

*Risk Management, Credit Risk and Credit
Derivatives*

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Overview of Presentation

1. Growth in markets & instruments has outpaced the developments in risk measurement, documentation, back-office facilities, models and risk management safeguards.
2. Market is experiencing a rapid disintermediation of credit risk and wider credit risk transfer than ever before.
3. Risk management opportunities have increased, but the propagation of credit risk has a greater reach today.
4. Regulatory challenges have increased as a result of credit derivatives.

ISDA Year 2005 Survey of Growth of Derivatives

Interest rate Derivatives grew almost 6 percent to \$213.2 trillion. This is a 16 percent increase from one year ago, and is in line with gradually decreasing growth rates for interest rate derivatives.

Credit default swaps grew 38 percent from \$12.4 trillion to \$17.1 trillion, compared with 48 percent growth during the first half of 2005. ***Growth during all of 2005 was 105 percent, compared with 123 percent during 2004.***

Credit-Risky Instruments

Corporate Debt Claims & Bank Loans

The conventional way in which one thought about credit risky instruments less than 20 years ago would be roughly as follows:

1. Bank loans -- senior claims.
2. Investment grade corporate bonds (often senior claims).
3. Non-investment grade corporate bonds (more typically junior and subordinated claims).

Corporate Bond Issuance - Yearly (1)
1990-2006*
(\$ Billions)

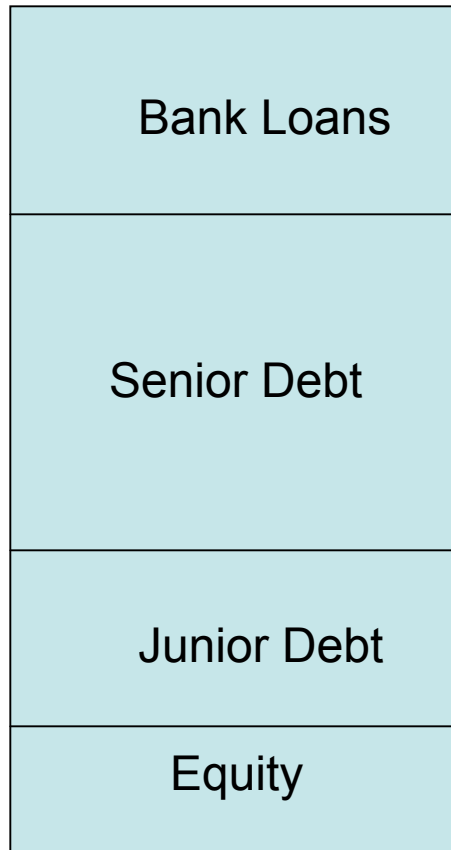
Year	High Yield	Investment Grade	Total
1990	12.0	152.2	164.2
1991	13.4	210.8	224.2
1992	42.4	250.2	292.6
1993	73.6	329.2	402.8
1994	45.7	260.3	306.0
1995	45.0	285.8	330.8
1996	72.3	336.6	408.9
1997	132.4	423.9	556.3
1998	144.8	563.8	708.6
1999	97.2	657.2	754.4
2000	41.3	704.5	745.8
2001	86.4	793.8	880.2
2002	58.1	591.9	650.0
2003	124.8	630.6	755.4
2004	112.4	611.2	723.6
2005	75.6	627.6	703.2
2006*	37.5	405.7	443.2

(1) Includes all non-convertible corporate debt, MTNs and Yankee bonds, but excludes all issues with maturities of one year or less, CDs and federal and agency debt.

*As of June 30, 2006

Source: Thomson Financial Securities Data

Corporate Credit/Equity Structure



- Very difficult to short corporate debt securities.
- Fixed range of maturities as dictated by the needs of the issuers.
- Limited Trading possibilities.
- Poor transparency until the introduction of TRACE.
- Impossible to alter the risks of corporate bond portfolios without outright transactions, which entail significant transactions costs.
- Limited risk-return profiles.

CDO Credit/Equity Structure



- Reliance on Underlying pool of Collateral.
- Customized Attachment and Detachment Points.
- Ability to take long or short positions.
- Standardized indexes with daily pricing.
- Ratings goals met via investment in relevant tranches.
- Underlying single name CDS markets provide the ability to create synthetic indexes and tranches.

Link Between Cash and Derivatives

- CDS contracts settle on the basis of the prices of deliverable cash bonds and loans. This provides a tight link between cash and derivatives markets.
- The probability of default depends on the specification credit events that are covered by the CDS. This provides the other link between cash and CDS markets.
- With the increase in CDO trading and hedging of tranches by the underlying single name CDS contracts, there are forces on the CDS markets that may not directly act on the underlying cash bonds, except through arbitrage

Structured Derivatives, Their Growth and Diversity

The structured derivatives market has grown by leaps and bounds in the last two decades. We now have the following major categories of products:

1. Single Name CDS (Corporate and Sovereign)
2. Credit Linked Notes.
3. First to Default Baskets.
4. Cash CLOs and CDOs.
5. Synthetic CDOs (unfunded and partially funded).
6. Synthetic Indexes (TRACX, Dow Jones, etc.).
7. Single Tranche Issuances.
8. Customized Tranches.

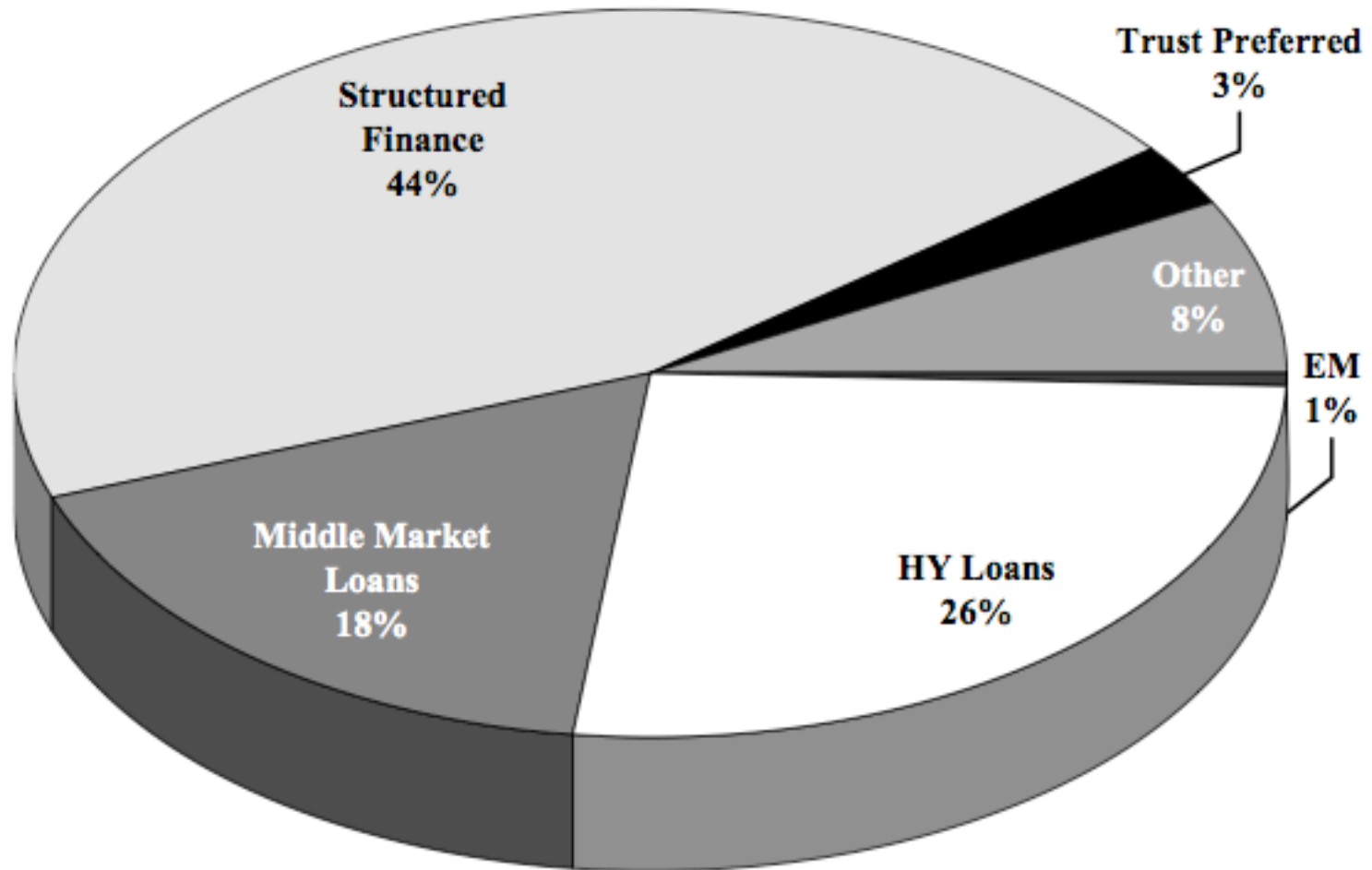
Initial Economic Motivation & Evolution

1. Cash CDOs were originated for regulatory and or economic capital relief. They were motivated by balance sheet or arbitrage considerations.
2. The movement towards synthetic CDOs and single tranche customized CDOs implies that the market is using the CDOs as a way to assume varying degrees of credit exposure.
3. Varying risk-return profiles on standard or customized baskets of credit risky instruments.
4. Achieving certain ratings profile at a lower cost.

Evolution of Underlying Collateral

1. Initially CLOs and CDOs were issued with bank loans, and corporate bonds as the underlying collateral.
2. Now, more and more of the CDOs are issued with structured credit instruments such as ABS, CDS, tranches of other CDOs as the underlying collateral.

Source: Morgan Stanley -- Collateral for CDO has shifted to structured finance assets such as ABS, CDS and tranches of other CDOs



THE BOND MARKET ASSOCIATION

Global CDO Market Issuance Data¹

BY ISSUANCE TYPE (\$MM)

	TOTAL ISSUANCE	Cash Flow ²	Synthetic Funded ³	Market Value ⁴	Arbitrage ⁵	Balance Sheet ⁶	Long Term ⁷	Short Term ⁸
2004-Q1	24,982.5	18,807.8	6,174.7	0.0	23,157.5	1,825.0	20,495.1	4,487.4
2004-Q2	42,861.6	25,786.7	17,074.9	0.0	39,715.5	3,146.1	29,611.4	13,250.2
2004-Q3	42,086.6	36,106.9	5,329.7	650.0	38,207.7	3,878.8	34,023.9	8,062.7
2004-Q4	47,487.8	38,829.9	8,657.9	0.0	45,917.8	1,569.9	38,771.4	8,716.4
2004 TOTAL	157,418.5	119,531.3	37,237.2	650.0	146,998.5	10,419.8	122,901.8	34,516.7
2005-Q1	47,816.3	40,759.6	7,056.7	0.0	41,965.0	5,851.4	43,381.3	4,435.0
2005-Q2	60,630.0	51,152.6	9,247.4	230.0	51,230.1	9,399.9	54,223.1	6,406.9
2005-Q3	50,983.6	45,316.7	5,666.9	0.0	48,624.9	2,358.6	47,632.7	3,350.9
2005-Q4	89,888.4	70,548.0	18,950.3	390.1	69,617.9	20,270.5	79,916.5	9,971.9
2005 TOTAL	249,318.3	207,776.9	40,921.3	620.1	211,437.9	37,880.4	225,153.6	24,164.7
2006-Q1	87,531.8	77,776.2	9,755.6	0.0	80,934.9	6,596.9	73,514.3	14,017.5
2006-Q2	89,512.2	76,215.4	12,124.3	1,172.5	75,382.8	14,129.4	87,052.5	2,459.7
2006 YTD TOTAL	177,044.0	153,991.6	21,879.9	1,172.5	156,317.7	20,726.3	160,566.8	16,477.2

Source: Thomson Financial

Totals may not foot due to rounding.

** Revised to reflect changes in classification or information submitted after prior cut-off date.

Disintermediation of Credit Risk & Credit Transfer

Three decades ago, banks and corporate bond markets were the dominant institutions for absorbing credit risk of corporations and sovereigns.

High Yield (HY) market was the first innovation whereby non-investment grade firms were able to access capital directly bypassing banks.

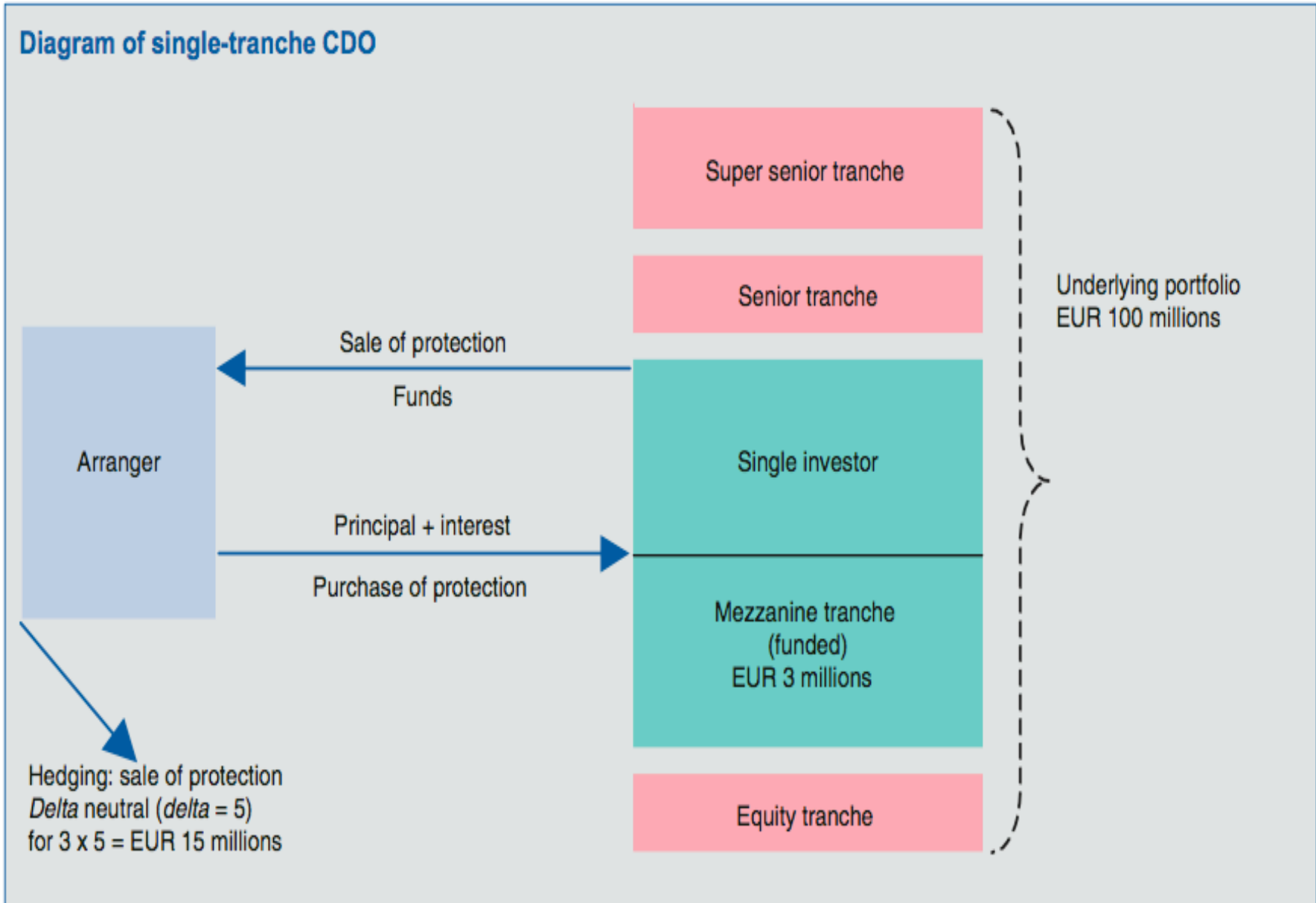
HY market coupled with loan sales already set the stage for the disintermediation process.

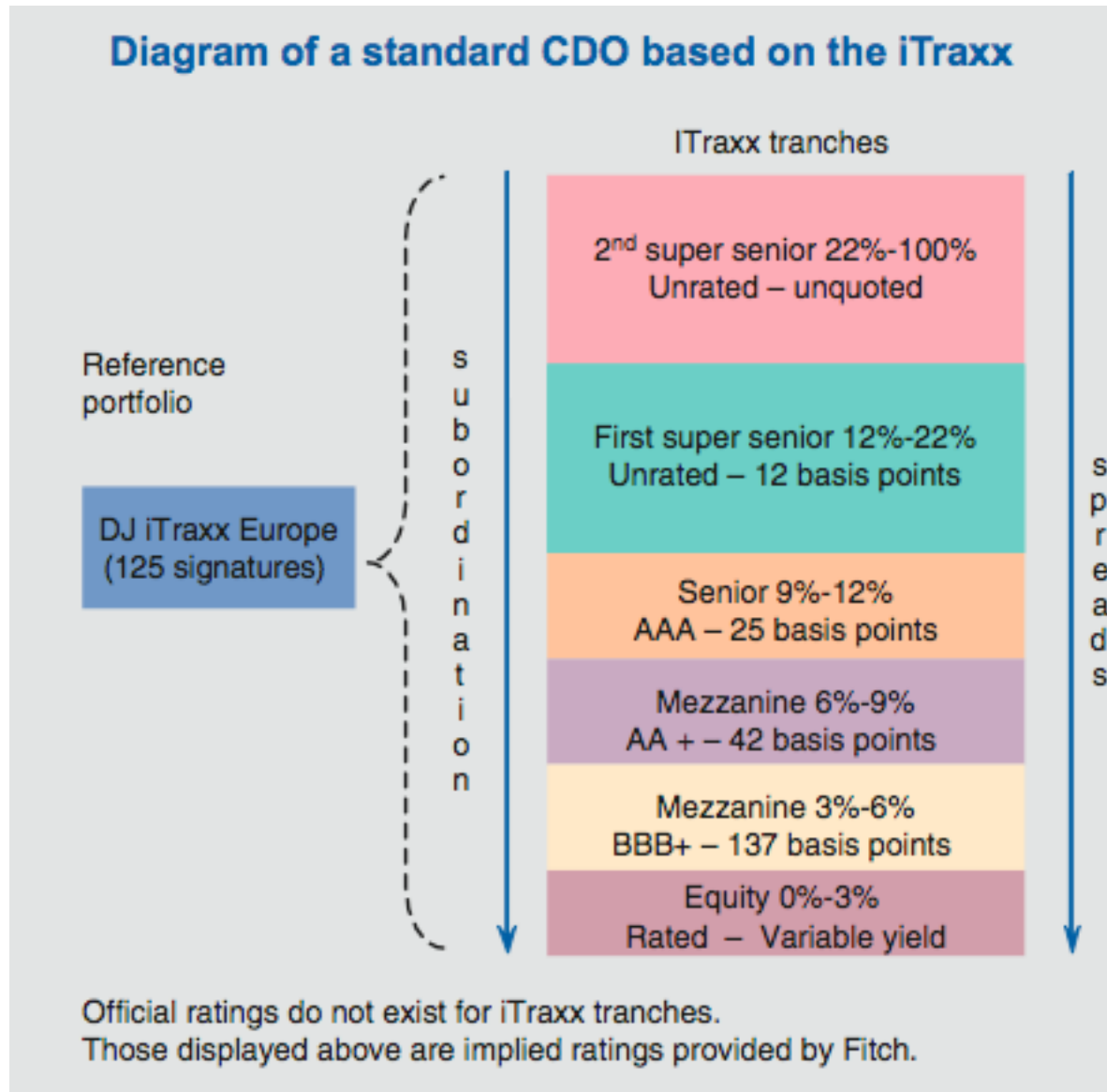
Credit Derivatives represents a major innovation in this process. For the first time in many years, investors are able to take short positions in portfolios of corporate credits.

Advantages of Disintermediation & Credit Risk Transfer

- 1. Diversification Benefits:*** More players now buy and sell protection on individual names and portfolios. This process helps to distribute and diversify credit risk.
- 2. Ability to Short-sell:*** For the first time, investors are able to take short positions in individual names and portfolios. This has always been possible in equity through options and stock index futures.
- 3. Customizing Credit Exposure:*** Through varying attachment and detachment points and customizing the underlying portfolios, it is now possible to tailor exposure to credit risk.

Source: Bank of France -- Financial Stability Review





» Index Symbols

NORTH AMERICA	BLOOMBERG SYMBOL	BRIDGE SYMBOL	COMSTOCK SYMBOL	REUTERS SYMBOL	ILX SYMBOL
Investment grade, North America	DJCDXNI	US&CDXNI	DJCDXNI	.DJCDXNI	.DACIG
High volatility	DJCDXNIV	US&CDXNI.V	DJCDXNIV	.DJCDXNIV	.DACHV
High yield, North America	DJCDXH	US&CDXH	DJCDXH	.DJCDXH	.DACHY
B-rated	DJCDXHB	US&CDXHB	DJCDXHB	.DJCDXHB	.DACHB
BB-rated	DJCDXHBB	US&CDXHB.B	DJCDXHBB	.DJCDXHBB	.DACBB
Crossover, North America	DJCDXXO	US&CDXXO	DJCDXXP	.DJCDXXO	.DACXO
EMERGING MARKETS					
Emerging markets	DJCDXEM	US&CDXEM	DJCDXEM	.DJCDXEM	.DACEM
Emerging markets diversified (corp. gov't)	DJCDXEMD	US&CDXEM.D	DJCDXEMD	.DJCDXEMD	.DACED

Potential Problems with Disintermediation & Credit Risk Transfer

- 1. *Knowledge of Risk:*** Do players in the market who take positions in credit derivatives fully understand the risks? Is the risk being borne by institutions that are in the best position to understand and absorb it?
- 2. *Proliferation of Risk:*** How would the regulators measure and manage the quantum of credit risk and its propagation through the financial system?
- 3. *Models and Quality of Data:*** Historical data on defaults and loss given default is limited. The financial architecture (bankruptcy code, DIP financing, etc) has changed over time, making the historical data less meaningful.

Potential Problems with Disintermediation & Credit Risk Transfer

- 4. *Correlation Assumptions:*** Pricing and hedging CDOs require assumptions about the likely correlation of defaults and loss given default. Correlation experience in “normal” times are likely to be poor indicators of correlation in “protracted recessions”.
- 5. *Products Outpace Risk Management Systems:*** Quality of pricing data, data integrity, their dissemination, back-office systems, ability to perform “what if” analysis have lagged the growth of products and strategies.

Customized CDO Trading

Customized (bespoke) CDOs: These products present unique challenges to regulators. Many institutions are bearing credit exposures through these products, and the central bank will have to determine how a “shock” to the financial system might be amplified by the presence of these products.

Risk Management: How effective are “delta neutral” hedging strategies in these markets? What are the implications of such hedging when there is a system-wide shock?

Trading screen showing iTraxx tranches

iTRAXX EXOTICS - Tranched iTRAXX			
5Y DJ ITRAXX EUROPE RUN (S2)			
TRANCHE	Running Spread	DELTA	MID IMPLIED CORREL
0% - 3%	500/500	18.1x	21.9%
3% - 6%	137/143	6.3x	6.8%
6% - 9%	42/47	2.4x	14.3%
9% - 12%	25/29	1.3x	21.4%
12% - 22%	12/14	0.7x	30.5%
Delta exchange	@ 37		
Index maturity	Mar-10		