



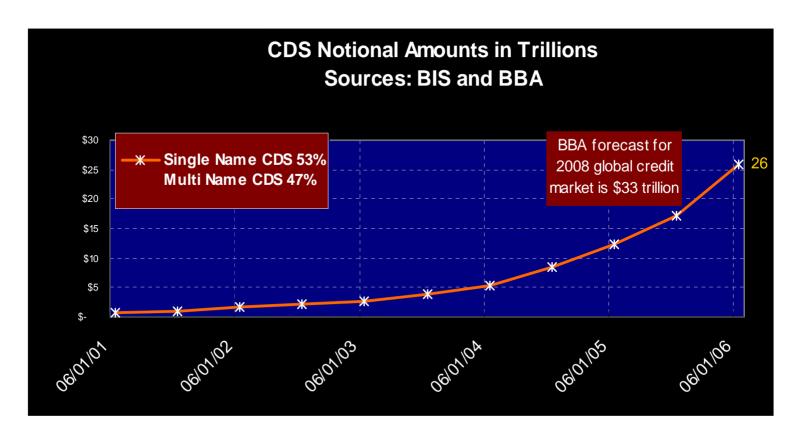
Agenda

- The over-the-counter (OTC) credit derivatives environment
 - Credit Default Swaps (CDS)
 - Definition
 - Cash Flows
 - CDS Example
- CBOE's offerings within the credit derivatives space
 - Advantages of trading credit derivatives on an exchange
 - Defining Credit Event Binary Options (CEBOs)
 - Single-Name CEBOs
 - Basket CEBOs
 - Contract Specifications
 - CEBO Price History
 - Trading Applications
 - Theoretical Pricing
 - Margin Requirements
 - Quoting / Trading CEBOs on TWS



Credit Derivatives

- Dominated by the OTC market
 - Credit Default Swaps (CDS)
- Notional value projected to reach \$33 trillion by the end of 2008





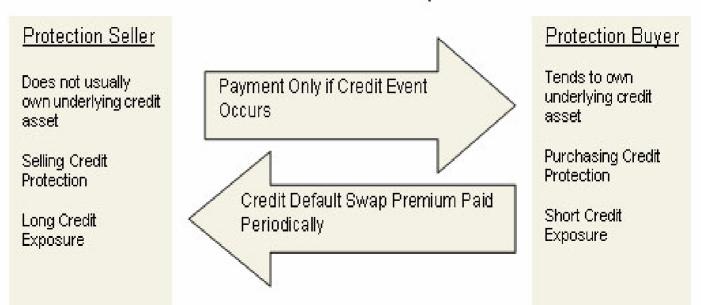
What is an OTC Credit Default Swap?

- A bilateral agreement between two counterparties to isolate the credit risk of a reference entity
- CDS are like insurance contracts on corporate debt
 - 'Protection Buyer' and 'Protection Seller'
 - Protection Buyer agrees to make periodic payments (quarterly) to the Protection Seller
 - Payments expressed in basis points based on credit spreads
 - Protection Seller collects premium and agrees to deliver par value of bonds upon confirmation of a credit event (e.g. bankruptcy, failure-topay, restructuring)
- 5 years is the standard length of a typical CDS
- CDS contracts written on single names and baskets
- Hedge funds, banks, and insurance companies are the major players
 - ISDA master agreement required to trade CDS



CDS Cash Flows

A Common Credit Default Swap Transaction



Source: Credit Derivatives and Synthetic Structures, John Wiley & Sons. 2001.



CDS Example

- Investor has a bullish view on the credit quality of XYZ Corp.
- Sell 5-year protection through CDS
 - Why sell CDS if bullish on XYZ's credit quality?
 - CDS will increase in value if the credit quality of XYZ decreases
 - CDS will decrease in value if the credit quality of XYZ increases
 - Dealer quotes 5-year protection on XYZ as 37 / 39 basis points
 - Protection seller would receive 37 basis points per annum on the notional value of the contract for the life of the contract
 - Protection buyer would pay 39 basis points per annum on the notional value of the contract for the life of the contract



CDS Example (continued)

- Investor wants to sell \$1 million worth of protection
 - Sells at 37 basis points = Receives \$3,700 per year; 4 quarterly credits of \$925
 - If there is no credit event before expiration, the Protection Seller simply keeps the premiums received
 - Maximum gain to seller is \$18,500 (\$3,700 x 5 years)
 - If there is a credit event prior to expiration:
 - The value of XYZ's debt will fall significantly
 - Recovery rate ~40%
 - Protection Buyer delivers appropriate bonds (at their market value after the credit event) to the Protection Seller in exchange for the par value of the bonds
 - Protection Buyer Receives
 - Notional value of CDS * (1- Recovery Rate)
 - \$1 million * (1-0.40) = \$600,000



Exchange Traded Advantages

- Streamlined market place with easy access through securities accounts
 - All investors, not just institutions, can now trade credit derivatives
- Transparent pricing and anonymous trading
- Reduced counterparty risk
 - Cleared through AAA-rated Options Clearing Corporation
- Operational efficiency
 - Standardization of contract terms
 - Minimal documentation
 - Immediate and unambiguous resolution of credit events
- Accessibility to other highly related CBOE products
 - VIX Options / futures
 - Equities (CBSX)
 - Equity & Index options
- Consistent liquidity provided by Designated Primary Market Makers



What are CEBOs?

- Credit Event Binary Options (CEBOs) are the CBOE's translation of credit default swaps (CDS) to a regulated and centralized marketplace
- CEBOs pay a fixed amount if a credit event is confirmed in a reference entity.
- CEBOs expire worthless if no credit event is confirmed before expiration
- 'Credit Event':
 - Bankruptcy
 - Failure to pay
 - Debt restructuring



CBOE's Credit Options Complex

- Single Name CEBOs
 - Ford Motor Co.
 - General Motors Corp.
 - Hovnanian Enterprises
 - Standard Pacific Corp

- Basket CEBOs
 - Auto Sector
 - Homebuilder Sector
 - High-Yield Composite

- Each CEBO currently has two expirations
 - September 2008
 - September 2012
- More CEBOs with more expirations will be listed
- New products in the pipeline
 - Credit spread options

October 2007



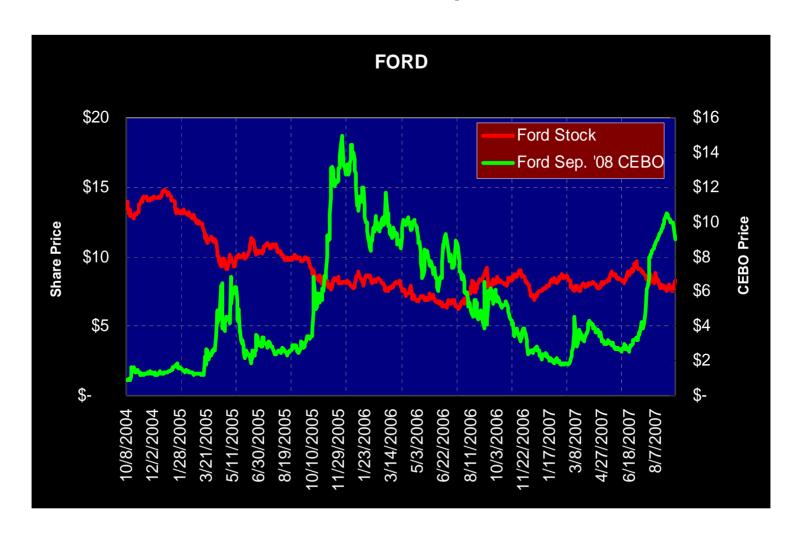
Credit Event Binary Options

Trading Specifications

Credit Option	Single-Name CEBOs	Basket CEBOs						
Underliers	Debt securities of Reference Entity	Debt securities of multiple Reference Entities						
Notional Value	\$100,000	Total basket notional value and component weights are specified at listing date. Component notional value = basket notional * component weight. Example: with 10 equally weighted components and \$100,000 total basket notional, each component has a \$10,000 notional value						
Recovery rates	 Recovery rates are estimates of what can be recovered per dollar of debt after a Credit Event. The credit option pays the residual, i.e. the loss per dollar The recovery rate of a single-name CEBO is always assumed to be 0 Recovery rates of CEBO basket components are specified at listing date of option 							
When does The option pay?	After a Credit Event After any Credit Event in a basket component							
		After each Credit Event:						
What does it pay?	\$100,000	Component notional value * (1-recovery rate) <u>Example</u> : If recovery rate is .4 and component notional is \$10,000, option pays \$6,000= \$10,000 * (14)						
Option Price Quotation and Effective Price	Option price is quoted per \$100 of total notional It is quoted in dollars and nickels, e.g. \$35.25 Effective price = quoted price * contract notional /100 Example: For single name CEBO, \$35.25 quoted price corresponds to an effective price of \$35,250							
Credit Event	event of default specifies qual CBOE specifies qual CBOE confirms Cre newswire or informa SEC, an exchange agency or similar aut Dow Jones News S Times.	o-pay, and may also include bankruptcy, debt restructuring, or any other cified by the CBOE. lifying Credit Events at listing time. dit Events based on at least two sources drawn from a list of specified tion services, and/or information submitted to or filed with the courts, the or association, the Options Clearing corporation, or another regulatory thority. The news services currently used by the Exchange are Bloomberg, services, the Wall Street Journal, the Financial Times and the New York credit Events up to four business days after last day of trading.						
Successions	Successor percentages are specified pursuant to CBOE rules. Successor weights and recovery rates are specified pursuant to CBOE rules. Successor weights add up to weight of the original Reference Entity. Successor Recovery rates can differ from the recovery rate of the original Reference Entity.							
Contract Maturities	Contracts expire from 1 to	o 10 ¼ years from listing date						
Last Day of Trading	The earlier of 3 rd Friday of contract month or date on which Credit or Redemption Event The earlier of 3 rd Friday of contract month or date on which Credit or Redemption Events in all basket components have been confirmed							
Expiration	4th business day after so trading.	heduled last day of trading or 2 business days after early last day of						

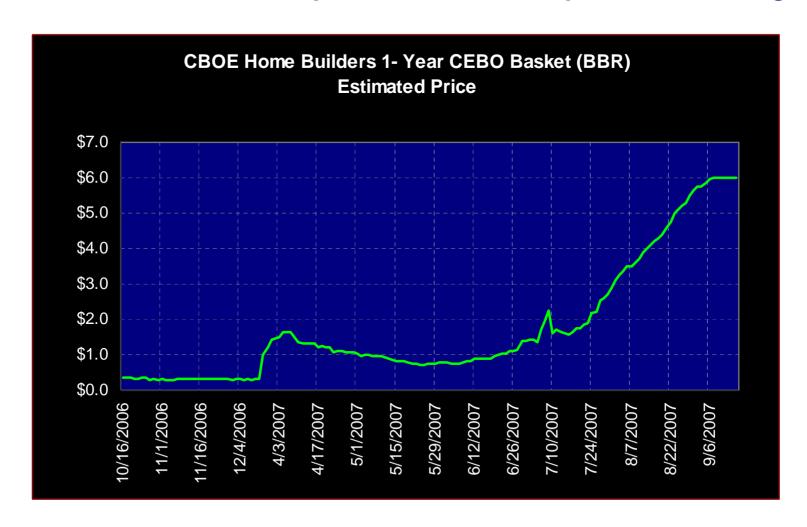


Ford Stock vs. Ford Sept. 2008 CEBO



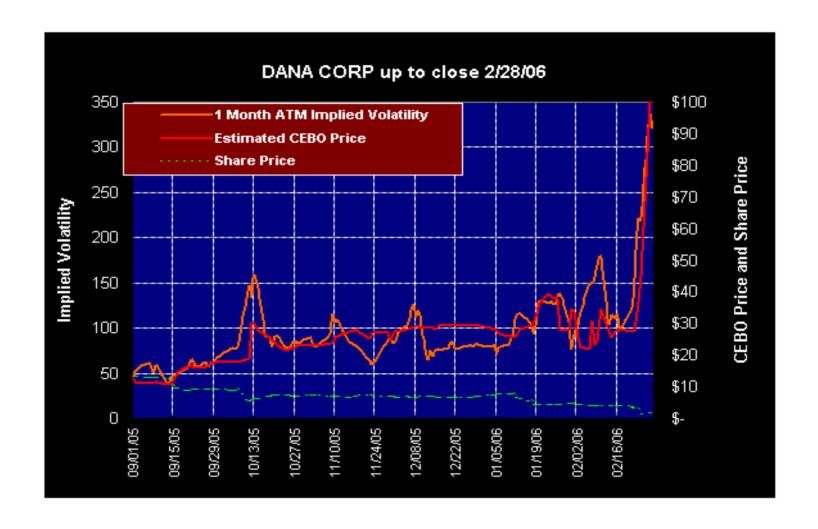


Homebuilder Sept. '08 CEBO price history





When a default occurs:





Basket CEBOs

- Basket CEBOs pay-out a fixed cash amount each time there is a credit event in a basket component
 - Basket components are weighted equally
 - All multiple pay-out baskets
 - 40% recovery rate assumed for each component
 - When a credit event occurs in a component, the option pays out the fixed amount
 - Basket continues to trade without that component until expiration or all components experience a credit event
- 3 baskets initially, with Sep. '08 & Sep. '12 expirations:
 - Auto Sector
 - Homebuilder Sector
 - High-Yield Composite



Auto sector basket

		Auto Sect	or Multiple Payo	ut Basket CE	BOS (AFY	, AFZ)				
	As of July 31, 2007									
	Company Name	Equity Ticker	Reference Obligation	REF OB CUSIP	Equity Cusip	Notional Value	Assumed Recovery Rate	Cash Settlement Amount		
1	ArvinMeritor Inc	ARM	ARM 8 1/8 09/15/15	043353AC5	043353101	\$14,285.71	0.40	\$8,571.4		
2	Amern Axle & Mfg Inc	AXL	AXL 5 1/402/11/14	02406PAE0	024061103	\$14,285.71	0,40	\$8,571.4		
3	Ford Mtr Co	F	F 6 1/2 08/01/18	345370BX7	319963104	\$14,285.71	0,40	\$8,571.4		
4	Gen Mtrs Corp	GM	GM 7 1/8 07/15/13	370442BS3	382550101	\$14,285.71	0.40	\$8,571.4		
5	Goodyear Tire & Rubr Co	GT	GT 9 07/01/15	382550AU5	413619107	\$14,285.71	0.40	\$8,571.4		
6	TRW Automotive Inc	TRW	TRW 9 3/8 02/15/13	87264QAM2	873168108	\$14,285.71	0.40	\$8,571.4		
7	Visteon Corp	VC	VC 7 03/10/14	92839UAC1	969457100	\$14,285.71	0.40	\$8,571.4		
						\$100,000.00		\$60,000.0		



Homebuilder sector basket

	Home Builder Sector Multiple Payout Basket CEBOS (BBR, BBS)										
	As of August 27, 2007										
	Company Name	Equity Ticker	Reference Obligation	REF OB CUSIP	Equity Cusip	Notional Value	Recovery	Amount			
1 1	KB Home	KBH	KBH 7.75 02/01/10	48666KAF6	526057104	\$12,500.00	0.40	\$7,500.			
2 I	K Hovnanian Entpers Inc	HOV	HOV 6.5 01/15/14	442488AQ8	451663108	\$12,500.00	0.40	\$7,500.			
3 1	Beazer Homes USA Inc	BZH	BZH 6.5 11/15/13	07556QAJ4	07556Q105	\$12,500.00	0.40	\$7,500.			
4 3	Std Pac Corp	SPF	SPF 7 08/15/15	85375CAT8	00206R102	\$12,500.00	0.40	\$7,500			
5 (Centex Corp	CTX	CTX 5.25 06/15/15	152312AQ7	126650100	\$12,500.00	0.40	\$7,500.			
6 I	Lennar Corp	LEN	LEN 5.95 03/01/13	526057AG9	532716107	\$12,500.00	0.40	\$7,500.			
71	Pulte Homes Inc	PHM	PHM 5.25 01/15/14	745867AQ4	V7780T103	\$12,500.00	0.40	\$7,500.			
8	Γο11 Bros Inc	TOL	TOL 6.875 11/15/12	88947EAA8	88732J108	\$12,500.00	0.40	\$7,500			
						\$100,000.00		\$60,000.			



High Yield Composite

		d Composite Mu			00 (1110, 111		
			As of August 23, 2				
Company Name	Equity Ticker	_	REF OB CUSIP	Equity Cusip			ash Settlement Am
1 Ford Mtr Co		F 6 1/2 08/01/18	345370BX7	345370860	\$2,000.00	0.40	,
2 Gen Mtrs Corp	GM	GM 7 1/8 07/15/13	370442BS3	370442105	\$2,000.00	0.40	
3 Charter Comms Hidgs LLC	CHTR	CHTR 10 04/01/09	16117PAK6	16117M107	\$2,000.00	0.40	* - ,
4 El Paso Corp	EP	EP 7 7/8 06/15/12	28336LAE9	28336L109	\$2,000.00	0.40	
5 Williams Cos Inc	WMB	WMB 7 1/2 01/15/31	969457BB5	969457100	\$2,000.00	0.40	*-,
6 The AES Corp	AES	AES 7 3/4 03/01/14	00130HBC8	00130H105	\$2,000.00	0.40	· · · · · ·
7 Chesapeake Engy Corp	CHK	CHK 6 7/8 01/15/16	165167BE6	165167107	\$2,000.00	0.40	
8 CMS Engy Corp	CMS	CMS 6 7/8 12/15/15	125896AZ3	125896100	\$2,000.00	0.40	
9 RH DONNELLEY Corp	RHD	RHD 8 7/8 01/15/16	74955WAG4	74955W307	\$2,000.00	0.40	*-,
0 NRG Energy Inc	XEL	NRG 7 1/4 02/01/14	629377AT9	98389B100	\$2,000.00	0.40	
1 Level 3 Comms Inc	LVLT	LVLT 3 1/2 06/15/12	52729NBK5	52729N100	\$2,000.00	0.40	* - ,
2 Dynegy Hidgs Inc	DYN	DYN 8 3/8 05/01/16	26816LAT9	26817G102	\$2,000.00	0.40	*
3 AMR Corp	AMR	AMR 9.1 05/01/16	001765AB2	001765106	\$2,000.00	0.40	
4 Allied Waste North Amer Inc	AW	AM 7 3/8 06/01/16	026375AL9	019589308	\$2,000.00	0.40	*-,
5 EchoStar DBS Corp	DISH	DISH 6 5/8 10/01/14	27876GAX4	278762109	\$2,000.00	0.40	*-,
6 Tenet Healthcare Corp	THC	THC 7 3/8 02/01/13	88033GAY6	88033G100	\$2,000.00	0.40	
7 Ctzns Comms Co	CZN	CZN 6 1/4 01/15/13	17453BAP6	17453B101	\$2,000.00	0.40	
8 Royal Caribbean Cruises Ltd	RCL	RCL 6 7/8 12/01/13	780153AP7	V7780T103	\$2,000.00	0.40	7-,
9 L3 Comms Corp	LLL	LLL 7 5/8 06/15/12	502413AJ6	502424104	\$2,000.00	0.40	\$1,20
0 Mirant North America LLC	MIR	MIR 7 3/8 12/31/13	60467XAC1	60467R100	\$2,000.00	0.40	\$1,200
1 Goodyear Tire & Rubr Co	GT	GT 9 07/01/15	382550AU5	382550101	\$2,000.00	0.40	* - ,
2 Rite Aid Corp	RAD	RAD 7.7 02/15/27	767754AJ3	767754104	\$2,000.00	0.40	\$1,200
3 Abitibi Consol Inc	ABY	ABY 8 3/8 04/01/15	003669AJ7	003924107	\$2,000.00	0.40	\$1,20
4 Nortel Networks Corp	ит	NT 4 1/4 09/01/08	656568AB8	656568508	\$2,000.00	0.40	\$1,200
5 Reynolds Amern Inc	RAI	RAI 7 5/8 06/01/16	761713AE6	761713106	\$2,000.00	0.40	\$1,200
6 Idearc Inc	IAR	IAR 8 11/15/16	451663AC2	451663108	\$2,000.00	0.40	\$1,200
7 KB Home	KBH	KBH 7 3/4 02/01/10	48666KAF6	48666K109	\$2,000.00	0.40	\$1,200
8 Advanced Micro Devices Inc	AMD	AMD 7 3/4 11/01/12	007903AJ6	007903107	\$2,000.00	0.40	\$1,20
9 Enterprises Inc	SSCC	SSCC 7 1/2 06/01/13	47508XAD7	832727101	\$2,000.00	0.40	\$1,200
O Allegheny Engy Supp Co LLC	AYE	AYE 8 1/4 04/15/12	017363AE2	017361106	\$2,000.00	0.40	\$1,20
1 K Hovnanian Entpers Inc	HOV	HOV 6 1/2 01/15/14	442488AQ8	442487203	\$2,000.00	0.40	\$1,20
2 NOVA Chems Corp	NCX	NCX 0 11/15/13	66977WAH2	66977W109	\$2,000.00	0.40	\$1,200
3 Sanmina SCI Corp	SANM	SANM 8 1/8 03/01/16	800907AK3	800907107	\$2,000.00	0.40	\$1,20
4 TRW Automotive Inc	TRW	TRW 9 3/8 02/15/13	87264QAM2	87264S106	\$2,000.00	0.40	\$1,200
5 Pride International Inc	PDE	PDE 3 1/4 05/01/33	74153QAF9	741553Q10	\$2,000.00	0.40	\$1,20
6 Fst Oil Corp	FST	FST 7 3/4 05/01/14	346091AU5	346091705	\$2,000.00	0.40	\$1,200
7 Smithfield Foods Inc	SFD	SFD 7 3/4 05/15/13	832248AH1	832248108	\$2,000.00	0.40	\$1,200
8 Flextronics Intl Ltd	FLEX	FLEX 6 1/2 05/15/13	33938EAJ6	Y2573F102	\$2,000.00	0.40	\$1,200
9 Tesoro Corp	TSO	TSO 6 1/4 11/01/12	881609AQ4	881609101	\$2,000.00	0.40	
O Amkor Tech Inc	AMKR	AMKR 7 3/4 05/15/13	031652AQ3	031652100	\$2,000.00	0.40	\$1,200
1 ArvinMeritor Inc	ARM	ARM 8 1/8 09/15/15	043353AC5	043353101	\$2,000.00	0.40	\$1,200
2 Eastman Kodak Co	EK	EK 7 1/4 11/15/13	277461BD0	277461109	\$2,000.00	0.40	\$1,200
3 Mosaic Co	MOS	MOS 7 3/8 08/01/18	449669CD0	61945A107	\$2,000.00	0.40	\$1,200
4 Dillards Inc	DDS	DDS 7.13 08/01/18	254067AH4	254067101	\$2,000.00	0.40	
5 Massey Engy Co	MEE	MEE 6 7/8 12/15/13	576203AH6	576206106	\$2,000.00	0.40	
6 Mediacom LLC	MCCC	MCCC 9 1/2 01/15/13	58445MAJ1	58446K105	\$2,000.00	0.40	
7 Unisys Corp	UIS	UIS 8 1/2 10/15/15	909214BK3	909214108	\$2,000.00	0.40	* - ,
8 Visteon Corp	VC	VC 7 03/10/14	92839UAC1	92839U107	\$2,000.00	0.40	* - ,
9 Std Pac Corp	SPF	SPF 7 08/15/15	85375CAT8	00206R102	\$2,000.00	0.40	
50 Solectron Corp	SLR	SLR 8 03/15/16	83418XAB5	8341821077	\$2,000.00	0.40	
		=======================================	00-1021107	33 .13210,,	\$100,000.00	0.40	\$60,000

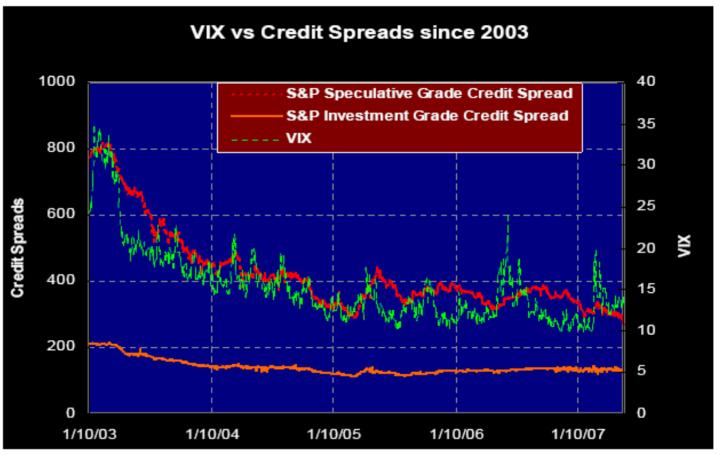


Trading Applications

- Single Name CEBOs
 - Hedge corporate debt
 - Hedge equities
 - Speculate on the credit quality of corporate debt
- Basket CEBOs
 - Hedge credit exposures to economic sectors, credit quality sectors or a cross-section of the market
 - Adjust the sector or quality profile of a broadbased CDS index
 - Hedge volatility exposures



Credit / Volatility Correlation



Sources: Standard and Poor's and CBOE



Single Name CEBO Quotes

	Equity	Sep 2008 CEBO		Sep 2012 CEBO		
Company Name	Ticker	Ticker	9/17/07 Mid- day Quotes	Ticker	9/17/07 Mid-day Quotes	
General Motors Corp	GM	GCB	6.75B / 9.75A	GCY	36.00B / 41.00A	
Ford Motor Company	F	FDE	7.50B / 10.50A	FDW	37.00B / 42.00A	
Hovnanian Enterprises Inc	HOV	CKA	14.25B / 17.25A	CKJ	57.00B / 62.00A	
Standard Pacific Corp	SPF	JSV	19.00B / 22.00A	JSW	61.00B / 66.00A	



Basket CEBO Quotes

	Equity	Sep 2008 CEBO		Se	p 2012 CEBO
Basket Name	Ticker	Ticker	9/17/07 Mid- day Quotes	Ticker	9/17/07 Mid-day Quotes
Auto Sector	(ARM, AXL, F, GM, GT, TRW, VC)	AFY	2.50B / 4.50A	GCY	18.00B / 22.00A
Homebuilder Sector	(KBH, HOV, SPF, CTX, LEN, PHM, TOL)	BBR	5.00B / 7.00A	FDW	21.00B / 25.00A
High Yield Composite	50 component s (e.g. F, GM, EP, CHK, NT, EK)	HAU	1.50B / 6.50A	HEU	16.00B / 19.00A



CEBO Theoretical Pricing

- -summation of discounted probabilities of a credit event occurring over the contract's life
- -estimated default probabilities can be found from Bloomberg, Moody's KMV, Reuters, RiskMetrics

	term structure of		p = sub-period	D = disco unt	
	de fault probabilities	time period	de fault probability	factor	100*p*D
6 m	0.0158	0- 6m	0.0158	0.9758	1.5417
1 yr	0.0312	бт-1yr	0.0154	0.9530	1.4676
2 yr	0.1037	1 - 2 yr	0.0725	0.9121	6.6124
3 yr	0.2043	2 -3 yr	0.1006	0.8733	8.7852
4 yr	0.3063	3 - 4 yr	0.1020	0.8352	8.5190
5 yr	0.3970	4 - 5 yr	0.0907	0.7990	7.2470
					\$ 34.17



Single-Name CEBO Margin Requirements

- Qualified Investor (>\$5 million)
 - Purchases = 20% * purchase amount
 - E.g. purchase amount = \$10,000; margin required = \$2,000
 - Sales the lesser of:
 - Option proceeds + 20% of the cash settlement value
 - The cash settlement value
 - E.g. proceeds = \$10,000; margin required = \$30,000 (\$10,000 + 20% of \$100,000)
- Non-qualified Investor
 - Purchases option must be paid for in full
 - Sales writers must maintain 100% of the cash settlement amount (\$100,000 per contact)



Basket CEBO Margin Requirements

- Qualified Investor (>\$5 million)
 - Purchases = 15% * purchase amount
 - E.g. purchase amount = \$10,000; margin required = \$1,500
 - Sales the lesser of:
 - Option proceeds + 15% of the cash settlement value
 - The cash settlement value
 - E.g. proceeds = \$10,000; margin required = \$22,000 (\$10,000 + 20% of \$60,000)
- Non-qualified Investor
 - Purchases option must be paid for in full
 - Sales writers must maintain 100% of the cash settlement amount (\$60,000 per contract)



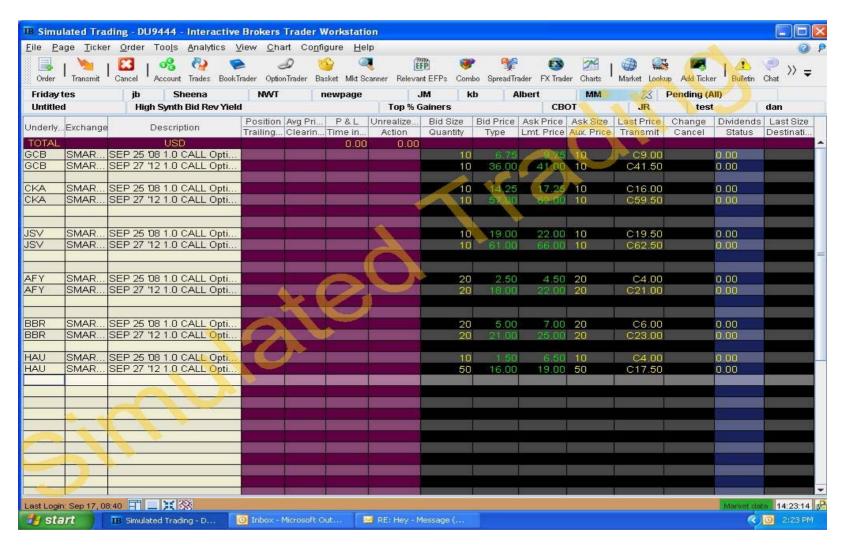
CEBO Symbology on TWS

- Single-Name CEBOs
 - \blacksquare GM = GCB
 - Ford = FDE
 - Hovnanian = CKA
 - \blacksquare SPF = JSV

- Basket CEBOs
 - Auto Sector = AYF
 - Homebuilder Sector = BBR
 - High-Yield Composite = HAU



CEBOs on TWS





CEBOs from CBOE

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