

Invisible Hedge Funds

STCDO Arrangers' Correlation Books

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Synthetic collateralized debt obligations (CDOs) are complex products. While these securitizations can yield gratifying rewards for savvy investors, they are also fraught with significant risks.

In the realm of synthetic CDOs – securitizations that leverage credit derivatives technology to transfer asset risks and cash flows – assessing the profitability of transactions is a difficult task. Consequently, it's hard for capital markets managers and risk managers to assess the risk/reward metrics of synthetic CDO and single-tranche CDO (STCDO) deals.

In this article, we'll identify and analyze the challenges facing investors and banks arrangers – the key players in the synthetic CDO and STCDO realm. We'll also answer few important questions, including: What are the risk/reward differences between synthetic CDOs and STCDOs? Why is it so difficult to gauge the profitability of these types of instruments? What's the definition of delta hedging and how does it work? And why is it important to manage residual risk?

Let's start by taking a closer look STCDOs. Also known as mezzanine-only CDOs, instant CDOs (iCDO), custom tailored CDO tranches and bespoke (meaning custom tailored) CDO tranches, STCDO deals are based on synthetic CDO technology. A bank arranger will create a customized tranche for an investor. The investor chooses the initial portfolio – usually a portfolio of diversified corporate reference credits. The portfolio may be static, or the investor may “lightly manage” the portfolio, usually at no extra cost.

No one knows the size of the single tranche CDO market. Moody's will not even disclose the number of deals they have rated. Even if the rating agencies disclosed this information, it would still be impossible to accurately determine the size of this market. Most of the deals are unrated, even though tranching technology is employed to determine an implied rating. STCDO technology has been generally established in the market among the top Arrangers for the past two years.

The advantage to the investor is that the tranche is created according to the investor's specific credit risk appetite. For most investors, this is the chief appeal of this investment. These deals are sometimes managed, but that defeats the purpose of creating a tranche tailored to an investor's needs and a third party manager adds extra costs to the tailored investment.

Occasionally two tranches of such deals are sold, but the market still refers to this as single tranche technology when correlation traders hedge the transactions using delta hedging technology.

Risks to Investors

Investors have been educated that there are unique hazards to investing in the synthetic CDO market. Hazards for investors include, but are not limited to the following issues:

- 1) Arrangers sometimes “optimize” portfolio selection to have the riskiest portfolio allowable given the credit constraints, to maximize spread;
- 2) Arrangers sometimes arbitrage the credit default swap contract documentation, the ISDA language, so that the Arranger gets the most favorable language and the CDO investor gets the least favorable language.
- 3) The Arranger provides inadequate cash flow structural protections for the CDO investor;
- 4) Naïve investors fail to participate in all available cash flows, such as collateral coupon spreads, among other cash flows. Arrangers realize the investor is naïve, but doesn’t educate the investor that they exist in the first place (this is partly the investor’s responsibility);
- 5) For STCDOs, the senior tranches benefit from low correlation, sometimes called co-dependence, in the asset portfolio. The equity investor benefits from high correlation. When the Arranger retains the equity, the investor must make sure the portfolio choice including credit and correlation works in their favor.
- 6) Trading limitations need to be imposed on the portfolio, and to merely limit the number of trades and volume of trading isn’t sufficient. This is usually best determined when one is close to final portfolio selection.

What is less well known, is that there are also unique hazards to Arrangers. This is particularly true for STCDOs in which the Arranger essentially runs a hedge fund in order to manage the residual risk. Furthermore, when the Arranger synthetically shorts the mezzanine tranche, it is synthetically long the other tranches of the deal, including the equity tranche.

Before examining the unique challenges to risk managers posed by this technology, it is useful to review some of the principles behind CDOs in general and synthetic CDOs in particular.

The Illusion of Diversification

If sole focus is only on the diversity score, portfolio diversification can result in holding suboptimal credit risk. Overall quality, and not merely diversity score, is the key criterion for choosing a portfolio. This necessarily makes it difficult for the investor, structurer, rating agency, or anyone else to assign parametric measures to determine credit quality.

It is a paradox in the CDO market that improving the diversity score of a portfolio, even if the ratings remain the same, can sometimes lower portfolio quality and increase the probability of losses. It is possible to forcibly diversify into less desirable credits of equal rating in an attempt to create a high diversity score. Improving the diversity score allows more leverage and less subordination, just when the senior tranches may need subordination most. The rating agencies

don't have a mechanism for dealing with this. This is where an experienced credit manager is most helpful in choosing the portfolio. Management is an art as well as a science.

Simplified Synthetic CDO Profitability

With the use of correlation models, it is difficult to get a grip on the true profitability of a synthetic CDO. As Winston Churchill said of the potential action of Russia during WWII: *"It is a riddle, wrapped in a mystery, inside an enigma...but perhaps there is a key."*

Many experienced market professionals have difficulty assessing the profitability of synthetic CDOs. Capital markets managers and risk managers have a particularly difficult time following the cash flows when the synthetic CDO employs single tranche technology.

I recently saw an experienced credit derivatives risk manager struggle with this problem. He examined the output of his models, but the key isn't in the outputs, it is in the inputs. The following simplified explanation of full hedged synthetic CDOs provides a benchmark for opining on the value of STCDOs. Boiled down to first principles, the risks and rewards are much easier to understand.

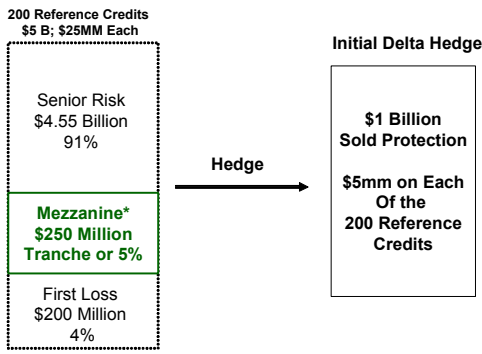
When the Arranger underwrites and sells all the tranches in a synthetic CDO, it is buying credit default protection on the bid side of the market on each of the reference credits in the portfolio. The cleanest way for the Arranger to hedge this transaction is to sell protection in the open market on the offer side of the market on each of the reference credits in the portfolio. If the Arranger matches off its risk in this way, it locks in the bid/offer spread in the CDS market, and locks in the revenue this creates. If a name in the reference portfolio defaults, the Arranger has no risk, but its income reduces slightly by the amount of the bid/offer spread for the name that defaulted.

What is the value of the bid/offer spread on execution of the CDS contracts? Suppose the overall reference portfolio has a notional size of \$5 billion. There are 200 reference credits in the portfolio, each with a notional size of \$25 million. Buying protection on the portfolio of reference credits with a notional size of \$5 billion in the form of a CDO has tremendous value to Arranger's trading desk.

For instance, if the Arranger locks in the bid/offer spread, and if the bid/offer spread is 5 bps, the Arranger can lock in \$2.5 million per annum, for a typical deal with a 5-year maturity. In the no-default scenario, this has a present value of about \$11.3 million using a 4% discount rate over the life of the deal.

If the Arranger can capture excess spread cash flows, the Arranger will make even more money over the life of the deal. Once all of the structuring expenses and tranche liabilities have been accounted for, if the equity investor will buy on the basis of a lower internal rate of return than is represented by the remaining deal cash flows, the Arranger can capture some of the deal cash flows by quoting a lower average spread on the portfolio than is represented by the average bid side of the market. This was often the case with equity cash flows imbedded in principal protected structures and sold to investors.

Initial Delta Hedge for STCDO



* Only the Mezzanine Tranche is Sold to Investors.

Simplified STCDO Economics

Assessing the profitability of a single tranche CDO deal (STCDO) can be much more confusing. This also makes it more difficult for capital markets managers and risk managers to assess the risk/reward metrics of these deals. These are the single most gamed transactions both from the investor’s and ironically, from the Arranger’s point of view.

As mentioned previously, the cleanest hedge a synthetic CDO is to sell protection in the CDO market on the full notional amount while simultaneously

buying protection from the CDO investors. The STCDO always leaves the Arranger with residual credit risk and a huge position to hedge.

One would think that greater risk means greater reward to the Arranger. One might reason that fully hedging the deal cuts into the deal profitability. Often just the opposite is true, given the state of the art of hedging STCDO deals.

If this is true, why do banks do STCDOs? One of the main reasons is that Arrangers have difficulty finding investors for all of the tranches. Arrangers created STCDOs so they could still do business without developing a deeper investor base for these transactions.

Bear in mind the revenue value of more than \$11.3 million in the fully hedged deal shown above. In an STCDO, the Arranger sells the mezzanine tranche, but now the Arranger is long the credit risk of the lower tranches, long the credit risk of the equity tranche (often unbeknownst to its own management), long the credit risk of the AAA tranche, and long the credit risk of the super senior tranche. The Arranger “delta” hedges the remaining credit risk. Delta hedging is sometimes referred to as “dynamic” hedging.

How does this work? For our \$5 billion deal, the Arranger creates an STCDO for an investor with an AA rating and a notional size of \$250 million, and the Arranger sells the mezzanine tranche to the investor. The CDO needs to pay the stated coupon on the mezzanine tranche. Instead of selling protection on the entire \$5 billion notional amount, the Arranger initially only sell protection on a notional amount of \$1 billion. Note that the hedge amount must be recalculated over time, but this is the initial “delta” hedge amount.

Suppose the average offer spread on the portfolio is 80 bps. Suppose the stated coupon on the \$250 million mezzanine tranche is 120 bps per annum. The Arranger earns the following:

$$\$1,000,000,000 \times .0080 = \$8,000,000 \text{ per annum.}$$

After tranche expenses, the net amount is \$5,000,000 per annum or \$22.3 million over the life of the deal assuming a 4% discount rate.

Note that if there are no defaults, the Arranger does better than it otherwise would have done with the fully hedged deal. At first glance, one might think the Arranger is making more money doing the STCDO than doing a fully hedged deal, but this isn’t necessary the case. This revenue

must cover other deal expenses plus reserves for potential losses. In other words, the higher apparent revenue comes with greater risk.

For instance, if one of the 200 names, or reference entities, in the reference portfolio defaulted immediately, the Arranger must settle on the protection it sold. Let's assume a recovery rate of 40% in the event of default. The original notional amount was \$5 billion, and the Arranger sold protection on approximately 1/5 of that amount, or \$1 billion. In the event of default of one of the \$25 million notional reference entities, the Arranger would have to pay a cash amount of $\$5,000,000 \times (1 - 0.4) = \$3,000,000$.

When the STCDO comes to market, it isn't obvious that the Arranger has the first loss risk, also known as the equity risk, of the CDO. If losses are tracked by the individual deal, however, it is easy to see that the Arranger has underwritten the equity of the entire CDO. Until the notional value of the CDO equity is entirely used up to absorb theoretical CDO losses, the Arranger continues to have a potential liability for credit default losses of the Reference Entities in the Reference Portfolio.

Whether Arranger makes more money over time than they would have done if they had fully hedged their position is a matter of how well they manage their residual risk.

Notice that the retained equity is virtually invisible. For banks this is problematic. If reported, this equity exposure should attract a dollar for dollar deduction against regulatory capital. This equity is not always reported, however. As the head of structuring at a Canadian bank said: "If my boss knew what I was really doing, he'd fire me."

Reporting is largely the responsibility of risk management. If a bank securitizes assets and has any residual credit exposure due to retained tranches, the bank holding company must report it. Specifically, they must state the maximum exposure they have as a result of a securitization. U.S. banks Bank holding companies file Y-9's. There is a line item for this type of risk. At the bank level, banks file a Call Report which should have a similar line item.

Whether or not the Arranger is a bank, the Arranger has significant position management risk. Traders tend to make additional lopsided bets to exploit a particular viewpoint on the way they hedge the risk. The traders don't have a lot of downside in making a bet, but have quite a bit of upside.

If they aren't rigorously tracked, STCDO cash flows effectively obscure the effect of bets. If credit bets win, the traders have a call on the upside in the form of a higher bonus related to the higher profitability (the bet payoff). Anyone who owns such a call option has an affinity for greater volatility, so the interests of the Arranger's managers and traders are misaligned. This isn't intentional, it is the nature of this business, and managers must fully understand this natural tension.

If the Arranger isn't making more on STCDOs than the Arranger would have made on a fully hedged CDO, then the positions weren't managed in a way that compensated the Arranger for the additional risk. That means their traders were unsuccessful in exploiting the risk/reward potential (or they made unsuccessful bets), and the Arranger would have been better off fully hedging their positions.

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