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NEPC

CLO Primer

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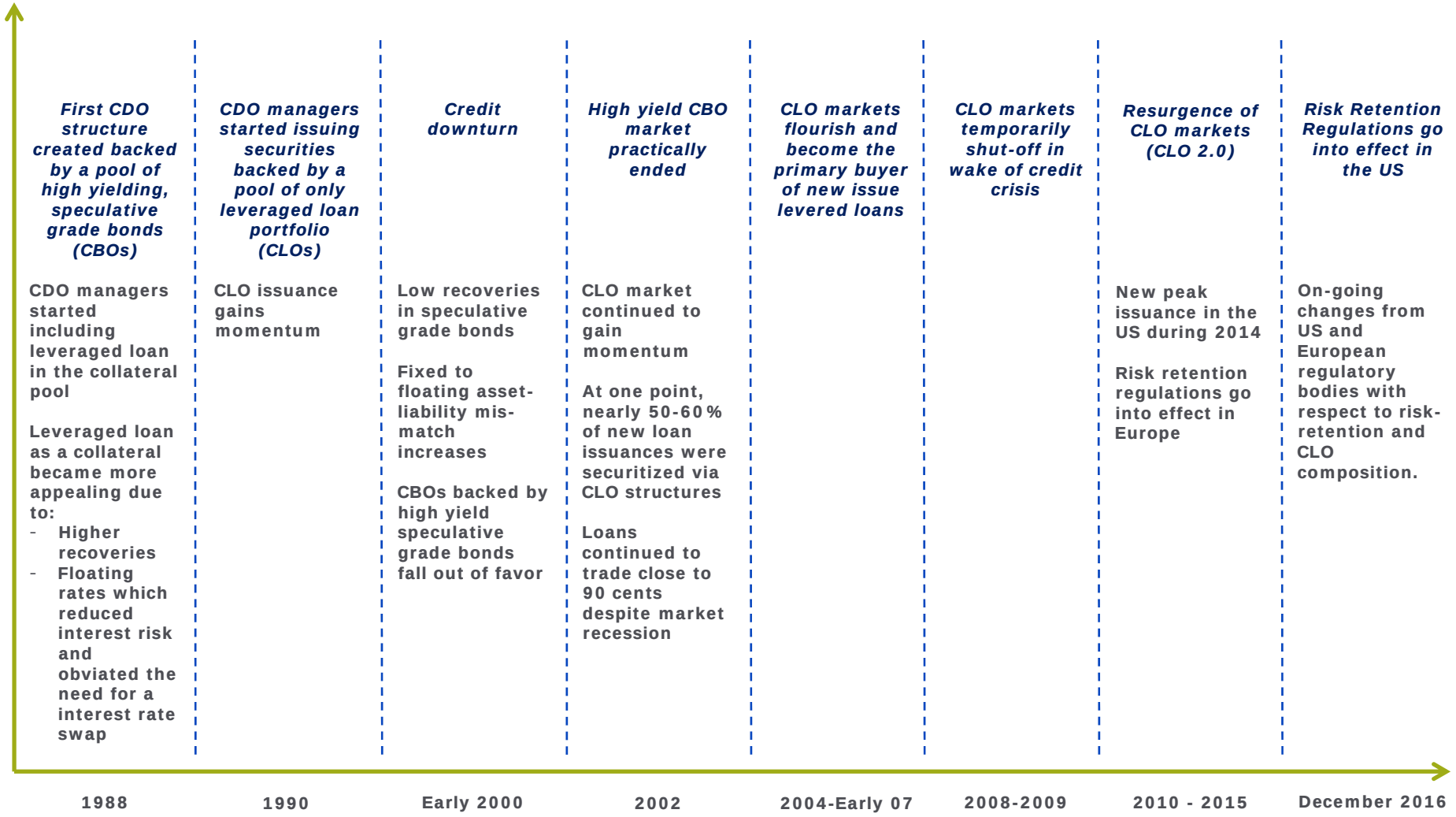
CLO: General Introduction

- **CDOs backed by leveraged loans are called 'CLOs'**
  - Mostly corporate floating rate debt
  - Majority of the loans in the collateral are senior secured loans
  - Many deals may contain small concentrations of high-yield and second lien loans
    - Referred to as high-yield or second lien buckets
  - Some CLOs may use middle market loans to boost yields
- **Collateral performance determines CLO return**
- **CLOs provide vital source of funding for U.S. non-investment grade corporations**
- **CLOs are transparent; most assets have public ratings and audited financial statements**

Source: RBS, Wells Fargo

CLO Market: Timeline



Source: ING, Wells Fargo

General Introduction to Arbitrage CLOs

- **Arbitrage CLOs exist to earn a spread between their assets and liabilities**
  - "Funding Gap" = Return on Assets – Defaults – Cost of Liabilities – Expenses
  - Return on Assets determined by average leveraged loan spread and active portfolio management by CLO manager
  - See slide 6 for a detailed history of default and recovery rates for leveraged loans
  - Cost of Liabilities for a CLO structure referred to as the Weighted Average Cost of Funding (WACF). See slide 7 for a recent history of WACF

- **Collateral performance determines return for CLO Equity**
  - Mostly corporate floating rate debt, primary or secondary issuance
    - Broadly syndicated, single B rated paper on average
  - Majority of the collateral (≥90%) is senior secured loans
    - Many deals may contain small concentrations of high-yield and second lien loans
    - Some CLO's may use middle market loans to boost yields
    - Exposure to non-senior secured loans is limited by a CLO's indenture

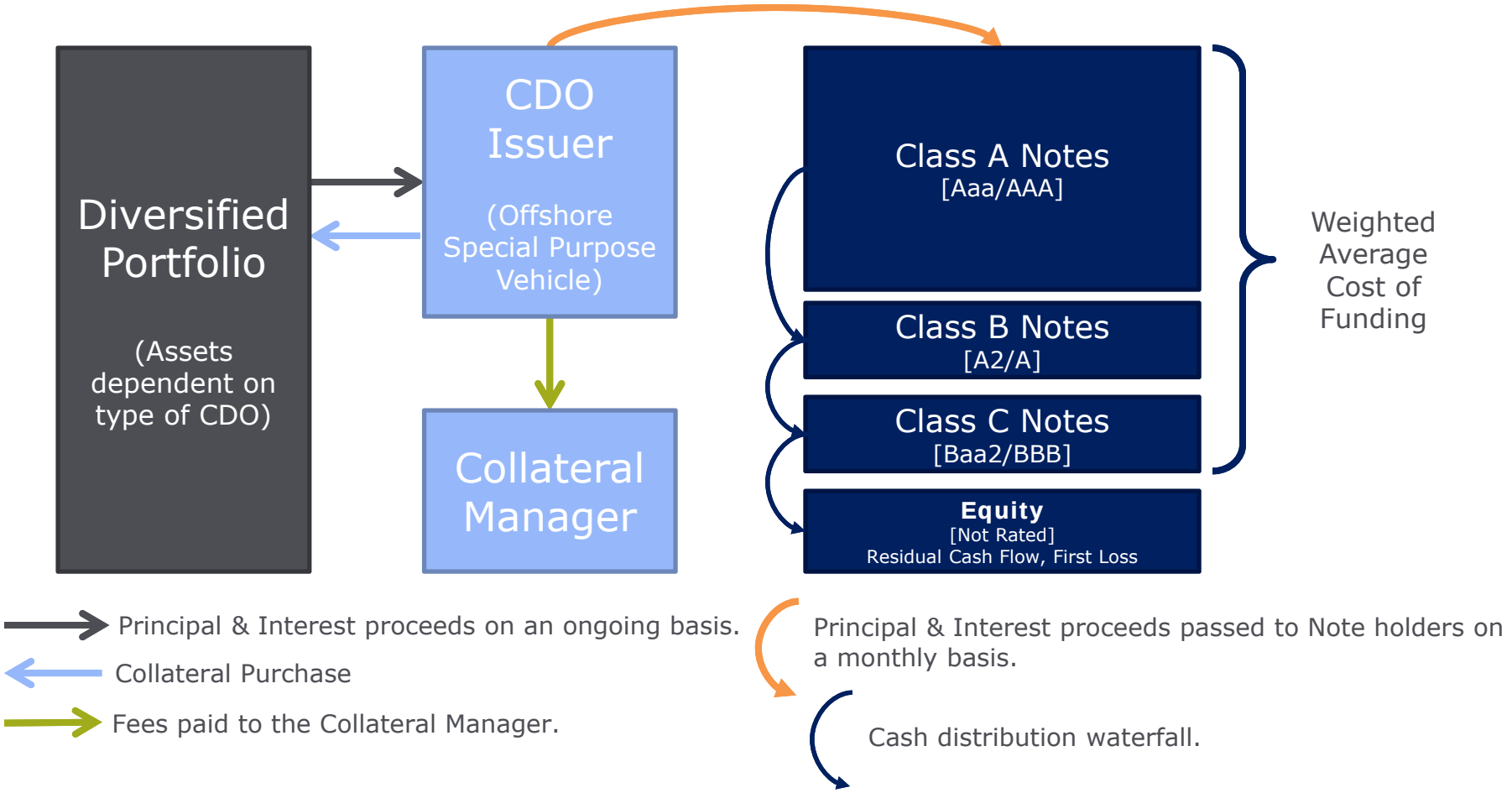
- **CLOs are transparent; most assets have public ratings, disclose loan level holdings monthly, and hold annual financial audits**

- **CLOs provide vital source of funding for U.S. non-investment grade corporations**

Source: RBS, Wells Fargo, Credit Suisse

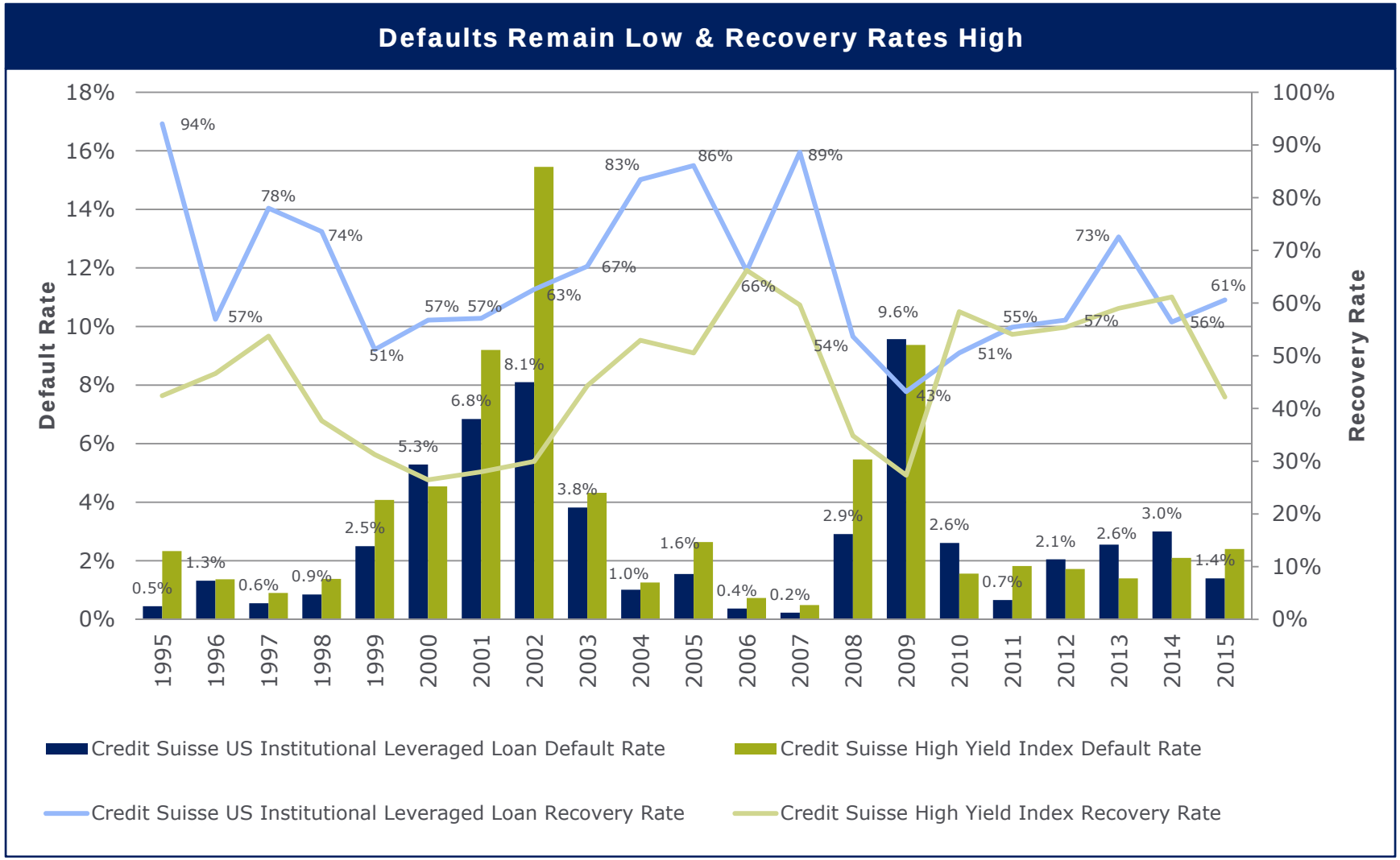
CLOs: General Introduction

- **CDOs are backed by a variety pool of debt depending on the type of CDO**
  - CDOs backed by leveraged loans are called 'CLOs', Collateralized Loan Obligations
  - CDOs backed by bonds (HY/speculative grade) are called 'CBOs', Collateralized Bond Obligations



Source: Wells Fargo Securities, LLC

Leveraged Loan and High Yield Historical Default and Recovery Rates



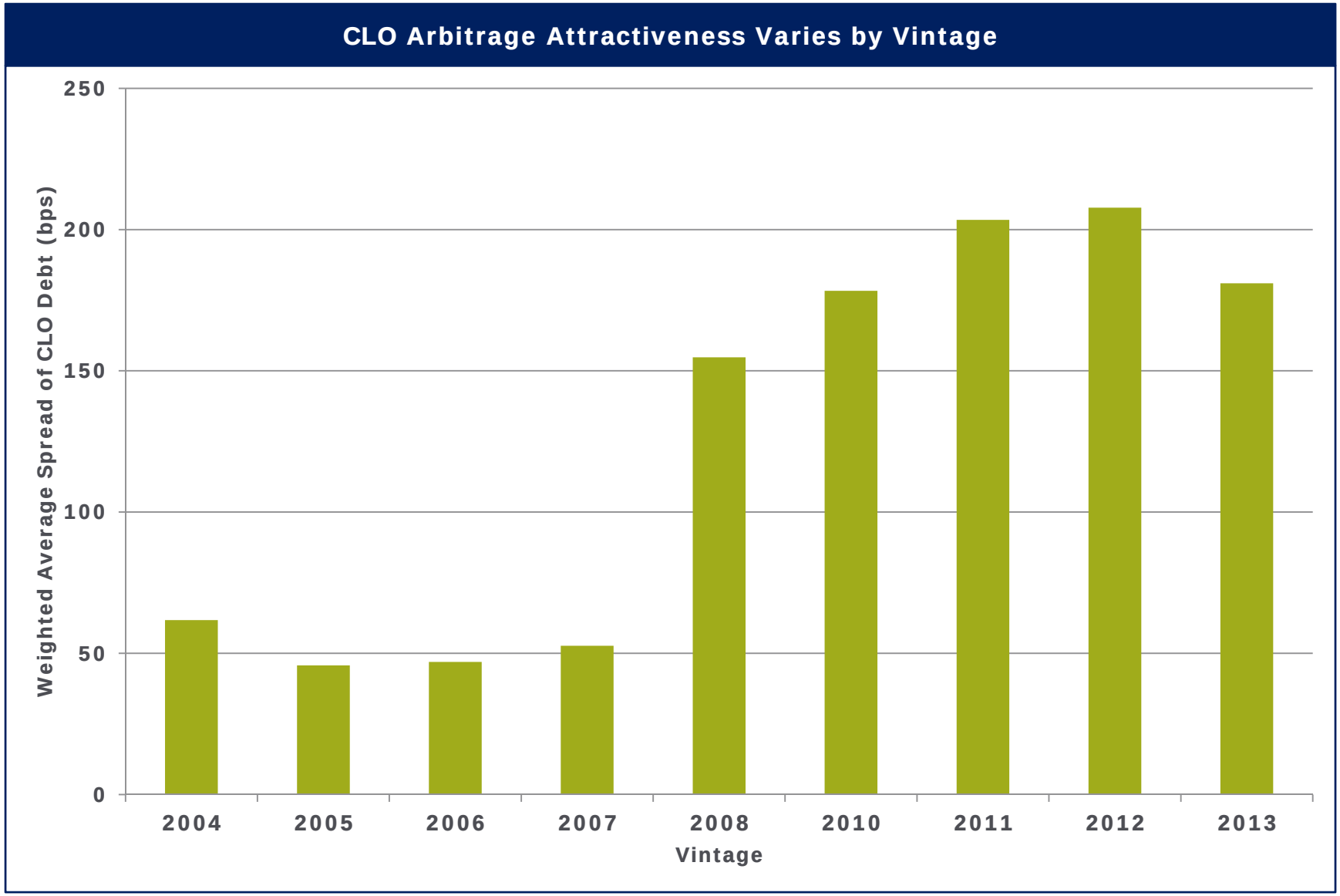
Source: Credit Suisse, Leveraged Finance Default Review, October 2015

Leveraged loan default analysis is restricted to institutional leverage loan tranches that could be sourced in the public domain with an initial issuance size greater than $25mm. The majority of these loans had public debt or equity. A loan is considered to be in default if it has either missed a coupon or principal payment (including a cross-default provision with other debt) or filed for Chapter 11.

*The **default rate** is calculated by summing the amount of institutional leveraged loans that have gone into default over a 12-month period, and dividing this by the average size of the institutional loan market over the same period of time. The defaulted amount is determined based on the initial amount of institutional debt issued.*

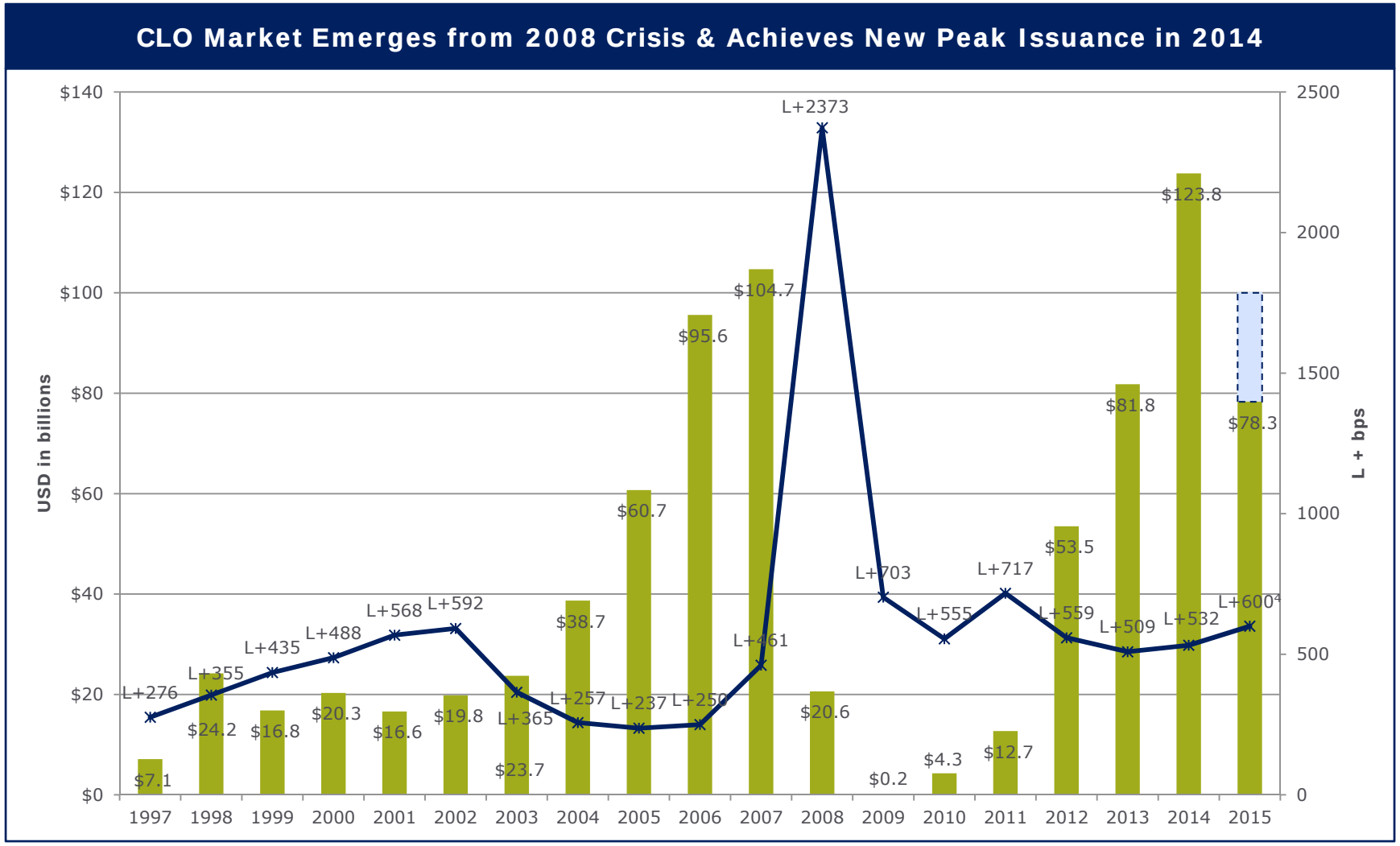
*The **recovery rate** is calculated from the issue's default price and issuance price. This represents the amount of an investor's original investment that survives the average default event.*

Median Weighted Average Liability Costs for US CLOs by Vintage



Source: Libremax, Intex, RBS

CLOs: US Historical Issuance & Average Leveraged Loan Spreads[1]



1. Original Source for Graph is Octagon Credit Investors.

2. Sources: Intel, S&P's/Leveraged Commentary & Data, Moody's, Wells Fargo Securities LLC. YTD 2014 as of September 30, 2015.

3. Source: S&P's/Leveraged Commentary & Data. Represents average discounted spread for the S&P/LSTA Leveraged Loan Index as of December 31st of the respective year. Assumes discount from par is amortized evenly over a three-year life. Excludes facilities in default.

4.Represents current average leveraged loan spread (as described fully in note 2 above) as of September 30, 2015.

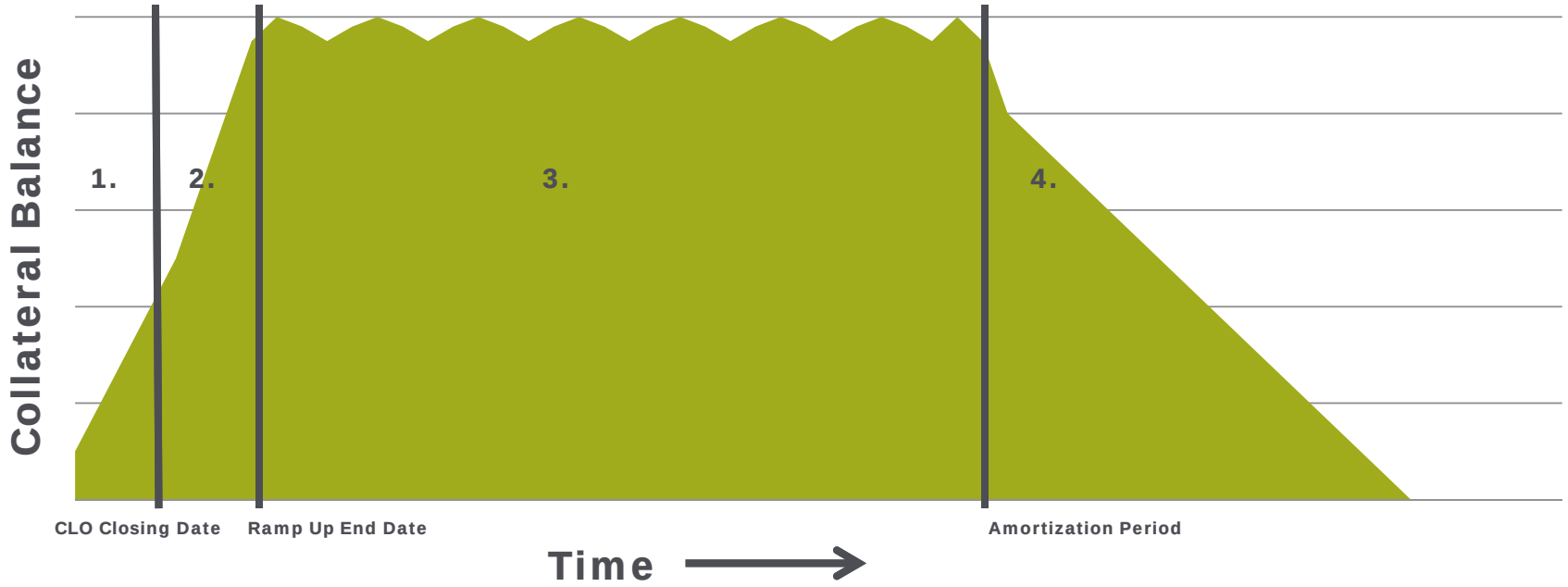
5.FY 2015 CLO new issuance forecast is $100B, which represents the straight average based on published market participants' estimates (J.P. Morgan, Morgan Stanley, Barclays Capital and Bank of America Merrill Lynch). This projection is a forward-looking statement, subject to change, and does not represent a guarantee.

CLOs: New vs. Legacy CLO Issuance (1.0 vs. 2.0 deals)

	CLO 1.0 Pre 2008/2009 Credit Crisis	CLO 2.0 Post Credit Crisis
Size	$300 - $1,000mm Par Value	$300 - $500mm Par Value
Number of Loans	200 – 300 Loans, 15 – 25 Industries	100 – 150 Loans, 15 – 25 Industries
Ratings	Predominately BB, B 90% Senior Secured Corporate Loans	Predominately BB, B 95% Senior Secured Corporate Loans
Other Composition	10% HY Bonds, Other CLOs, and Second Lien Obligations	5% HY Bonds, and Second Lien Obligations Investments in other CLOs typically not allowed
Weighted Average Cost of Liabilities	50 – 100bps	150 – 200bps
Reinvestment Period	5 – 7 years	2 – 4 years
Non-Call Period	3 – 5 years	~2 years
Indentures	Less Restrictive	More Restrictive
Tranche Refinancing Option	Not Permitted	After Non-Call Period

Source: RBS, Octagon, Wells Fargo

Collateral Management over the Life of a CLO

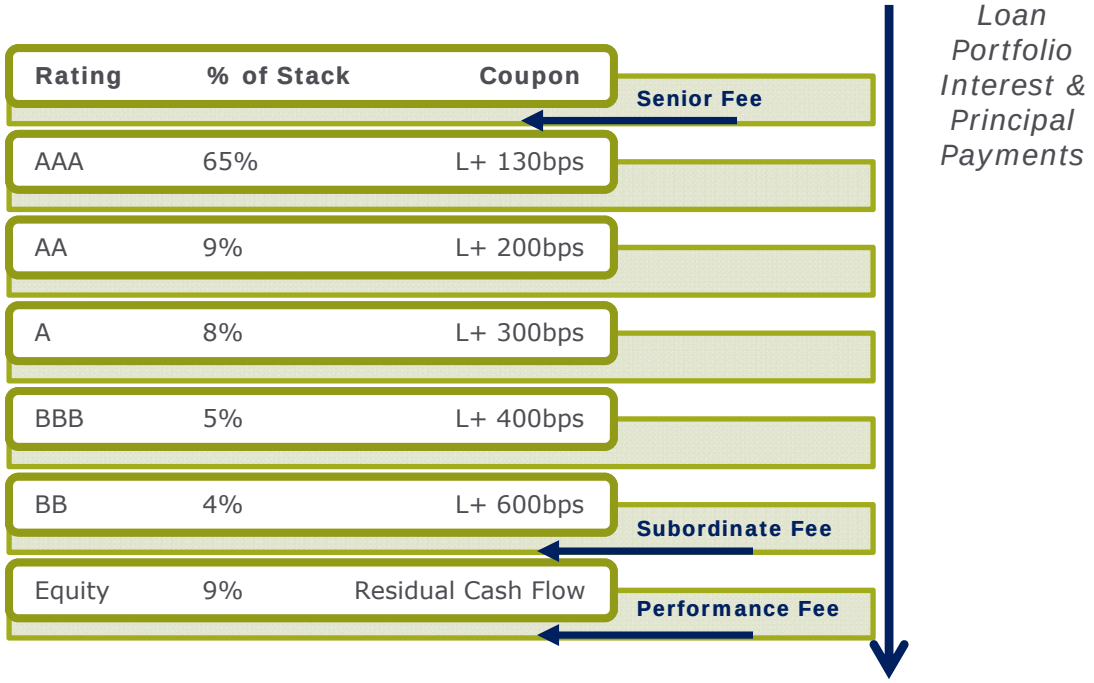


CLO Timeline			
1.	Warehouse Period	Warehouse Bank provides CLO Manager financing to acquire assets.	0-18 Months
2.	Ramp-Up Period	Proceeds from CLO Issuance used to purchase additional assets.	
3.	Reinvestment Period	Collateral Manager permitted to actively trade underlying assets. Principal cash flows from underlying assets can be used by Collateral Manager to purchase new assets.	Old Issuance: 5-7 years New Issuances: 2-4 years
4.	Amortization Period	Cash flows from assets are used to pay down the outstanding notes.	2-4 years or Stated Maturity

Source: Wells Fargo

How is a CLO Manager paid?

- CLO Manager takes a 10-20bps **Senior Fee** before notes are paid.
- Debt notes are paid in order of seniority
- CLO Manager takes a 20-40bps **Subordinate Fee** if all notes are paid
- Equity tranche receives excess payments.
- CLO Manager takes an additional **Performance Fee** (typically 10-20%) if certain IRR hurdles are met (average ranges 8-12%)
- Waterfall structure is typical
- AAA, AA, A notes are referred to as Senior Tranches or Senior CLO Debt
- BBB, B notes are also known as Mezzanine Tranches



CLOs: Marking Policies

- ***Underlying assets* in CLOs are marked at par and are not subject to mark-to-market volatility, EXCEPT under the following circumstances:**
  - **Default:** When a default occurs, the asset is marked at the lower of market value or anticipated recovery value.
  - **Excess CCC Assets**: When the CCC basket exceeds a predetermined test level (normally 7.5%), the excess CCC assets are held at market value.
  - **Discounted Obligations**: Loans purchased below 80 – 85 (depending on the rating). Initially carried at purchase prices as opposed to par until they trade above 90 for more than 30 days.
  - *These valuations are used to determine whether coverage tests are failed NOT monthly pricing for the CLO tranche. All other assets are marked at par.*

- ***CLO debt and equity tranches* are marked on a regular basis (at least monthly) by dealers and are subject to market volatility**

- **Many long-term CLO equity investors use a "mark-to-model" approach**
  - CLO Equity is generally considered a Level III asset.
  - Investors maintain their own pricing models with embedded assumptions instead of relying on dealer marks. *Operational Due Diligence and comfort with a particular Firm's marking policies are key for this strategy.*

CLOs: Structural Enhancements

Protection	Types
Coverage Tests • **Determines if senior tranches are sufficiently protected** • **Thresholds vary by individual CLO indentures** • **If a CLO fails a test, cash flows are directed to senior tranches until a deal is back in compliance with the test**	**Interest Diversion Test** • Usually trips before the OC or IC tests • Measures the adequacy of collateral supporting each class of notes • If triggered, interest payments to junior tranches are suspended and used to purchase additional collateral. In some cases, interest payments may be used to down subordinate notes **Overcollateralization (OC)** • Usually trips before the IC test • Measures the adequacy of collateral supporting each class of notes • Expressed as a ratio of the principal collateral value over the outstanding liabilities • Subordinate tranches have lower OC thresholds compared to senior tranches • If OC test is failed, interest and principal cash flows are diverted from more junior classes of notes to pay down the liabilities in order of seniority until the deal is back in compliance with the test. • Deleverages the portfolio and reduces the possibility of greater losses in the future. • A CLO manager no longer receives subordinate fees when an OC or IC test is triggered. **Interest Coverage (IC)** • Measures the sufficiency of the interest income of the underlying collateral to cover the scheduled interest payments to the note holders. Like OC tests, each class of notes has its own IC test. • If IC test is failed, interest and principal cash flows are diverted from more junior classes of notes to pay down the liabilities in order of seniority until the deal is back in compliance with the test. • Pay-In-Kind: if IC test is failed, subordinate bond holders may be compensated with more bonds equivalent to unpaid interest (dependent on a CLO's indenture). **Turbo Trigger** • Not standard for most CLOs, interest cash flows are used to accelerate repayment of subordinate (expensive) notes • Subject to all coverage tests being met and a minimum IRR on the equity tranche being achieved • De-leverages the structure, reduces rated note subordination, reduces cost of funding **Par Preservation** • Usually trips before the OC trigger or based on OC trigger • Equity cash flows are used to purchase additional collateral • Increases Leverage, extends equity maturity, impedes manager's ability to game the OC tests
Event of Default (EoD)	• Typically when OC falls below a second threshold, a deal is in EoD • Reinvestment period is terminated and all cash flows are used to retire liabilities in order of seniority • No standard deal has ever hit EoD because of this clause in the indenture
Collateral Quality Test	• Includes tests to ensure collateral quality is per guidelines (weighted average rating factor (WARF), diversity scores, weighted average life of collateral, weighted average spread, etc.) • If any test fails, CLO manager can only trade the collateral to bring that test in compliance

Source: RBS, *Collateralized Loan Obligations 101*, September 2012

CLOs: Equity Tranche Redemption Features

- **Optional Redemption Call**
  - Equity tranche holders have the right to redeem their notes after a stated non-call period
  - Non-call periods have varied based on CLO vintage
    - 2003-07 vintage had call protection extending 3-5 years
    - 2010-11 vintage had call protection extending 1-3 years
  - Equity holders typically choose to redeem when funding gap decreases

- **Call options vary between CLO 1.0 vs. CLO 2.0**
  - Legacy issues (CLO 1.0): Options to call or refinance a deal
  - New issues (post 2008 2009, CLO 2.0): Options to call, refinance, or re-price a deal

- **Call options defined:**
  - **Call:** the CLO manager must liquidate all collateral at the existing market value and repay note holders with sale proceeds
  - **Refinance:** the CLO manager to obtain a loan or issue new notes to replace existing notes
  - **Re-price:** the CLO manager reduces the spread over Libor for an entire class of notes
    - Does not require full par value or redemption to be there for the entire class of notes that are being re-priced (but is there for investors that disagree with the spread reduction)
    - Less time consuming than refinancing
    - Typically not allowed for AAA tranche

CLO Equity

Understanding CLO Equity Return Components

- **CLO Equity Total Return: Primarily includes two main components:**
  - Interest-Only Yield Spread
  - Principal-Only portion

- **Interest Only Spread (IO):**
  - Asset Yield – [CLO Fees (management and deal fees) + Interest Cost]
  - Interest Cost is also called 'weighted Average Liability' (WAL)
  - Asset yield changes over time, but cost of liability is typically locked
  - This spread, also known as 'Funding Gap' is leveraged, generally in 10x range for 2.0 CLO structures
  - Portfolio losses and defaults affect this spread by reducing the total interest paying asset

- **Principal-Only Portion (PO)**
  - PO is typically valued as an NAV [market value of the collateral assets - principal value of the notes/debt issued]
  - NAV is typically expressed as a percentage of the equity tranche notional value
  - Portfolio losses and defaults affect this return by reducing the value of the collateral

- **In summary, CLO equity receives cash flow from the underlying assets, less fees and CLO liability interest payments (WAL)**

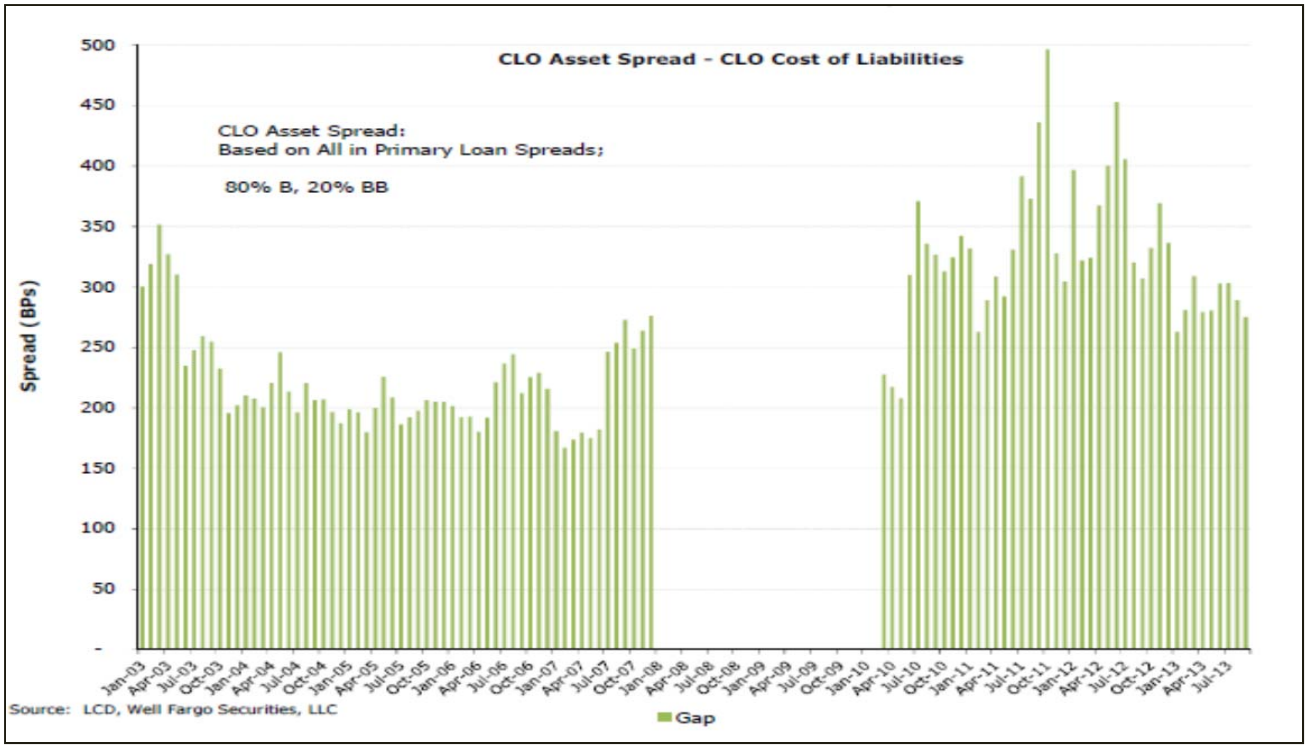
Key Return Drivers For CLO Equity

1. Timing of the reinvestment period:

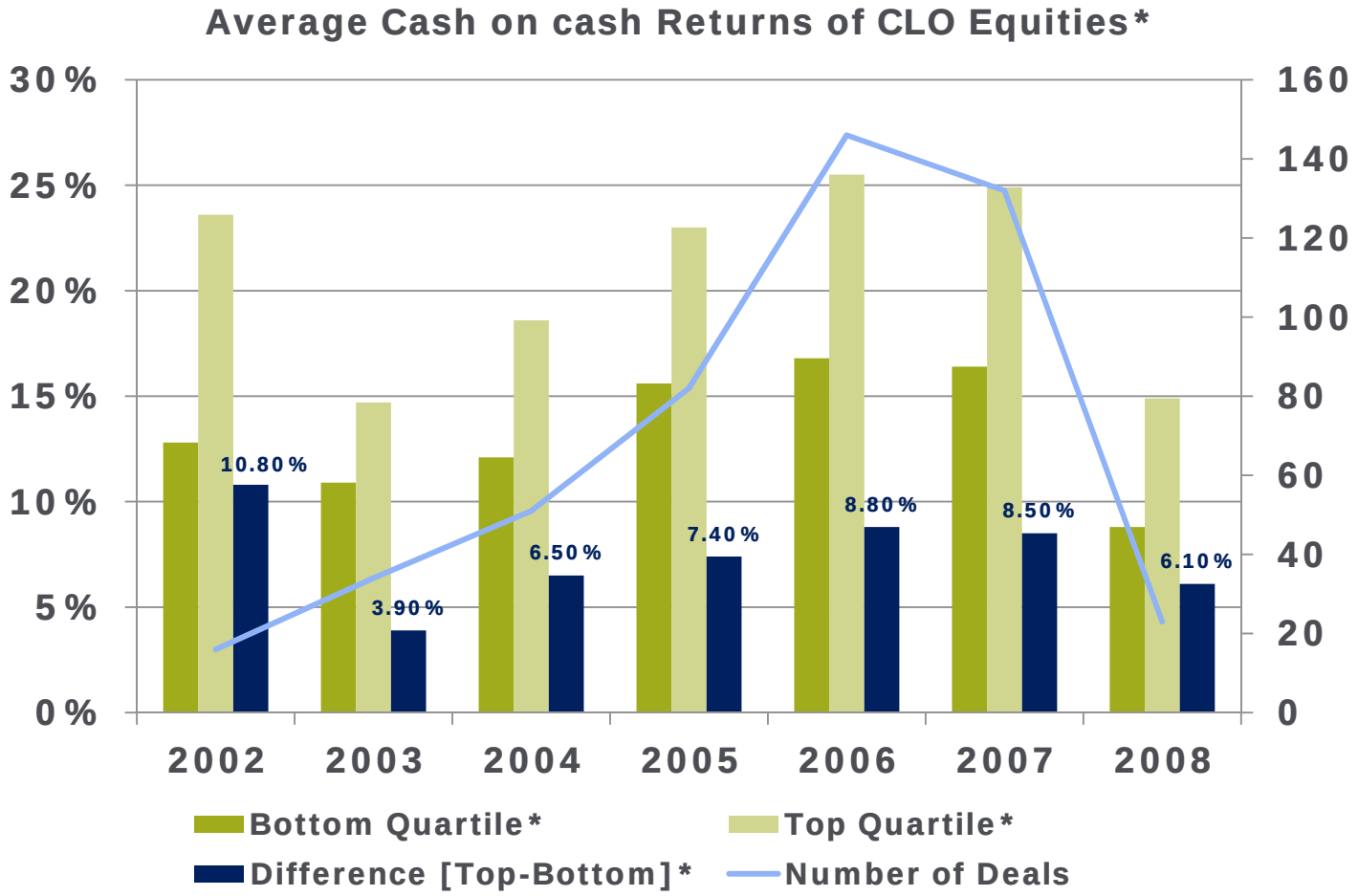
- Since CLOs are actively managed deals with a finite reinvestment period, the performance of equity tranche greatly depends on the future path of asset spreads
- Reinvestment period benefits from spread volatility
- Refer case study : 2003 vs. 2007 vintage performance in the next tab

2. The arbitrage spread (Asset spreads - Cost of Liability)

- All else equal, deals with lower liability cost can generate higher equity returns



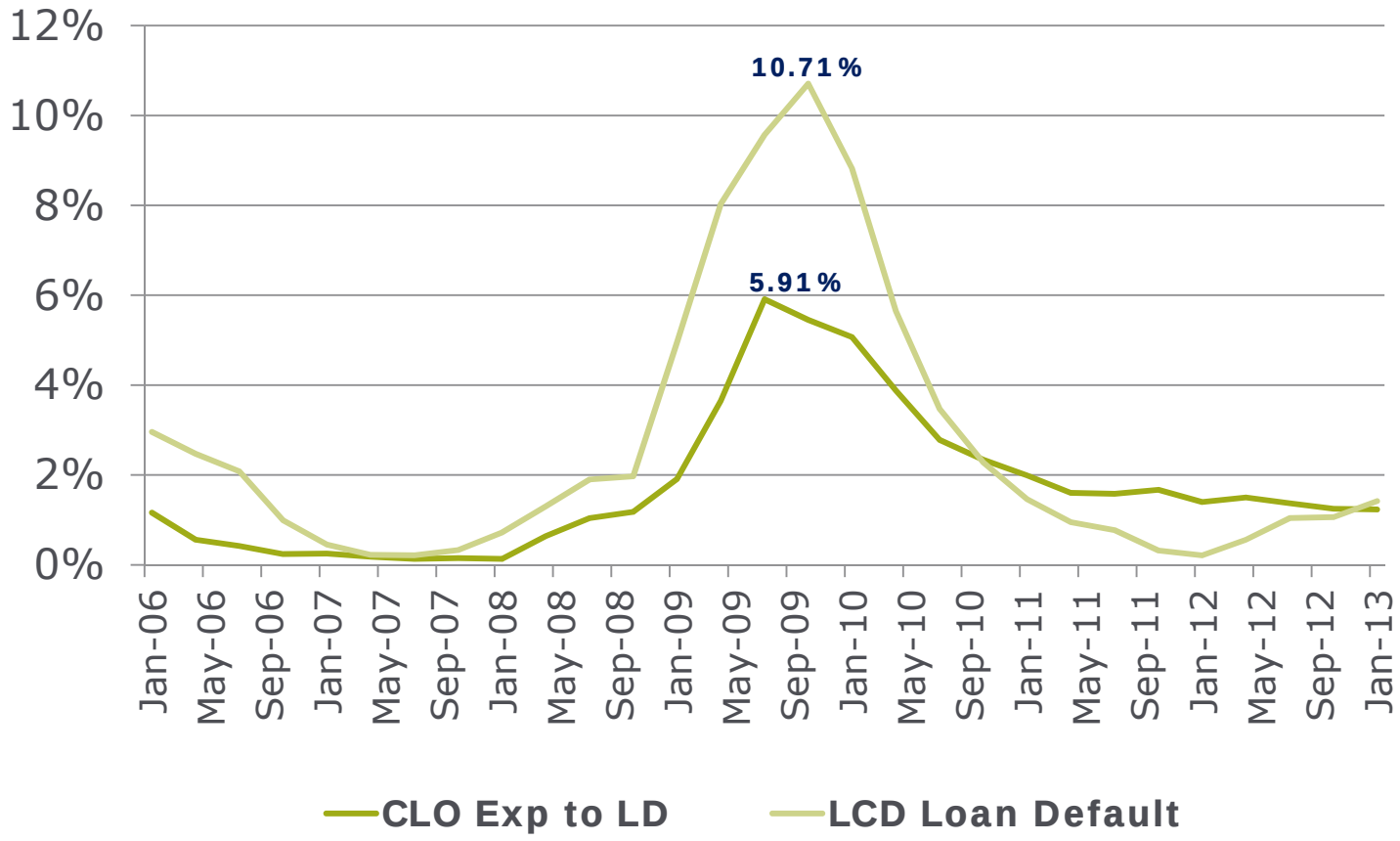
3. CLO Manager Skill: Wide gap between top and bottom quartile equity returns



Source: Credit Suisse, Intex
As if 2/15/12. Representative universe excludes CLO squared deals, deals with Lehman Par Building structure**, middle market CLOs and other CLOs with non-standard features
**Lehman Par Structure: when a default occurs or a loan is sold at a discount, payments are diverted from equity holders to buy new loans so the collateral does not shrink

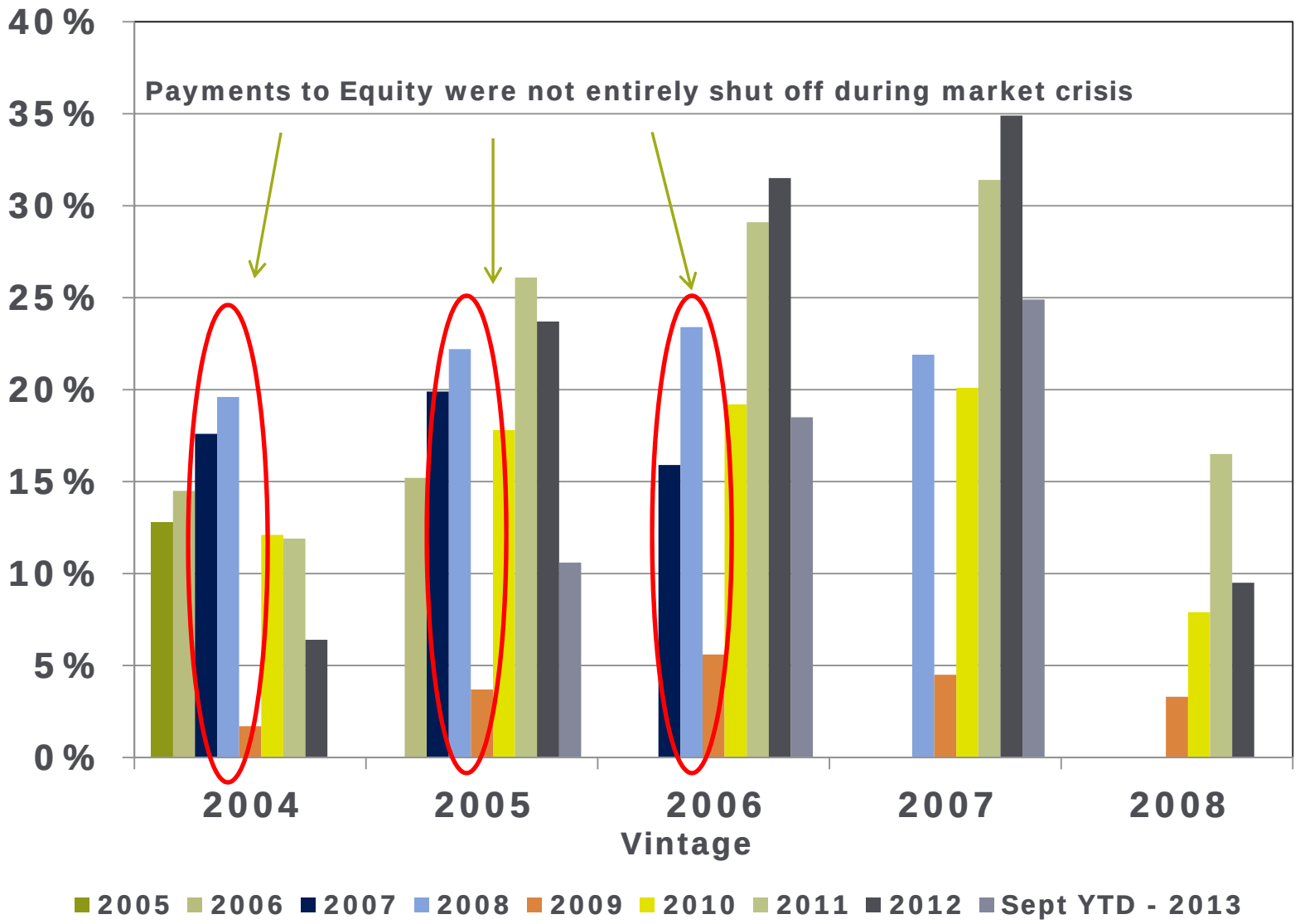
4. Default rate specific to the CLO

– It will also depend on the manager's skill for analyzing underlying collateral and navigating the asset pool during reinvestment period



Source: LibreMax,RBS,Intex

Importance of Vintage Diversification: Cash On Cash Yield By Vintage



Source: Morgan Stanley CLO Tracker September 2013

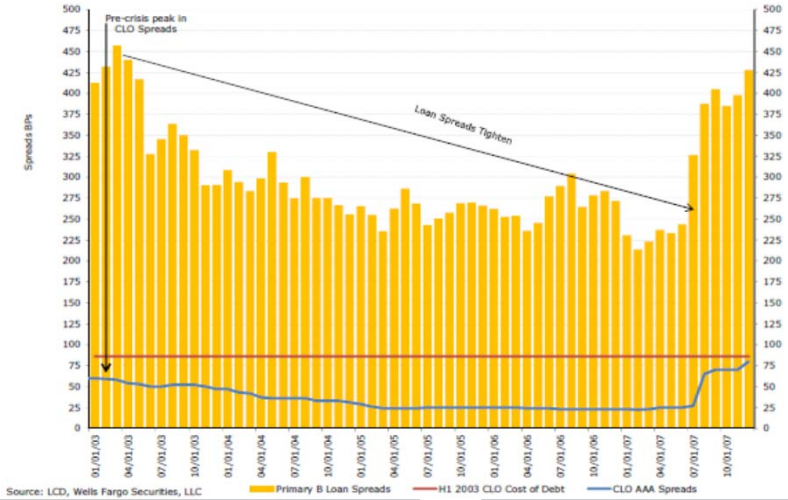
Gaining Exposure to the CLO Market

- **Types of manager participation in the CLO market**
  - Primary Issuance – managers investing in new issue CLOs
  - Secondary Issuance – managers buying stakes in CLOs on the secondary market
  - Active Investment – managers taking majority/control stakes in CLOs in order to maintain the ability to call a deal
  - Passive Investment – managers purchasing minority/non-control stakes in CLOs
  - Risk Retention – Typically closed-end fund in nature, investors invest directly with CLO managers for the life of the CLO. This satisfies the US and European regulators as it pertains to 5% stake CLO managers must invest in new issue deals.
- **How to access these strategies**
  - Multi-Strategy:
    - Dedicated CLO Funds
    - Multi-Strategy Structured Credit
    - Multi-Strategy Credit
  - Closed End & Evergreen
    - Increased liquidity is not always better

Case Study: CLO 2003 vs. 2007 Vintage

2003 Vintage CLO : Performance

2003 Vintage CLO Performance



Issuance Environment

- High relative funding gap at issuance, ~ at or above 300 bps
- 80%/20% mix of single-B/BB loans produced an average spread of approximately 400 bps
- CLO financing costs were approximately 90 bps (AAA spreads were 50 bps–60 bps)
- Issuance occurred at the cusp of a four-year tightening of loan and credit markets

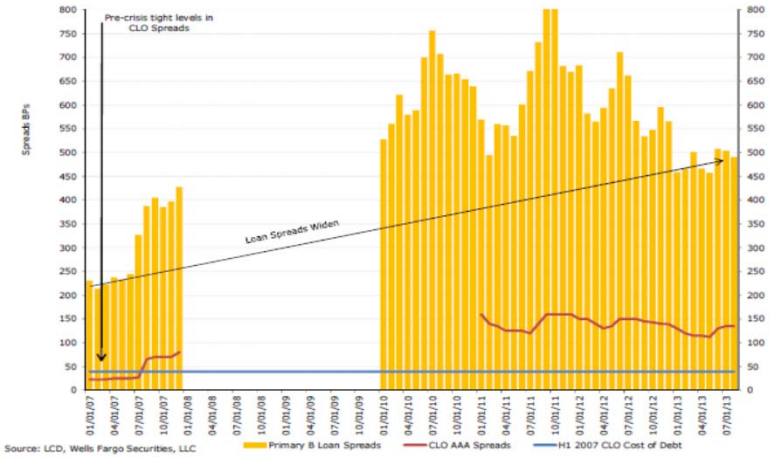
Reinvestment Environment

- CLOs had relatively high liability spreads and faced several years of reinvesting in a tightening market
- Loan spreads were approximately 150 bps tighter than at issuance
- CLOs could not reinvest since they were already in amortization period

Source: Wells Fargo

2007 Vintage CLO : Performance

2007 Vintage CLO Performance



Issuance Environment

- Low Funding gap (low arbitrage spreads)
- Typical deal had a seven year reinvestment period
- Issuances occurred at a cusp of financial crisis
-

Reinvestment Environment

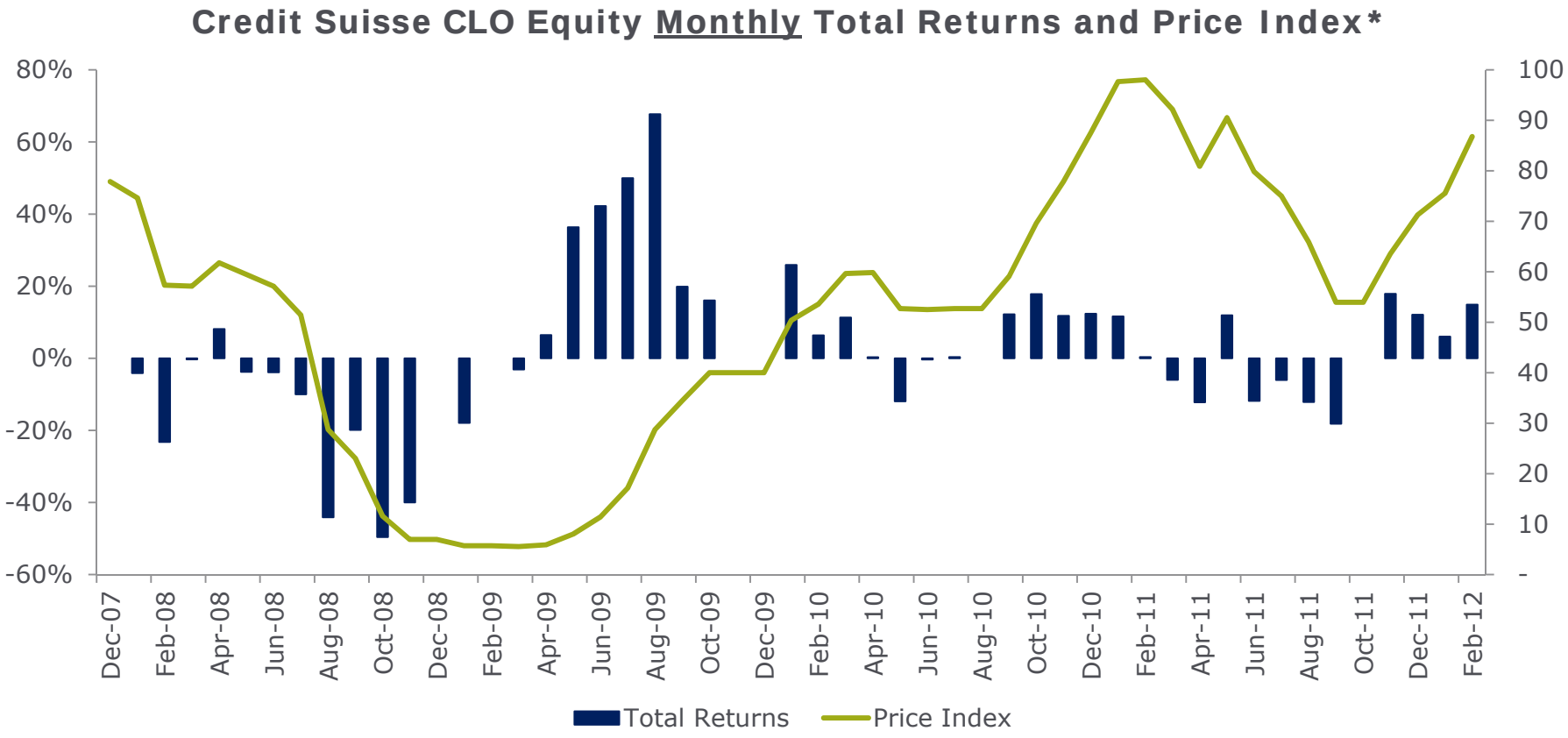
- Financial crisis caused the loan spreads to widen out considerably
- Deals could reinvest in loans with much wider spreads than at deal issuance
- Some deals experienced a temporary shutoff of equity distribution in 2008-09, but most managers could navigate through that since the CLO's were still in reinvestment mode.

Source: Wells Fargo

Historical Performance – CLO Equity

CLOs: Volatility of CLO Equity

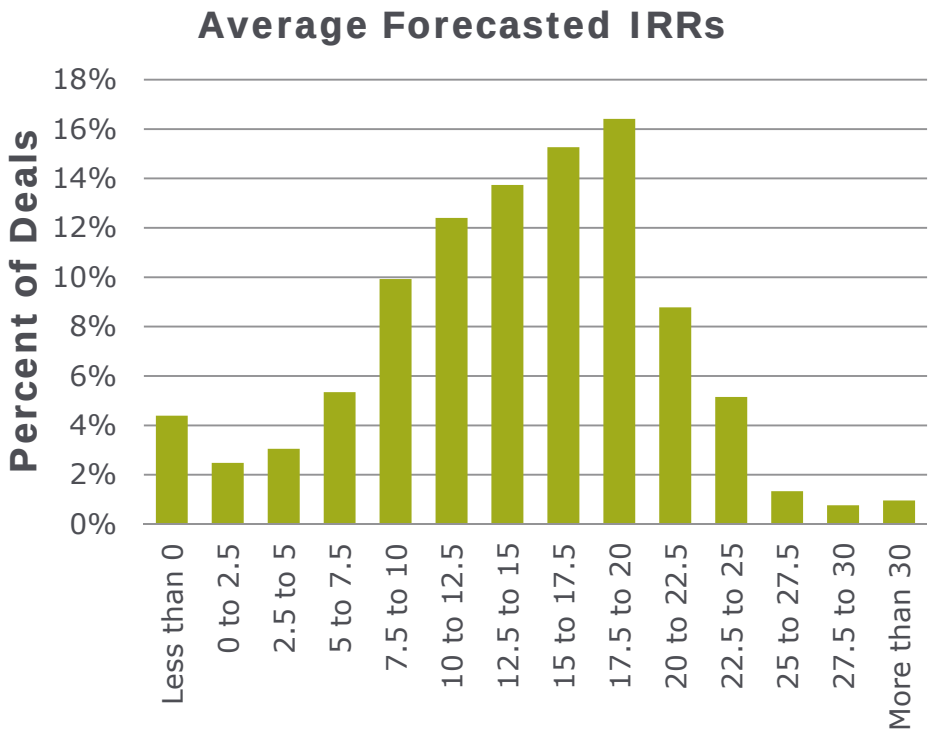
Since 2008, total returns have been quite volatile mainly due to a high price volatility. On a monthly basis, a CLO equity investor could lose as much as 40-50% during the fall of 2008, but the investor could later earn more than 50% each month in mid-2009.



Source: Credit Suisse, *The CDO Strategist*, February 2012
Primarily 2005 to 2008 vintages.

CLOs: Forecasted IRR of CLO Equity

Deal Universe by Vintage	
2002	7
2003	27
2004	51
2005	82
2006	155
2007	155
2008	16
2009	0
2010	9
2011	22
Total	**524**



- **96% of CLOs issued from 2002 to 2011 are expected to return at least full capital to the equity holder**
- **49% are expected to generate IRRs of at least 15% for the equity holder**

Source: Citi Research, *Global Structured Credit Strategy*, September 2012
Forecasted IRRs assume a 2% annual default rate, a 75% recovery rate, and a 20% prepayment rate for the collateral loans

Risk Factors

Key Risk Considerations: Investment in CLO Equity

- **Warehousing period MTM risk**
  - Typically applicable for primary market control investing
  - Not applicable for secondary market investments
- **Timing of the reinvestment period**
  - Refer case study 2003 vs. 2007 vintage
- **Increase in the cost of leverage will reduce the arbitrage spread available to the equity tranche**
- **Equity tranche is the first loss security, therefore it is important to note the key default / recovery assumptions of a particular CLO**
- **Manager skill set varies considerably from collateral analysis to structuring capabilities**
  - There is a considerable difference in performance of top and bottom quartile managers
- **Consider diversifying investments across different vintages to reduce exposure to a single reinvestment period**

Disclaimer

- **Past performance is no guarantee of future results.**
- **Data used to prepare this report was obtained directly from the investment manager(s). While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.**
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Alternative Investment Disclosures

It is important that investors understand the following characteristics of non-traditional investment strategies including hedge funds and private equity:

1. **Performance can be volatile and investors could lose all or a substantial portion of their investment**
2. **Leverage and other speculative practices may increase the risk of loss**
3. **Past performance may be revised due to the revaluation of investments**
4. **These investments can be illiquid, and investors may be subject to lock-ups or lengthy redemption terms**
5. **A secondary market may not be available for all funds, and any sales that occur may take place at a discount to value**
6. **These funds are not subject to the same regulatory requirements as registered investment vehicles**
7. **Managers may not be required to provide periodic pricing or valuation information to investors**
8. **These funds may have complex tax structures and delays in distributing important tax information**
9. **These funds often charge high fees**
10. **Investment agreements often give the manager authority to trade in securities, markets or currencies that are not within the manager's realm of expertise or contemplated investment strategy**