

Modern Techniques for Analyzing CLOs

A Workshop

Agenda

- » Introduction
- » Basic Fundamental and Market Valuation Techniques
- » Data-driven Valuation Enhancements
 - » Comparables
 - » Manager Style
 - » Single Name Analysis

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Basic Fundamental and Market Valuation Techniques

Static Analysis

- Defaults: 2 CDR is a common baseline, use stresses too
- Recovery Rate: 70% for senior loans, 30% for second liens
- Prepayments: 20 – 40 CPR
- Make assumptions about reinvestment spreads, interest rates, calls, etc.
- CDOnet Yield Table:

The screenshot shows the 'Yield Table' window in Moody's Multi-Sector Analytics CDOnet 10.0. The window contains a large table with columns for 'Tranche' (1 through 10) and rows for 'Yield' (1 through 10). The table displays various financial metrics and yields for each tranche. The data is organized into a grid with multiple columns and rows, showing various financial metrics and yields. The table is titled 'Yield Table' and has a 'Calculate Yield Table' button at the bottom.

Sample Static Results

CDR	2	4	7	10	15	2	4	7	10	15
CPR	15	15	15	15	15	20	20	20	20	20
Severity	35	35	35	35	35	35	35	35	35	35
Present Value @ Tranche Issuance Spread:										
A3	100	100	100	100	100	100	100	100	100	100
B	100	100	100	100	100	100	100	100	100	100
C	100	100	100	100	85.12	100	100	100	100	99.08
D	100	100	100	85.99	0.66	100	100	100	98.43	4.51
Equity	63.02	37.53	8.14	0	0	62.38	38.25	10.13	0	0

Aggregate Market Spread Data

- Market sources, such as the banks, distribute market summary statistics

Sector	WAL (years)	Current Spread	Change vs 01/19	Change YTD	Change 2010	Recommendation
US CLO						
Super Senior	3-5	180	-5	-10	20	Overweight
AAA	6-8	210	-5	-10	-10	Overweight
AA	7-10	375	0	-75	100	Overweight
A	8-10	550	-25	-65	165	Neutral
BBB	9-11	775	-25	-75	200	Neutral
BB	9-11	1050	-25	-125	225	Neutral
Euro CLO						
AAA	6-8	260	-10	-20	25	Overweight
AA	7-10	650	-75	-100	150	Overweight
A	8-10	1050	-100	-150	500	Neutral
BBB	9-11	1450	-100	-100	500	Neutral
BB	9-11	2150	0	0	650	Neutral

US CLO Tranche Prices

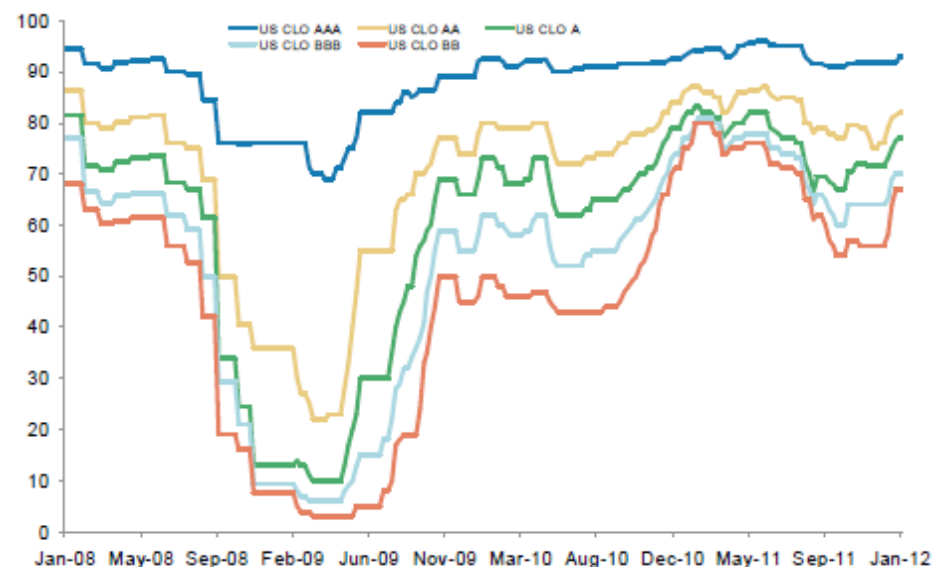


Table 1: CLO liabilities estimated* trading levels

	AAA	AA	A	BBB	BB
US	~180 DM	Mid to High \$80	Low to Mid \$80	High \$70	Mid \$70
Europe	~275 DM	High €70	Low €70	Low €60	Mid €50

Sources: JP Morgan, Morgan Stanley, BofA

Differentiating Factors

- Running analysis based on original rating is not always enough
- Other factors can affect the assumptions used in the analysis:
 - Manager reputation in the market
 - Overall collateral quality statistics versus cohorts
 - OC cushions
 - PIK status
 - Turbo
 - Reinvestment period timing / post-reinvestment reinvestment ability
 - Likelihood of a call
 - Rating transitions
 - Voting rights
- Judgment and/or a model must be used to adjust the aggregate DM data

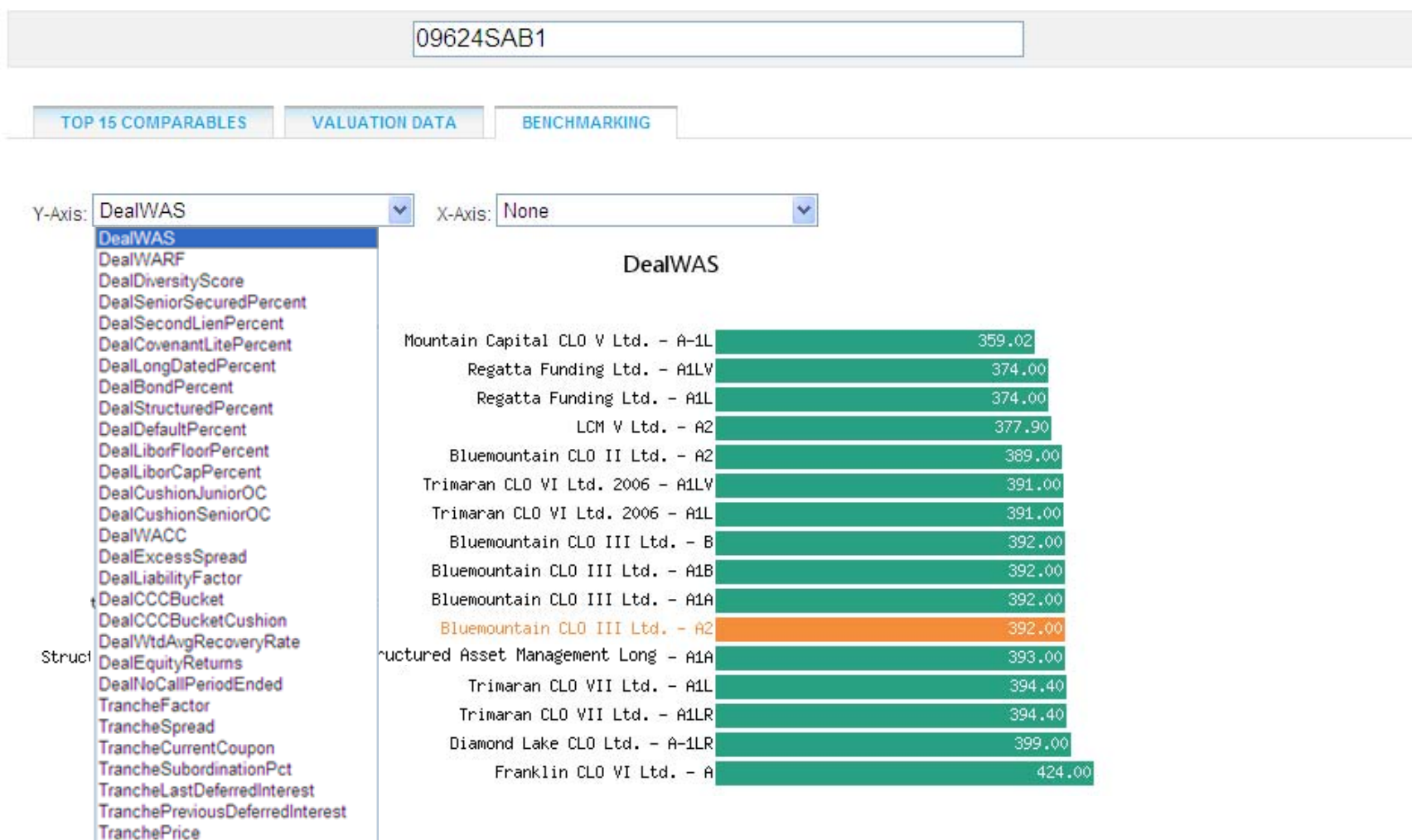
Comparing to Peers

- Performance statistics like WARF, WAS, etc., can be compared to the deal's cohorts
- Moody's Analytics Performance Data Services, and others, deliver monthly trustee data as well as historical information

Test	Percentile
Senior OC	45%
Mezz OC	51%
Sub OC	60%
Sub IC	16%
WAS	42%
SSL	89%
SEC_LIEN	22%
CAA/CCC	62%
STRUCTSEC	39%
Weighted Avg	51%

Benchmarking

Users can pick from hundreds of data points to rank the comparing tranche against its peers



Comparables

Enhanced Market Valuations

- Model-driven market pricing has its benefits
 - Aggregate spread levels for CLOs are freely available
 - Adjusting DM on a tranche basis allows you to express qualitative judgment about the tranche, the deal, and the manager
- However, we should not ignore other data points
 - Several vendors provide market color for Structured tranches, generally derived from BWICs
- If our tranche hasn't traded, how does market color help?

Finding Comparable Bonds



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Dashboard

Bond Comparables x

Market Color x

Search any security MADPK10.E

Provide Feedback

MADPK10.E Madison Park Funding X Ltd. E 2012 L3M + 5.25 N/R / N/R (sf)

US CLO | 2012 | N/R / N/R (sf) | USD 375000000M / USD 375000000M (1%) | LIBOR 3MO + 5.2500

Identifier	Deal Name	Class	Vintage	Coupon	Credit Rating	Relevance
1 MADPK9.E	Madison Park Funding IX Ltd.	E	2012	L3M + 5.25	N/R / N/R (sf)	98.86%
2 ATRIUM8.E	Atrium VIII	E	2012	L3M + 6.00	N/R / N/R (sf)	98.23%
3 WDRV12-1.E	THL Credit Wind River 2012-1 CLO Ltd.	E	2012	L3M + 5.25	N/R / N/R (sf)	98.23%
4 GALAXY14.E	Galaxy XIV CLO Ltd.	E	2012	L3M + 5.40	N/R / N/R (sf)	98.16%
5 MADPK10.D	Madison Park Funding X Ltd.	D	2012	L3M + 4.25	N/R / N/R (sf)	97.75%
6 OHACP_7.E	OHA Credit Partners VII Ltd.	E	2012	L3M + 5.00	N/R / N/R (sf)	97.54%
7 ACAS12-1.E	ACAS CLO 2012-1 Ltd.	E	2012	L3M + 6.00	N/R / N/R (sf)	97.53%
8 ALM_VI.D	ALM VI Ltd.	D	2012	L3M + 5.50	N/R / N/R (sf)	97.51%
9 BD_12-1.D	Black Diamond CLO 2012-1 Ltd.	D	2013	L3M + 6.00	N/R / N/R (sf)	97.51%
10 OCT_XIV.D	Octagon Investment Partners XIV Ltd.	D	2012	L3M + 5.25	N/R / N/R (sf)	97.49%
11 WHORSEVI.B2L	WhiteHorse VI Ltd.	B2L	2013	L3M + 5.25	N/R / N/R (sf)	97.46%
12 CIFC12-3.B2L	CIFC Funding 2012-III Ltd.	B2L	2013	L3M + 6.00	N/R / N/R (sf)	97.40%
13 CIFC12-2.B2L	CIFC Funding 2012-II Ltd.	B2L	2012	L3M + 6.00	N/R / N/R (sf)	97.37%
14 MAGNET6.E	Magnetite VI Ltd.	E	2012	L3M + 5.75	N/R / N/R (sf)	97.33%
15 OZLMFD_2.D	OZLM Funding II Ltd.	D	2012	L3M + 5.30	N/R / N/R (sf)	97.31%

Associated Market Color



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Dashboard

Bond Comparables x

Market Color x

List of securities

Submit

Provide Feedback

Identifier	Deal Name	Class	EFV ^A	EMV ^{A*}	Market Color	
1 MADPK9.E	Madison Park Funding IX Ltd.	E	99.47%	98.14%		
2 ATRIUM8.E	Atrium VIII	E	99.73%	101.88%	99.71%	26 Apr 13
3 WDRV12-1.E	THL Credit Wind River 2012-1 CLO Ltd.	E	99.18%	98.12%		
4 GALAXY14.E	Galaxy XIV CLO Ltd.	E	99.57%	98.79%	99.44%	21 May 13
5 MADPK10.D	Madison Park Funding X Ltd.	D	100.00%	102.47%	99.63%	22 Mar 13
6 OHACP_7.E	OHA Credit Partners VII Ltd.	E	99.15%	75.57%		
7 ACAS12-1.E	ACAS CLO 2012-1 Ltd.	E	99.40%	101.89%	99.06%	01 Feb 13
8 ALM_VI.D	ALM VI Ltd.	D	99.66%	99.36%	95.56%	13 Mar 13
9 BD_12-1.D	Black Diamond CLO 2012-1 Ltd.	D	99.33%	101.84%		
10 OCT_XIV.D	Octagon Investment Partners XIV Ltd.	D	98.38%	108.35%		
11 WHORSEVI.B2L	WhiteHorse VI Ltd.	B2L	99.56%	98.13%	97.73%	31 May 13
12 CIFC12-3.B2L	CIFC Funding 2012-III Ltd.	B2L	99.69%	101.91%	98.67%	20 Feb 13
13 CIFC12-2.B2L	CIFC Funding 2012-II Ltd.	B2L	99.82%	101.84%	100.22%	30 May 13
14 MAGNET6.E	Magnetite VI Ltd.	E	98.75%	100.64%	82.51%	06 Jun 13
15 OZLMFD_2.D	OZLM Funding II Ltd.	D	N/A	N/A	96.31%	13 May 13

Market Color History



Trade Date	Settle Date	Record Type	Price32	Price	Spread	Color
02 May 13	07 May 13	pxtalk	mh90s	97		
02 May 13	07 May 13	pxtalk	m90s	95		
02 May 13	07 May 13	bwic	97h	97.25	220	cover
02 May 13			97h	97		CVR
02 May 13			97a	97		TALK
02 May 13			M90s	90.5		TALK
14 Nov 12			L90s	92		CVR
13 Nov 12			LM90s	93.5		TALK
02 Nov 12	07 Nov 12	pxtalk	L90s	92		
02 Nov 12	07 Nov 12	pxtalk	L90s	92		
02 Nov 12			L90s	92		CVR
02 Nov 12			93h	93		TALK

Manager Style

Understanding the Manager

- With model-driven market valuations and comparables, we can understand what other market participants seem to think about a given tranche, deal, and manager
- How do we refine our own opinion?
- One way is to understand the manager's style

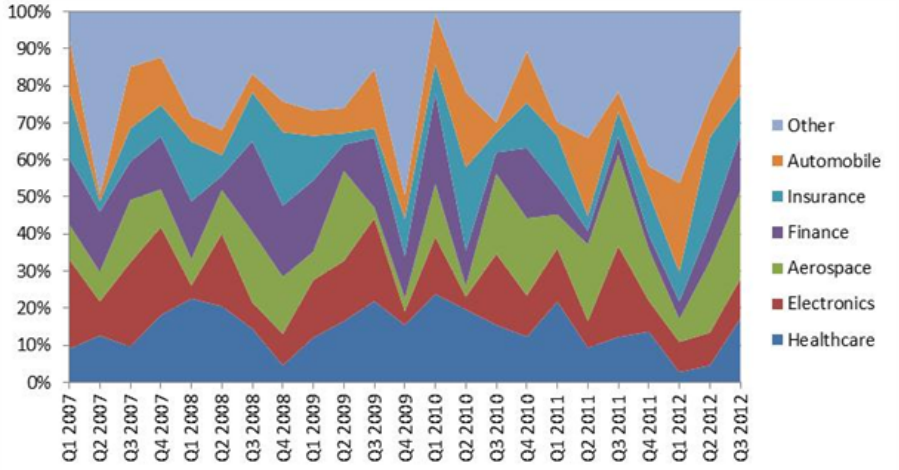
Data-based Manager Analysis



TRADE BEHAVIOR	Deal	Manager	Comparables	CLO Cohorts
Average loan purchase price (12-mo trailing)	98	97.25	99.25	98.5
Average purchased loan spread (bps) (12-mo trailing)	367	346	410	392
Average loan sell price (12-mo trailing)	92	95	97	96
Average realized trading gain (per trade)	1.20%	1.30%	0.75%	0.72%
Average yearly portfolio turnover	9%	11%	7%	6%
Average yearly post-reinvestment reinvestment	2%	2.50%	1.50%	1.70%
UNDERLYING MARKET PRICING (% of Pool)	Deal	Manager	Comparables	CLO Cohorts
Loan Price > 100	1.20%	1.30%	0.75%	0.77%
Loan Price 100-95	89.20%	87.20%	91.20%	91.40%
Loan Price 95-90	4.60%	6.20%	3.10%	3.05%
Loan Price 90-85	2.10%	2.50%	2.53%	2.45%
Loan Price 85-80	1.65%	1.45%	1.20%	1.10%
Loan Price 80-75	0.75%	0.55%	0.55%	0.55%
Loan Price <75	0.25%	0.45%	0.35%	0.37%
Loans Unpriced	0.25%	0.35%	0.32%	0.31%
LOSS MITIGATION	Deal	Manager	Comparables	CLO Cohorts
Annualized default rate	3.50%	3.10%	2.10%	1.90%
Annualized loss rate	0.90%	0.75%	0.40%	0.35%
Average time to recovery (days)	85	90	102	105
Average Junior OC cushion	3.20%	2.10%	3.50%	3.75%
Junior OC Cushion Standard Deviation	0.25%	0.27%	0.35%	0.37%
DEBT VS. EQUITY	Deal	Manager	Comparables	CLO Cohorts
Senior Management Fee	0.10%	0.11%	0.12%	0.09%
Subordinate Management Fee	0.50%	0.45%	0.30%	0.35%
Incentive Management Fee	10 / 30%	10 / 30%	12 / 20%	12 / 20%
Annualized Equity Return	14%	13%	18%	17%
Equity Return Standard Deviation	3%	2.70%	4.50%	6%
% of Underlying Amend-to-Extend	7%	6.00%	4.00%	5%

Data-based Manager Analysis

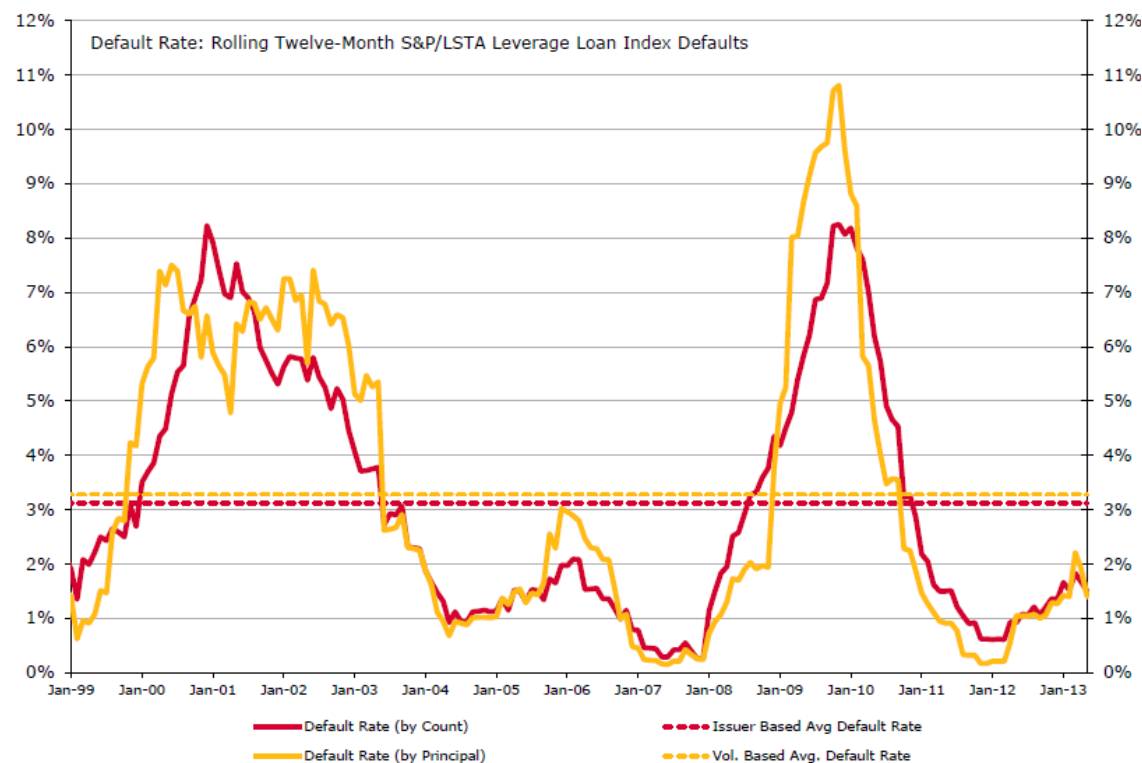


TRANCHE CASHFLOW DISRUPTION		Disruption?	# of Months	# of Separate Times		
Junior Tranches		No	N/A	N/A		
Equity Tranche		Yes	14	2		
MARKET SENTIMENT TRAILING 6 MONTHS (bps)						
Tranche Original Rating		Their Tranche Avg Market Color	Comparables Avg Market Color	Average Delta	Market Avg Market Color	Average Delta
Aaa		150	130	-20	130	-20
Aa		230	210	-20	210	-20
A		400	350	-50	350	-50
Baa		550	500	-50	500	-50
Ba		750	700	-50	700	-50
DEAL A: INDUSTRIES						
<div></div>						
INDUSTRIES		Deal	Manager	Comparables	CLO Cohorts	
Automobile		8.1%	8.5%	9.7%	10.1%	
Finance		4.5%	4.2%	6.2%	6.7%	
Insurance		11.1%	11.6%	6.5%	6.2%	
Healthcare		3.2%	3.4%	4.1%	3.7%	
Electronics		6.2%	5.9%	4.5%	5.2%	
(etc)						

Single Name Analysis

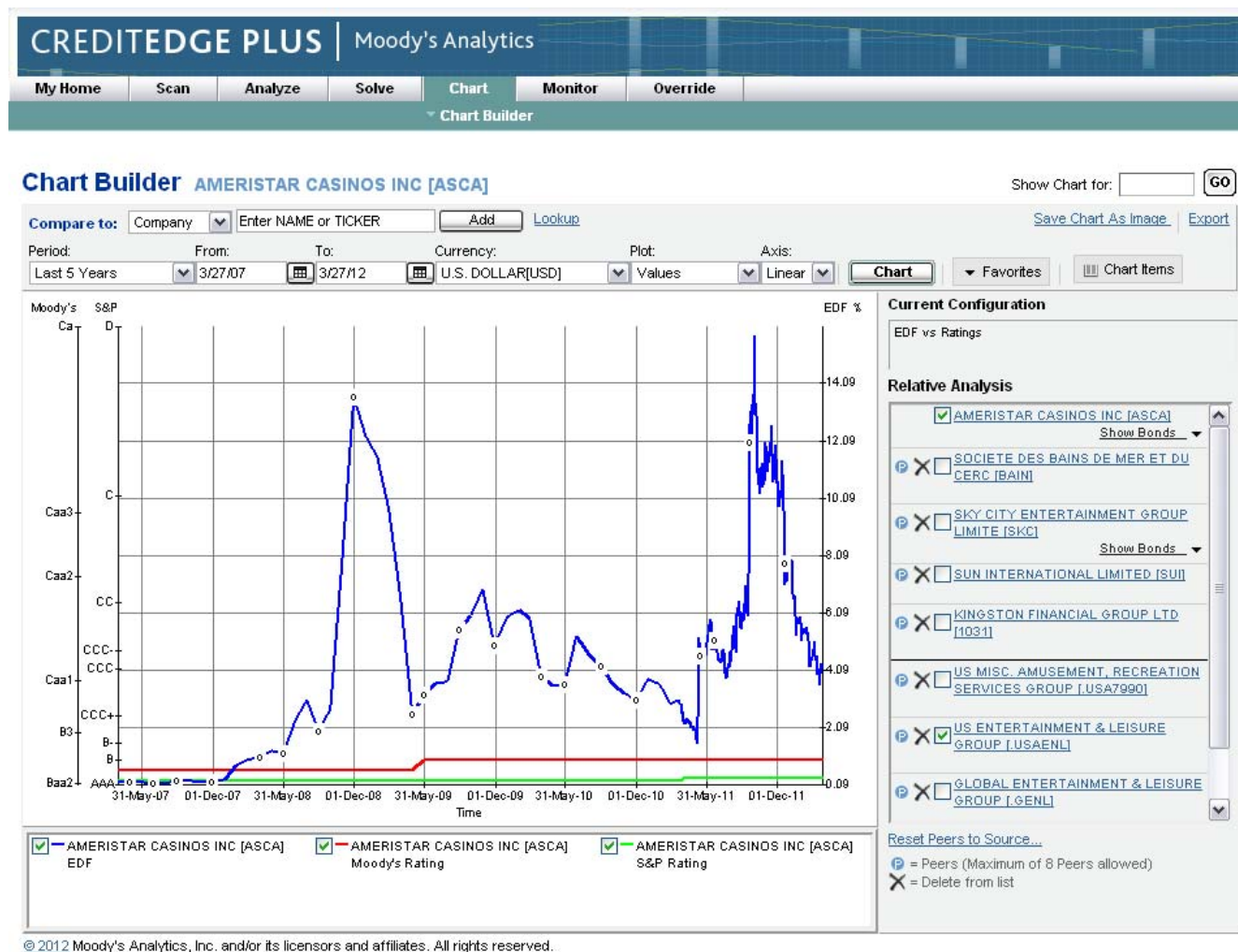
Single Name Analysis

- Besides analyzing the manager and looking at market valuations, we should also understand what's going on with the individual underlying credits
- Especially important for junior tranches
- This applies both to fundamental valuations as well as portfolio management
- Mapping individual loans enables metrics like MVOC, especially important with so many calls happening



Stochastic Analysis

- Need loan-level default probabilities and recovery rates to power the Monte Carlo simulation



Stochastic Analysis

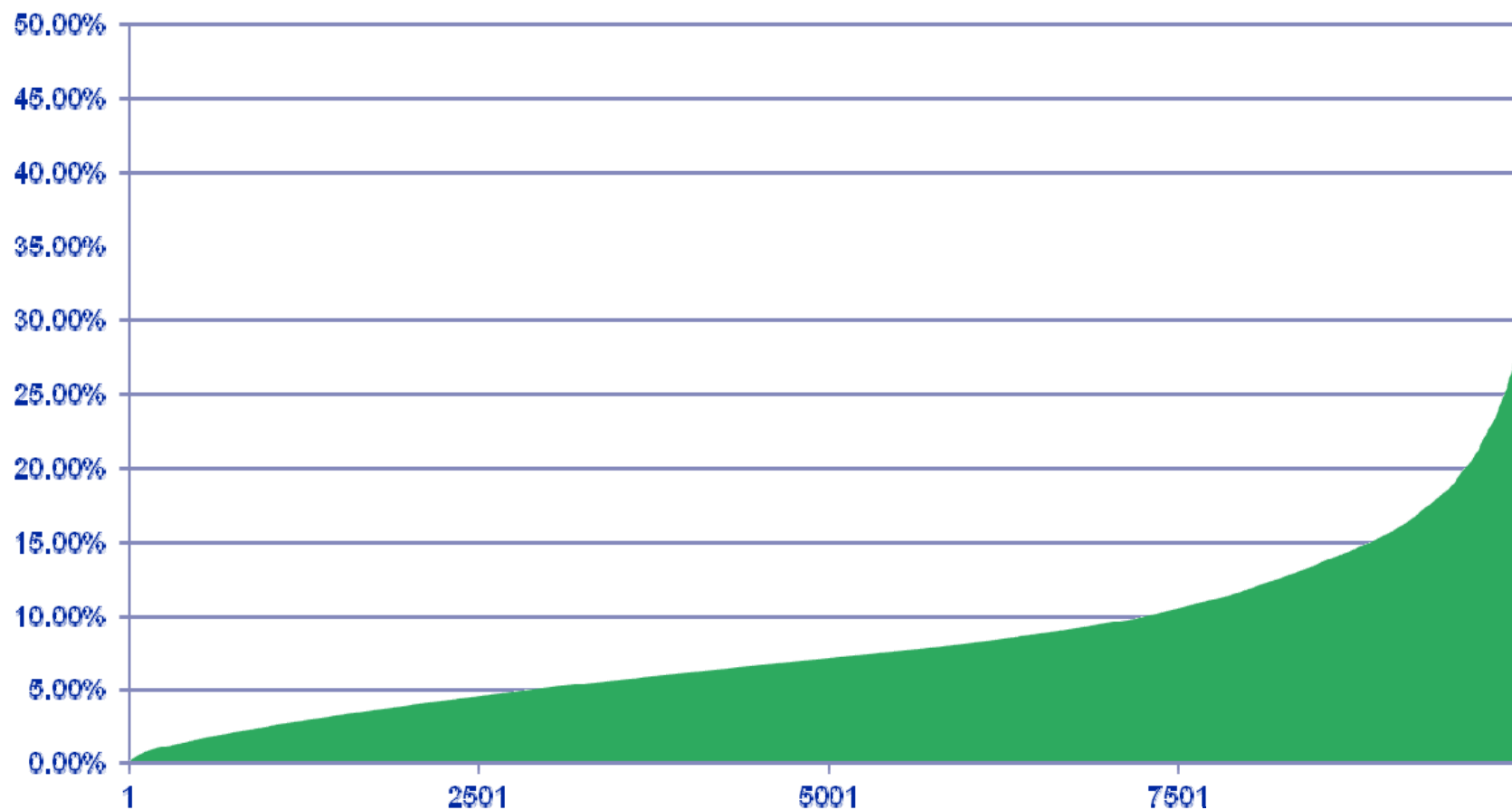
- Loan-level default probabilities from CreditEdge power the Monte Carlo simulation
- CreditEdge is not necessary, however; ratings-based or any other loan-level corporate credit risk model can be incorporated

Loan Name	1 Year P.D.	2 Year P.D.	3 Year P.D.	4 Year P.D.	5 Year P.D.
Allison Transmission, Inc. Term Loan B	5.05%	5.05%	4.95%	4.74%	4.53%
American Homepatient 1st Lien Term Loan	6.08%	6.15%	5.93%	5.59%	5.27%
Ameristar Casinos, Inc. Term Loan B	9.82%	13.58%	12.79%	12.48%	11.71%
Aramark Corporation Extended Term Loan B	4.91%	4.78%	4.56%	4.32%	4.11%
Avaya, Inc. Extended Term Loan B3	6.91%	6.83%	6.53%	6.17%	5.82%
AWAS Finance Luxembourg S.A.R.L. Term Loan B	2.14%	2.21%	2.20%	2.17%	2.13%
Bausch and Lomb, Inc. Term Loan	7.66%	7.60%	7.30%	6.86%	6.45%
Biomet Inc. Term Loan B	6.08%	6.15%	5.93%	5.59%	5.27%
And so on....					

Stochastic Analysis

- Monte Carlo simulation across typically 10,000 stochastic paths

Collateral Loss %



Stochastic Analysis

- Monte Carlo simulation across typically 10,000 stochastic paths
- Easier to understand the credit risk to each tranche



Portfolio Analysis

- If you own a portfolio of CLO tranches and you want to do your own analysis on some of the credits the managers have picked, how do you prioritize?
- Many different methods

MY CLO PORTFOLIO		
	MY	PORTFOLIO
TRANCHE	POSITION	WEIGHT
Deal A, Tranche Equity	15,000,000	18%
Deal B, Tranche B	10,000,000	12%
Deal C, Tranche A	60,000,000	71%

	LOAN	FACE	TYPE	RECOVERY
Deal A	Loan A	3,000,000	Senior Secured	70%
	Loan B	2,500,000	Second Lien	25%
	Loan C	1,250,000	Senior Secured	70%
	...			
	LOAN	FACE	TYPE	RECOVERY
Deal B	Loan B	5,000,000	Second Lien	25%
	Loan C	3,000,000	Senior Secured	70%
	Loan D	1,250,000	CLO	0%
	...			
	LOAN	FACE	TYPE	RECOVERY
Deal C	Loan D	6,000,000	Senior Secured	70%
	Loan E	4,000,000	CLO	0%

					AS A
LOAN	DEAL A "EXPOSURE"	DEAL B "EXPOSURE"	DEAL C "EXPOSURE"	TOTAL	MULTIPLE
Loan A	24,923	-	-	4,398	10
Loan B	108,173	82,397	-	28,783	62
Loan C	4,327	1,139	-	898	2
Loan D	-	3,052	147	463	1
Loan E	-	-	1,609	1,136	2

Issuer Watch List

Watchlist ✕								
Click here to Search		Remove All ▼		Export				
Global Issuer	Percentage of Portfolio	Prepay Rate	Prepay Type	Default Rate	Default Type	Loss Rate	Loss Type	Lag (months)
24 HOUR FITNESS WORL	0.4378	0	CPR ▼	11/15/2012 ⌵	DATE ▼	40	%	12
ADVANCEPIERRE FOODS	0.2465	0	CPR ▼	1/10/2013 ⌵	DATE ▼	45	%	12
ASHLAND INC.	0.3823	3.5	CPR ▼	Enter date ⌵	DATE ▼	40	%	18
ATLANTIC BROADBAND F	0.6689	0	CPR ▼	12/12/2012 ⌵	DATE ▼	35	%	15

3 out of 4

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