JPMorgan

Corporate Quantitative Research
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CDX Primer

Introducing the Series 6 Investment Grade, Crossover, and High Yield CDX Indices

Introduction

Credit default swap (CDS) indices are tradable products that allow investors to establish long or short credit risk positions in specific credit markets or market segments. JPMorgan has worked with other dealers and the Dow Jones Company to create a global family of standardized CDS indices. The results of this effort are the Dow Jones CDX indices for North America and the Emerging Markets, and the Dow Jones iTraxx indices for Europe, Japan, and Asia (two collective ventures within the global credit derivatives dealer community).

Like the S&P 500 and other market benchmarks, the credit default swap indices reflect the performance of a basket of assets, namely, a basket of single-name credit default swaps (credit default swaps on individual credits). Unlike a perpetual index, such as the S&P 500, CDS indices have a fixed composition and fixed maturities with equal weight given to each underlying credit in the index. A new series of indices is established approximately every six months with a new underlying portfolio and maturity date, to reflect changes in the credit market and to give the indices a consistent duration of approximately five years. The desired portfolio contains credits that are liquid in the CDS market. If there is a credit event in an underlying CDS, the credit is effectively removed from the index.

When a new index is launched, dubbed the "on-the-run index," the existing indices continue to trade (as "off-the-run"), until maturity. Investors have the option to close their positions in off-the-run series and enter into new positions in the on-the-run indices, but are not obligated to do so. The on-the-run indices tend to be more liquid than the off-the-run indices.

This report reviews the CDX product in general, and details the launch of the Series 6 Investment Grade, Crossover, and High Yield CDX indices, named the Dow Jones CDX.NA.IG.6, DJ CDX.NA.XO.6, and DJ CDX.NA.HY.6. The Series 6 Investment Grade, Crossover and High Yield indices were launched on March 20, March 20 and March 27, 2006, respectively.

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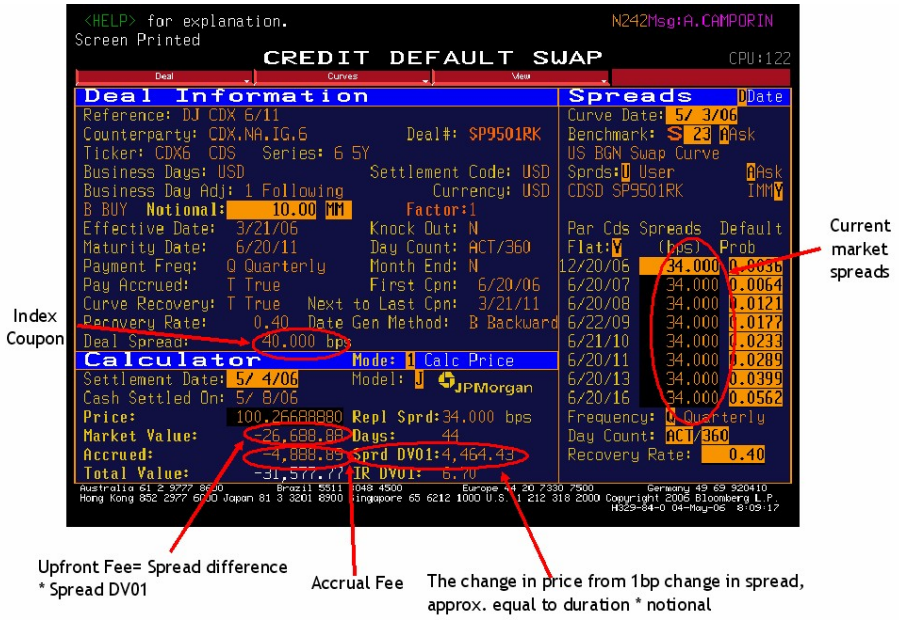
Mechanics of the CDX indices

Each CDX index is a separate, standard credit default swap contract with a fixed portfolio of credits and a fixed annual coupon. Investors will pay or receive a quarterly payment of this fixed coupon on a desired notional. As with standard credit default swap contracts, payments are made on the 20th of March, June, September, and December. Accrued interest is calculated on an Actual/360 basis.

While CDX products pay or receive a fixed coupon, they also trade in the market. The traded level of the CDX is determined by supply and demand. To offset the difference between the fixed coupon and the market spread, investors must either pay or receive an upfront amount when a contract is created. If the market spread of the index is tighter than the fixed coupon, for example, an investor selling protection (long risk) will be required to pay an upfront amount, as they will be receiving a greater fixed spread than the market dictates it should be. The opposite is true if the spread on the index is wider than the fixed coupon; a buyer of protection (short risk) must pay an upfront fee, as the protection buyer is paying a fixed coupon that is lower than the spread determined by the market. The upfront fee is the risky present value of the spread difference, or (spread difference) x (duration) x (notional). It can be calculated using the CDSW page on Bloomberg. To access Series 6 information, for example, enter: CDX6 CDS Corp [go], select the index, then type CDSW [go]. Note that HY CDX indices are quoted in price terms, thus the upfront payment is the price difference from par.

Figure 1: CDX CDSW model on Bloomberg



Source: Bloomberg

In addition to the market value upfront payment, investors must either pay or receive an accrued fee when entering into a new contract. An investor who has a long risk position on a coupon payment date will receive the full quarterly coupon payment, regardless of when she entered into the contract. If the contract was created in the middle of a payment period, for example, in order to offset the "extra" amount of coupon she will receive, the seller of protection (long risk) must pay an accrued fee upfront.

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As mentioned in the Introduction, investors do not need to hold CDX contracts until maturity but can close-out, or unwind positions at any time. Investors can use the CDSW page on Bloomberg to calculate the value of unwinding an existing CDX contract, just as they calculate the value of the upfront payment when entering the contract. As the HY CDX is quoted in price terms, the value of the unwind is the difference from par.

Basis to theoretical

The CDX spread is not directly based on the value of the underlying credit default swaps, but is set by the supply and demand of the market. This is analogous to the pricing of a closed-end mutual fund, where the traded price is based on the buying and selling of the index, not on the net asset value of the underlying securities directly.

Thus, the CDX spread is different from both the average spread of the underlying credit default swaps, and the theoretical value of the index. The theoretical value is the duration weighted average of the underlying CDS. We compute the theoretical value of the index using the following calculations:

- Observe the current market levels of the single-name CDS that have the same maturity date of the index. If the on-the-run single-name CDS has a different maturity date than the CDX, we interpolate between two points on the CDS curve.
- Convert the single-name CDS spreads into prices. We value each spread relative to the fixed coupon of the CDX. This is analogous to entering the fixed CDX coupon as the "deal spread," and the CDS spread as the "current spread" on the CDSW calculator on Bloomberg. For example, if the index has a coupon of 50bp and the market spread of an underlying CDS was 75bp, we approximate the price as par – (spread difference) x (duration). If we assume duration is 4, the result is 1 – (0.0075 - 0.0050) x 4 = $0.99.
- Once the prices for the underlying credits are calculated, we take a simple average. This is the theoretical value of the index in price terms. We convert this price into a spread using the same methodology used in the CDSW calculator.
- The market-quoted CDX spread less the theoretical spread is the basis to theoretical.

If the quoted spread of the index is wider than this theoretical value, basis to theoretical is positive. If the opposite is true, basis to theoretical is negative. The terminology is different for the US High Yield CDX indices as they trade on price rather than spread terms. When the HY CDX indices trade at a higher price than the theoretical price implied by the underlying credits, the index is considered to be trading with a positive basis to theoretical value. For individual credits, investors attempt to arbitrage basis by buying the cheap security and selling the expensive security. This is also possible to do with the indices; however, the transaction costs involved with trading a basket of single-name CDS against the index need to be considered.

In a rapidly changing market, the index tends to move more quickly than the underlying credits. This is because, in buying and selling the index, investors can express positive and negative views about the broader credit market in a single trade. This creates greater liquidity in the indices compared with the individual credits. As a result, the basis to theoretical for the indices tends to increase in magnitude in volatile markets.

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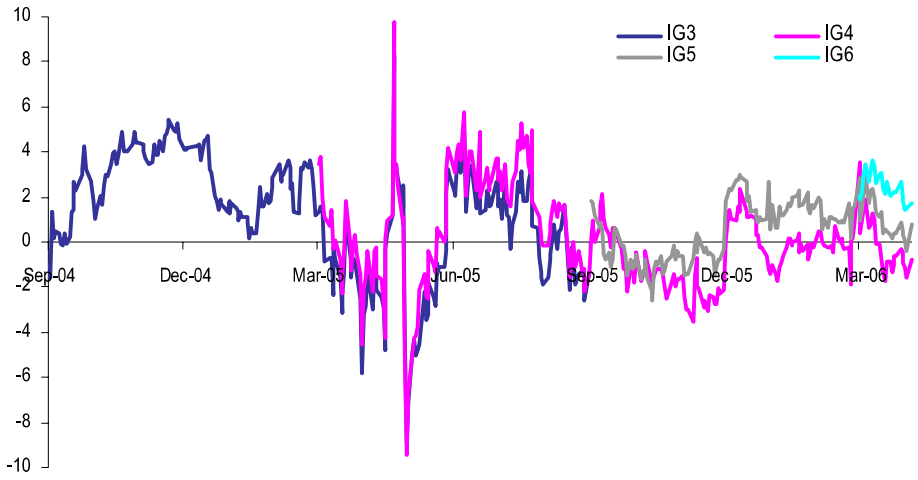
Single-name North American high-grade credits typically include Modified Restructuring as a credit event (MR spread curve), while single-name North American high-yield credits typically do not (NR spread curve). However, across all indices, theoretical values are calculated using NR spread curves.

Comparing on-the-run and off-the-run basis

Investors commonly use the CDX indices to gain broad market exposure and to take short risk positions to hedge a portfolio of bonds. Because of the latter, on-the-run CDX indices often trade at a wider spread relative to their theoretical value, or at a discount in dollar terms. For, if an investor wishes to enter into a short risk position, they usually do so in the on-the-run CDX, as opposed to the off-the-run CDX. As a result, in spread terms, on-the-run indices usually have a more positive basis to theoretical than off-the-run indices. Further supporting this trend is the tendency of long-risk CDX investors to hold off-the-run indices longer than short-risk investors. Long-risk investors enjoy the roll down the curve, while short-risk investors usually prefer not to "overpay" for a shorter maturity index. For example, assume an investor receives 100bp for taking a long-risk position in a 5-year CDX index. A year later, the same investor will still receive 100bp for a product that will now mature in only four years. In an upward sloping and constant CDS curve environment, this spread will be higher than the spread of a 4-year CDX index. An investor with a long risk position is more likely to hold an off-the-run index

Figure 2: CDX IG basis to theoretical tends to be more positive (CDX has wider spread than underlying) in the on-the-run index

bp



Source: JPMorgan

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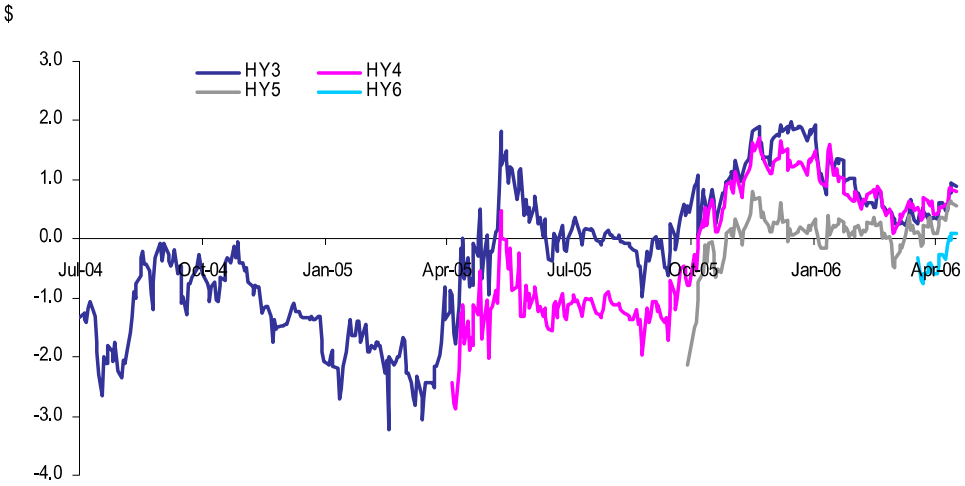
Figure 3: CDX HY basis to theoretical tends to be more negative (CDX has a lower dollar price than underlying) in the on-the-run index.



Source: JPMorgan

Credit events

The credit default swaps in the index are equally weighted in terms of default protection; if there is a credit event in one credit, the notional value of an investor's CDS contract will fall by 1/100, if there are 100 credits in the index. After a credit event, in this example, the index will be comprised of 99 credits.

Consider an investor who buys $100 of protection (short risk) on an index with a coupon of 50bp. Assume a credit event occurs in one credit whose bonds fall to $0.40 per $1 face. If the position is physically settled, she will deliver one bond, purchased for $0.40 in the marketplace, with a $1 face (notional * 1/100), to the seller of protection (long risk) and receive $1 in cash. She will continue paying 50bp annually, but on the new notional value of $99.

The market spread of an index may change if there is a credit event in an underlying credit. Continuing our example, assume that, before the credit event, 99 of the credits underlying the index have a spread of 50 and one credit has a spread of 1,000. Also assume that the index is trading at its theoretical value. The market spread of the index will be approximately 60bp. If the credit with a spread of 1,000 defaults, the credit is removed from the index, and the market spread of the index will now be 50bp, the average of the remaining 99 credits (Figure 4). An investor who is long protection (short risk) will therefore lose money when the index spread rallies, but receive money on the credit event ($0.60 in our example). If the credit event was widely anticipated, these two factors will likely offset one another with no significant net impact on her profit and loss statement.

Figure 4: After a credit event in an underlying credit, the credit drops out of the index, and the spread of the index should adjust to a tighter level.

	Number of underlying credits	Spread on each credit	Sum of spreads	Average spread	
	99	50	4,950	50	(market spread after credit event)
	1	1,000	1,000	1,000	
Total	100			60	(market spread before credit event)

Source: JPMorgan.

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CDX settlement protocol

In a credit event, CDX documentation calls for physically settlement. In 2005, however, a protocol was developed by the International Swaps and Derivatives Association (ISDA), working with the dealer community, to allow CDX investors to cash-settle a CDX position in a fair and convenient manner. The protocol involves a bond auction to determine the recovery rate of the defaulted credit. The auction protocol has been widely adopted, and is summarized below:

- The protocol is voluntary; investors may physically settle their exposure as described in the index and tranche contracts.
- Investors who choose to opt into the protocol will cash-settle their CDX contracts at a price determined by an auction process. Once opted in, investors cannot settle any index or tranche contract outside of the protocol.
- The protocol does not cover single-name CDS contracts, but does provide a mechanism for investors to physically settle their CDX positions. The bonds received or delivered in CDX settlement could then be used to physically settle single-name CDS positions. Furthermore, investors can submit limit orders to buy and sell bonds in the auction, which may or may not be filled.
- The auction process has two parts. Part one is a fixing by the CDX dealers. The result of the Dutch auction must fall within $15 of the price found in part one. Part two is a Dutch auction, where market orders for bonds are filled by limit orders. Market orders are determined by calculating the bonds that would have been bought or sold if all contracts were physically settled. In other words, if time was stopped and all investor positions were settled, what would the net buying and selling of bonds have been. Note that if all investors cash settled, or if all investors physically settled, the net market order would be zero, as there is a seller for every buyer of protection. However, investors use the protocol to cash and physically settle positions, creating an imbalance. This market imbalance is satisfied using limit buy/sell orders for bonds submitted by the dealers and market participants at large.

For more information about the protocol, please see “Calpine Corporation: CDX cash settlement protocol mechanics,” dated January 10, 2006. For protocol information, www.isda.org is the best source.

Dow Jones CDX Investment Grade Indices

The Investment Grade main index, quoted in basis points per annum, is comprised of 125 underlying credits. To be eligible for inclusion in the index, a credit must have an investment grade rating from both Moody’s and Standard and Poor’s. The CDX dealer consortium, or the group of dealers who actively participate in the CDX market, choose the portfolio through a voting process. Before the launch of the new series, dealers submit a list of credits that are in the old series, but should be, in their opinion, excluded from the new series. Credits with low liquidity in the CDS market are often candidates for removal. Additionally, dealers who trade the CDX products cannot be included in the CDX portfolios. The final portfolio is determined through a voting process, detailed on http://djindexes.com.

The Dow Jones Investment Grade High Volatility Index is a 30-credit subset of the Investment Grade Main Index. During the launch of each new series, the dealer consortium votes on the credits to be included in the smaller portfolio. Generally, these 30 credits have the widest spreads amongst the 125 credits in the Main Index.

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The most liquid maturity is the five-year tenor, followed by the ten-year tenor. However, other tenors have started to trade actively in both IG and HY indices. Standard trade sizes are $100-50 million for the IG CDX, , and $10-25 million for subindices.

Dow Jones CDX.NA.IG.6

The complete list of the underlying credits that comprise the Dow Jones Investment Grade Series 6 Main Index is found in Appendix I. Four credits that are in the Series 5 portfolio are not included in the Series 6 portfolio. Four new credits were introduced to replace them (see Figure 5).

Figure 5: Credits in DJ CDX.NA.IG.5 not in Series 6

	Company	Ticker	In High Volatility CDX?
1	Albertson's, Inc.	ABS	Yes
2	Amern Axle & Mfg Inc.	AXL	Yes
3	BellSouth Corporation	BLS	No
4	Hilton Hotels Corp.	HLT	Yes

Source: JPMorgan

Credits in DJ CDX.NA.IG.6 not in Series 5

	Company	Ticker	In High Volatility CDX?
1	Sherwin Williams Inc.	SHW	Yes
2	Temple Inland Inc.	TIN	Yes
3	Tribune Company	TRB	Yes
4	Wendy's International	WEN	Yes

Source: JPMorgan

Investment Grade High Volatility Index

The 30 underlying credits that comprise the DJ CDX.NA.IG.6 High Volatility index are noted in Appendix I. Seven credits that are in the Series 5 High Volatility portfolios are not included in the Series 6 portfolios (see Figure 6). Three of these credits are not included because they are not in the Main index. The remaining four credits changed based on dealer consortium voting. We note that, while Appendix I lists sector sub-indices, the indices exist in name only and do not trade.

Figure 6: Credits in DJ CDX.NA.IG.5 HiVol, not in Series 6 HiVol

	Company	Ticker	In CDX.NA.IG.6?
1	Albertsons Inc.	ABS	No
2	Amer. Axle & Mfg Inc.	AXL	No
3	Cardinal Health Inc.	CAH	Yes
4	Goodrich Corp.	GR	Yes
5	Hilton Hotels Corp.	HLT	No
6	Marsh & McLennan Cos. Inc.	MMC	Yes
7	XL Cap Ltd.	XL	Yes

Source: JPMorgan

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Credits in DJ CDX.NA.IG.6 HiVol, not in Series 5 HiVol

	Company	Ticker	In CDX.NA.IG.5?
1	Cendant Corp.	CD	Yes
2	Computer Sciences Corp	CSC	Yes
3	MeadWestvaco	MWV	Yes
4	Sherwin Williams Co	SHW	No
5	Temple Inland Inc	TIN	No
6	Tribune Co	TRB	No
7	Wendys Intl Inc	WEN	No

Source: JPMorgan

DJ CDX.NA.IG.6 coupons

One-, two-, three-, four-, five-, seven-, and ten-year tenors are quoted for the Dow Jones Investment Grade Main Index and High Volatility Index. The five-year tenor is the most liquid. While the underlying portfolio of credits is the same for all tenors, the maturity dates and fixed coupons differ. All indices mature on June 20 of the respective year (or the following business day if the 20th falls on a non-business day). The annual coupons, listed below, are paid quarterly and accrue on an Actual/360 basis.

Figure 7: DJ CDX.NA.IG.6 Coupons

Tenor	1y	2y	3y	5y	7y	10y
Maturity	Jun-07	Jun-08	Jun-09	Jun-11	Jun-13	Jun-16
Coupon (bp): Main	10	15	25	40	50	65
Coupon (bp): Hi Vol	20	30	50	75	90	110

Source: JPMorgan

Comparison of the Dow Jones CDX.NA.IG.6 to the JULI (JPMorgan's US investment-grade cash bond market index)

The DJ CDX.NA.IG.6 differs from the cash bond market, as defined by the JPMorgan US Liquid Index (JULI). First and most importantly, the Investment Grade Main index has 125 underlying credits, while JULI has approximately 1,500 to 2,000 underlying bonds.

The sector composition of the CDX differs somewhat significantly from JULI. The cash market is heavily weighted toward banks and financial services, which together comprise about 40% of the cash index but only 10% of the CDX. The CDX makes up for this difference with higher weights in most of the other sectors, particularly the Basic Industry and Consumer Non-Cyclicals sectors. We note that, because the composition of Series 6 and Series 5 Investment Grade portfolios differs by only four underlying credits, there is minimal difference in the sector or rating composition of the two series.

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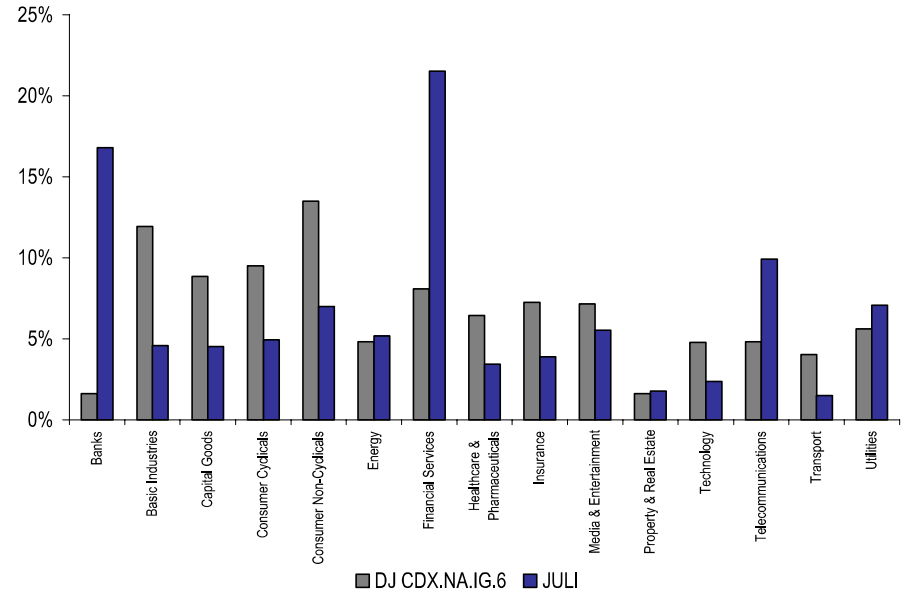
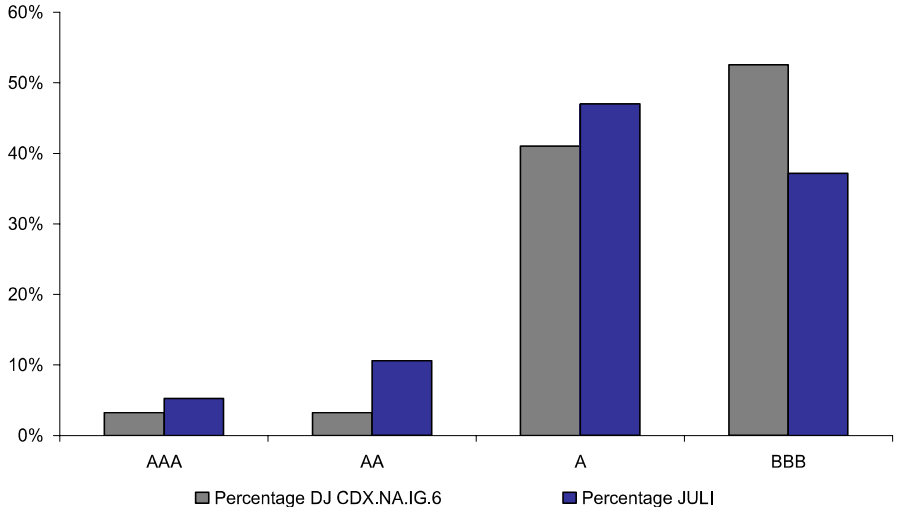
Figure 8: Sector comparison between DJ CDX.NA.IG.6 and JULI index



Source: JPMorgan

The ratings composition of the underlying credits in the Investment Grade Series 6 Main Index and JULI is shown in Figure 9. The credit derivatives market is more liquid in BBB credits and less liquid in AA and AAA credits, as market participants generally do not feel compelled to buy default protection on credits with high credit ratings and low perceived default risk. Consequently, the Investment Grade Series 6 Main Index has a greater weighting to BBB credits and lower weighting to AAA-A ratings when compared to the JULI.

Figure 9: Rating comparison between DJ CDX.NA.IG.6 and JULI index



Source: JPMorgan

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Dow Jones CDX Crossover Index

The crossover index is comprised of 35 credits with four- or five-B ratings. Namely, a four-B credit is rated BB by both S&P and Moody's and a five-B credit is rated BB by one agency and BBB by the other rating agency. The portfolio selection process is the same process used in the investment grade indices. This index was launched for the first time with the Series 5 Investment Grade and High Yield Indices on Sept 20, 2005, and was labelled with a "5" at the time of its introduction. Accordingly, the new Crossover Index is labelled with a "6".

The maturity date for this index is the same as the investment grade index. Currently, the five-year tenor is the most actively traded tenor and has a fixed coupon of 190bp. The index is quoted in basis points per annum and paid quarterly, as in the investment grade indices.

The composition of the index and its overlap with other indices is shown in Appendix II.

Comparison of the DJ CDX.NA.XO.6 to the JULIX (JPMorgan's US crossover cash market index)

Dow Jones Crossover Index Series 6 also differs from the cash market as defined by the JPMorgan US Liquid Index Crossover (JULIX). First and foremost, the CDX has 35 underlying credits while JULIX has approximately 150 underlying bonds.

Similar to the investment grade indices, the sector composition of the crossover index differs considerably from JULIX. Currently, Consumer Cyclicals represents 58% of the cash index, dominated by Ford Motor Company (F) and General Motors Corp. (GM) bonds. Bonds issued by these two auto companies account for 57% of the index overall, measured by the face value of the outstanding issues. Conversely, the credit derivative Crossover Index gives equal weight to each underlying credit in its portfolio, so that every credit is 1/35 of the index. Basic Industry, Consumer Cyclical, and Technology sectors are more heavily weighted in the Crossover index.

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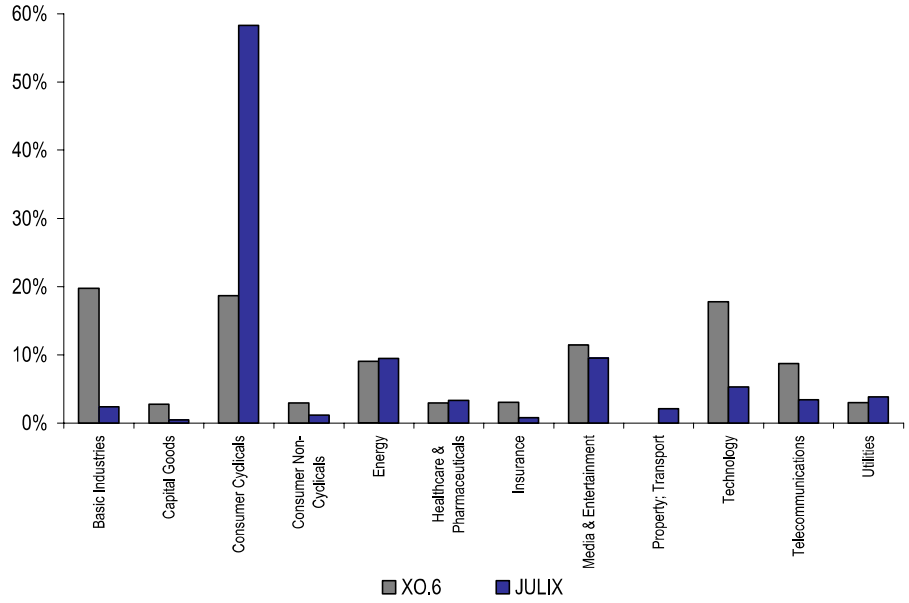
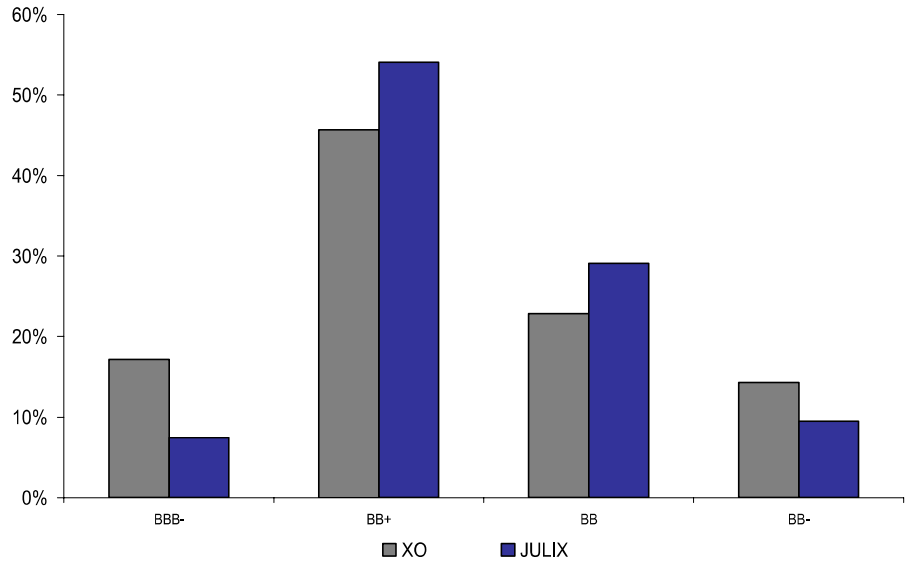
Figure 10: Sector comparison between DJ CDX.NA.XO.6 and JULIX index



Source: JPMorgan

The ratings composition of the credit derivative Crossover index and JULIX is similar, as shown in Figure 11. As of September 20, the CDX has a better credit profile, as it has more BBB- credits and fewer BB credits than the JULIX.

Figure 11: Rating comparison between DJ CDX.NA.XO.6 and JULIX index



Source: JPMorgan

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Dow Jones CDX High Yield Index

The Dow Jones CDX.NA.HY.6 100 is comprised of 100 underlying credits. The CDX dealer consortium chooses the portfolio through a voting process similar to the Investment Grade indices. To be eligible for inclusion in the index, a credit must not have an investment grade rating from both Moody's and Standard and Poor's, but can have an investment grade rating from one of the two agencies. The most liquid credits are usually selected.

The High Yield index has three subindices, namely the DJ CDX.NA.HY.6 BB, DJ CDX.NA.HY.6 B and DJ CDX.NA.HY.6 High Beta indices. The underlying credits of the BB and B sub-indices are based on the Moody's ratings at the time of the indices' launch. The High Beta index, like the investment grade High Volatility index, is a 30-credit index determined by the dealer consortium. Generally, the 30 credit default swaps with the highest spreads at the time of portfolio selection are included.

Unlike the investment grade indices, the high yield CDX is quoted in dollar prices. Furthermore, the 100, BB, and B indices are available in both swap (unfunded) and note (funded) form.

Dow Jones CDX.NA.HY Notes: Each Dow Jones CDX.NA.HY Note is a separate trust certificate with a fixed portfolio of credits and a fixed coupon. The notes have a prospectus and trade like bonds, with transfers of cash at the time of purchase. Like a bond, Dow Jones CDX.NA.HY Notes pay a fixed coupon on a semi-annual basis, with accrued interest calculated on a 30/360 day count convention. Payments are made on the 20th of June and December. The CDX notes can be thought of as a package of the CDX swaps plus a trust that pays Libor. A detailed diagram of the CDX.NA.HY Notes structure is provided in Appendix III.

When a new index is launched, the CDX dealer consortium draws bonds from the trust. Dealers are able to draw from the trust, up to the amount specified in the prospectus, for up to 90 days after the CDX launch. After 90 days, dealers may be able to draw from the trust for up to one year if there has not been a credit event in an underlying CDS. Thus, bonds may trade rich or cheap compared to theoretical value depending on the number of bonds drawn from the trust and the overall supply and demand.

If there is a credit event, note holders do not need to take any action in order for a default to be settled. The settlement procedures for the notes are outlined in the offering memorandum. In summary, the CDX dealers will hold the three auctions for bonds of the defaulted credit. The CDX dealers deliver bonds to the auction agent over the course of the three auctions. The auction agent then sells the bonds to the marketplace through an auction process. The weighted average price paid by the marketplace during the three auctions will be the recovery price. Note holders in affected indices then receive a payment of this recovery price. The entire process takes approximately four to six weeks.

The CDX.NA.HY Note will continue to pay the original coupon amount but on a reduced notional. For the 100 index, for example, each subsequent credit event will reduce the notional of a position by 1/100 of the original notional. The process is the same for the other Dow Jones CDX.NA.HY Notes except the ratios are different, as the original number of credits in each index is fewer than 100.

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DJ CDX.NA.HY.6

A complete list of the High Yield Series 6 portfolio can be seen in Appendix IV. Eleven credits in the 100 index, nine credits in BB subindex, and eight credits in B subindex are in the Series 5 portfolios but not in the Series 6 portfolios. A comparison of Series 6 composition versus Series 5 can be seen in Figure 12.

Figure 12: Comparison of DJ CDX.NA.HY Series 6 to Series 5

Credits New to DJ CDX.NA.HY.6, not in DJ CDX.NA.HY.5 (11 credits)

Reference Entity	Ticker
American Axle & Manuf. Inc	AXL
Beazer Homes USA, Inc	BZH
Domtar Inc.	DTC
Hovnanian Enterprises, Inc.	HOV
Massey Energy Company	MEE
Mirant Corporation	MIR
NRG Energy, Inc.	NRG
Quebecor World Inc.	IQW
The Hertz Corporation	HTZ
The Neiman Marcus Group, Inc.	NMG
Tesoro Corp Senior	TSO

Credits in DJ CDX.NA.HY.5 not in DJ CDX.NA.HY.6 (11 credits)

Reference Entity	Ticker
American Tower Corp	AMT
AmerisourceBergen Corp	ABC
Calpine	CPN
Crown Euro Holdings	CCK-CEH
D R Horton Inc	DHI
Dana	DCN
Delphi	DPH
Meristar Hospitality Corp	MHX
TX Genco LLC	TGENCO
Vintage Petroleum Inc	VPI
Tesoro Corp Sub	TSO

Credits New to DJ CDX.NA.HY.6 BB (6 credits)

Reference Entity	Ticker
Amern Axle & Mfg Inc	AXL-Inc
Beazer Homes USA Inc	BZH
Hovnanian Entpers Inc	HOV
Quebecor World Inc	IQWCN
RJ Reynolds Tobacco Hldgs Inc	RAI-RJR
Tesoro Corp	TSO

Credits in DJ CDX.NA.HY.5 BB not in DJ CDX.NA.HY.6 BB (9 credits)

Reference Entity	Ticker
Abitibi Consol Inc	ABY
AmerisourceBergen Corp	ABC
Bowater Inc	BOW
D R Horton Inc	DHI
Dana Corp	DCN
GA Pac Corp	GP
Gen Mtrs Corp	GM
Navistar Intl Corp	NAV
Vintage Pete Inc	VPI

Credits New to DJ CDX.NA.HY.6 B (14 credits)

Reference Entity	Ticker
Abitibi Consol Inc	ABY
Domtar Inc	DTC
Massey Engy Co	MEE
Mirant Corporation	MIR
Neiman Marcus Gp Inc	NMG
NRG Energy, Inc.	NRG
Bowater Inc	BOW
Navistar Intl Corp	NAV
Hertz Corp	F-Hertz
GA Pac Corp	GP
Dynegy Hldgs Inc	DYN-Holdings
Gen Mtrs Corp	GM
Qwest Cap Fdg Inc	QUS-CapFund
Levi Strauss & Co	LEVI-+Co

Credits in DJ CDX.NA.HY.5 B not in DJ CDX.NA.HY.6 B (8 credits)

Reference Entity	Ticker
Amern Tower Corp	AMT
Crown Euro Hldgs SA	CCK-CEH
Meristar Hospitality Corp	MHX
RJ Reynolds Tobacco Hldgs Inc	RAI-RJR
Tembec Inds Inc	TEMBEC-Inds
Tesoro Corp	TSO
Toys R Us Inc	TOY
TX Genco LLC	TGENCO

Source: JPMorgan

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DJ CDX.NA.HY.6 coupons

Coupons associated with Dow Jones High Yield Series 6 Swaps and Notes are found in Figure 13.

Figure 13: DJ CDX.NA.HY.6 Coupons

	Maturity Date	No. of Credits	5Y Fixed Coupon	Swaps(bp)
DJ. CDX .NA.HY.6	June-11	100	8.625%	345
BB	June-11	38	7.375%	210
B	June-11	48	8.125%	300
HB	June-11	30	--	500

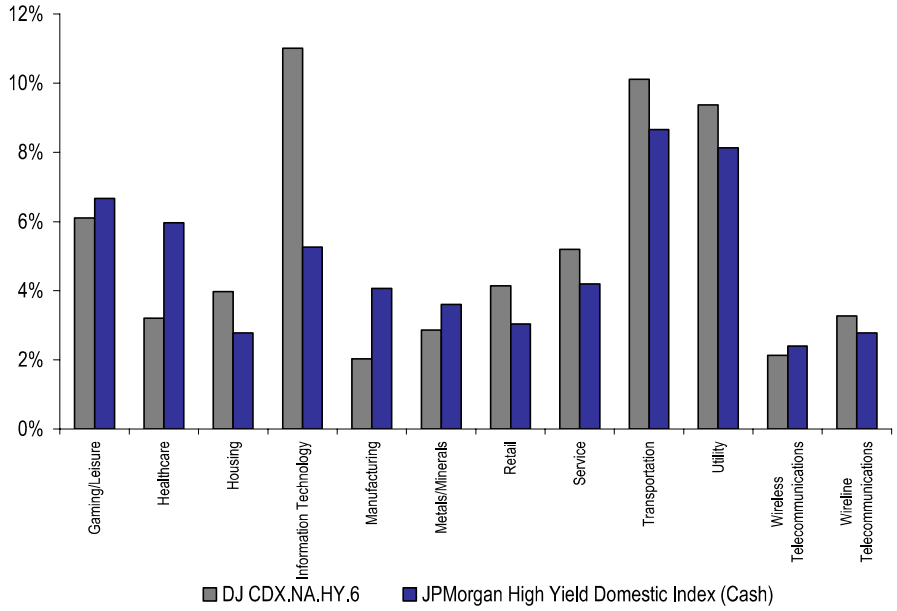
Source: JPMorgan

Comparison of DJ CDX.NA.HY.6 Main Index to the JPMorgan High-Yield Domestic Index (cash bond index)

The Dow Jones HY.CDX.NA.HY.6 100 differs from the High Yield cash bond index. First, the CDX index has 100 underlying credits, while the cash bond index has approximately 1,200 underlying bonds.

Second, the sector composition of the CDX also differs from the cash index, most notably in the Information Technology sector. The sector comparisons are given in Figure 14.

Figure 14: Sector comparison between DJ CDX.NA.HY.6 and JPMorgan High Yield Domestic Index



Source: JPMorgan

The rating composition of the two indices differs. Credit default swaps are more liquid in the BB and B-rated credits, and generally less liquid in the lesser quality credits, as the credits are often smaller companies. This is reflected in a comparison of the indices, with the CDX more heavily weighted in the BB and B credits, and the cash bond index more heavily weighted in the BBB and lower credits.

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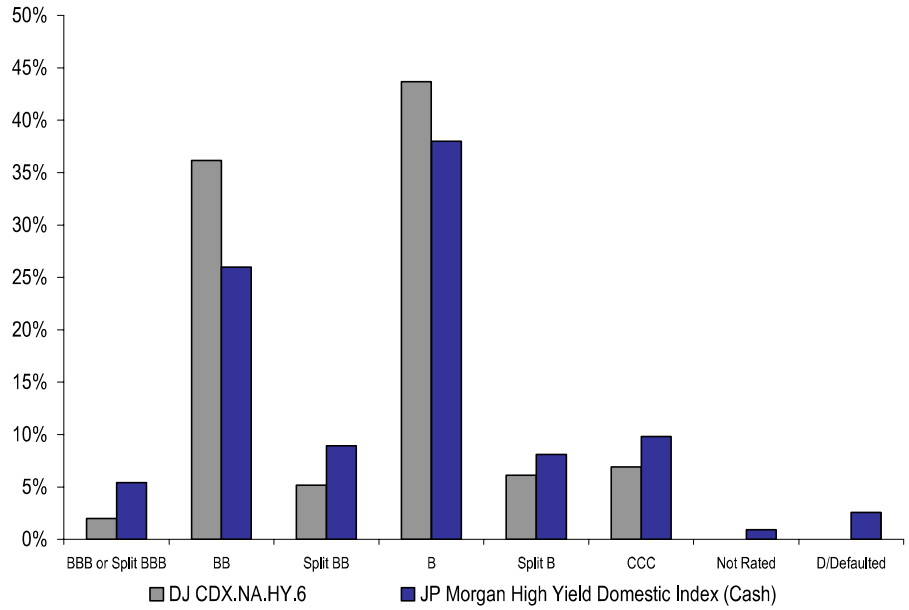
Figure 15: Sector comparison between DJ CDX.NA.HY.6 and JPMorgan High Yield Domestic Index



Source: JPMorgan

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JPMorgan

Appendix I

Dow Jones CDX.NA.IG.6 Composition (125 credit Portfolio)

Shading indicated the credit is not in the DJ CDX.NA.IG.5 portfolio

Reference Entity	Ticker	High Volatility	Consumer	Energy	Financial Services	Industrial	Technology, Media & Telecom
ACE Limited	ACE						
Aetna Inc.	AET						
Alcan Inc.	AL					x	
Alcoa Inc.	AA					x	
ALLTEL Corporation	AT						x
Altria Group, Inc.	MO	x	x				
American Electric Power Company, Inc.	AEP			x			
American Express Company	AXP						
American International Group, Inc.	AIG						
Amgen Inc.	AMGN		x				
Anadarko Petroleum Corporation	APC			x			
Arrow Electronics, Inc.	ARW	x					x
Autozone Inc.	AZO	x	x				
Baxter International Inc.	BAX		x				
Boeing Capital Corporation	BA						
Bristol-Myers Squibb Company	BMY		x				
Burlington Northern Santa Fe Corporation	BNI					x	
Campbell Soup Company	CPB		x				
Capital One Bank	COF						
Cardinal Health Inc.	CAH		x				
Carnival Corporation	CCL		x				
Caterpillar Inc.	CAT					x	
Cendant Corporation	CD	x	x				
Centex Corporation	CTX					x	
Centurytel, Inc.	CTL	x					x
Cigna Corporation	CI				x		
Cingular Wireless LLC	CNG						x
CIT Group Inc.	CIT				x		
Clear Channel Communications, Inc.	CCU	x					x
Comcast Cable Communications, Inc.	CMCSA						
Computer Sciences Corporation	CSC	x					x
ConAgra Foods, Inc.	CAG	x	x				
Conocophillips	COP			x			
Constellation Energy Group, Inc.	CEG			x			
Countrywide Home Loans, Inc.	CFC						
Cox Communications, Inc.	COX	x					
CSX Corporation	CSX					x	
CVS Corporation	CVS		x				
Deere & Company	DE					x	
Devon Energy Corporation	DVN			x			
Dominion Resources, Inc.	D			x			
Duke Energy Corporation	DUK			x			
E. I. Du Pont De Nemours And Company	DD					x	
Eastman Chemical Company	EMN					x	
EOP Operating Limited Partnership	EOP						
Federal Home Loan Mortgage Corporation	FHLMC				x		
Federal National Mortgage Association	FNMA				x		
Federated Department Stores, Inc.	FD		x				
FirstEnergy Corp.	FE			x			
General Electric Capital Corporation	GE						
General Mills, Inc.	GIS		x				
Goodrich Corporation	GR					x	
Halliburton Company	HAL			x			
Harrah's Operating Company, Inc.	HET	x					
Hewlett-Packard Company	HPQ						x
Honeywell International Inc.	HON					x	
IAC InterActiveCorp	IACI	x					x
Ingersoll-Rand Company	IR						
International Business Machines Corporation	IBM						x
International Lease Finance Corporation	ILF						
International Paper Company	IP	x				x	
Jones Apparel Group, Inc.	JNY	x	x				
Knight Ridder Inc	KRI	x					x
Kraft Foods Inc.	KFT		x				
Lennar Corp.	LEN	x					x
Lockheed Martin Corporation	LMT						x
Loews Corporation	LTR				x		
Ltd Brands Inc	LTD	x	x				
Marriott International, Inc.	MAR		x				
Marsh & Mclennan Cos Inc	MMC				x		
MBIA Insurance Corporation	MBI						
McDonald's Corporation	MCD		x				
McKesson Corp.	MCK		x				
MeadWestvaco Corporation	MWV	x					x
Metlife, Inc.	MET				x		
Motorola, Inc.	MOT						x
National Rural Utilities Cooperative Finance Corporation	NRUC			x			
Newell Rubbermaid Inc.	NWL		x				
News America Incorporated	NCP						
Nordstrom, Inc.	JWN		x				
Norfolk Southern Corporation	NSC						x
Northrop Grumman Corporation	NOC						x
Omnicom Group Inc.	OMC						x
Progress Energy, Inc.	PGN			x			
Pulte Homes, Inc.	PHM	x					x
RadioShack Corp	RSH	x	x				
Raytheon Company	RTN						x
Rohm and Haas Company	ROH						x
Sabre Hldgs Corp	TSG	x	x				
Safeway Inc.	SWY	x	x				
Sara Lee Corp	SLE		x				
SBC Communications Inc.	SBC						
Sempra Energy	SRE			x			
Sherwin Williams Inc	SHW	x					x
Simon Property Group, L.P.	SPG						
Southwest Airlines Co.	LUV		x				
Sprint Corporation	FON						
SUPERVALU INC.	SVU	x	x				
Target Corporation	TGT		x				
Temple Inland Inc	TIN	x					x
Textron Financial Corporation	TXT						
The Allstate Corporation	ALL					x	
The Chubb Corporation	CB					x	
The Dow Chemical Company	DOW						x
The Gap Inc	GPS	x	x				
The Hartford Financial Services Group, Inc.	HIG					x	
The Kroger Co.	KR		x				
The Walt Disney Company	DIS						x
Time Warner Inc.	TWX	x					
Toll Bros Inc	TOL	x					x
Transocean Inc.	RIG			x			
Tribune Company	TRB	x					x
Tyson Foods, Inc.	TSN		x				
Union Pacific Corporation	UNP						x
Valero Energy Corporation	VLO						
Verizon Global Funding Corp.	VZ						
Viacom Inc.	VIA						
Wal-Mart Stores, Inc.	WMT		x				
Washington Mutual, Inc.	WM					x	
Wells Fargo & Company	WFC					x	
Wendy's International	WEN	x	x				
Weyerhaeuser Company	WY						x
Whirlpool Corporation	WHR	x	x				
Wyeth	WYE		x				
XL CAPITAL LTD	XL					x	
Count		125	30	35	13	13	26	14

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Appendix II

DJ CDX.NA.XO.6 Credits

		IG HiVol 5	DJ.NA.HY.6		DJ.NA.HY.5	
Reference Entity	**Ticker**	**Hi Vol**	**100**	**BB**	**100**	**BB**
Amerada Hess Corporation	AHC					
American Axle & Manufacturing, Inc.	AXL	x	x	x		
ArvinMeritor, Inc.	ARM		x	x	x	x
Avnet, Inc.	AVT					
Beazer Homes USA, Inc.	BZH		x	x		
BOMBARDIER INC.	BOMB		x	x	x	x
Citizens Communications Company	CZN		x	x	x	x
Computer Associates International, Inc.	CA					
Cooper Tire & Rubber Company	CTB					
D.R. Horton, Inc.	DHI				x	x
Delhaize America, Inc.	DELBB-America		x	x	x	x
EchoStar DBS Corporation	DISH-ESDBS		x	x	x	x
Electronic Data Systems Corporation	EDS					
FLEXTRONICS INTERNATIONAL LTD.	FLEX		x	x	x	x
FORD MOTOR CREDIT COMPANY	F-MotorCred					
General Motors Acceptance Corporation	GMAC					
HCA Inc.	HCA		x	x	x	x
Hilton Hotels Corporation	HLT	x				
Hovnanian Enterprises, Inc.	HOV		x	x		
KB Home	KBH		x	x	x	x
KERR-McGEE CORPORATION	KMG					
Lear Corporation	LEA		x	x	x	x
Liberty Media Corporation	L		x	x	x	x
MGM MIRAGE	MGG		x	x	x	x
NOVA CHEMICALS CORPORATION	NCX		x	x	x	x
Pioneer Natural Resources Company	PXD					
Quebecor World Inc.	IQW		x	x		
Qwest Corporation	QUS-Corp					
ROYAL CARIBBEAN CRUISES LTD.	RCL		x	x	x	x
Sears Roebuck Acceptance Corp.	SHC-Acceptance					
Starwood Hotels & Resorts Worldwide, Inc.	HOT		x	x	x	x
Sun Microsystems, Inc.	SUNW					
TXU Corp.	TXU					
Unisys Corporation	UIS		x	x	x	x
UnumProvident Corporation	UNM		x	x	x	x
Total no. of credits in CDX		30	100	38	97	40
Number Overlap with CDX.NA.XO.6		2	20	20	17	17
Percentage Overlap		7%	20%	53%	18%	43%

Source: JPMorgan

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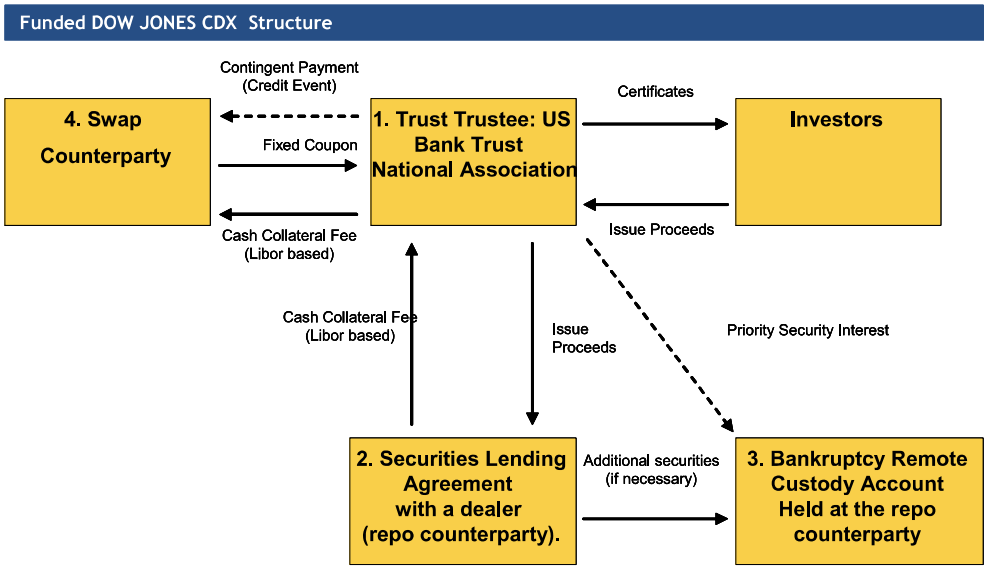
Appendix III

DOW JONES CDX notes structure

The Dow Jones CDX.NA.HY note is structured as follows:

1. A Delaware trust is established to issue certificates
2. Repo counterparty lends securities (the "Loaned Securities") to the Trust in return for the issue proceeds
3. The Loaned Securities are deposited in a bankruptcy remote account
4. The Trust enters into a credit default swap with the Swap Counterparty, comprised of CDX dealers, referencing the DOW JONES CDX.NA.HY index



Source: JPMorgan

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Appendix IV

Underlying credits in DJ CDX.NA.HY.6

Reference Entity	Ticker	DJ CDX.NA.HY.6 BB	DJ CDX.NA.HY.6 B	DJ CDX.NA.HY.6 HB
Abitibi Consol Inc	ABY		x	x
Advanced Micro Devices Inc	AMD	x		
AK Stl Corp	AKS-Corp		x	
Allegheny Engy Supp Co LLC	AYE-EnergySupp	x		
Allied Waste North Amer Inc	AW-NorthAmerica			x
American Axle & Manuf. Inc	AXL	x		x
Amkor Tech Inc	AMKR			x
AMR Corp	AMR	x		x
ArvinMeritor Inc	ARM			x
Beazer Homes USA, Inc	BZH	x		
Bombardier Inc	BOMB	x		x
Bowater Inc	BOW		x	
CASE NEW HOLLAND INC	CNH-CNH		x	
Celestica Inc	CLS	x		
Charter Comms Inc	CHTR			x
Chesapeake Engy Corp	CHK		x	
CMS Engy Corp	CMS		x	
CSC Hldgs Inc	CVCCSC	x		
Ctzns Comms Co	CZN	x		
Delhaize Amer Inc	DELBB-America		x	
Dillards Inc	DDS		x	
Dole Food Co Inc	DOL			x
Domtar Inc.	DTC		x	
Dura Oper Corp	DRRA-OpCo		x	
Dynegy Hldgs Inc	DYN-Holdings	x		
Eastman Kodak Co	EK			
EchoStar DBS Corp	DISH-ESDBS		x	x
El Paso Corp	EP	x		x
Fairfax Finl Hldgs Ltd	FFHCN	x		x
Felcor Lodging LP	FCH-LP	x		
Flextronics Intl Ltd	FLEX		x	
Ford Mtr Co	F		x	
Fst Oil Corp	FST		x	x
GA Pac Corp	GP	x		
Gen Mtrs Corp	GM		x	x
Goodyear Tire & Rubr Co	GT	x		
HCA Inc.	HCA		x	
Host Marriott L P	HMT-LP	x		
Houghton Mifflin Co	HTN			
Hovnanian Enterprises, Inc.	HOV			x
HUNTSMAN Intl LLC	HNTSMN-IntlLLC		x	
IKON Office Solutions Inc	IKN	x		
Intelsat Ltd	INTEL	x		
Iron Mtn Inc	IRM			x
KB Home	KBH		x	x
L 3 Comms Corp	LLL-Corp		x	
Lear Corp	LEA		x	
Level 3 Comms Inc	LVLT	x		
Levi Strauss & Co	LEVI-+Co		x	
Liberty Media Corp	L	x		
Lucent Tech Inc	LU		x	x
Lyondell Chem Co	LYO		x	
Massey Energy Company	MEE		x	
Mediacom LLC	MCCC-MedcomLLC		x	
MGM MIRAGE	MGG		x	x
Mirant Corporation	MIR		x	
Mosaic Glob Hldgs Inc	MOS-GlobHold	x		
NALCO Co	NALCO		x	
Navistar Intl Corp	NAV		x	
Nortel Networks Corp	NT	x		
NOVA Chems Corp	NCX		x	
NRG Energy, Inc.	NRG		x	
Owens IL Inc	OI		x	x
Parker Drilling Co	PKD		x	
Polyone Corp	POL			x
Pride Intl Inc	PDE	x		
Primedia Inc	PRM	x		
Quebecor World Inc.	IQW	x		x
Qwest Cap Fdg Inc	QUS-CapFund	x		
Reliant Energy Inc	REI	x		
Rite Aid Corp	RAD		x	
RJ Reynolds Tobacco Hldgs Inc	RAI-RJR		x	
Royal Caribbean Cruises Ltd	RCL			x
Saks Inc	SKS	x		
Sinclair Broadcast Gp Inc	SBGI		x	x
Six Flags Inc	PKS		x	x
Smithfield Foods Inc	SFD		x	
Smurfit Stone Container Enterprises Inc	SSCC-SSCE			x
Solectron Corp	SLR			x
Starwood Hotels & Resorts Wwide Inc	HOT	x		
Std Pac Corp	SPF		x	
SunCom Wireless Inc	TRITON-SunCom		x	
Sungard Data Systems Inc	SGDS	x		
Svc Corp Intl	SRV	x		
Tembec Inds Inc	TEMBEC-Inds		x	
Tenet Healthcare Corp	THC	x		
Tesoro Corp	TSO Senior		x	
The AES Corp	AES		x	
The Hertz Corporation	HTZ	x		
The Neiman Marcus Group, Inc.	NMG		x	x
Toys R Us Inc	TOY		x	
Triad Hosps Inc	TRI		x	
TRW Automotive Inc	TRWAuto			x
Unisys Corp	UIS	x		
UnumProvident Corp	UNM	x		
Utd Rents North Amer Inc	URI-NorthAmer	x		
Utd Sts Stl Corp	X		x	x
Visteon Corp	VC		x	
Williams Cos Inc	WMB	x		
Xerox Corp	XRX	x		
Count	**100**	**38**	**48**	**30**

Source: JPMorgan

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Appendix V

History of CDS Indices

Before DJ CDX.NA.IG.2 and DJ CDX.NA.HY.3, there were competing index products among dealers. In 2004, JPMorgan and other dealers worked with the Dow Jones Company to create and endorse a family of standardized CDS indices in both the Investment Grade and High Yield markets. This has increased the liquidity and innovation in credit derivative products, in our opinion.

The table below provides a brief history of current and predecessor indices.

Investment Grade	Maturity Date (5Y)	No. of Credits	5Y Fixed Coupon(bp)
DJ TRAC-X NA Series 2	March-09	98	100
Hi Vol		40	100
CDX.NA.IG.2 Main	September-09	125	60
Hi Vol		30	115
DJ CDX.NA.IG.3 Main	March-10	125	50
Hi Vol		30	105
DJ CDX.NA.IG.4 Main	June-10	125	40
Hi Vol		30	90
DJ CDX.NA.IG.5 Main	December-10	125	45
Hi Vol		30	85
DJ CDX.NA.IG.6 Main	June-11	125	40
Hi Vol		30	75

Cross Over	Maturity Date (5Y)	No. of Credits	5Y Fixed Coupon(bp)
DJ CDX.NA.XO.5	December-10	35	200
DJ CDX.NA.XO.6	June-11	35	190

High Yield		Maturity Date (5Y)	No. of Credits	5Y Fixed Coupon(%)	Swaps Coupon(bp)
TRAC-X NA HY	100	June-09	99	8.00%	450
	BB		43	6.40%	320
	B		53	9.00%	520
	HB		32	10.00%	750
TRAC-X NA HY.2	100	March-09	100	7.38%	350
	BB		38	6.05%	220
	B		59	8.00%	410
	HB		33	10.13%	615
DJ CDX .NA.HY.3	100	December-09	100	7.75%	375
	BB		43	6.38%	225
	B		44	8.00%	400
	HB		30	10.50%	625
DJ CDX .NA.HY.4	100	June-10	98	8.25%	360
	BB		42	6.75%	210
	B		40	8.00%	340
	HB		28	--	500
DJ CDX .NA.HY.5	100	December-10	100	8.75%	395
	BB		43	7.25%	250
	B		44	8.25%	340
	HB		30	--	500
DJ CDX .NA.HY.6	100	June-11	100	8.625%	345
	BB		38	7.375%	210
	B		48	8.125%	300
	HB		30	--	500

Note: Coupons for HY are for fixed notes
Source: JPMorgan

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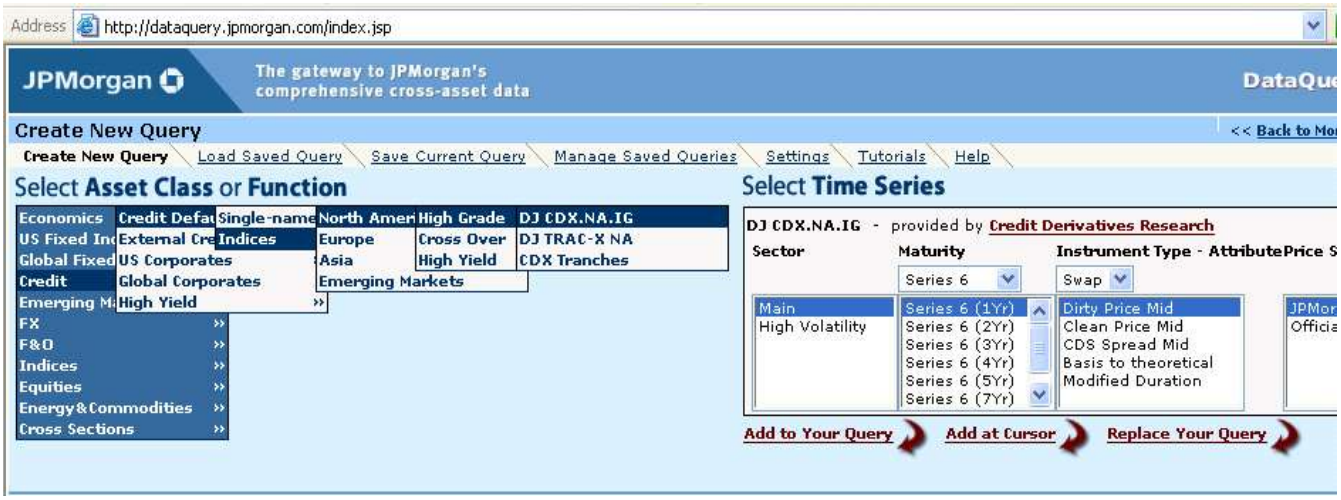
Appendix VI

How to get DJ CDX data

Historical data on Dow Jones CDX are available on the DataQuery tool (http://dataquery.jpmorgan.com/index.jsp) on MorganMarkets. Using this tool, prices, spreads, basis to theoretical value and duration for current and predecessor indices can be retrieved. The path to retrieve the CDX data is:

Credit → Credit Default Swaps → Indices → North America



Source: JPMorgan

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