

MEMORANDUM FOR THE RECORD

Event: Darrell Duffie, Stanford University

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Team Leader: Greg Feldberg

Location: 1717 Pennsylvania Ave, Suite 800

Participants - Non-Commission:

- Darrell Duffie

Participants - Commission:

- Greg Feldberg
- Chris Seefer
- Kim Shafer
- Jon Armstrong
- Randall Dodd
- Carl McCarden

MFR Prepared by: Greg Feldberg

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Summary of the Interview or Submission:

This MFR is a paraphrasing of the dialogue and should not be quoted as a transcript.

- Background: Professor at Stanford; Moody's board since 2008; Board of iShares; Financial Advisory Roundtable of New York Fed. Past President of American Finance Association. Main author of *Squam Lake* report. Coming soon: *How Big Banks Fail and What to Do About It*.
- [How did derivatives contribute to the crisis?] Three batches of derivatives:
 - (1) exchange traded, which didn't play a role;
 - (2) OTC but standardized, which did play a significant role because they created investors' fear about their counterparty exposures;
 - (3) OTC but not standardized, primarily CDOs, caused problems, particularly for AIG and other insurance providers. Responsible for near-failure of monoline insurance companies and what would have been failure of AIG if it hadn't been for the US government.
- [How important were OTC derivatives other than credit derivatives as a contributor?]
 - I'm not just talking about credit derivatives, although the third batch is credit derivatives in CDOs. The second batch, it was by the nature of Master Swap Agreements is that you

can't separate credit default swaps from other derivatives because they work together. These other categories were more important than credit derivatives.

- Lehman has obligations of many types. Counterparties became concerned about (1) how much they would lose if Lehman failed and whether to pull back; (2) was Lehman exposing other institutions to its credit risk. This contributed to the extreme nervousness of participants in the market system and caused them to withdraw credit from each other.
- Derivatives were not the most important (factor in contagion) but... derivatives would be third after (1) exposures of clearing banks and (2) repo. The clearing banks became skittish: (1) the crisis caused them to act defensively, to withdraw collateral; and (2) the clearing banks are the most systemic firms in the system. Lehman was not the only large dealer bank that exposed the clearing banks during the week that Lehman fell. Also Morgan Stanley, Merrill Lynch; somewhat further down the ranking was Goldman Sachs. I'll send you a copy of the manuscript that describes how these arguments work together on the TBTF problem. [The paper is *How Big Banks Fail And What to Do About It* and has been uploaded].
- Central clearing. Clearing is very important. That's more on the remedy side. Transparency is crucially important, which is coming through with new repositories. Part of it was uncertainty about where the exposures were.
- Collateral. There's also the problem of collateral, which was used by large banks like Lehman to fund itself, but was a source of fragility... when counterparties pulled out, those collateral monies are not segregated.
 - [Run on repo and call for more collateral; please say more about that.] There was a general shift, it wasn't sudden, to get more collateral from counterparties and have it more in the form of cash, for two reasons: (1) there was a heightened sense of risk, and (2) the dealer banks were under heightened pressure to fund themselves and it was at the expense of the counterparties. The movement to cash collateral shouldn't happen in a crisis but in a boom time. This had been happening for some months. The ISDA surveys showing distribution of collateral types and others could give you more comprehensive data on that.
- Risk management. [How good was the risk management of the dealers?] The dealers rarely ask for collateral from each other. They generally had matched books with each other. Between Goldman and Morgan Stanley, they would have extremely large positions with each other across many instruments. Their credit officers are responsible for monitoring their exposures. Some do that well, some less well. The lack of collateralization that was common in the OTC derivatives market was another source of fragility because the dealers can pull back from each other. They didn't use independent collateral, they didn't have upfront buffers. The large amount of collateral was generally collected from hedge funds. They didn't collect it from high-quality counterparties like AIG or Berkshire-Hathaway, which is now arguing it still shouldn't have to post collateral even if there is a clearinghouse.

- Prime brokers. These are prime brokerage relationships between the hedge fund and the dealers; the Credit Support Annex describes how the collateral is exchanged. [Should we discuss derivatives collateral as just one aspect of the prime brokerage relationship?] Yes.
- [Is it a problem that they didn't require independent margin?] Yes. Conditional on the failure of a dealer bank. Now you ask yourself—which type of counterparty would have been most likely to cause a failure? Hedge fund X? Greece? Fannie Mae? Berkshire Hathaway? Anyone one of them would have been viewed as very unlikely to fail outside of a financial crisis but, given a financial crisis, the likelihood that a crisis would lead to a failure of a counterparty would be a... If it's a life-threatening loss that occurred, it wouldn't be five or 10 hedge funds, it would be an immense counterparty that you gave an enormous amount of credit. It turned out the government bailed them out.
- [GSEs use of derivatives.] We know the total amount of derivatives that FNM and FRE had, particularly interest rate swaps. Just one-fifth of those derivatives uncollateralized represents a huge amount of risk. If you're thinking about where a systemic loss could flow through to derivatives market it would be through an extremely large counterparty.
 - [Did you look at non-hedge fund sources of collateral for the dealers?] We discussed the lack of collateral from sovereigns, from dealers. The other major sources would be institutional investors – large pension funds, large collateral managers like Pimco.
 - The fact that there was a huge gain to the dealers because of the decline in interest rates means there would have been a huge loss the other way.
- Watchdogs. [Who should have said that there should have been independent margin?] We didn't have appropriate regulation of the OTC derivatives market in terms of minimal collateral requirements. Under the Dodd amendment, the SEC will be given that authority. In the absence of that regulation, the SEC would have been the agency that should have seen the exposure of Lehman through the derivatives markets and should have been... [Also insurance supervisor?] Absolutely. The OTS is known to be ineffective, and the monolines were supervised by regulators who were known at the time not to be up to speed.
 - SEC had supervisory authority to judge the adequacy of capital in a qualitative sense. They had the ability to direct a dealer to correct an inadequate risk management. It's hard to stand up in the middle of a fantastic economy. People talked about it, but I don't think anybody made a fuss about it. [Were any dealers better than others?] No, they needed the business.
 - [ISDA?] I don't know to what extent they view themselves as responsible for risk management. They don't want extra risk. They were responsible for bringing about all sorts of improvements in risk management. They worked out to bring about netting in settlement, all through the 1990s. They got improved legal infrastructure in netting. In 1992, and 2002 swap agreements, and the Credit Support Annex. While they may have had other shortcomings, these things improved the safety of the OTC derivatives markets. Another way to argue this is that they allowed the market to grow from X to \$600 trillion, so the net result was too much risk. ISDA did a pretty good job.

- [Fed could have used its margin rules?] I don't believe so. They could have used their supervisory mandate to tell a bank with an investment bank that their risk management wasn't sufficient. The Fed if you read the Valukas report could have done more of that.
- [It would have had to be interagency coordination?] Yes. Under the Dodd amendment there is a nine-agency Council. I would have preferred to have the Fed be in charge of cross-agency issues... I didn't see any evidence that the agencies were over-looking on purpose the risk management problems. My sense was that they weren't sufficiently on top of them or didn't have sufficient aggressive management to bring their judgment to bear. I don't think the moral hazard problem of allowing my jurisdiction to grow factored into this.
- [Role of capital standards?] This starts to the fragmented jurisdiction between banks and investment banks. Europe says we don't like this international system where your investment banks don't have the same capital standards we have. Rather than forcing them to be formally regulated as banks, they would be subject to Basel II capital requirements as administered by the SEC. **That strikes me that the US was more in a reactive mode than a proactive mode.**
- The documentation of the lack of attention of the SEC described by the Valukas report is relatively alarming on its own.
- Some people call a CDO a derivative. Let's call a derivative a CDS or an interest rate default swap. The securitization industry which has its merits, somehow went off the rails. It was used to create highly rated structured products that were relied upon by the financial system as though they were good collateral. Satisfaction with those products created lax lending... created feedback that increased reliance on securitized credit products. **In this picture, derivatives played a role largely through streamlining the process through which credit risk was distributed throughout the financial system.**
- Speculation. [Speculative?] Very rarely are positions taken in these products not speculative. Most of the investors in these products felt the risk they were taken was sufficient... any investment you're taking without hedging is by definition speculation. The CDOs were by and large speculative assets. The AAA ones were not supposed to be speculative at all. CDS were used for both hedging and speculative purposes in this market. Speculation is not a bad activity on its own. It's bad when you don't have the capital to back it.
 - It's normal in the CDS market that investors take a position of, say, 100, and reduce it to 30; the gross positions are 170 – 100 for you and 70 for somebody else, but the net position to you is 30.
- Contribution of derivatives to mortgage bubble. [Was the existence of the ability to hedge part of the process of creating larger amounts of cash mortgages?] Yes. The pipeline that carries the mortgages to the agencies... and gets passed on to investors. All along this food chain are parties that are mostly interested in intermediating it and would normally hedge their exposures and lay off some of their risks. Let's take the Abacus deal. Goldman used CDS with Abacus to hedge itself with the risk. It wasn't particularly interested in taking risk on either side. [Were more cash subprime mortgages in your view created because of synthetics? Single-name, index,

the timing of those were pretty late in the bubble.] I wrote a paper with some time-series data... I don't know if you can line up the growth in cash CDOs with the growth in CDS.

- **[Did existence of CDS facilitate mortgage market?] Absolutely it did... the synthetic market made it much easier to facilitate the provision of subprime mortgages... Had it not been for the CDS market's growth, it would have been difficult for that to occur. That doesn't mean credit derivatives are a bad idea... (derivatives have contributed to an increase in lending in many ways). When you see a derivatives market that is growing along with capital markets activity, you shouldn't necessarily assume there is something going wrong.**
- **[Amplification?] If you think in terms of the amplification of subprime risk, the net amount of subprime risk in the economy would not have been able to grow as it did without the advent and growth and increasing use of the derivatives market.** That doesn't mean that one points one's finger at the derivatives market as the problem. The problem was somewhere else.
- **[Do you know anyone who has documented this?] I don't know any research that supports that conclusion, although if you ask people involved in the derivatives market, 100 out of 100 would agree with that. Correlation doesn't necessarily imply causation. I don't know how you could document that. The logical argument doesn't seem that controversial to me.**
- [Remedies?] We could throw sand in the gears, just like we could make banks no more than \$100 billion, that might not be the right thing to do. We could say, no credit default swaps. The problem really goes back to the obvious moral hazard in the documentation of the loans; the extreme over-reliance on the ratings, the AAA ratings which turned out to be inappropriate... I know the rating agencies have now agreed that those ratings were not appropriate. **It's also inappropriate to say that investors should do their own due diligence... the rating is supposed to help the unsophisticated investor.** Those prospectuses for CDOs are very complicated.
- A lot of the cause lies with the government and the large banks – not looking around corners and seeing what could happen if you grow these markets...
- [Is it possible to do much due diligence on a CDO?] If you're a hedge fund, yes. If you're a teacher's pension fund, maybe not. Have you read the chapter in The Big Short about the head of Scion Capital... it was rarely done but it is possible. It's not something I would try on a CDO-squared.
- Definition of sophisticated investors. [Sophisticated investor?] Friend has pointed out that to be a sophisticated investor is essentially a matter of how much money you put in; that's probably not the right definition. Joe Grundfest at Stanford Law School.
- [Derivatives provide price discovery. When credit derivatives stop functioning, it has a broader impact?] The ABX market got thinner and bid-ask spreads were getting wider... people said, we don't know what stuff is worth, but the ABX is going down fast. Nancy Wallace at Berkeley has documented CDS pricing over-shot actual value of CDO underlyings.
- Systemic implications of the use of CDS information. [We had heard that CDS was in debt covenants?] That may have affected the corporate market. You could put any trigger you want in a contractual agreement. CDS in the corporate world continued to provide reasonably good information. While it doesn't surprise me that that would be a trigger, I don't think it was a

common one. [The single-name corporate didn't have the same problem as indices.] The corporate bonds themselves were trading at illiquidity discounts that were so severe that the CDS market was providing superior pricing.

- Credit risk transfer. [Note Duffie paper, *Credit Risk Transfer*.] What I'd like to see is, where was this risk ultimately allocated? We know it went to UBS, etc. [Fitch survey, semi-annually, asking participants who was buying and selling protection.] That's correct but it doesn't tell anyone's net position. The Call Reports are interesting. **The banks had mostly a matched book until the crisis began, but then they became net buyers of protection.**
 - The banks generally keep their net exposures... It was shocking that UBS didn't know what its exposure was... You'd have to ask them. [Is DTCC a good source of information on who was exposed to CDO CDS?] They probably have only corporate and sovereign CDS, not CDO CDS. They've recently added a few things. We don't have data on what types of protection people have in the area of securitized structured products, they're just not standard enough.
- **[Were corporate CDS losses material? The CSO market, single-name corporate synthetics appeared to be radically larger than mortgage-related derivatives?] There was a very large amount of CDS on corporate names, although on a net basis it was a relatively small amount of the debt outstanding at corporations. Probably not as large in the residential mortgage market. Either they would be running matched book operations, or the activity on an individual name wasn't that large. By name there were only three companies for which the CDS that was used to buy protection was larger than the debt outstanding... they were all monoline insurance companies. Three out of 1000. The press has exaggerated this.**
- [ABX Index?] Price discovery; allowed people to speculate and hedge... [Gary Gorton argument that price discovery contributed to panic?] Yes, but lack of price discovery also a problem... it's the unknown unknowns.
- [Abacus?] Paulson wants to speculate; he calls Goldman. Paulson says, here's the piece I want. I have a slideshow on this.
- [Do you have any views on naked CDS? Should we allow people to gamble on securities when they don't own them?] I've been talking to Senate staffers for two weeks. The Dorgan amendment would essentially ban naked protection buying. First let me give you the positives for allowing speculation in this market and then the reasons that hedging, even when you own the underlying, can be even worse. Positives: Price discovery. If you leave these buyers out, the pricing won't be as valuable information. The data show that the CDS market first of all did not cause Greece's cost of borrowing to go up, Greece did. The CDS market is responsible for alerting the world to Greece's problem. Second, **you can't have hedging without speculation. You can't exit a position without somebody else entering a position.**
- [Does Abacus deal contribute to transparency?] I don't think that was a socially advantageous deal. Not that the government should be deciding... There's not much price discovery because this isn't a publicly disclosed deal. Nobody knew how much Paulson was paying for his protection.

- [Price discovery throughout OTC markets?] Bloomberg and other services sample prices in the OTC markets. I support the Senate Ag move that every price of every OTC transaction would be reported, not only for price discovery.
- Empty creditor problem. Naked and CDS together have come to have a moral connotation. The insurance analogy doesn't hold up. You can't burn down Greece. Suppose I have lent money to a company; I am at risk if they fail. I call my CDS counterparty and say, I would like to buy protection against the failure of this company. I buy protection from hedge fund X. Now I don't care as much if the company defaults, so maybe I'm not going to pay close attention to enforcing the covenants. I may even want to accelerate the default. My efficient control of the borrower's risk, and my efficient decision to forebear on the loan... is not going to work any more because I'm not at risk myself. This is a much worse situation. Magnetar is a good example of this, although it was synthetic so it couldn't force the borrowers into default. [There was a hedge fund in Austin that sold credit protection on a CDO but they owned most of the underlying MBS. They went out and prepaid all of the mortgages.] **[Policy response?] I would require disclosure. If you have lent more than X% of bonds, you should be required to disclose that you have bought protection.**
- [Manipulation of pricing through CDS?] It's hard to tell the whiners from the truth-tellers. Greece the same way. I don't really give much credence to these complaints. Almost always when there is smoke, there is fire. When CDS buyers are active, they're not just trying to create harm, they're trying to make money because the company is in bad shape. Market manipulation is illegal... you're going to have those trade repositories and then we'll be able to find out who's trying to manipulate the market. In the vast majority of cases the hedge funds are just trying to buy low and sell high.
 - Papers by Amir Sufi, Akif Mian lend credence to the idea... you create these triple-A rated CDOs, the market becomes accustomed to the idea that they are high-quality; this makes it easier for people to buy homes; this raises the price of homes; which makes the products look safer.
- [Price transparency in other markets?] Bloomberg and others provide indicative quotes. They poll the banks for what the rates people are offering to do this or that. Those rates, you can not hit those to get a trade. They're only a narrow sample and they're known to be sketchy data. If I called Morgan Stanley and said, what are you doing on the 10-year CDS on Spain, the numbers I would get would be different from another bank. Tomorrow, when I find out the execution I got at my bank... I could have gotten better pricing. Bloomberg's are not actual executions. There are places you can get executions. TradeWeb, but it's limited. You can go and hit a bid or an ask for a trade. You could ask them for their data. But the vast majority of trades don't go through them. I don't see a reason not to bring a TRACE system into the OTC market. The banks make huge profits and they'll complain.
 - The dealers gave some good arguments about why it's not a good idea to give price discovery in real time, because it would be harder to set positions. The Lincoln bill, the language is very well crafted; the price is reported with a lag correlated to the size of the position so you don't impair the ability to do large trades. (We need this for) every

standard OTC. This wouldn't include CDS on CDOs, because the price wouldn't be of interest to anybody.

- [Indicative quotes... what do people use those for?] It's embarrassing for them to give you a new price that's so far off that you would view it as rubbish... Academics and a lot of investors use that data. Investors use Bloomberg data for mark-to-market accounting. By marking it slightly incorrectly you don't lose money, you only lose the money when you sell at the wrong price. I haven't seen any arguments why we shouldn't have any at all. It's costly. We have to prepare systems. It takes new software, new IT. If you do it in standardized derivatives already to clearinghouses.
- [Even if we don't get price discovery on CDS on CDOs, shouldn't we at least get who is exposed to what?] The regulators should have access to every trade in the OTC market through the trade repositories that are coming in. It will help with the SEC doing investigations. It will be a while before that is useful for supervisors. In the mean time we should require supervisors to get individual company exposures. The largest 10 dealers should get exposure to top 10 counterparties. 10x10x10.
- [Negative basis?] I think of the CDS basis as a canary in the goldmine in terms of the capital... as a result corporate bond prices went way down because it was expensive to hold them because the repo margins became large; holding inventories of them was expensive. CDS remained relatively accurate. As soon as the financial crisis started to go away, dealers got enough capital. This wasn't really a cause of the financial crisis.
- [Capital and liquidity standards?] The liquidity problem was very large. We didn't really require the dealers to have capital in liquid forms. The new Basel requirement for a liquidity coverage ratio is going in the right direction. They don't include enough on derivatives. More important is the withdrawal of assets held by a prime brokerage customer. The prime broker is hard-pressed to replace those assets. That's not included in the liquidity coverage ratio. My recommendation is not that they force banks to stop rehypothecating... if you're relying on it for financing you need to prove that you have other sources of financing. Rehypothecating is still the most important method for financing liquid securities. It hasn't gone to zero but it has fallen a lot.
- Other sources: Gary Gorton. I've been talking a lot with David Scharfstein. Jeremy Stein. We're all in the Squam Lake Group. Ken Griffin, Citadel, you may get an earful on OTC derivatives and the manner in which the dealers run the markets. Kimberly Summe is good on the derivatives at Lehman and the circumstances. *Ending Government Bailouts As We Know Them*. Latest draft of Squam Lake book.