

Index Arbitrage – A Primer

March 9, 2007

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INDEX ARB – BACKGROUND AND MECHANICS

The growing liquidity of CDX indices over the past three years has made them very popular with investors seeking to hedge credit exposure or add leverage to their portfolio. Over time, they have become the leading indicator of macro spread moves in the credit market. Consequently, the traded spread on CDX products tends to overshoot the movement of underlying CDS in a volatile environment, creating the opportunity for index arbitrage. This activity can often create single-name opportunities for investors with longer term credit views.

What Is an Index Arb?

Theoretically CDX should trade at its intrinsic value¹ as determined by its constituents. However, much like the price of an ETF or closed-end mutual fund can vary from its NAV, the traded spread often differs from the intrinsic spread. The CDX intrinsic spread is approximately the PV01 (price value of a basis point) weighted average of the constituents' CDS spreads. If the difference between this measure and the market price is sufficiently large, the prospect of index arbitrage exists. In such a transaction, arbitrageurs buy/sell protection on the CDX while selling/buying protection on the single-name CDS that constitute the CDX. Thus, they can earn the spread difference between the two values while assuming limited² risk.

What Causes Index Arb Opportunities?

Single-name CDS, being less liquid than the CDX, typically lag movement in the CDX. In addition, macro hedgers will often buy protection on the index with little concern for the levels (or fundamentals) of the underlying single names. These are the main factors that create the index arbitrage opportunity. Because sellers of risk are more active seekers of liquidity in credit protection than long investors, the index often trades wide to intrinsic rather than the other way round. Therefore, most index arbs occur when CDX is trading wider than intrinsic.

¹ Please see "[Computing Intrinsic Spreads of Portfolio Credit Default Swaps](#)," *Quantitative Credit Strategies*, Lehman Brothers, July 8, 2004, for details on the computation of intrinsic spread of indices

² We discuss the risks in the index arb trade in the next page.

At What Levels Does an Index Arb Make Sense?

The process of executing and unwinding an index arb involves two sets of transactions and consequently arbitrageurs need to cross bid-ask spreads twice. Accounting for the bid-ask spreads, liquidity and risks involved, we estimate the mid-to-mid difference between intrinsic and traded spread where index arb is economical (Figure 1). For example, during the week of February 26, the HY.CDX traded 35 bp wider than intrinsic.

Figure 1. Levels for Spread Differential for Index Arb

Series	Bid Ask for CDX (bp)	Bid Ask for Single Name CDS (bp)	Spread Differential at which Index Arbitrage Is Profitable (bp)	Estimated Volume of Index Arbs between 2/26 and 3/2
CDX.IG	0.25-0.5	2-5	6	\$625 mn
CDX.HVOL	0.5-1.0	2-5	10	\$2.4 bn
CDX.XO	2.0-3.0	5-10	12	\$1.6 bn
CDX.HY	6.0-8.0	5-10	15	\$ 9.2 bn

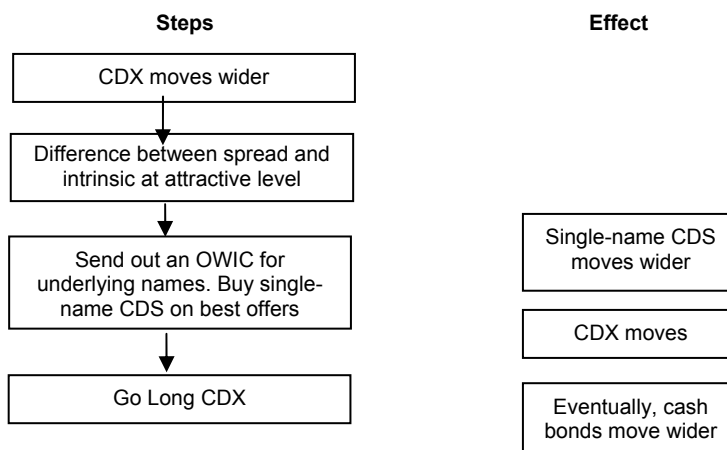
Prices are indicative only. Source: Lehman Brothers

How Is an Index Arb Executed?

When the spread differential reaches an attractive level, the arbitrageur puts out an OWIC (offer wanted in competition) listing the names and amounts of the single-name CDS protection that will be bought (this assumes the CDX is trading wide of intrinsic as is typically the case for these trades). Protection in each credit is purchased in the same ratio as its weight in the CDX. For example, \$10 million of protection is purchased for each name to complete a \$1 billion CDX.HY arb. If some issues are thinly traded (e.g., distressed names in high yield), these can sometimes be substituted with a position in an appropriate sub-index (e.g., CDX HY High Beta).

The arbitrageur then goes long the CDX in the market after buying protection on each credit in the index. The whole chain of activity often takes place in the space of a few hours and almost immediately narrows the difference between traded spreads and intrinsic. Figure 2 illustrates the steps involved and the effect of each leg of the transaction.

Figure 2. Sequence of Steps for Typical Index Arb Execution



Source: Lehman Brothers

What Are the Risks Involved in Executing an Arb?

- **No restructuring versus modified restructuring:** All CDX indices trade with a no-restructuring clause. However, most single-name investment grade or fallen angel CDS contracts trade with a modified restructuring clause. This mismatch creates a basis risk between the index and the single-name leg. Typically, this basis is worth between 2% and 5% of the ModRe CDS spread. The arbitrage spread should at least partially compensate for this basis risk.
- **Cash flow mismatch:** Each CDX series has a fixed coupon. When the traded spread on a CDX varies from the pre-determined coupon, the buyer and seller exchange cash upfront to compensate for the difference. This is analogous to the relationship between coupons and yield for cash bonds. CDS cash flows are generally based on the traded spread levels. Therefore, cash flows between the CDX and its constituents will be slightly mismatched – both at the upfront payment level and at the coupon/running spread level. As a result, default of an issuer that trades wider than the index coupon level benefits the arbitrageur while the default of a name that trades tighter than the CDX has a negative impact on arb profitability. There are further complications with respect to cash flows mismatches in high yield when the arbitrageur must purchase protection on names in points up front format.

How Is an Arb Unwound?

Arbs are unwound when the traded spread reverts back to its intrinsic value. Essentially, the unwind transaction is a step-by-step reversal of the arb execution. CDX off-the-run indices typically trade on top of their intrinsic spread because the short interest moves into the on-the-run series. So, arb unwinds are favorable subsequent to the roll (assume volatility is modest). The arbitrageur puts out a BWIC (bid wanted in competition) for the single names. If the levels are attractive, the single-name CDS protection is sold while buying back the CDX protection to offset both legs of the transaction. The profit that has been captured is approximately equal to the change spread multiplied by the PV01 and the notional of the trade. Figure 3 shows the profitability computation for a typical trade.

Figure 3. Profitability for an HVOL Index Arbitrage

CDX Index Chosen for Arbitrage	CDX.HVOL7
PV01 of CDX.HVOL7	4.15
Notional of the Index Arb	\$100 million
Arb spread after transaction costs	8 bp
Approximate Profit	$\$100 \text{ million} \times 8 \text{ bp} \times 4.15$ ~ \$330,000

Source: Lehman Brothers

TRADE OPPORTUNITIES

The technical environment created by index arbs produces a number of compelling trade opportunities. The volatility of the past week has made both the impact of index arbs and the opportunities they create more apparent than ever. We split these opportunities into two categories: long-term fundamental trades and short-term technical trades.

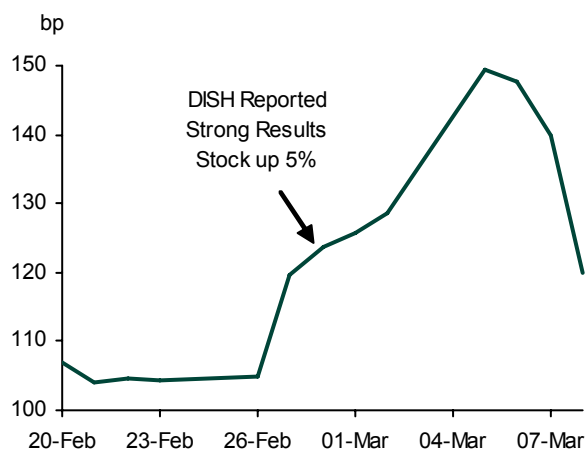
Fundamental Trades

As explained previously, during a market retreat the liquid index products will widen considerably more than the single-name constituents. As arb activity accelerates, however, and single names widen, even improving credits will be affected by this technical trade (especially if they are not very liquid). Consequently, we recommend investors take advantage of the higher cost of protection and go long credits (i.e., sell protection) for which they have positive views. Recent price movement in Echostar (DISH) illustrates this trade. Between February 26 and March 5 DISH 5-year CDS widened 45 bp to touch 150 bp. During this period, the company announced strong results and the stock surged to a new 12-month high. Weighed down by index arb activity, the market seemingly ignored the positive development. However, investors who viewed the credit from a fundamental standpoint and sold protection benefited as prices narrowed to 125 bp over the subsequent two days (Figure 4). The next time there is a pickup in volatility we believe more of these opportunities will present themselves.

Technical Trades

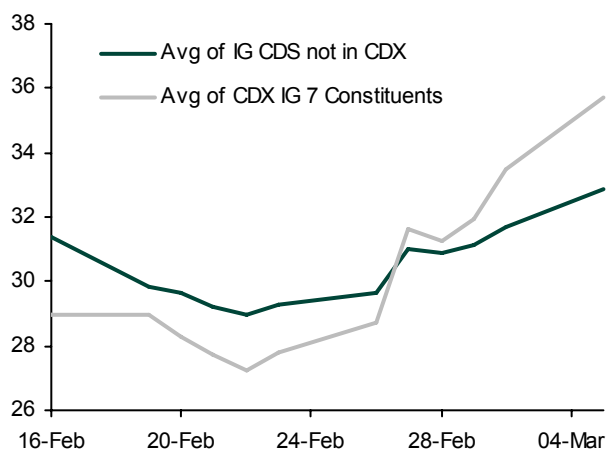
Although intended to be short term, technical trades are also attractive in this environment. Specifically, non-index credits will usually widen less than comparable issuers in the CDX. Figure 5 illustrates this phenomenon with the non-index liquid CDS names widening less than the average of the IG7 constituents (and the trend is similar in HY although there are fewer liquid non-index credits). When CDX moves wide of intrinsic there is a case to execute pair trades buying protection on index constituents while selling protection on similar credits that are not in the CDX.

Figure 4. Echostar (DISH) 5-year CDS Spread



Source: :Lehman Brothers

Figure 5. Spreads of IG7 Constituents



Source: Lehman Brothers, Markit Partners

Notes: IG CDS not in CDX consists of issuers with investment grade rating and entity domiciled in North America with at least five contributors to spread

SUMMARY

In times of market volatility, investors need to be careful while using CDX indices to hedge credit exposure because the traded spread can diverge from the underlying intrinsic. For investors with execution capability, if bid-ask spreads are conducive, this dislocation presents a profitable opportunity for index arb trading. For other participants, the index arb technical creates single-name opportunities that can be exploited meaningfully. As we have seen in the past two weeks, index trading and subsequently index arbs will have a major impact in the market during volatility times. Please do not delete this section break

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