
The Science of Finance

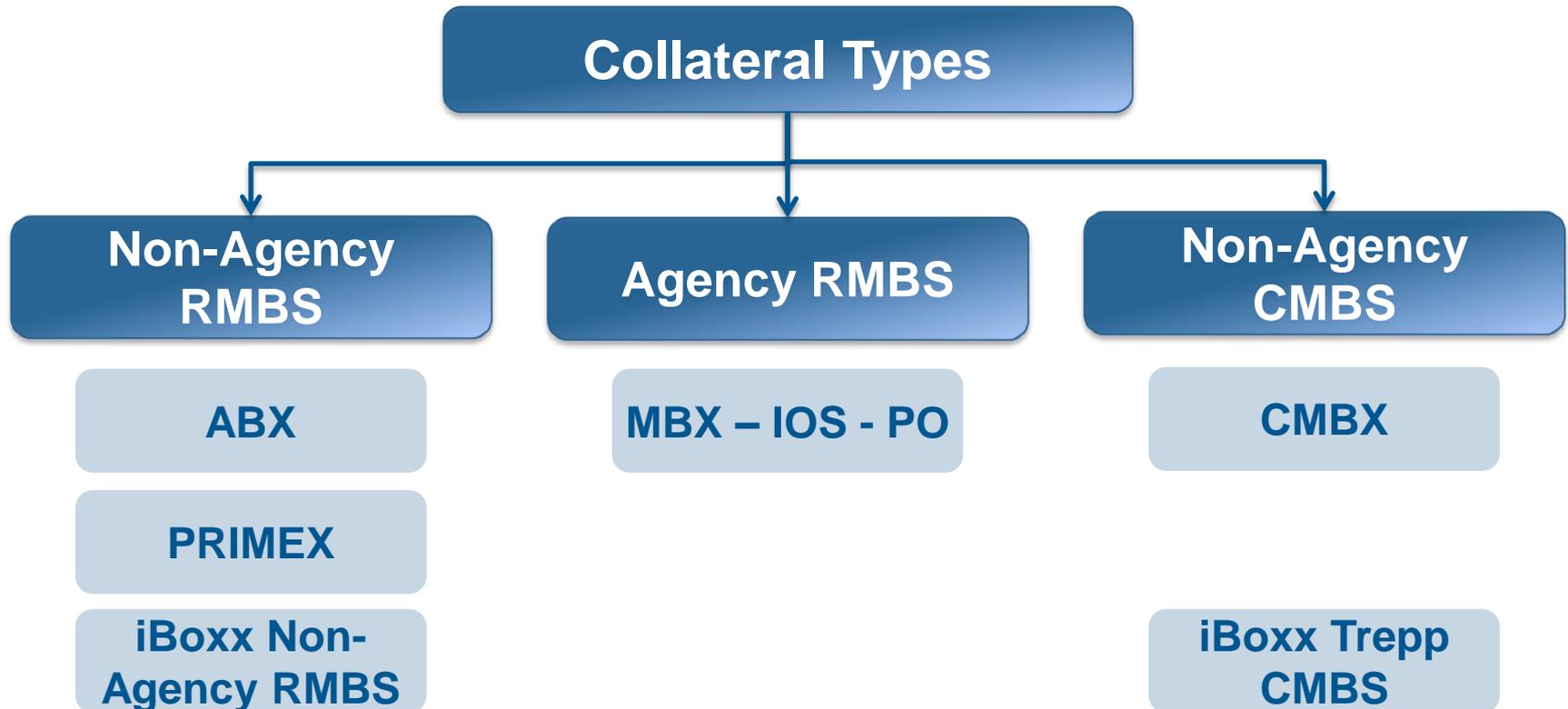
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Markit Securitised Products Indices

November 2015

Introduction

- Markit Securitized Products Indices allow investors to gain exposure to and/or track the performance of the Agency RMBS, Non-agency RMBS, and CMBS markets.



Markit Securitised Products Indices

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Markit ABX Indices

- The Markit ABX.HE Indices are a synthetic tradable index family that allows investors to gain/hedge exposure to subprime RMBS collateral via ABCDS contracts
- Launched on January 16th, 2006
- Each index references 20 subprime RMBS deals/bonds satisfying a series of concentration and collateral criteria that were issued six months prior to each roll date (480)
- 24 Sub-indices – Ratings from AAA to BBB-
 - 06-1: references deals from June 2005 – Jan 2006
 - 06-2: references deals from Jan 2006 – June 2006
 - 07-1: references deals from July 2006 – Jan 2007
 - 07-2: references deals from Jan 2007 – June 2007

XYZ Sells Protection on \$100mm ABX.HE.AAA.06-1

Fixed Rate on ABX.HE.AAA.06-1 is 18 basis points per annum, payable monthly

• **Fixed Rate Payer = Protection Buyer**

- Pays 18 bps per annum, monthly, to counterparty on notional amount
 - Notional amount will decline over time based on amortization of reference obligations
- Receives floating payments in the event of:
 - Interest Shortfall
 - Principal Shortfall
 - Writedown
- Makes payment in the event of:
 - Interest Shortfall Reimbursement
 - Principal Shortfall Reimbursement
 - Writedown Reimbursement

• **Floating Rate Payer = Protection Seller**

- Receives 18 bps per annum, monthly, from counterparty on notional amount
 - Notional amount will decline over time based on amortization of reference obligations
- Pays Fixed Rate Payer in the event of:
 - Interest Shortfall (capped at fixed rate)
 - Principal Shortfall
 - Writedown
- Receives payment in the event of:
 - Interest Shortfall Reimbursement
 - Principal Shortfall Reimbursement
 - Writedown Reimbursement

Markit ABX Indices – Upfront Exchange



Initial Trade Details

| | |
|-----------------------|--------------------------------|
| Notional Amount: | \$10,000,000 |
| Trade Date: | April 5th, 2010 |
| Initial Payment Date: | April 8th, 2010 (T+3) |
| Period Index Factor: | 0.844995803 (March 25th, 2010) |
| Coupon: | 0.0054 |
| Day Accrued: | 21 |
| Traded Price: | 0.85 |

Initial (Upfront) Payment – Protection Seller

Index Calculation

$$=(\text{Traded Price} - \text{Par}) * \text{Factor} * \text{Notional}$$

$$=(0.85 - 1) * 0.844995803 * (-10,000,000) = \mathbf{\$1,267,493.70}$$

Accrued

$$=\text{Daycount} * \text{Coupon} * \text{Factor} * \text{Notional}$$

$$=(21/360) * 0.005 * 0.844995803 * (-10,000,000) = \mathbf{\$(2,464.57)}$$

Total

$$= \text{Index Calculation} + \text{Accrued} = \mathbf{\$1,265,029.13}$$

Markit ABX Indices – Monthly Settlement



Monthly Settlement Details

| | |
|--------------------|---|
| Notional Amount: | \$10,000,000 |
| Trade Date: | April 5 th , 2010 |
| Period Start Date: | March 25 th , 2010 |
| Period End Date: | April 25 th , 2010 |
| Index Factor: | 0.844995803 (March 25 th , 2010) |
| Coupon: | 0.0054 |
| Day Accrued: | 31 |

First Settlement Payment – Protection Seller

Interest Amount

=DayCount * Factor * Coupon * Notional

$=((31/360) * 0.844995803 * 0.0054 * 10,000,000)$

=\$3,929.23

Writedown & ISF

=(Writedown Amount + Interest Shortfall Amount)

=\$0

Total Monthly Payment

=Fixed Coupon + Writedown + ISF

=\$3,929.23

- **Trades are confirmed via DTCC**
- DTCC confirms all inter-dealer trades and trades with customers who are enabled
- Trades are documented using two-page confirms, referencing a standard terms supplement and annex posted on Markit's website
- **Standardized settlement calculation**
- Markit publishes monthly fixed and floating payments for each contract on its public website
- **Valuation analytics publicly available on www.markit.com**
- **Daily closing prices are available to clients who wish to purchase a data license**

Markit Securitised Products Indices

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Markit PrimeX Indices

- The Markit PRIMEX Indices are a synthetic tradable index family that allows investors to gain/hedge exposure to Prime RMBS collateral via ABCDS contracts
- Original launch date of April 25th, 2010
 - Each index will serve as a standardized, diverse, and liquid tool referencing 20 securitized fixed-rate or hybrid ARM loans satisfying a series of concentration and collateral criteria
- Vintages will be separated by a cutoff date of July 1st, 2006, creating 4 different sub-indices. (191)
 - PrimeX.FRM.1 (issued btw 1/1/2005 & 7/1/2006)
 - PrimeX.ARM.1 (issued btw 1/1/2005 & 7/1/2006)
 - PrimeX.FRM.2 (issued btw 7/1/2006 & 12/31/2007)
 - PrimeX.ARM.2 (issued btw 7/1/2006 & 12/31/2007)

Trading – XYZ Sells Protection on \$10mm PRIMEX.FRM.1

Fixed Rate on PRIMEX.FRM.1 is 442 basis points per annum, payable monthly

- **Fixed Rate Payer = Protection Buyer = Index Buyer**

- Pays 442 bps per annum, monthly, to counterparty on notional amount
 - Notional amount will decline over time based on amortization of reference obligations
- Receives floating payments in the event of:
 - Interest Shortfall
 - Principal Shortfall
 - Writedown
- Makes payment in the event of:
 - Interest Shortfall Reimbursement
 - Principal Shortfall Reimbursement
 - Writedown Reimbursement

- **Floating Rate Payer = Protection Seller = Index Seller**

- Receives 442 bps per annum, monthly, from counterparty on notional amount
 - Notional amount will decline over time based on amortization of reference obligations
- Pays Fixed Rate Payer in the event of:
 - Interest Shortfall (capped at fixed rate)
 - Principal Shortfall
 - Writedown
- Receives payment in the event of:
 - Interest Shortfall Reimbursement
 - Principal Shortfall Reimbursement
 - Writedown Reimbursement

Markit PrimeX Indices – Upfront Exchange



Trade Details

Notional Amount: \$10,000,000

Trade Date: May 19th, 2011

Initial Payment Date: May 24th, 2011 (T+3)

Traded Price: 88.75

Index Factor: 0.505893262713023 (published April 25th)

Coupon: 442 bps

Day Accrued: 24 (from April 25th)

Initial (Upfront) Payment – Protection Buyer

=Clean PV - Accrued Interest

$$=(\text{Notional} * ((\text{Price}/100) - 1) * \text{Factor}) + (\text{Coupon} * \text{Notional} * \text{DayCount} * \text{Factor})$$

$$=(10,000,000 * ((88.75/100)-1) * 0.505893262713023) + (0.0442 * 10,000,000 * (24/360) * 0.505893262713023)$$

=\$(-554,222.93)

There is a negative PV using a positive notional, meaning the short position needs to compensate the long position for the added risk implied by the price below par. Accrued interest is positive with positive notional..

Markit PrimeX Indices – Monthly Settlement



Monthly Settlement Details

Notional Amount: \$10,000,000

Trade Date: May 19th, 2011

Period Start Date: April 25th, 2011

Period End Date: May 25th, 2011

Index Factor: 0.505893262713023 (published April 25th)

Coupon: 442 bps

Day Accrued: 30 (since April 25th)

First Settlement Payment – Protection Seller

Interest Amount

=DayCount * Factor * Coupon * Notional

$=((30/360) * 0.505893262713023 * 0.0442 * 10,000,000$

=\$18,663.74

Writedown & ISF

=(Writedown Amount + Interest Shortfall Amount)

=\$-(21,189.00)

Total Monthly Payment

=Fixed Coupon + Writedown + ISF

=\$-(2,555.27)

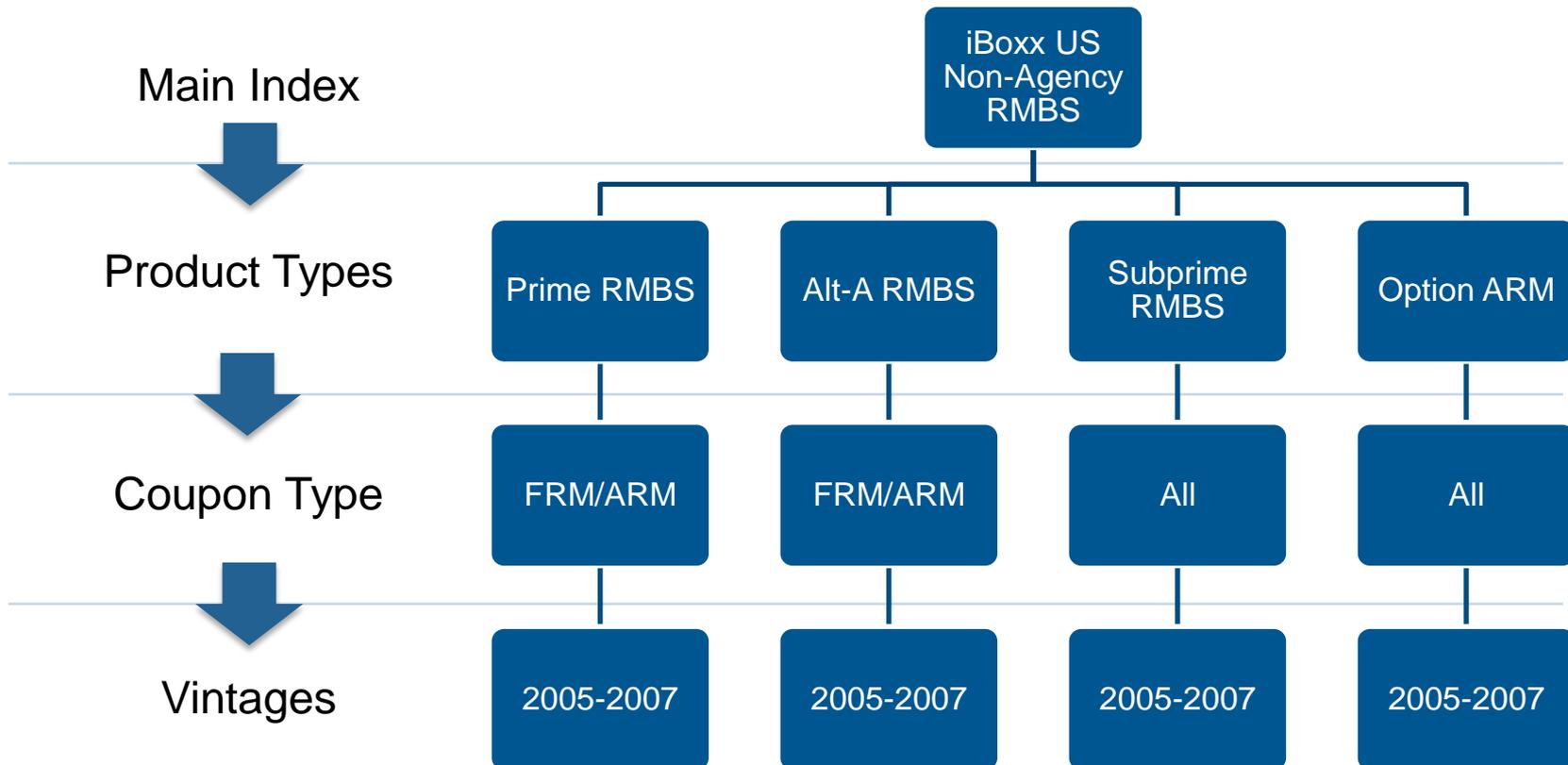
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Markit Securitised Products Indices

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Markit iBoxx U.S. Non-Agency RMBS Indices

Markit iBoxx US Non-Agency RMBS – Universe Breakdown



Our goal is to create an index which compiles a representative set bonds from each of the main Non-Agency RMBS sub-sectors

- 18 separate sub-sectors representing the Non-Agency RMBS universe
 - 27 Total Indices, broken down by collateral type, coupon, and vintage
- Index references a total of 350 “senior” securities issued between 2005-2007
 - Each sub-sector references the top 20% of the current balance of all qualifying bonds within that sub-sector (**rebalanced annually**)
 - At least 15 securities in each of the 18 sub-sectors
 - Super-Senior or currently paying senior SubPrime, all originally AAA rated
 - No bonds in the index can be from the same deal
- Over \$75B in principal balance referenced
 - Average tranche size is \$200MM current face
- iBoxx US Non-Agency RMBS indices use standard iBoxx index methodology
 - Incorporates all redemptions, calculates total return & price return

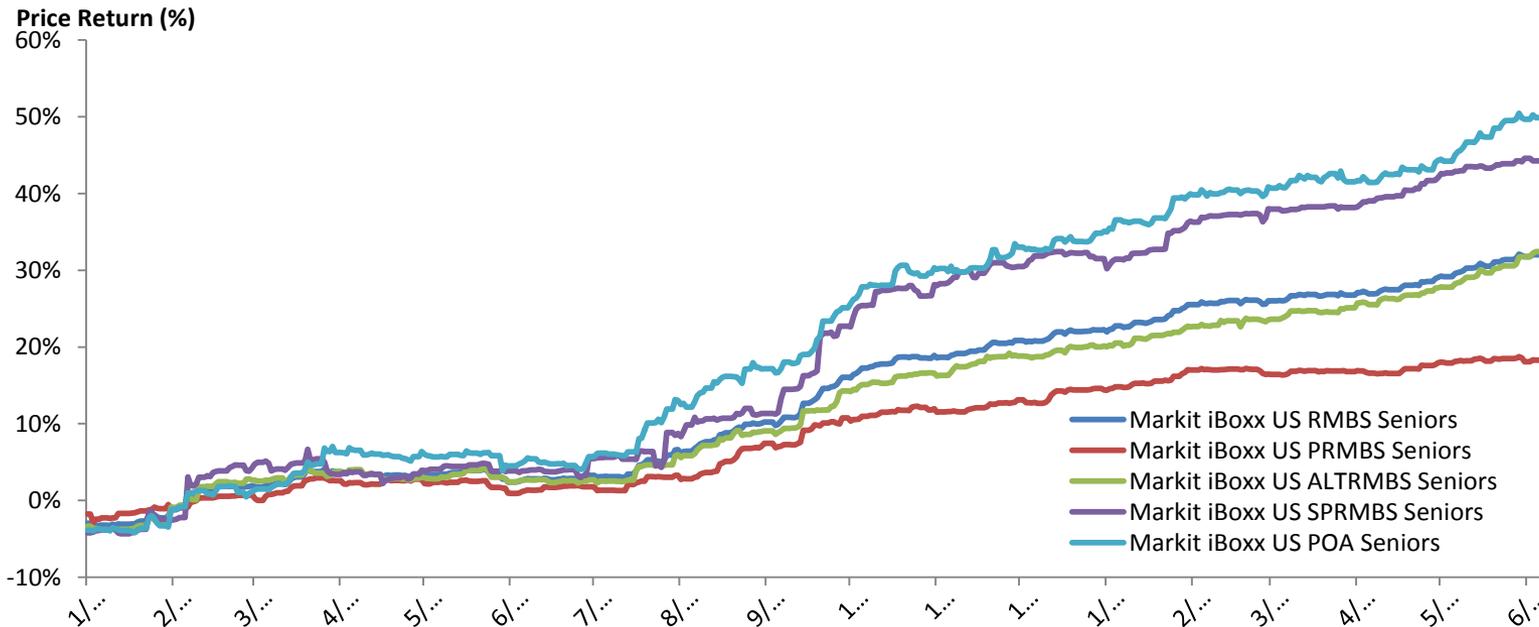
| | |
|------------------------------|---|
| Included Bonds | US Non-Agency Bonds Publically Available |
| Structure Selection | Senior most Notes Subprime: Current Pay Seniors |
| Excluded Securities** | ReRemics, HELOCs, Second Liens, Exchangeable, Insured, Subordinate Notes |

** Exclusions are based on underlying loan size, deal structure and liquidity. Insured and ReRemic bonds are excluded due to complex pricing scenarios and lack of liquidity.

The Non-Agency RMBS sector produced substantial returns in 2012

- Overall RMBS Index up 22.24% in Price Return; 30.65% in Total Return
- Pay-Option ARM and SubPrime security prices were up over 30%
- Alt-A and Prime security prices were up about 15-20%

Markit iBoxx US Non-Agency Performance



Markit provides index level Total Return and Price Return for all available indices

- Total Return files include base asset value, current market value, sector return, price return, and total cash received (i.e. redemption & coupon payments)
- Files are provided by 5pm on each US business day

Markit provides price data on all iBoxx constituents

- Includes prices (bid, mid, ask), projected weighted average life, and cashflow assumptions used in generating the prices

Total Return Calculator available for subscribers

- Provides clients with the ability to calculate total return and price return between specific date ranges

Nonagency iBoxx

ABX.HE CMBX TRX PrimeX Agency Derivatives **Nonagency iBoxx** Euro Total Retu

Select sector

From To as of

Index History

| Date | Base Asset Value |
|-----------|-------------------|
| 01Jan2013 | 43,791,318,664.65 |

| Date | Base Asset Value |
|-----------|-------------------|
| 01Jan2013 | 43,791,318,664.65 |
| 01Dec2012 | 44,137,427,023.46 |
| 01Nov2012 | 43,966,387,065.49 |
| 01Oct2012 | 43,638,923,617.28 |
| 01Sep2012 | 43,019,358,949.81 |
| 01Aug2012 | 43,256,145,249.24 |
| 01Jul2012 | 41,401,405,541.33 |
| 01Jun2012 | 42,206,546,113.07 |

Markit Securitised Products Indices

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Markit Agency Derivatives Indices

- The Agency Derivatives Indices are synthetic Total Return Swap Indices that allow investors to gain/hedge exposure to fixed rate Agency RMBS collateral
 - Launched on March 12th, 2010
 - 81 Sub-indices referencing different Agency coupons and vintages (102393 pass throughs)
- IOS, PO, and MBX varieties
 - Index cashflows reference either the interest component, principal component, or combined cashflows of the underlying collateral respectively
 - Monthly index cashflow exchanges reflect the change in market value of the reference pool's interest, principal, or combined cashflow component, in addition to the standard fixed coupon and floating rate (i.e. LIBOR) payments

XYZ goes short \$10mm IOS.FN30.450.09

Fixed Rate on IOS.FN30.450.09 is 450 basis points per annum, payable monthly

- **Long Position = Index Buyer**

- If Traded Price*Factor is **less** than Reset Date Price*Factor, Index Buyer receives initial payment amount calculated from price*factor differential for the calculation period **net** of coupon payments – financing payments as of Trade Date
- Buyer **pays** full financing amount on each payment date based on day count, LIBOR, factor, and Reset Date Price
- Buyer **receives** coupon amount on each payment date based on day count, agency coupon, and factor
- If 2nd Period End Price*Factor is **less** than Reset Date Price*Factor, Buyer pays MTM Payment

- **Short Position = Index Seller**

- If Traded Price*Factor is **greater** than Reset Date Price*Factor, Index Seller receives initial payment amount calculated from price*factor differential for the calculation period **net** of coupon payments – financing payments as of Trade Date
- Buyer **receives** full financing amount on each payment date based on day count, LIBOR, factor, and Reset Date Price
- Seller **pays** coupon amount on each payment date based on day count, agency coupon, and factor
- If 2nd Period End Price*Factor is **greater** than Reset Date Price*Factor, Seller pays MTM Payment

Markit Agency Derivatives Indices – Upfront Exchange



Initial Trade Details

| | |
|--------------------------|---------------------------------|
| Notional Amount: | \$10,000,000 |
| Trade Date: | April 5th, 2010 |
| Initial Payment Date: | April 8th, 2010 (T+3) |
| Initial Period End Date: | April 12th, 2010 |
| Reset Factor: | 0.969874532 (March 11th, 2010) |
| Reset Date Price: | 27.12 (March 11th, 2010) |
| Coupon: | 0.045 |
| Index LIBOR: | 0.0034 (EOD March 10th, 2010) |
| Day Accrued: | 23 for coupon, 24 for financing |

Initial (Upfront) Payment

MTM Component

$=(\text{Traded Price}-\text{Reset Date Price}) * \text{Reset Factor} * \text{Notional}$

$=(0.2645-0.2712) * 0.969874532 * 10,000,000 = \mathbf{\$(64,981.59)}$

Net Coupon & Financing Component

$=[(\text{Coupon} * (\text{day count } 30/360) * \text{Notional} * \text{Reset Factor})] - [(\text{LIBOR} * \text{Reset Date Price} * (\text{day count } A/360) * \text{Notional} * \text{Reset Factor}0]$

$=[(0.045 * (23/360) * 10,000,000 * 0.9698745320)] - [(0.0034 * 0.2712 * (24/360) * 10,000,000 * 0.9698745320]$

$= \mathbf{\$27,287.69}$

Initial Payment of \$(37,693.90) indicates market value has decreased. Index buyer receives this amount, which is net of the interest/financing that has already occurred.

Markit Agency Derivatives Indices – Monthly Settlement



Monthly Settlement

Reset Date: April 9th, 2010

Period End Date: April 12th, 2010

Payment Date: April 15th, 2010

Coupon: 0.045

Index LIBOR: 0.0034 (March 10th, 2010)

Reset Factor: 0.969874532 (March 11th, 2010)

Reset Date Price: 27.12 (March 11th, 2010)

Period End Factor: 0.959942355 (April 9th, 2010)

Period End Price: 26.89 (April 9th, 2010)

First Settlement Payment

Interest Amount

$$=(\text{Coupon} * (\text{day count } 30/360) * \text{Notional} * \text{Reset Factor})$$
$$=(0.045 * (30/360) * 10,000,000 * 0.969874532)$$

=\$36,370.29 (paid by Index Seller)

Financing Amount

$$=(\text{LIBOR} * \text{Reset Date Price} * (\text{day count } A/360) * \text{Notional} * \text{Reset Factor})$$
$$=(0.0034 * 0.2712 * (31/360) * 10,000,000 * 0.969874532)$$

=\$770.09 (paid by Index Buyer)

MTM Change Amount

$$=[(\text{Period End Price} * \text{Period End Factor}) - (\text{Reset Date Price} * \text{Reset Factor})] * \text{Notional}$$
$$=(0.2689 * 0.959942355) - (0.2712 * 0.969874532) * 10,000,000$$

=\$ (49,014.74)

Negative MTM Change indicates Market Value decreased. Index Buyer pays \$13,414.54 for total payment, which is net of interest and financing.

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Markit Securitised Products Indices

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Markit CMBX Indices

- The Markit CMBX Indices are a synthetic tradable index family that allows investors to gain/hedge exposure to CMBS collateral via ABCDS contracts
- Original launch date was March 7th, 2006
- Each index references 25 subprime CMBS deals/bonds satisfying a series of concentration and collateral criteria that were issued six months prior to each roll date (1425 bonds)
- 57 Sub-indices - Ratings from AAA – BB (includes AM and AJ - launched in 2010)
- Each accrual period is from the 25th to the 25th
 - Underlying CMBS cash bonds actually pay throughout the month (11th – 19th)
 - Markit and Dealer group set the accrual period to make these standardized contracts

Trading – XYZ Sells Protection on \$10mm CMBX.NA.AAA.7

Fixed Rate on CMBX.NA.AAA.7 is 50 basis points per annum, payable monthly

- **Fixed Rate Payer = Protection Buyer = Index Buyer**
 - Pays 50 bps per annum, monthly, to counterparty on notional amount
 - Notional amount will decline over time based on amortization of reference obligations
 - Receives floating payments in the event of:
 - Interest Shortfall
 - Principal Shortfall
 - Writedown
 - Makes payment in the event of:
 - Interest Shortfall Reimbursement
 - Principal Shortfall Reimbursement
 - Writedown Reimbursement
- **Floating Rate Payer = Protection Seller = Index Seller**
 - Receives 50 bps per annum, monthly, from counterparty on notional amount
 - Notional amount will decline over time based on amortization of reference obligations
 - Pays Fixed Rate Payer in the event of:
 - Interest Shortfall (capped at fixed rate)
 - Principal Shortfall
 - Writedown
 - Receives payment in the event of:
 - Interest Shortfall Reimbursement
 - Principal Shortfall Reimbursement
 - Writedown Reimbursement

Markit CMBX Indices – Upfront Exchange



Initial Trade Details

| | |
|-----------------------|------------------------|
| Notional Amount: | \$10,000,000 |
| Trade Date: | June 16th, 2014 |
| Initial Payment Date: | June 19th, 2014 (T+3) |
| Index Factor: | 0.844995803 (May 25th) |
| Coupon: | 0.0050 |
| Day Accrued: | 21 |
| Traded Price: | 0.97 |

Initial (Upfront) Payment – Protection Seller

Index Calculation

$$=(\text{Traded Price} - \text{Par}) * \text{Factor} * \text{Notional}$$

$$=(0.97 - 1) * 0.844995803 * (-10,000,000) = \mathbf{\$253,498.74}$$

Accrued

$$=\text{Daycount} * \text{Coupon} * \text{Factor} * \text{Notional}$$

$$=(21/360) * 0.005 * 0.844995803 * (-10,000,000) = \mathbf{\$(2,464.57)}$$

Total

$$= \text{Index Calculation} + \text{Accrued} = \mathbf{\$251,034.17}$$

Markit CMBX Indices – Monthly Settlement



Monthly Settlement Details

| | |
|--------------------|------------------------------|
| Notional Amount: | \$10,000,000 |
| Trade Date: | June 16th, 2014 |
| Period Start Date: | May 25th, 2014 |
| Period End Date: | June 25 th , 2014 |
| Index Factor: | 0.844995803 (May 25th) |
| Coupon: | 0.0050 |
| Day Accrued: | 31 |

First Settlement Payment

Interest Amount

$$\begin{aligned} &= \text{DayCount} * \text{Factor} * \text{Coupon} * \text{Notional} \\ &= ((31/360) * 0.844995803 * 0.005 * 10,000,000) \\ &= \mathbf{\$3,638.18} \end{aligned}$$

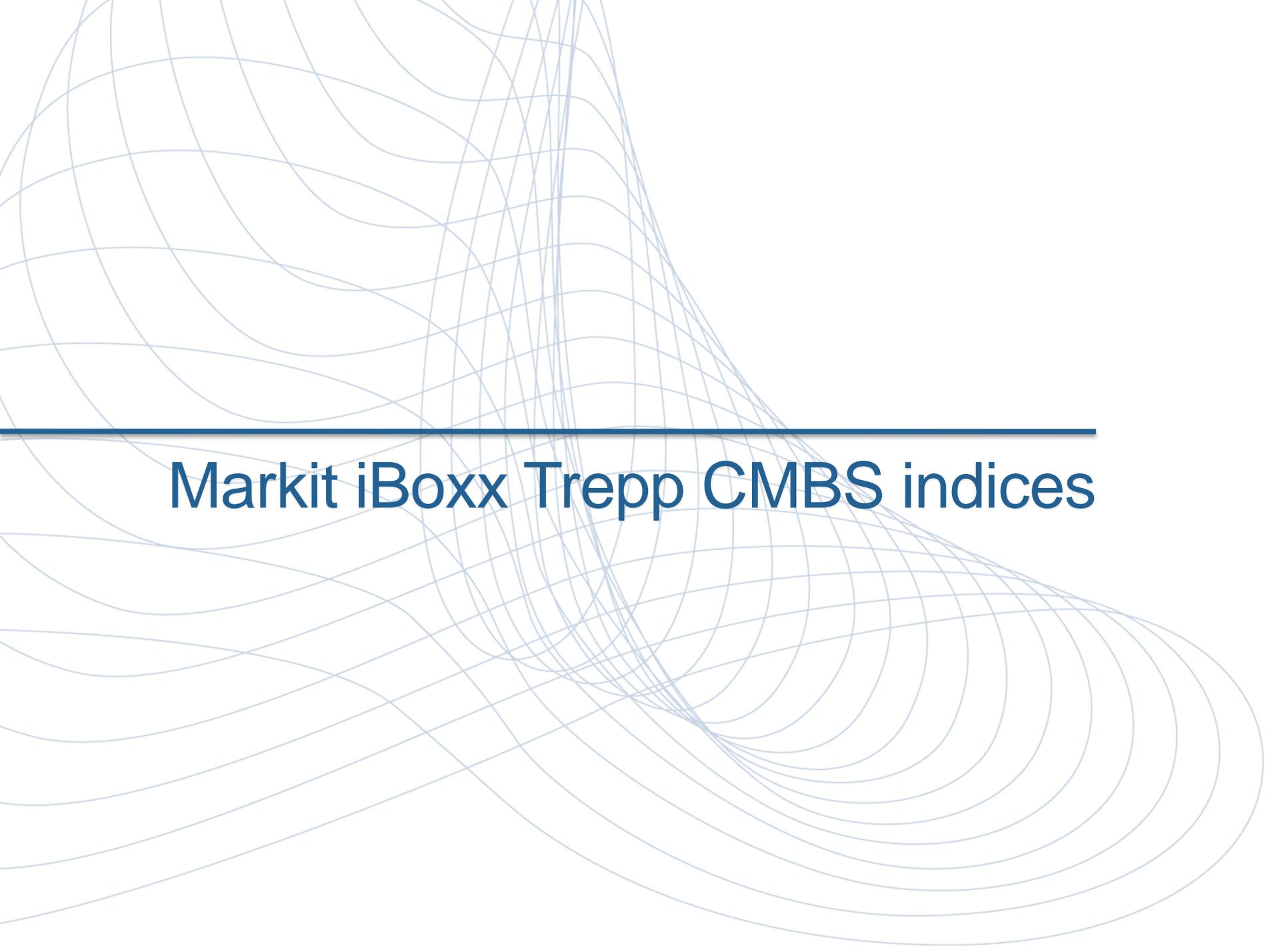
Writedown & ISF

$$\begin{aligned} &= (\text{Writedown Amount} + \text{Interest Shortfall Amount}) \\ &= \mathbf{\$0} \end{aligned}$$

Total Monthly Payment

$$\begin{aligned} &= \text{Fixed Coupon} + \text{Writedown} + \text{ISF} \\ &= \mathbf{\$3,638.18} \end{aligned}$$

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Markit iBoxx Trepp CMBS indices

The Markit iBoxx Trepp CMBS indices reflect the performance of USD denominated CMBS that are rated investment grade at issuance.

Markit iBoxx Trepp CMBS indices

CMBS Benchmark index

CMBS Liquid index

Benchmarking, research and risk management

Trading and replication

Investment Grade
Benchmark

AAA Benchmark

Markit iBoxx Trepp CMBS Investment Grade Benchmark



- Comprises **2,555** bonds, **50%** of the **5,101** bonds in the whole CMBS conduit non-IOs universe
- Total current balance is **\$383 billion**, **76.1%** of the whole CMBS conduit non-IOs universe

| | |
|--|---------|
| No. of bonds whole universe (excl interest only (IOs)) | 5,101 |
| No. of bonds in investment grade (IG) benchmark | 2,555 |
| No. of deals whole universe (excl. IOs) | 560 |
| No. of deals in IG benchmark | 334 |
| Whole total current balance (excl. IOs) | \$504bn |
| IG benchmark total current balance | \$383bn |
| IG benchmark % of whole universe (current bal) | 76.1% |

The CMBS conduit non-IO universe, the CMBS benchmark universe and the CMBS liquid universe are all derived using October 2014 data from Trepp, LLC.

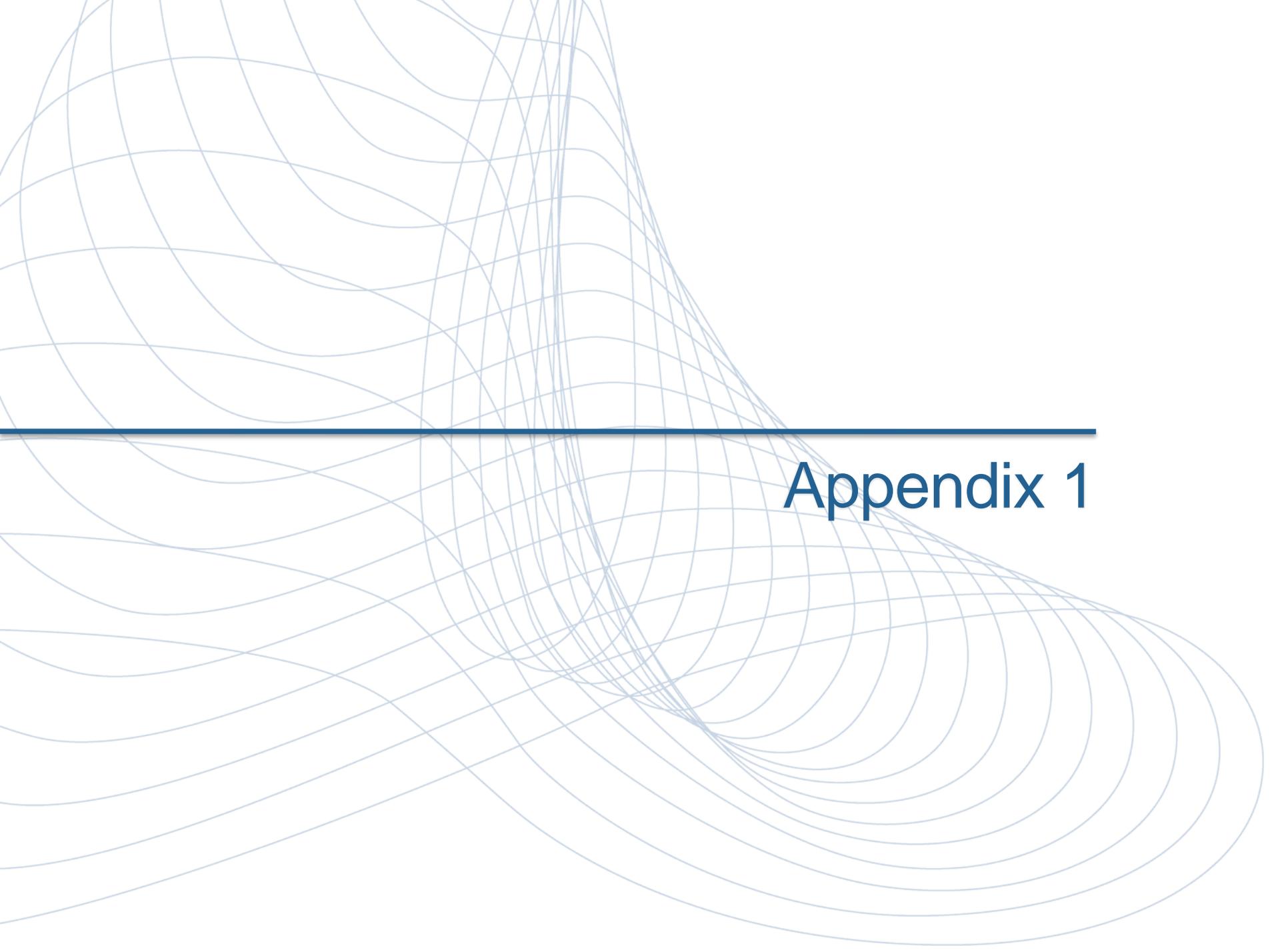
- Comprises **1,332** bonds, **26.1%** of the **5,101** bonds in the whole CMBS conduit non-IOs universe
- Total current balance is **\$338 billion**, **67.1%** of the whole CMBS conduit non-IOs universe

| | |
|--|---------|
| No. of bonds whole universe (excl. IOs) | 5,101 |
| No. of bonds in AAA benchmark | 1,332 |
| No. of deals whole universe (excl. IOs) | 560 |
| No. of deals in AAA benchmark | 282 |
| Whole total current balance (excl. IOs) | \$504bn |
| AAA benchmark total current balance | \$338bn |
| AAA benchmark % of whole universe (current bal) | 67.1% |

The CMBS conduit non-IO universe, the CMBS benchmark universe and the CMBS liquid universe are all derived using October 2014 data from Trepp, LLC.

- Comprises **127** bonds, **9.5%** of the 1,332 bonds in the CMBS AAA benchmark universe
- Total current balance is **\$79 billion**, **23.4%** of the CMBS AAA benchmark universe

| | |
|---|---------|
| No. of bonds in AAA benchmark | 1,332 |
| No. of bonds in liquid | 127 |
| No. of deals in AAA benchmark | 282 |
| No. of deals in liquid | 123 |
| AAA benchmark total current balance | \$338bn |
| Liquid total current balance | \$79bn |
| Liquid % of AAA benchmark (current bal) | 23.4% |



Appendix 1

CMBS Investment Grade Benchmark: Selection criteria

| | Include | Exclude |
|-------------------------------|--|--|
| Deal type | Conduit | Large loans, single-borrower, etc. |
| Original deal size | ≥ 500 mn | < 500 mn |
| Current deal size | ≥ 100 mn | < 100 mn |
| Original tranche size* | ≥ 10 mn | < 10 mn |
| Current tranche size | ≥ 1 mn | < 1 mn |
| Original rating | ≥ BBB- (IG Benchmark) ≥ AAA (AAA Benchmark) | < BBB- (IG Benchmark) < AAA (AAA Benchmark) |
| Bond type | Fixed-rate and WAC bonds | Floating-rate, modeling, non-polled single-asset, PEZ, PEX, PST, EC, Z, PAC, IO and PO bonds |
| Public/private | Public and 144A bonds | Private bonds |
| Weighted avg. life | ≥ 1 year | < 1 year |
| Bid price | >10 | <10 (Distressed bonds) |

*No tranche can be secured by underlying assets that are credit linked notes, synthetic CDOs or any similar synthetic obligations

CMBS Investment Grade Benchmark: Distribution and profile

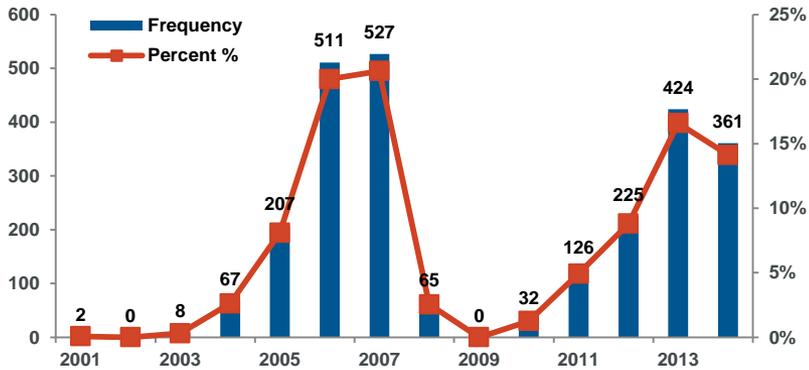
| | |
|-------------------------------------|--------|
| No. of bonds | 2,555 |
| No. of deals | 334 |
| Avg. original deal size (mn) | 1,999 |
| Avg. current deal size (mn) | 1,520 |
| Avg. original bond size (mn) | 161 |
| Avg. current bond size (mn) | 150 |
| Wgt. avg. price* | 102.92 |
| Wgt. avg. yield* | 3.19 |
| Wgt. avg. spread | 228.55 |
| Wgt. avg. WAL* | 3.89 |

*Weights for price and WAL are based on Current Bond Balance; weights for yield are based on Price * Current Bond Balance

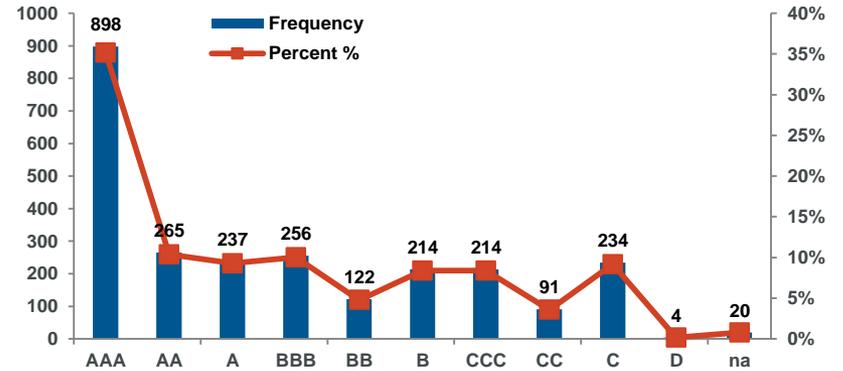
CMBS Investment Grade Benchmark: Distribution and profile



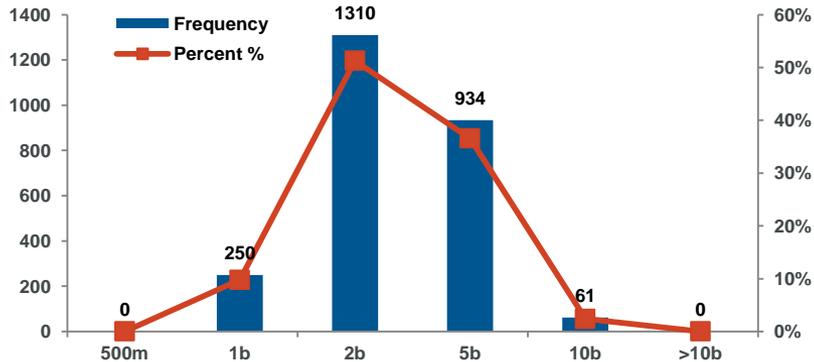
Vintage



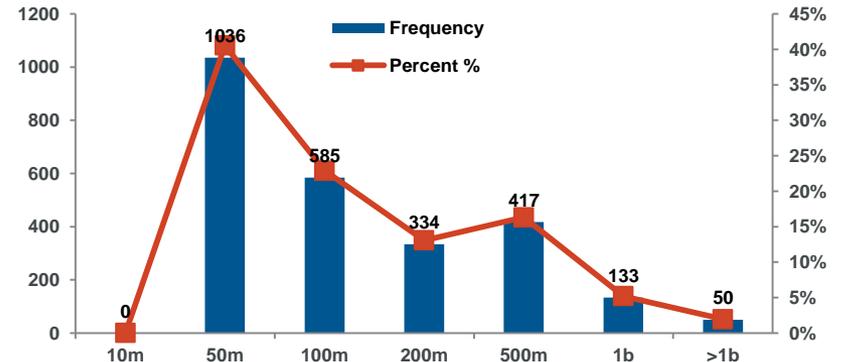
Current ratings



Original deal size



Original bond size



CMBS Investment Grade Benchmark: Sub indices



| | |
|-------------------------|--|
| Initial rating | AAA, AA, A, BBB |
| Current rating | AAA, AA, A, BBB, BB, B, CCC, CC, C |
| Seniority | SuperSenior, MezzSenior, SubSenior, Subordinated |
| Vintage | By year |
| Sector | Retail, Office, Multifamily, Hotel, Health Care, Industrials, Specialty, Diversified |
| State | By top 1 state |
| WAL | 1-3, 3-5, 5-7, 7-10, 10+ |
| Delinquency rate | 0, 0-0.01, 0,01-0.05, 0.05-0.1, 0.1+ |

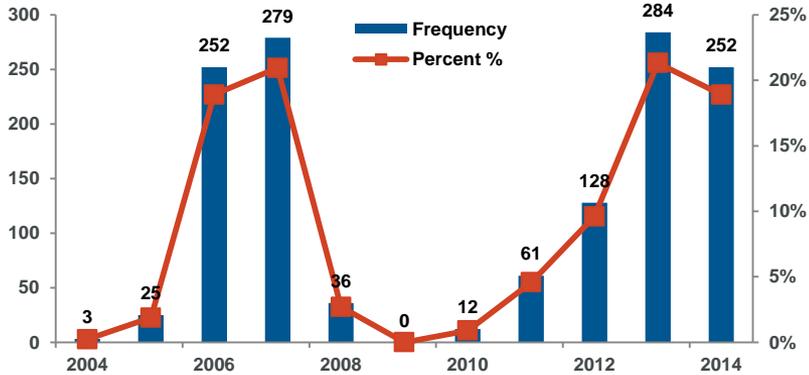
CMBS AAA Benchmark: Distribution and profile

| | |
|-------------------------------------|--------|
| No. of bonds | 1,332 |
| No. of deals | 282 |
| Avg. original deal size (mn) | 1,931 |
| Avg. current deal size (mn) | 1,535 |
| Avg. original bond size (mn) | 276 |
| Avg. current bond size (mn) | 254 |
| Wgt. avg. price* | 105.25 |
| Wgt. avg. yield* | 2.48 |
| Wgt. avg. spread | 163.48 |
| Wgt. avg. WAL* | 3.65 |

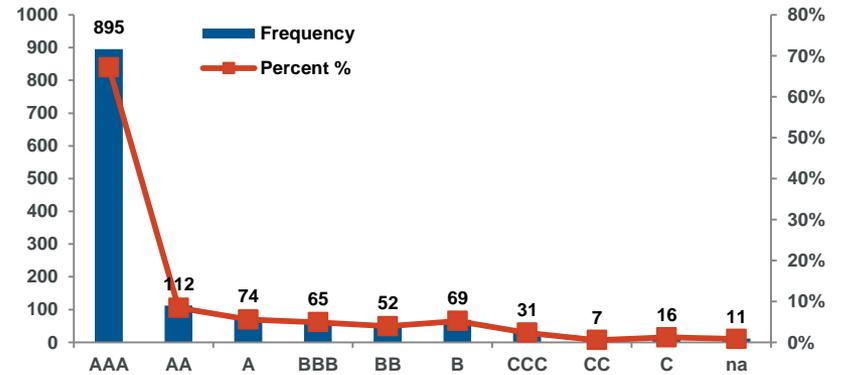
*Weights for price and WAL are based on Current Bond Balance; weights for yield are based on Price * Current Bond Balance

CMBS AAA Benchmark: Distribution and profile

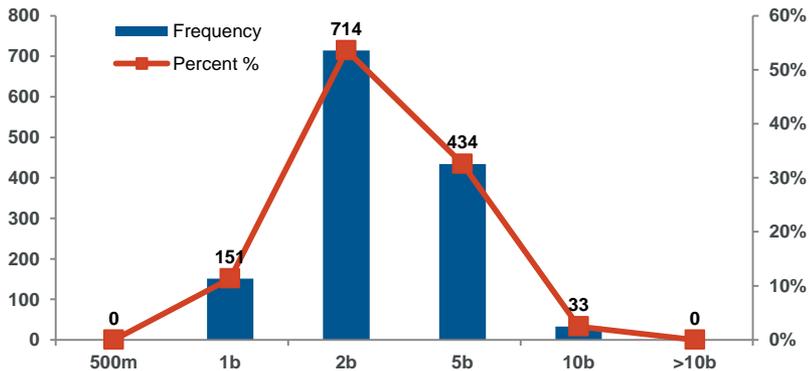
Vintage



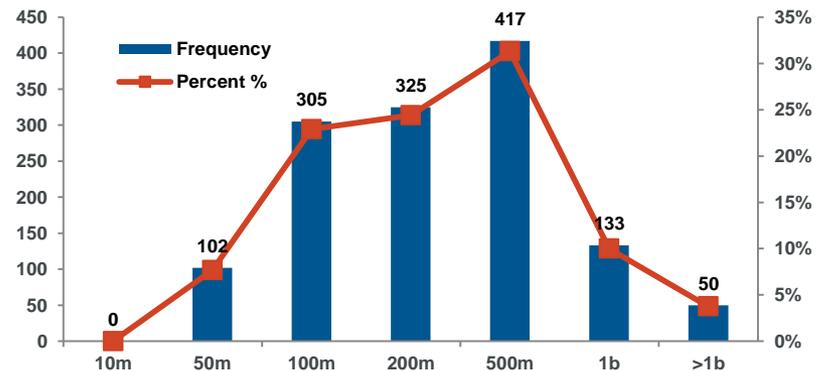
Current ratings



Original deal size



Original bond size



CMBS Liquid: Selection criteria

| | Include | Exclude |
|------------------------------|-----------------------|---|
| Deal type | Conduit | Large loans, single-borrower, etc. |
| Original deal size | ≥ 500 mn | < 500 mn |
| Current deal size | ≥ 300 mn | < 300 mn |
| Original tranche size | ≥ 100 mn | < 100 mn |
| Current tranche size | ≥ 10 mn | < 10 mn |
| Original rating | AAA | Non-AAA |
| Current rating | AAA, AA, A | Below A- |
| Seniority | SuperSenior | All others |
| Bond type | Fixed-rate, WAC | Floating-rate, modeling, multi-family-directed, non-pooled single-asset, PEZ, PEX, PST, EC, Z, PAC, IO and PO bonds |
| Public/private | Public and 144A bonds | Private bonds |
| ERISA eligibility | ERISA eligible only | Non ERISA eligible bonds |
| Weighted avg. life | ≥ 1 year | < 1 year |

CMBS Liquid: Selection criteria

CMBS Liquid index (cont.)

| | |
|-----------------------------------|---|
| Real estate | Exclude bonds backed by 100% multi-family loans |
| Deal concentration | At most one bond in each current rating category (AAA, AA+, AA, AA-, A+, A, A-) in each deal |
| Geographical concentration | Properties in one state \leq 40% of the aggregate value of the properties securing the deal |
| Loan concentration | Top 10 loans current balance \leq 50% of the aggregate value of the loans securing the deal |

Capping

| | |
|----------------|-------------------|
| Vintage | Weight \leq 30% |
| Shelf | Weight \leq 5% |

CMBS Liquid: Distribution and profile

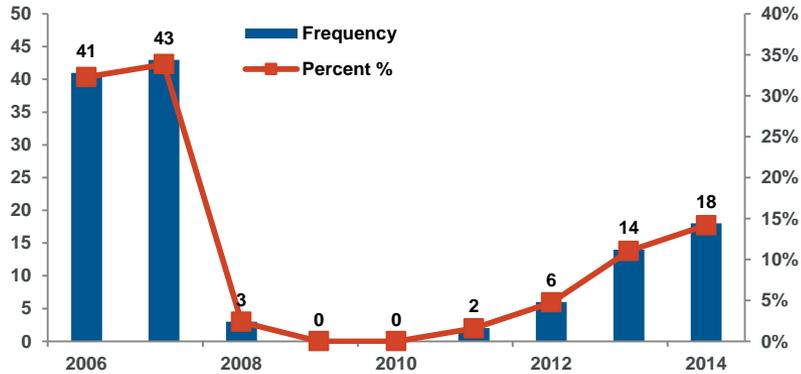
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| | |
|-------------------------------------|--------|
| No. of bonds | 127 |
| No. of deals | 123 |
| Avg. original deal size (mn) | 2,354 |
| Avg. current deal size (mn) | 1,739 |
| Avg. original bond size (mn) | 659 |
| Avg. current bond size (mn) | 623 |
| Wgt. avg. price | 106.91 |
| Wgt. avg. yield | 1.93 |
| Wgt. avg. spread | 126.41 |
| Wgt. avg. WAL | 3.08 |

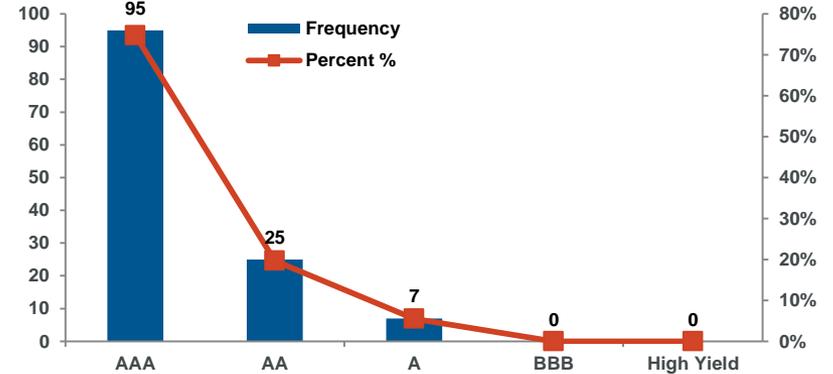
Weights for price and WAL are based on Current Bond Balance; weights for yield are based on Price * Current Bond Balance

CMBS Liquid: Distribution and profile

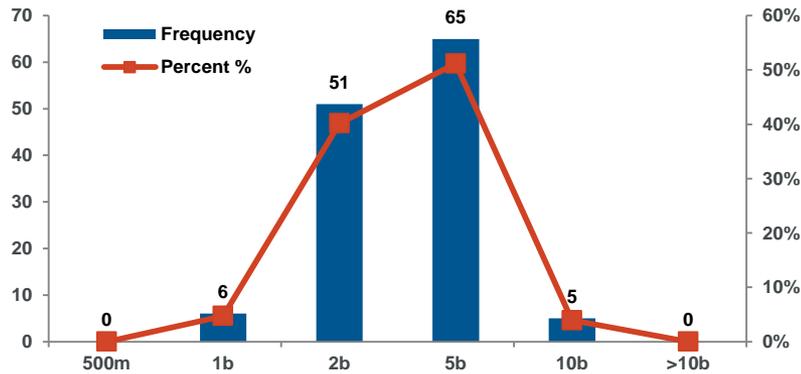
Vintage



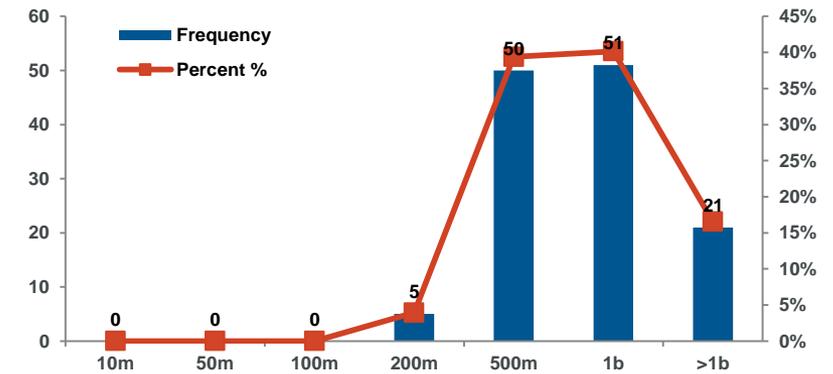
Current ratings



Original deal size



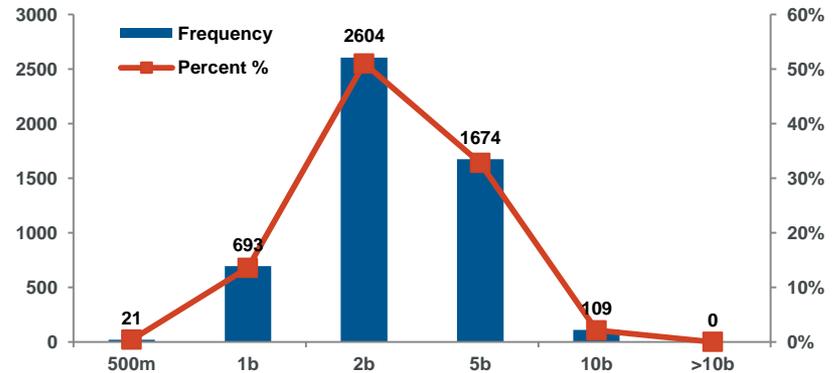
Original bond size



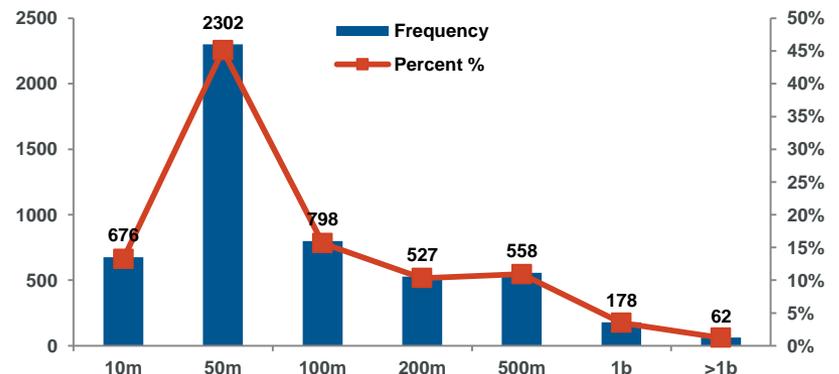
CMBS conduit market (excl. IOs)

| | |
|-------------------------------------|--------|
| No. of bonds | 5,101 |
| No. of deals | 560 |
| Avg. original deal size (mn) | 1,912 |
| Avg. current deal size (mn) | 1,244 |
| Avg. original bond size (mn) | 113 |
| Avg. current bond size (mn) | 99 |
| Wgt. avg. price | 99.98 |
| Wgt. avg. yield | 3.46 |
| Wgt. avg. spread | 261.92 |
| Wgt. avg. WAL | 3.56 |
| No. of PAC bonds | 100 |
| PAC % (current balance) | 0.64% |
| No. of floaters | 91 |
| Floaters % (current balance) | 1.91% |

Original deal size

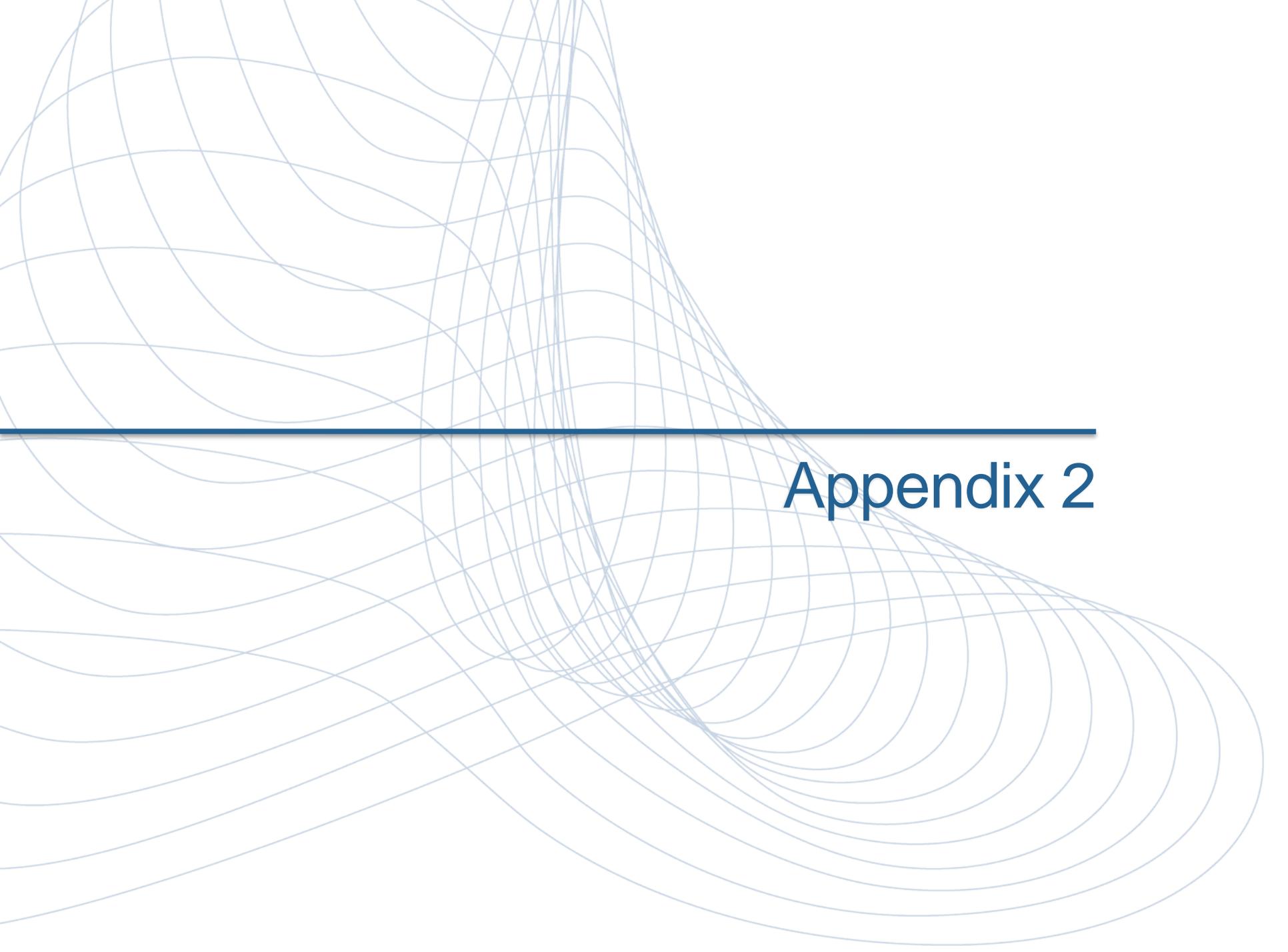


Original bond size



Four universe comparisons

| | Whole conduit non-IO universe | IG Benchmark universe | AAA Benchmark universe | Liquid universe |
|-------------------------------------|----------------------------------|--------------------------|---------------------------|--------------------|
| No. of bonds | 5,101 | 2,555 | 1,332 | 127 |
| No. of deals | 560 | 334 | 282 | 123 |
| Avg. original deal size (mn) | 1,912 | 1,999 | 1,931 | 2,354 |
| Avg. current deal size (mn) | 1,244 | 1,520 | 1,535 | 1,739 |
| Avg. original bond size (mn) | 113 | 161 | 276 | 659 |
| Avg. current bond size (mn) | 99 | 150 | 254 | 623 |
| Wgt. avg. price | 99.98 | 102.92 | 105.25 | 106.91 |
| Wgt. avg. yield | 3.46 | 3.19 | 2.48 | 1.93 |
| Wgt. avg. spread | 261.92 | 228.55 | 163.48 | 126.41 |
| Wgt. avg. WAL | 3.56 | 3.89 | 3.65 | 3.08 |



Appendix 2

Markit Securitised Products Indices

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Synthetic Tradable Securitised Products Indices - Appendix

Securitised Products Indices – Index Construction

| Index | CDS vs. TRS | # of sub - indices | Deal Issuance Timeframe | # of Constituents | Portfolio Make-Up | Bond/Deal Weightings |
|--------------------|--------------------------------------|--------------------|--|--|-------------------|--|
| ABX Indices | Non-Agency RMBS Credit Default Swaps | 24 sub-indices | 06-1: 6/2005 – 1/2006 06-2: 1/2006 – 6/2006 07-1: 7/2006 – 1/2007 07-2: 1/2007 – 6/2007 | 20 bonds per sub index | Static | All bonds weighted Equal (5%) |
| CMBX Indices | CMBS Credit Default Swaps | 57 sub-indices | S1: 10/2005 – 3/2006 S2: 3/2006 – 10/2006 S3: 10/2006 – 4/2007 S4: 4/2007 – 10/2007 S5: 10/2007 – 5/2008 | 25 bonds per sub index | Static | All bonds weighted Equal (4%) |
| IOS/PO/MBX Indices | Agency Total Return Swaps | 81 sub-indices | Agencies originated from 2003 - 2013 | 93680 pools Coupon/Agency/ Vintage specific | Static | All pools weighted by original principal balance |
| PrimeX Indices | Prime RMBS Credit Default Swaps | 4 sub-indices | FRM.1 & ARM.1 - 1/2005 & 6/2006 FRM.2 & ARM.2 - 7/2006 & 12/2007 | ARM.1 – 20 bonds ARM.2 – 20 bonds FRM.1 – 90 bonds FRM.2 – 61 bonds | Static | All deals weighted Equal (5%) |

Securitized Products Indices – Trading Conventions #1

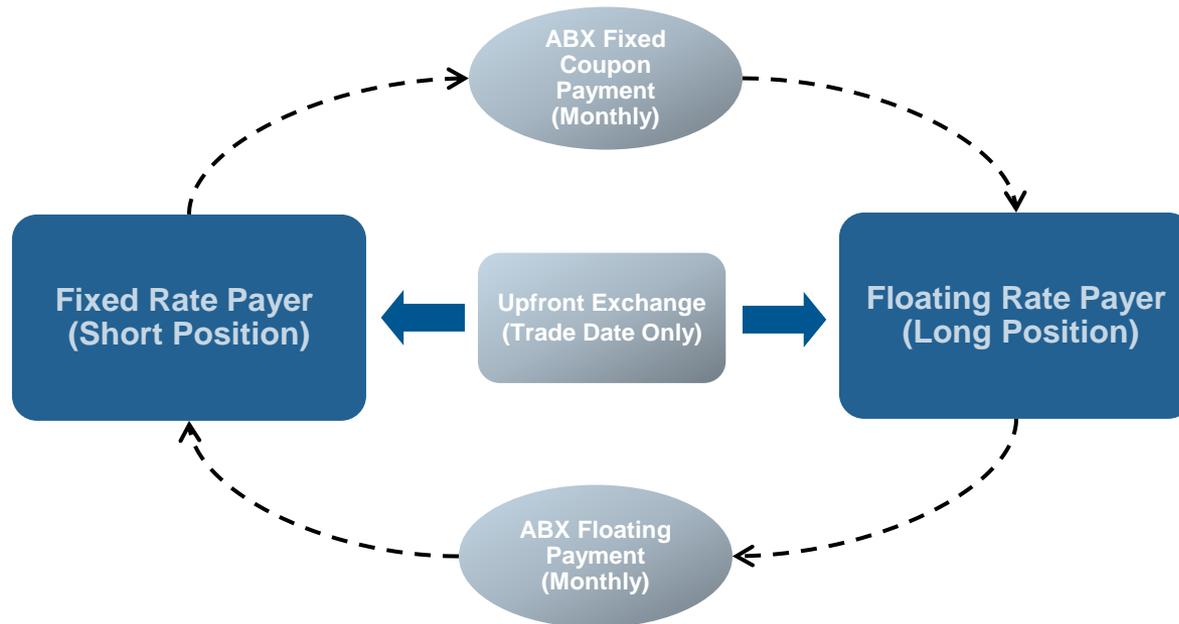
| Index | Trading Period | Bond Accrual Period | Index Reset Date | Business Day Convention | Day Count | Monthly Coupon |
|--------------------|-------------------------------------|---|---|--|------------------------------------|--|
| ABX Indices | 25 th – 25 th | Accrue 25 th – 25 th Same as Index | 25 th each month Factors update for next trading period | Following Business Day Convention | Actual/360 | Fixed - set at launch date, varies per index |
| CMBX Indices | 25 th – 25 th | Varies per constituent, bonds pay mid-month, different than Index | 25 th each month Factors update for next trading period | Independent of Business Day Convention | Actual/360 | Fixed - set at launch date, varies per index |
| IOS/PO/MBX Indices | 12 th – 12 th | Varies per GSE product | One business day prior to 12 th of each month. Price, Factor and Libor update | Independent of Business Day Convention | LIBOR – Act/360 Coupon – 30/360 | Fixed – based on coupon of underlying pools |
| PrimeX Indices | 25 th – 25 th | Accrue 25 th – 25 th Same as Index | 25 th each month Factors update for next trading period | Following Business Day Convention | Actual/360 | Fixed - set at launch date, varies per index |

Securitized Products Indices – Trading Conventions

| Index | Counterparty Positions | Traded on Spread/Price | Upfront Exchange | Settlement Date | XML Settlements |
|--------------------|--|------------------------|------------------|---|---|
| ABX Indices | Long = Protection Seller Short = Protection Buyer | Price | T + 3 | T + 5 from end of trading period. Adjusts for US/LN business day convention | ABX.HE Settlements |
| CMBX Indices | Long = Protection Seller Short = Protection Buyer | Price | T + 3 | T + 0 from 25 th of each month. Adjusts for US/LN business day convention | CMBX Settlements |
| IOS/PO/MBX Indices | Long = Protection Seller Short = Protection Buyer | Price | T + 3 | T + 3 from 12 th of each month. Adjusts for US/LN business day convention | Agency Derivative Settlements |
| PrimeX Indices | Long = Protection Seller Short = Protection Buyer | Price | T + 3 | T + 5 from end of trading period. Adjusts for US/LN business day convention | PRIMEX Settlements |

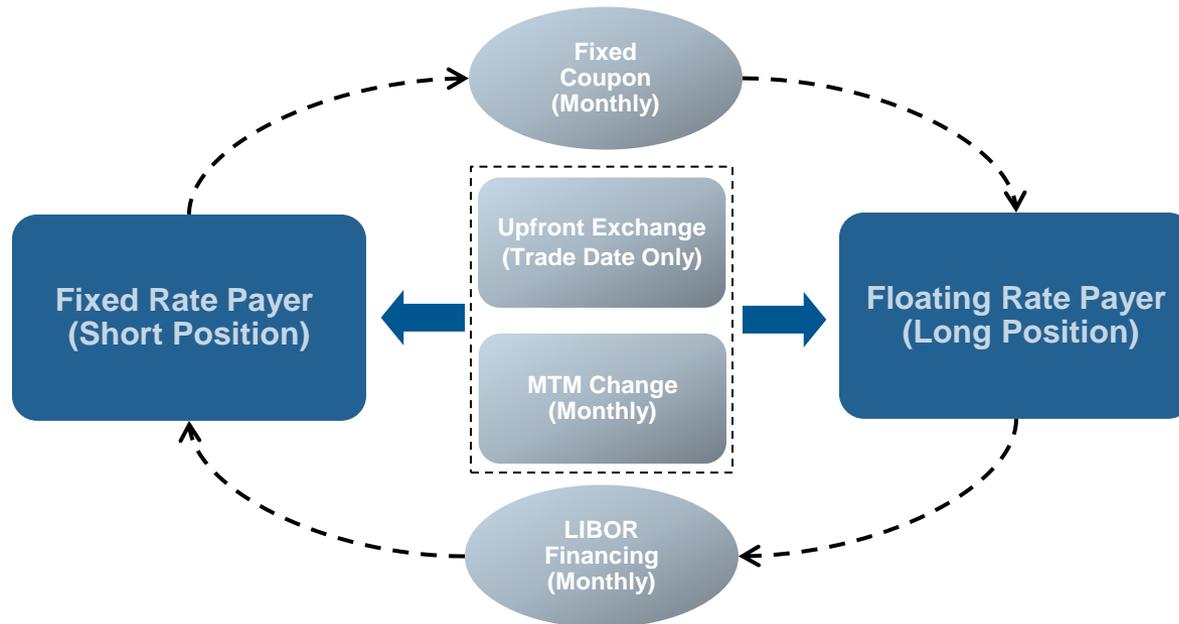
Markit ABX/CMBX/PrimeX Indices – Trade Diagram

The Markit ABX/CMBX/PrimeX Index trades are bilateral ABCDS contracts involving a Fixed Rate Payer (Protection Buyer) and a Floating Rate Payer (Protection Seller)



Markit Agency Derivatives Indices – Trade Diagram

The Markit MBX, IOS, and PO Index trades are bilateral TRS contracts involving a Fixed Rate Payer (short position on the underlying agency RMBS collateral) and a Floating Rate Payer (long position on the underlying agency RMBS collateral)





Thank you.

markit mines data
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extends networks
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