs to be measured, managed and controlled. They are looking at their internal processes and will see whether they are sufficiently robust and integrated," he says.

We asked Sloggett if the opposite was true: While there's a credit crunch on, energy companies are enjoying hefty inflows of capital thanks to high prices and growing demand. Does more cash in hand means energy companies are ready to invest in risk systems? Maybe, maybe not, he says. When the money is rolling in, companies can get absent-minded about the need for

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risk mitigation and control. “Sometimes (in a boom) they don’t look for what we offer. While they might have more capital to spend on IT, in my experience they don’t necessarily increase IT spending, they just keep it flat,” he says. “In the downturn, that’s when all the fundamental drivers for energy credit start to come to the fore. As companies do start to go bankrupt, as these default losses actually start to occur, that’s when everyone absolutely realizes they need a robust credit risk management solution in place.”

But boom or bust, Sloggett adds, “volatility in the energy markets is obviously considerably higher than in the financial services market, so that always affects credit. Rating changes, new counterparties, new trading products, that all spurs on demand for energy credit.”

As the financial services industry moves more into energy, even in terms of owning physical power assets, does their banking experience make them better prepared for energy risk? Sloggett, who covered Asia and the UK for Thomson Financial Services before his lengthy stint at SunGard, says energy companies have a thorough understanding of counterparty exposure in terms of the physical commodities they trade, but they’re less mature than financial services players in adopting technology to mitigate those risks. Energy firms are more likely to try to reinvent the wheel internally than seek out third-party applications specialists.

“Financial institutions do recognize that their core business and competency is about trading, arbitrage and distributing risk as an intermediary in the energy value chain. So they rely on specialist software providers rather than trying to build it themselves,” he says. “However, the question they really should ask themselves is: Having come from the financial space where

they have applications to manage credit risk for the financial instruments they trade... can those systems handle the physical nature and the operational constraints of a commodity like oil, power and gas?”

Unfortunately, financial services players entering the energy markets often naively conclude that their banking risk systems can support energy commodities and, Sloggett says, spend a lot of time and money trying to adapt those applications to the commodities business. Six months to two years later, they’ve usually wised up about the commodities business and come looking for an energy-specific solutions provider.

“It’s a big growth inhibitor and time delay for them,” Sloggett says. “That’s the lesson that the financial institutions need to learn. They are buying up these energy assets themselves so they can compete on a level playing field with utilities, producers and generators, but it’s the expertise that they hire into the organization that is what actually changes things, that educates them to the vast difference between financial instructions and commodities.”

But there’s a risk there as well. The first round of energy hires is usually for the front office, while credit risk management is considered a middle-office issue. “The disconnect is that the credit risk management process is being adopted much later after the trading positions are already in place, after they have the exposure to the market,” he says. “In the time period between getting experience in the middle office and therefore deploying proper credit risk management solutions, they are extremely well exposed to any form of counterparty default or liquidity surprises.”

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(DEMISTIFYING LIQUIDITY RISK from page 1)

the markets. We can’t think of a better example to press home the idea that today there is a greater need than ever to better understand liquidity risk.

In this article, we’ll demystify liquidity risk, provide a framework to quantify it and offer a few policy implications for principals and risk managers of commodity trading funds.

In the wake of Amaranth and other high-profile commodity hedge fund collapses, liquidity risk has become an important issue for risk managers and investors. While much attention has been paid to risk management policies, there is still no solid consensus in academic literature as to how best to measure liquidity risk. One common way to measure such risk is to calculate the time to unwind a position (volume-duration measure), but the most practical measure is to calculate “impact cost.” Impact cost calculation is an ex-ante method that provides the risk/portfolio manager with the practical tools necessary to predict losses in the case of unwinding trades.

Liquidity risk is defined as the “impact cost” incurred to instantaneously unwind a position in a portfolio. Impact cost is the percentage change between the traded price and the pre-trade executable price. In other words, impact cost is the additional transaction cost due to the large size of the trade. Opportunity cost is defined as the opportunity cost of not executing a trade. In other words, it is the lost opportunity for not executing a trade

The impact cost represents the change in price due to an “unusual” volume. If a mechanism is evolved to measure the impact cost, it can then be used to predict the impact of large trades. A solid risk management policy that measures impact cost will provide useful metrics for portfolio/risk managers.

Impact Cost Versus Opportunity Cost

If one executes an order in the exchange that is the average size of customarily traded orders, the order will probably be executed without being charged an “impact cost.” On the other hand, if one executes a fairly above-average order, it is probable that the liquidity provider will demand a premium to immediately execute it, resulting in an impact cost.

A trader has to choose between paying the impact cost and being exposed to the opportunity cost of not trading. For example, assume that a trader has 1,000,000 MMBtu natural gas long position in the front-month contract. The trader wants to unwind this position. He has two options: Dump everything instantly and “seek liquidity” from the market or be patient in selling his position at reasonable prices. He knows that by seeking liquidity he may have to sell at a price below the current bid.

Alternatively, waiting and working out his trade exposes him to the opportunity cost of taking the next trade. If he waited two days to exit his position, he would lose the opportunity to

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trade another strategy that could have netted him money. There is a tradeoff between impact cost and opportunity cost.

Measuring Liquidity Risk

It would be prudent for risk managers to measure the liquidity risk in their portfolios. If a portfolio contains positions in exchange-traded or -cleared contracts that may incur huge impact costs, it would benefit them to quantify such costs should an unpleasant unwind situation occur. Once such costs are quantified, the fund can create policies and procedures to put limits on such a measure.

directly related to average volume in each five-minute interval.

Unusual Volume and Unusual Price

To understand the magnitude of impact cost, I also calculated the five-minute interval price returns that are the natural log of price change from one five-minute interval to the next.

Unusual Volume = Maximum ($V_t - 2 * \sigma_{v,t}$, 0)
 Unusual Price = Maximum ($|\ln(P_t/P_{t-1})| - 2 * \sigma_{p,t}$, 0)

Where:

t = five-minute interval

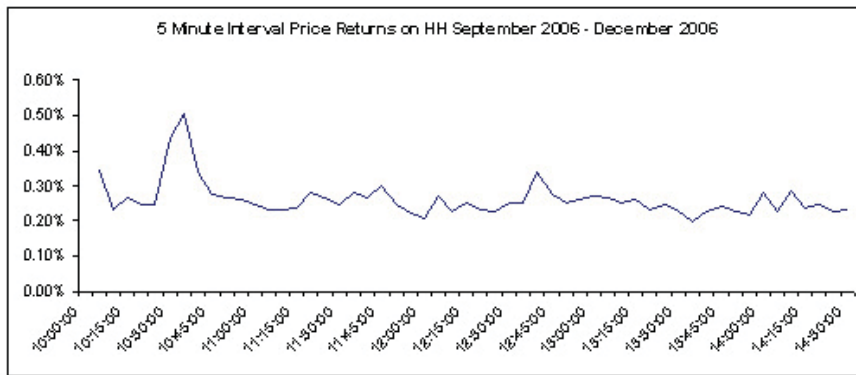
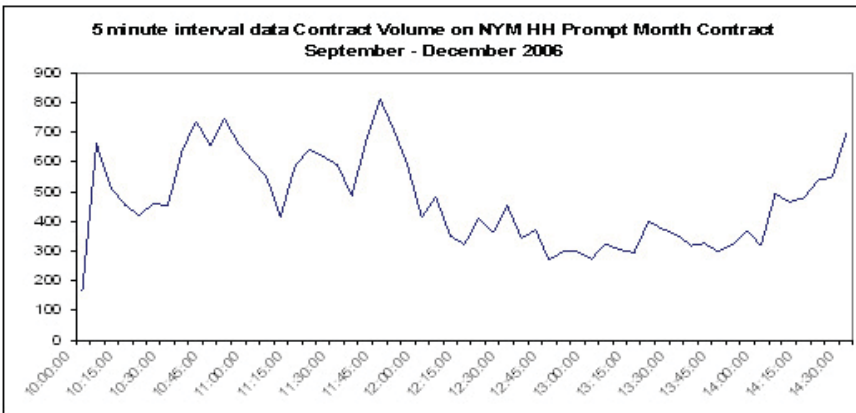
V_t = Volume at tth interval

$\sigma_{v,t}$ = Standard Deviation of volume for tth interval

$\sigma_{p,t}$ = Standard Deviation of price for tth interval

Unusual volume and price are extreme volume and extreme price events in each five-minute interval, considering the peculiar profile of each five-minute interval. Most of the time series data studied resulted in zero values for both unusual price and unusual volume. Most of the time, markets do not see extraordinarily large orders or price jumps. However, a few interesting insights were recorded in looking at data when I found values for “unusual price” or “unusual volume.”

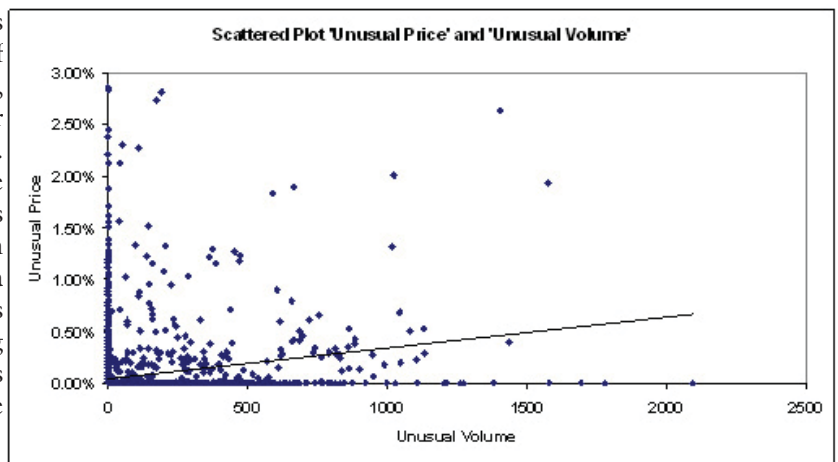
Since the purpose is not to study the direction of the price movement in unusual volumes but to quantify the magnitude of such movement whether it is an order to buy or an order to sell, unusual price changes are taken in absolute terms irrespective of direction. The graphic below shows a scattered plot diagram for all of the instances of unusual price or unusual volume. As the scattered plot shows, unusual price and unusual volume are generally both zero as defined above, but there also seems to be a relationship between unusual price and volume.



The impact cost occurs when the liquidity provider is able to charge a premium for providing liquidity. If there is a large order for buy/sell at a given interval, then one must understand the corresponding behavior of the price to completely appreciate the impact cost. To fully quantify the impact cost, one must analyze the change in bid/offer spreads for a given order as well as the direction and size of the order. Unfortunately, such data is not available in NYMEX contracts. The only data available is of five-minute interval volumes and prices traded on GLOBEX, the NYMEX electronic trading platform. This model assumes that GLOBEX quotes provide the proxy of trade volumes on the floor in the open market outcry.

To measure liquidity risk, I analyzed five-minute interval data on NYMEX HH contracts traded on the exchange between September and December of 2006. The figure below represents the average daily five-minute profile of NYMEX HH prompt contract on the exchange.

One important observation: Choosing the right time to unwind a large position may pay dividends because impact costs are



The next step was to quantify the strength of this relationship. To measure the strength, I omitted all observations where both the unusual volume and unusual price had zero values. In this data, again taken from September 2006 to December 2006 five-minute intervals on NYM HH prompt month contract, there

(Click to continue on page 14)

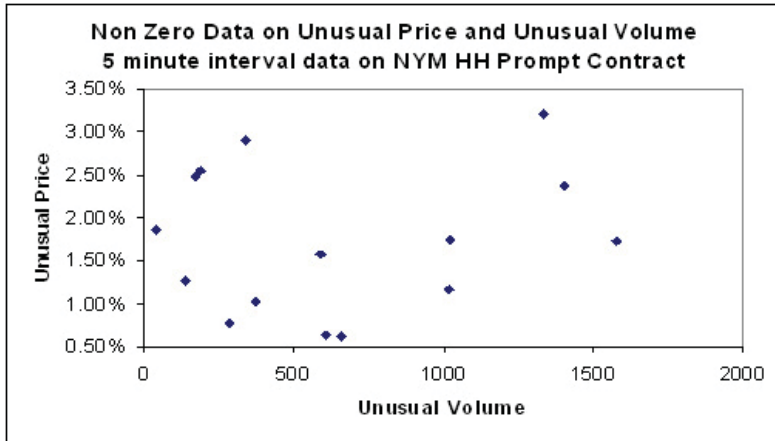
(DEMYSTIFYING LIQUIDITY RISK from page 13)

were 403 observations where either unusual volume or unusual price had a value other than zero. The analysis shows a very low R-Square. In order to make a meaningful analysis, it is preferable to test relationships with higher R-Square statistics.

$$\text{Total MMBTU} = \text{Number of Contracts} * 10,000 \text{ (NYM HH)}$$

$$\text{Impact Cost per MMBTU} = \text{Total MMBTU} * \text{Coefficient for change in price}$$

$$\text{Possible Impact Cost} = \text{Impact Cost per MMBTU} * \text{Price per MMBTU} * \text{Total MMBTU}$$



To calculate impact cost for other contract months, one must calculate coefficients for each contract month separately using the same analysis.

Contracts Beyond Prompt Month

Exchange-traded contracts have open interest that is either long/short open contracts held by investors. One useful measure is to calculate the ratio of open interest to average daily volume (OI/ADV). The table below shows the OI/ADV ratio on the NYMEX HH contracts calculated during 2006. The table expresses that when a contract is fifth from the prompt, the ratio starts to decrease at an accelerated rate. The graph depicts the change in ratio for different months.

Since this relationship measures the movement between unusual price and unusual volume, a low R-Square is understandable. It proves that the change in price cannot be explained by changes in volume only. Many factors affect prices like weather, market fundamentals, market sentiments, etc. Change in volume explains a very small portion of the change in price. The purpose of this analysis is not to analyze the predictability of prices using the volume data. However, a T Stat of 1.644 shows that the unusual volume is a significant determinant to change in price. Hence, this analysis can be used to measure liquidity-related effects on changes in price.

For example, the OI/ADV ratio drops 50 percent when the contract rolls into the front month. It drops 20 percent when a contract rolls from the third-in-line to second-in-line. Risk managers should be especially careful in quantifying the liquidity risk (impact cost) in trades in the second and third forward months

(Click to continue on page 15)

Regression Statistics	
Multiple R	0.08174145
R Square	0.00668166
Adjusted R Square	0.0041941
Standard Error	0.01391025
Observations	403

	Coefficients	Standard Error	t Stat
Change in Price	0.00025%	0.00015%	1.6444

Practical Applications

The coefficient calculated above provides the sensitivity to impact cost. It quantifies the predicted loss in the value of a portfolio if a large (+/- two standard deviations) order to buy/sell is given in the prompt month NYMEX HH contract. For example, assume the trader has a position of 5,000 contracts. The risk manager can use the analysis below to calculate the impact cost of unwinding this transaction.

Number of Contracts	5,000
Total MMBTU	50,000,000
Coefficient for Chg Price	0.00025%
Impact cost per MMBTU	1.2449%
Price Per MMBTU	\$ 8.00
Possible Impact Cost	\$(4,979,406)

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because of the precipitous change in the ratio of open interest to average daily volume. A catastrophic event may cause many of the open interest holders to seek liquidity at the same time, causing higher impact costs.

Policy Implications

Post-Amaranth, liquidity risk has become an important issue for risk managers and investors. A good risk management policy should involve mechanisms to calculate impact costs on unwinding positions instantaneously (liquidity risk). This should be followed by policy measures to ensure that liquidity does not cause catastrophic outcome for the fund.

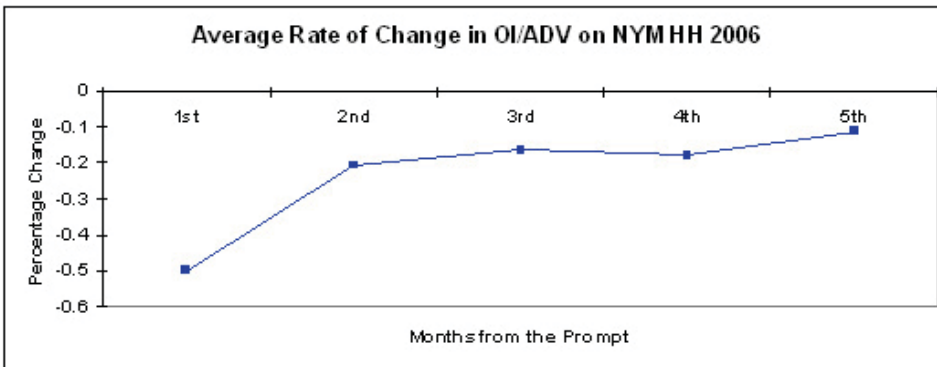
The risk manager should conduct sensitivity analysis to ensure that the fund can survive a catastrophic event when positions need to be cleared. Since leverage can give traders tremendous ability to enter large numbers of contracts in a given contract month, it is imperative that limits are put on the number of contracts to account for the liquidity risk. For example, risk managers or investors can calculate impact costs to unwind trades for each contract month and set limits that translate into the maximum number of contracts a trader puts in a single contract. This limit would ensure that if a catastrophic event requires contract unwinds, the fund would be able to sustain such a loss.

For more information, visit <http://www.sungard.com/kiodex>.

Open Interest/Average Daily Volume (OI/ADV) NYMEX HH 2006

	NGG06	NGH06	NGJ06	NGK06	NGM06	NGN06	NGQ06	NGU06	NGV06	NGX06	NGZ06	NGF06
Jan-06	1.99	4.81	4.06	6.01	10.04	18.31	13.29	18.23	10.16	13.72	15.58	11.70
Feb-06	-	2.34	3.16	5.59	7.11	10.02	12.10	12.98	6.91	7.73	13.58	7.12
Mar-06	-	-	2.17	5.97	7.88	8.60	15.00	17.66	8.09	18.22	19.39	17.88
Apr-06	-	-	-	1.92	3.39	6.60	11.02	11.57	7.00	22.13	16.43	11.18
May-06	-	-	-	-	2.00	5.54	6.47	6.93	6.27	16.43	10.88	10.73
Jun-06	-	-	-	-	-	2.14	4.08	7.09	8.51	21.12	17.66	17.00
Jul-06	-	-	-	-	-	-	2.02	5.47	5.56	10.76	9.89	15.23
Aug-06	-	-	-	-	-	-	-	2.30	4.10	5.56	8.31	14.04
Sep-06	-	-	-	-	-	-	-	-	2.44	4.77	7.72	10.98
Oct-06	-	-	-	-	-	-	-	-	-	1.94	4.23	9.37
Nov-06	-	-	-	-	-	-	-	-	-	-	2.05	9.90
Dec-06	-	-	-	-	-	-	-	-	-	-	-	1.28

Average Rate of Change in OI/ADV on NYMHH 2006



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(NATGAS DESK from page 1)

there is a higher potential for a momentary flight from commodities, much like we saw last August when the market first detonated. “Last Summer we saw lots of funds having to liquidate commodity positions to cover margin calls in unrelated areas, which created some significant downward price movement in commodities.” Sound familiar?

He says that commodities are so incredibly sensitive to perceptions and expectations these days, he’s never really seen anything like it. “Gasoline crack spreads pretty much completely collapsed this week. It wouldn’t take all that much in terms of fear factor (to make) that growth in distillate demand finally start meaningfully slowing down, such that we should see prices go back down to the high \$90s pretty quickly.”

Recently LIM’s Tony Kolton told us that in all likelihood a near-term price dip was in the cards, for at least a couple weeks, before the lofty price levels resume as refineries begin to gear up for the Summer driving season.

Weissman concurs. “I’ve always been a strong believer in looking closely at refiners’ buying cycles. Of course this doesn’t exactly dovetail with the maintenance season, but it’s certainly affected by it. I see a lot of potential right now for a seasonal correction.”

Weissman and Kolton do see some softening of prices in the near term and continued volatility generally. They don’t envision a price collapse in the traditional sense.

On the gas side, Weissman says the market seems to neither fully appreciate the significance of the drawdown in storage that has occurred this Winter, nor the dearth of LNG shipments over the past couple months. “For the past four weeks I’ve been saying we can expect a near-term softening of prices, but this is mostly because of the mild April we’re now looking at. I think if we see crude come back to the upper \$90s, we can expect gas to be around \$8.77. But I also think things are setting up for some explosive Summer prices, and this is mostly hinged on what LNG does or doesn’t do over the next month or so.”

Some analysts are saying that the expectedly taciturn April-May LNG import market may actually end up having a significant near-term role in pricing, should a few unscheduled cargoes make it to these shores. We’ve heard plenty of analysis on the macro role of seasonal or annual LNG import tallies, but few have given much lip service to the role that individual cargoes might play on basis markets and beyond. Well, in a market as tight as this one, we should find out soon enough. Weissman says he expects gas to be definitely back in the \$10 neighborhood, “and quite possibly up to \$12 before the end of the Summer.”


Lately, party leaders on both sides of the aisle have been making some noise on Capitol Hill about shutting off the fill tube for the SPR. With crude prices so high these days, they reason that perhaps a halt to the current buying program may actually ease market prices a bit. And though commercial inventories are at reasonable levels at this point in the US, memories of last year’s severe drawdown at Cushing and elsewhere are still fresh on many peoples’ minds. And never mind the recent, massive build that caught lots of folks by surprise. Why was that? What’s

the fate of Cushing stocks this year? Call it the Cushing Riddle; call it a factor to watch closely this year.

“Last year around May, everybody was thinking just the opposite. If there was any validity to the thinking back then, it should be worse now, because, for example, there are some increases in Canadian syn-crude supplies. I’m having a hard time getting a handle on Cushing stocks, considering the huge build last week. Why did that turn around so sharply? There was a small drop in refinery utilization out West, but that’s it. The dynamics of the current market simply aren’t that well understood. And what if the SPR stopped filling? I doubt it would impact price at all,” Weissman says.

On the crude side, he says tracking the value of the US dollar will keep you better informed than most indicators on the next price direction for crude.

Parting Comments: “I continue to think that while the markets – equity and energy – may go through a lot of volatility, the likelihood is still reasonably high that the global economy will do pretty well. And by all rights, the various stimulus packages the administration has put in motion should begin to have a significant beneficial impact on the US economy in another few months. So one would think that by the second half of the year, the US economy will start to pick up to some degree. And, as I said, the global economy will still be pretty healthy. I think the US stock market still has a little way to fall, but I think it will pick up significantly later on this year. As for energy prices? Besides the near-term softening I see, they will remain strong for the rest of the year.” Just call him Weissman the optimist. Strange days indeed.





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