

Speech by SEC Staff: Remarks before the AICPA/FMD National Conference on the Securities Industry by Erik R. Sirri, Director, Division of Trading and Markets, U.S. Securities and Exchange Commission, New York, N.Y.

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Thank you for inviting me here to speak with you. Before I begin my remarks, let me remind you that the views I express are my own and not necessarily the views of the U.S. Securities and Exchange Commission, the individual Commissioners, or my colleagues on the Commission staff.¹

One phrase: "Super senior ABS CDOs." Prior to August of this year, very few people knew what these words meant. But these words have come to be emblematic of the most difficult market conditions that even experienced traders and risk managers have seen in a number of years.

It is tempting to ascribe the losses associated with super senior ABS CDO to the newness and complexity of the products, carelessness of originators, inadequacies rating agencies models, or declines of the housing market. Surely, all of these factors and more played a role. But there is a danger in focusing too much on the idiosyncratic issues associated with this particular product, and the associated market dynamics. I believe that it is unlikely that financial institutions will ever experience large losses again due to super senior ABS CDO. I'm enough of a historian to know that, some number of years down the road, we or our successors likely will again be commenting on why some other product or business led to large and unexpected losses. But it will probably not be super senior ABS CDO. Thus the challenge for all of us is not to think about what we understand now that we wish we understood two years ago about that particular product. Rather, we spend our time better if we seek to distill more general lessons from what a number of senior managers of major institutions have acknowledged was a significant risk management failure. In particular, I believe it is essential in analyzing recent events to step back and recall risk management's roots, before "vol surface" and "correlation skew" and "heat rate" entered the risk lexicon.

My perspective on these issues is shaped by my involvement with the Commission's oversight of the large, internationally active US investment banks. At present, the Commission supervises five securities firms on a consolidated, or group-wide, basis — Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch, and Morgan Stanley — also known informally as the CSEs. For such firms, the Commission oversees not only the U.S.-registered broker-dealer, but the consolidated entity, which may include other regulated entities such as foreign-registered broker-dealers and banks, as well as unregulated entities, such as derivatives dealers and the holding company itself. The Commission's CSE program provides holding company supervision in a manner that is broadly consistent with the oversight of bank holding companies by the Federal Reserve. This program's aim is to diminish the likelihood that weakness in the holding company itself or any unregulated affiliates would place a regulated entity, such as a bank or broker-dealer, or the broader financial system, at risk.

CSEs are subject to a number of conditions under the program, including monthly computation of a capital adequacy measure consistent with the Basel II Standard, maintenance of substantial amounts of liquidity at the holding company, and documentation of a comprehensive system of internal controls that are subject to Commission inspection. Further, the holding company must provide the Commission on a regular basis with extensive information regarding its capital and risk exposures, including market and credit risk exposures, as well as an analysis of the holding company's liquidity risk.

A cornerstone of the Commission's approach to its consolidated supervision program is a reluctance to be prescriptive. An uncharitable view of the Commission's work might be that it would rather criticize what others do rather than direct their activities. Somewhat in that vein but without being too critical, I'd like to talk about where the fundamentals of risk management are clearly visible behind all the complexity of the super senior ABS CDO market.

If there is a fundamental premise of risk management, it is that concentrations are dangerous. A trade is ideally entered and unwound in a manner that leaves the market price unchanged. In practice, this is unattainable. But when positions are small and overall market activity large, one can come close. At the other extreme, participants can become so large relative to the market that their capacity to exit the position is affected. That, of course, is precisely what appears to have happened to a certain hedge fund in the natural gas market in September 2006. They began trading in a market, but soon became the market.

From the perspective of a risk manager, concentrations are clearly undesirable and are to be avoided. But how much is too much? The answer that most risk managers would likely give reminds me of what Justice Potter Stewart once said when asked to define obscenity: "I know it when I see it." Hindsight certainly helps. Today, it is easy to look at what happened to that certain hedge fund to which I referred above and chalk up its demise to a concentrated natural gas bet gone wrong. Or to look at certain hedge funds and attribute their distress to concentrated (and leveraged) subprime exposures.

But prospective identification is hard, and not only because bright line tests for how much is too much are elusive. If the "rates" trading desk at a firm sells an inflation swap based on \$1 billion notional, is that too concentrated? What if the desk hedges the swap with an inflation-linked bond? Now the position is theoretically hedged for changes in inflation rates, and what remains is a "basis" risk between the swap and the bond. It is certainly possible to have concentrated exposure to a risk factor, such as a basis, as well as a particular instrument. Concentration must also be assessed across many different dimensions. For example, how concentrated is a portfolio of fund derivatives of \$15 billion notional hedged with the underlying hedge fund shares? Would it make a difference if all of the hedge funds being referenced were "long/short equity"? Perhaps diversification across specific funds offsets concentration in a particular strategy. What if

half were funds-of-funds? Does diversification across funds investing in a range of strategies offset the concentrated exposure to the fund-of-fund model?

Another complication stems from the possibility that a position suddenly becomes concentrated because of the actions of other market participants. Positions that seem innocuous under normal market conditions can become anything but innocuous when liquidity dries up. As trading comes to a halt, even positions that appeared to be modest in size relative to market activity can prove virtually impossible to exit, leaving a trader "tied to the mast" with little or no ability to actively risk manage the position through sales or hedging activities.

Arguably, risk managers get paid for identifying which concentrations are worth worrying about and drawing attention to, and which ones are not. Not all concentrations are equal. Some are managed relatively easily, obvious and fundamental to the business model, like equity blocks. Some, however, have features that warrant special care.

Which brings me to a second fundamental rule of risk management: don't sell too many lottery tickets. This arises most clearly in the context of options trading but, as I will highlight shortly, is a ubiquitous issue in financial markets. A trader can always generate cash today by selling optionality. Of course, the resulting risk profile is very asymmetric, with the upside limited by the cash received while the downside is potentially unlimited — hence the phrase "selling lottery tickets". The risk profile for selling optionality requires special attention if the options have strikes that are out of the money, as this gives rise to negative convexity, a technical term for describing exposures where mark-to-market losses accelerate rapidly when markets move adversely.

Most derivatives traders and risk managers recognize that selling out of the money puts is dangerous and generally to be avoided, at least in size. (Recall the first rule of risk management related to concentrations referenced above.) Thus, overt trading activity along these lines tends to get flagged and escalated quickly. But the risk profile of an out of the money put can be manufactured in many different ways through a wide and ever-growing variety of instruments.

More subtle forms are apparent even in the cash markets trading vanilla products. Take a fixed income instrument, like a corporate bond, for example. For the investor, the upside is limited to the yield, while the downside is potentially large in the form of non-repayment of principal. This has the flavor of an out of the money put. In fact, this is the intuition behind the Merton model, which analyzes the capital structure of a firm by viewing equity and debt holders as long or short particular types of options. But most bond investors understand this risk in terms of probabilities of default, not as the more ominous sounding negative convexity.

With securitized products such as mortgage-backed or asset-backed securities, however, the negative convexity is less obvious and more complicated. Such products rely on the diversification produced by an underlying pool of assets. But reliance on diversification benefits adds a new risk factor: correlation, by which I mean correlation among defaults

or losses on underlying collateral. And this correlation exhibits a form of negative convexity that is particularly difficult to capture and manage.

Clearly, there is a spectrum of lottery tickets that can be written. Some are well-understood and transparent. Others are far more subtle and require more sophisticated analysis to understand the degree to which the risk profile of the position resembles the dreaded out-of-the-money put option.

Which brings me to the third fundamental rule of risk management: the valuation process is central to understanding risk. To the extent that a market participant trades cash instruments and listed derivatives, valuation is often simply a process to properly ascribe gain and loss, which can be done easily using no more sophisticated tools than a Bloomberg terminal. But for those who trade over-the-counter derivatives and securitized products, the valuation process is fundamental to understanding the risks of the position.

If a derivative product is trading in a liquid over-the-counter market, it is tempting to simply rely on dealer quotes to value position. But that is a very risky proposition. First, one is effectively relying on the continued liquidity of the market for marking, which is of course the fundamental risk and governance control of trading firms. Even more importantly, however, relying on the quotes of other dealers is effectively an abdication of the basic responsibility of a trader to understand her risks. "Mark-to-model" has taken on an ugly connotation in recent months, as commentators have questioned whether such a valuation process is distinguishable from simply making up a mark from whole cloth. Such commentators lose sight of the fact that the process of modeling the positions' value ensures that complex risks — such as out-of-the-money puts that generate negative convexity — are understood. Simply relying on a price from another market participant involves no such understanding of risks, and is tantamount to flying blind.

Flying blind in this sense also leaves a trading firm exposed to the morphing of risks from more obvious and easily measured types to more subtle and difficult to identify variants. Which brings me to a fourth fundamental rule of risk management, namely that the risk is fungible. A trading firm that carefully measures and limits risk of a particular type is likely to find its traders and counterparties, consciously or unconsciously, exposing the firm to risks of a type that are not as easily identified.

For example, firms may try to limit leverage and hence market risk exposure by limiting the balance sheet allocated to particular traders or businesses. In a world where off-balance sheet funding arrangements, ranging from simple repurchase agreements to highly complex conduit structures, is readily available, the efficacy of such governance tools is obviously quite limited. And there is a possibility that not only will risk not be effectively limited, but relatively straightforward market risk will be transformed to less easily measured liquidity risk. In a similar vein, a variety of market risk exposures can be easily transformed into counterparty credit risk using over-the-counter derivatives. And as we all know, credit risk can be recast as market risk using credit derivatives.

So what do these fundamental principles of risk management have to do with super senior ABS CDOs?

Before turning to that question, let's consider the structure of an ABS CDO. An ABS CDO is effectively a re-securitization of an already securitized products. In a first securitization, a variety of loan assets — in recent years frequently subprime mortgages — are assembled into a pool. Then a variety of liabilities are created with differing risk-return profiles intended to appeal to different types of investors. These so-called residential mortgage-backed securities or RMBS have been around for a long time.

ABS CDO is created by essentially repeating the process a second time. RMBS tranches are pooled. Then once again a variety of liability are created with differing risk-return profiles intended to appeal to different investors. The riskiest tranche bears losses first. The least risky tranche enjoys loss protection from the other tranches, which are subordinate to it. And there are many tranches in between. The so-called "super seniors" are at the top of the capital structure and are the least risky. At deal inception, they are all rated AAA.

An interesting feature of ABS CDOs is that because they layer diversification on top of diversification, the sizes of most super senior tranches are quite large. In many instances, over 90 percent of the capital structure may be rated AAA. This means that for a \$1 billion deal — a typical size — \$900mm of the resulting securities could be AAA rated. In retrospect, the super senior ABS CDO was nearly a perfect structure to lull even sophisticated traders and risk managers into a state approaching complacency — and blind them at least temporarily to fundamental principles of risk management that would not have been new to them and which they could surely recite from memory.

The AAA ratings in particular made market participants comfortable holding concentrations that would have been unthinkable otherwise. The recent third quarter 10-Qs filed by a variety of institutions are eye-opening, in the sense that the size of the super senior ABS CDO books were often measured in the tens of billions. While these balance sheet numbers are eye-popping, the degree to which the positions represented concentrations of exposure to certain risk factors was probably even greater.

Returns on super senior tranches were fairly low, because the expected loss was low. Until all of the tranches beneath the super senior get wiped out completely, the super senior noteholder receives principal and interest payments. In short, the investment is "money good". In a mark-to-market world, however, lack of principal loss is not a defensible basis for valuing the instrument at par. As defaults mount, the probability of taking losses — i.e., of the investment not being money good — increases. Much more importantly, however, from a fair value perspective the price at which the investor can sell the position will decline. As more defaults occur, the rate of that price decline increases. Negative convexity begins to exert itself.

In addition, being at the top of the capital structure in a securitization means being short correlation. That is, as defaults become more correlated, the probability of default losses

eating through the subordinate tranches increases. What happens when default losses increase not only in frequency and severity, but also in increasingly correlated fashion. The negative convexity compounds. Small increases in defaults lead to ever larger declines in valuation. To the degree that large balance sheet positions embed concentrated exposures to correlation, default probabilities, and a particularly difficult to capture interaction term between these two risk factors, the economic exposure rapidly becomes enormous.

Nonetheless, the degree of concentration and negative convexity of the super senior ABS CDO positions remained challenging to identify. First, liquidity in the relevant market did not really diminish markedly until summer 2007. That not only made positions appear less concentrated, but also spared market participants from having to spend lots of time and energy marking their super senior ABS CDO positions to model. But, of course, had they done so they would have been forced to confront the degree to which they had assumed concentrated exposures to certain risk factors such as cumulative loss and correlation. These market participants would have also been more likely to spot the negative convexity that, while present in all fixed income instruments, was particularly pronounced in super senior ABS CDOs with the high degree of subordination that made small changes in default rates relatively unimportant and effectively struck the implicit put option very far out of the money.

In addition, the concentrated positions had in part emerged as a result of very specific governance policies intended to minimize other risks. For many years, it has been well understood that, with securitizations, it is possible for the structuring institution to sell almost all of the bonds yet retain much of the risk. During earlier periods of mortgage market stress, a number of structuring institutions were left with residuals and other equity tranches, resulting in large losses when defaults rose and liquidity ebbed. As a result, most financial institutions instituted strict limit structures intended to force the sale of these risky tranches. That's precisely what occurred with the subprime securitizations. But to make the riskiest tranches attractive to purchasers, these were priced attractively relative to expected cash flows. And since the overall cash flow from the underlying assets is invariant to the capital structure, the cost for skewing its distribution toward the lower tranches was that higher tranches such as super seniors that would be relatively overpriced and, thus, more difficult to sell. So governance mechanisms intended to limit one type of risk effectively led to others risks being assumed that were more complex and difficult to analyze.

If a firm were to have a concentrated position in a risk that suddenly became illiquid, that would clearly be bad. However, much worse would be a concentrated position with negative convexity that suddenly became illiquid. That trifecta is a risk manager's nightmare, as there is little to do once the markets start moving adversely and liquidity goes away, other than to hope. And as one head trader wisely said recently, "Hope is a crappy hedge." Combine this unhappy situation with risk that has begun to morph into less obvious forms and one starts to understand what occurred with super senior ABS CDO over the past nine months.

Endnotes

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