

real estate debt securitization

PLANA6715

Class 1: **Introduction to CMBS**

- Market Overview
- Pooling Benefits
- Credit Enhancements
- Mortgage Math Review
- Illustrative Transaction

Semester Progression

Sessions Topics

<u>Session:</u> <u>Date</u>	<u>Topics</u>
Class 1 3/8	Introduction to RE Debt Securitization
3/15	Spring Recess
Class 2 3/22	Credit Enhancements
Class 3: 3/29	Structures
Class 4: 4/5	Pricing and Valuation
Class 5: 4/12	Origination
Class 6: 4/19	Modeling
Class 7: 4/26	Case Study



Course Description

In this course, students investigate the process of real estate debt securitization including underwriting, issuance templates, debt tranches, and ratings. The analysis and modeling of portfolios of commercial real estate loans for securitization will be undertaken with students performing individual securitization structuring. The securitization of residential mortgages will be briefly discussed.

Course Objectives

Understand Commercial Mortgage Backed Securities and other forms of real estate debt securitization

Structure CMBS pools

Determine appropriate levels of credit enhancements

Learn to price CMBS

Interpret CMBS models

Individual Goals

What are your objectives?

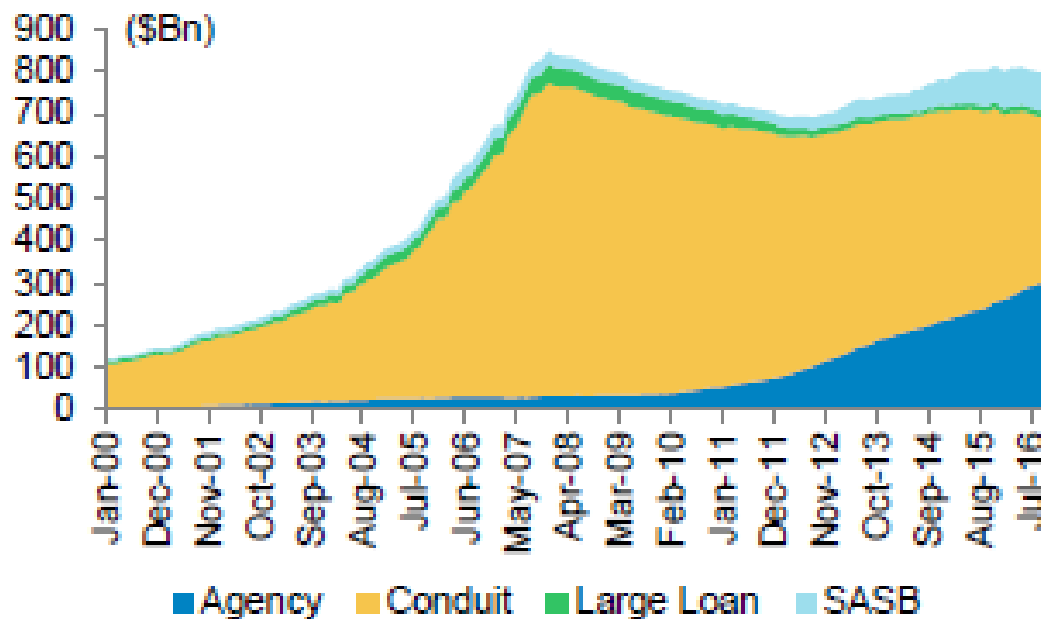
1. _____

2. _____

3. _____

Market Overview

2-E. CMBS Market Outstanding

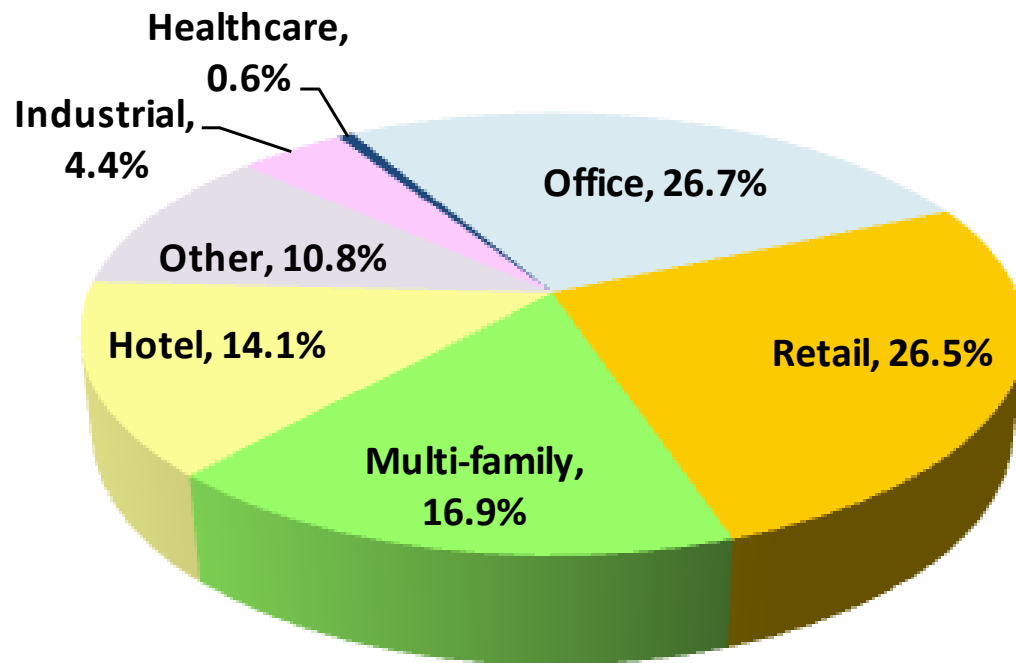


Source: Trepp, Morgan Stanley Research

SASB - Single Asset Single Borrower

Most Major Property Type Loans Have Been Securitized

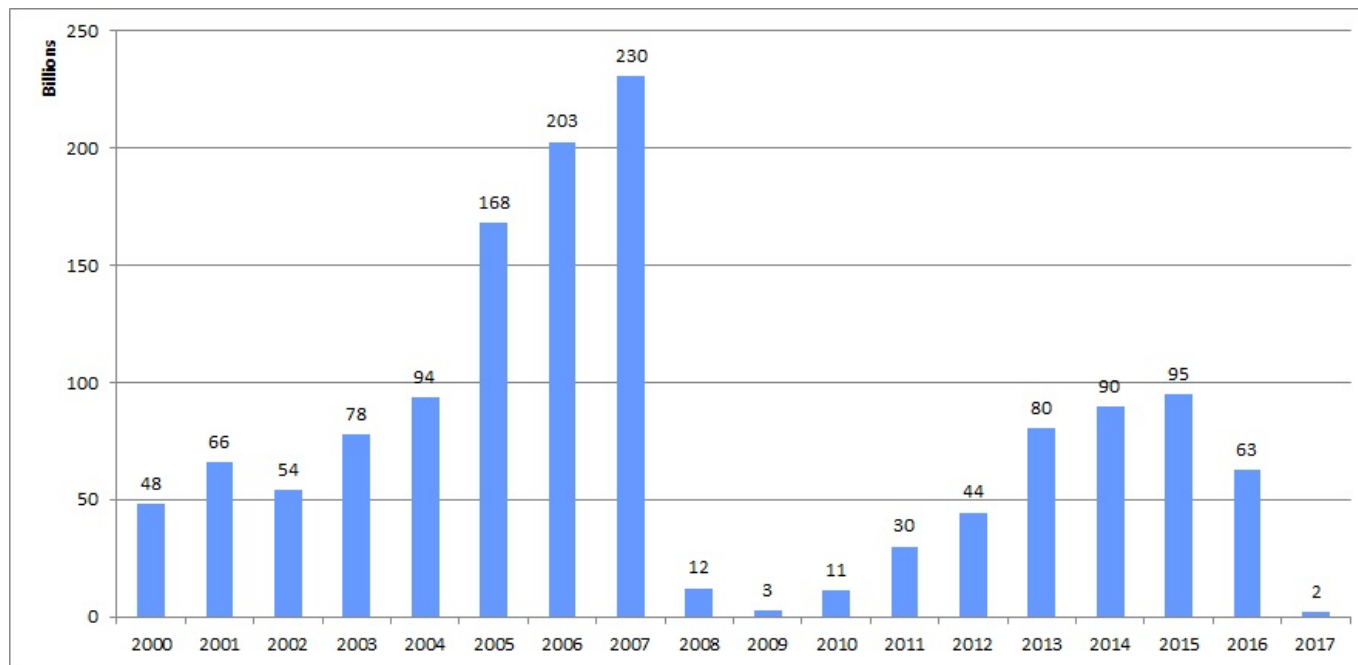
CMBS Balance By Property Type



Source: CREFC.org. As of December 1, 2016. Based on balance at origination

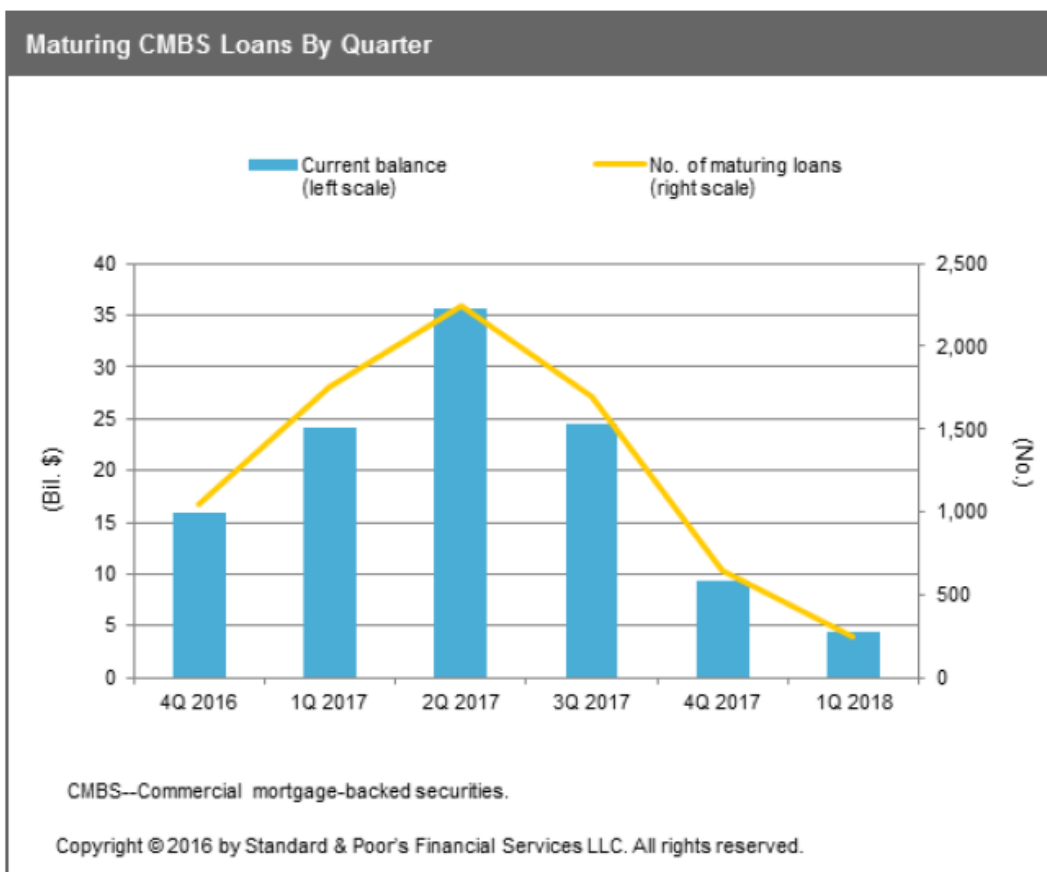
CMBS Issuance Moderated in 2016

U.S. CMBS Issuance By Year



Source: CREFC.org

Wall of Maturities Expected in 2017



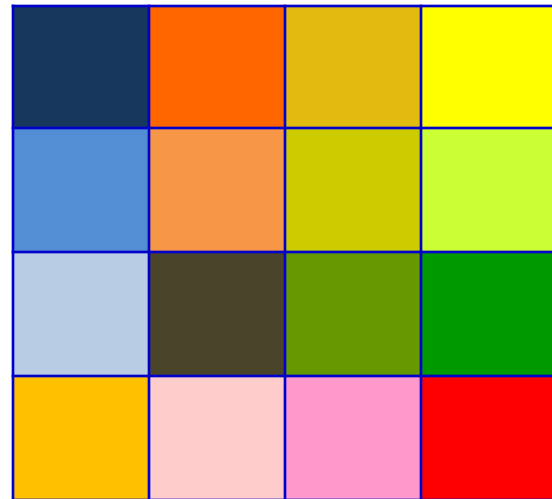
Why Pool Assets?

■ Which would you prefer to own?



100% of 100%

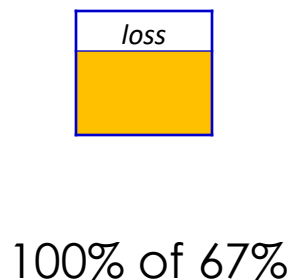
Or



6.25% of 100%

Pooling Reduces Risk

- What happens when gold-colored box loses 1/3 of its value?



Or



6.25% of 97.9% = 6.12%

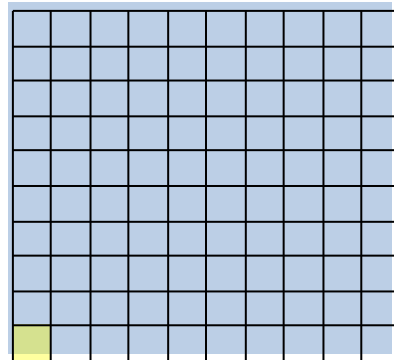
33% loss vs. 2.1% loss

Pooling Reduces Risk from Non-Systematic Events

■ What happens when gold box loses 1/3 of its value?



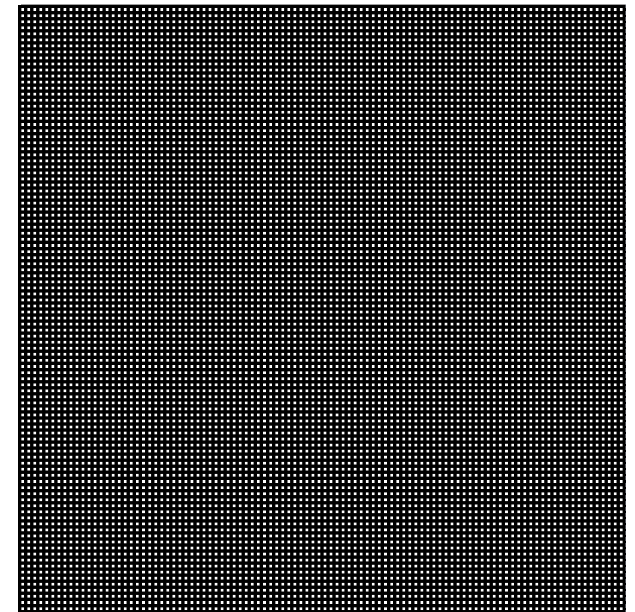
Or



100% of 67%

1% value declines to 0.9967%

33% loss vs. 3.3% loss vs. 0.33% loss



.1% value declines to 0.09967%

Expected Versus Realized Loss

- If the probability of loss is 2%

What is the expected loss of each pool assuming no recovery for a given loss?

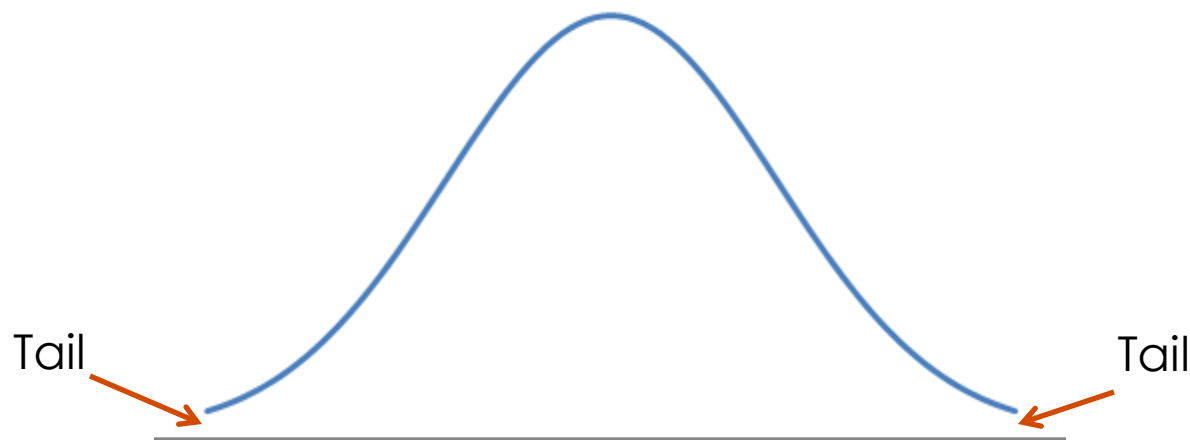
Answer: 2%

- What is the loss experience if one investment defaults assuming no recovery for the given loss?

- One loan – 100% !
- 100 loans – 1%
- 1,000 loans – 0.1%

Pooling Reduces Expected Losses from Idiosyncratic Events

- Tail Risk--small probability of occurring



Pooling Benefits

- 100% of one loan or 1% of 100 loans
- Diversification
- Liquidity
- Tranching
 - Risk selection
 - Subordination
- Credit ratings

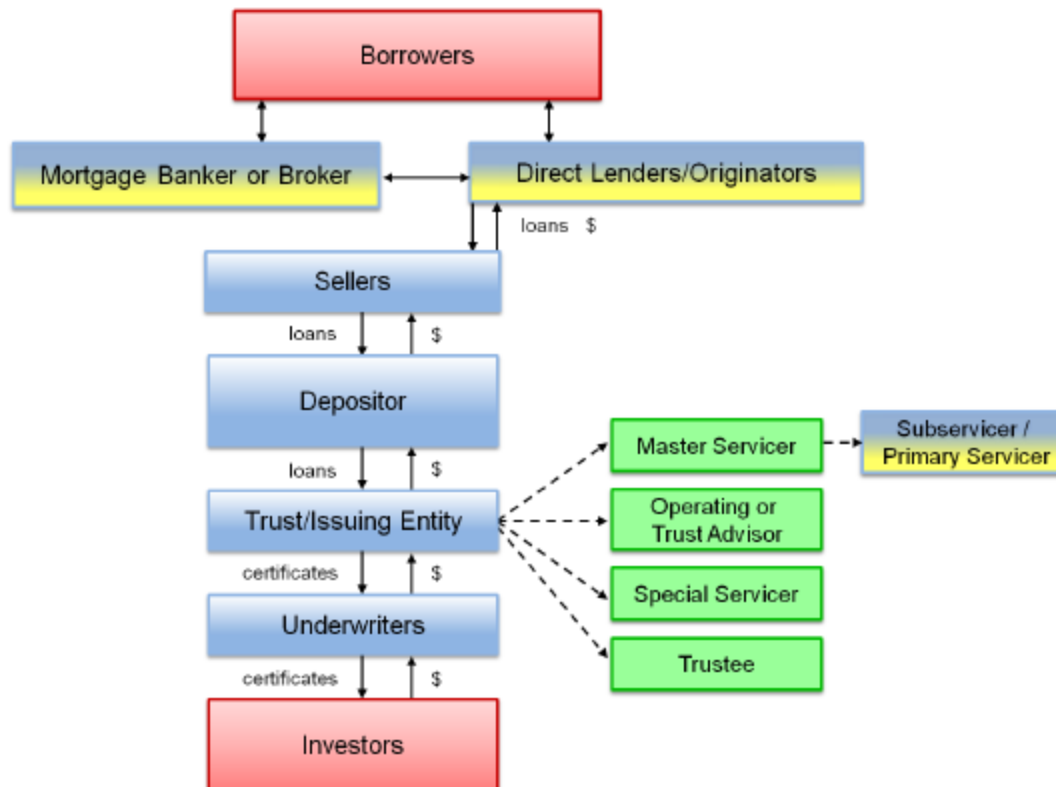
Securitization Overview

- Create asset pools (mortgages, credit cards, receivables)
- Sell ownership interests in underlying collateral
 - Securities
 - Pass-through certificates
 - Trust shares
- Structuring/tranching
 - Divided interests according to return and risk levels

Mortgage Basics

- Secured loan
- Interest rate, maturity, amortization
- LTV
- First lien, second lien
- Fixed- or floating-rate
- Payments—interest and principal
- Collateral

CMBS Process and Participants



Source: CRE Finance Council: CMBS E-Primer, 2015

Risk Transfer

- Lender sells loan
 - Mortgage brokers have no ownership interest
- Originator/sponsor sells or arranges for sale of loans to the trust or SPV
- Trusts issues and sells certificates and equity to fund loan acquisition
- Certificates represent interests in the cash flow generated by the underlying mortgages

Sample CMBS Structure

\$1.1bn JPMCC 2017-JP5

J.P. Morgan Chase Commercial Securities Mortgage Trust Corp., 2017-JP5

	Stack Thickness	Tranche Rating	Credit Enhancement	
Distributions ↓	70.0%	AAA Super Senior <i>(not drawn to scale)</i>		↑ Losses
	6.500%	AAA	30.00%	
	4.750%	AA-	23.50%	
	5.125%	A-	18.75%	
	3.375%	BBB	13.625%	
	2.500%	BBB-	10.25%	
	2.625%	BB-	7.75%	
	1.625%	B	5.125%	
	3.500%	Equity	3.50%	
	100.0%		0.00%	

Source: Fitch Ratings

AAA Tranches Are Paid First

- Choosing teams—first pick usually the strongest

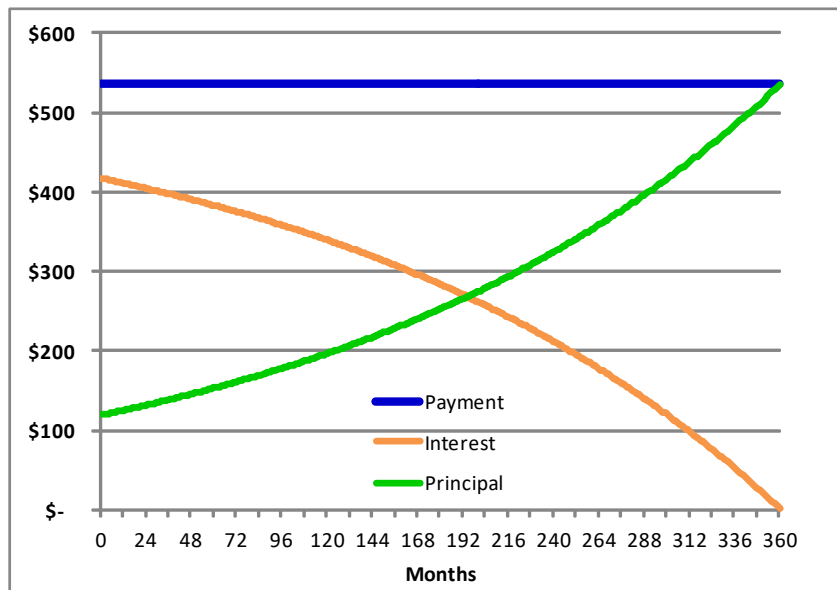


- Last to be picked may be most uncertain

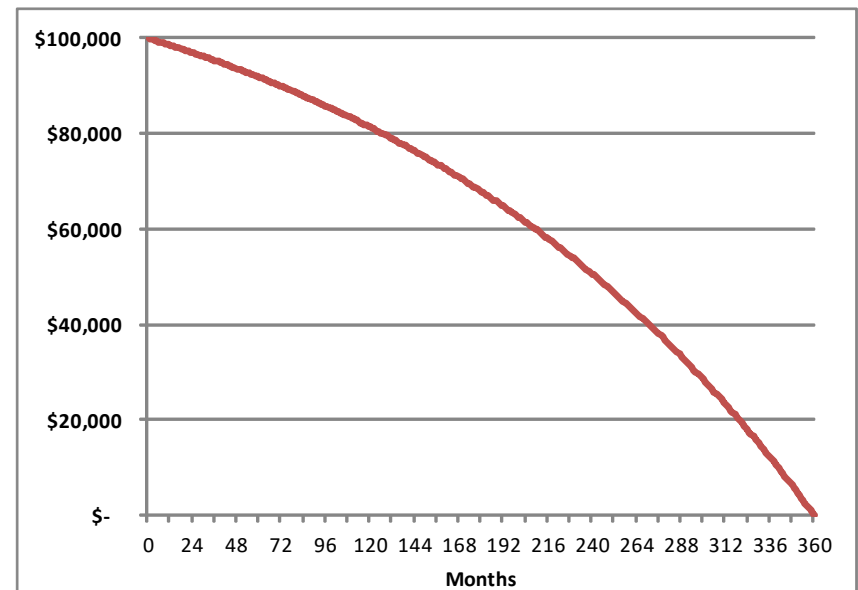
Mortgage Basics Review

■ Example: \$100,000, 5%, 30-year mortgage

Monthly Payment Components



Principle Balance



Mortgage Payment Factor

- Calculator

- $PV = (\$100,000)$
- $i = 5\% \text{ or } 5\%/12$
- $n = 30 \text{ or } 30 \times 12$
- **Pmt ?**

- Excel: `payment =pmt(rate/(pmts/year), nper, PV, FV)`

- $$\text{Payment} = \text{Principal} \times \left[\frac{\text{int rate} \times (1 + \text{rate})^{\# \text{ of payments}}}{(1 + \text{rate})^{\# \text{ of payments}} - 1} \right]$$

Mortgage Payment Calculation

- What is the regular payment due on a \$100,000, 30-year loan with a 5% interest rate?

$$\text{\$100,000} \times \frac{5\%/12 \times (1 + 5\%/12)^{(30 \times 12)}}{(1 + 5\%/12)^{(30 \times 12)} - 1}$$

$$= \text{\$537 per month}$$

Mortgage Basics Review

Period	Beginning Balance	Payment	Interest	Principal	Ending Balance
1	\$100,000	\$537	\$417	\$120	\$99,880
2	\$99,880	\$537	\$416	\$121	\$99,759
3	\$99,759	\$537	\$416	\$121	\$99,638
4	\$99,638	\$537	\$415	\$122	\$99,516
5	\$99,516	\$537	\$415	\$122	\$99,394
6	\$99,394	\$537	\$414	\$123	\$99,272

355	\$3,174	\$537	\$13	\$524	\$2,651
356	\$2,651	\$537	\$11	\$526	\$2,125
357	\$2,125	\$537	\$9	\$528	\$1,597
358	\$1,597	\$537	\$7	\$530	\$1,067
359	\$1,067	\$537	\$4	\$532	\$535
360	\$535	\$537	\$2	\$535	\$0

Commercial Mortgages

- Short-to-medium-term maturities
- Full amortization, or
- Partial amortization or interest-only with balloon payments
- Example:
\$10mm, 4.8%, 5-year maturity, 15-year amortization

Payment = ?

Interest and principal payment at a given date?

Due at maturity = ?

Commercial Mortgages

- Solution, part 1:

\$10mm, 4.8%, 5-year maturity, 15-year amortization

Payment formula in excel:

=pmt(rate/payments per year, total # of payments, loan value)

\$78.041k per month

and

\$950.44k per year

- How much interest and principal is paid with the last monthly payment, excluding the remaining principal repayment?

Commercial Mortgages

- Solution, Part 2:

\$10mm, 4.8%, 5-year maturity, 15-year amortization

In Excel:

- *Interest Payment*

= ipmt(rate/payments per year, payment number, total number of payments, initial loan value)

\$29.90k with the 60th payment

- *Principal Payment*

=ppmt(rate/payments per year, payment number, total number of payments, initial loan value)

\$48.14k with the 60th payment (excluding balloon repayment)

Commercial Mortgages

- What is the remaining principal balance at maturity (or at the end of any other period)?

\$10mm, 4.8%, 5-year maturity, 15-year amortization

In Excel:

- Future principal balance using constant payments
=FV(rate/payments per year, payment number,
payment, initial loan value)

\$7.426mm remaining after 60 payments

Commercial Mortgages

- What is the loan LTV at maturity for a 70% LTV loan at origination?
\$10mm, 4.8%, 5-year maturity, 15-year amortization
- Initial property value = $\$10\text{mm} / 70\% = \14.3mm
- Balance due after five years = \$7.4mm
- Ending LTV = $\$7.4 / \$14.3 = 52\%$

CMBS Risks

- General bond risks
 - Credit, interest rate, liquidity, inflation, duration
- CMBS-specific additional risks
 - Prepayment
 - Duration
 - Convexity
 - Negative Convexity

Bond Math Review

- Inputs
 - Interest rate
 - Present value
 - Future value
 - Payment
 - Number of periods
- Need 3 of the 4 components to calculate the missing item

Bond Math Practice

- What happens if:
 - Rates increase 100bp
 - Rates decline 100bp
- How much does price change when rates rise
 - When rates decline?
- How does the expected return (yield to maturity) change if the bond price declines, increases?
 - Assume a 1% change in price for each year remaining until maturity

Recent Offering—JPMCC 2017-JP5

Hilton Hawaiian Village Loan

Capital Structure					
Note	Balance	Debt Per Room	Fitch DSCR	Fitch LTV	Fitch DY
A-2-A-2 (Trust)	\$80.0M	\$243,566	1.68	61.0%	16.47%
Remaining A Notes	\$616.6M	\$243,566	1.68	61.0%	16.47%
B-Note	\$578.4M	\$445,804	0.92	111.7%	9.00%
Total Debt Stack	\$1275.0M				
Loan proceeds were used to retire existing debt of \$1.26 billion, pay closing costs of \$8.5 million, and return \$10.6 million of equity to the sponsor. The \$1.275 billion mortgage for the Hilton Hawaiian Village is split between a \$696.6 million A-note and a \$578.4 million subordinated component.					
The controlling A-1-A note was securitized in the Hilton USA Trust 2016-HHV.					
The loan was co-originated by J.P. Morgan (37.5%), Deutsche Bank (27.5%), Goldman Sachs (15%), Barclays (10%) and Morgan Stanley (10%).					
Underwriting					
Originator/Loan Seller	Appraisal	NCF	DSCR	LTV	NCF DY
JPMorgan Chase Bank, National Association	\$2230.0M	\$132.6M	4.47	31.2%	19.03%
Sponsor Information					
Sponsor	Loan Purpose				
Park Intermediate Holdings LLC	Refinance				
The sponsor, Park Hotels & Resorts Inc. (PHR), is one of the three Hilton Worldwide Holdings Inc. spin-off companies announced in February 2016. PHR will hold a portfolio of owned and leased hotels and resorts. PHR is expected to be the second-largest publicly traded hotel REIT.					

Loan Details	
Interest Rate	4.20%
Original Loan Term	120
Original Amortization Term	0
Original IO Periods	120
Seasoning (Months)	4
Amortization Type	Interest Only
Origination Date	10/24/2016
Maturity Date	11/1/2026
Maturity Balance	\$80.0M
Fitch Analysis	
Fitch NCF	\$114.7M
Fitch NCF Haircut	13.48%
Fitch Stressed Value	\$1141.4M
Fitch Stressed Value Decline	48.8%
Fitch Occupancy	90.0%
Fitch Stressed Cap Rate	10.05%
Fitch Stressed Constant	9.82%
Fitch PMM Score	5
Fitch Volatility Score	3
Fitch Property Grade	A-
Credit Opinion	BBB-sf*

JPMCC 2017-JP5

Hilton Hawaiian Village Loan Underwriting

Cash Flow Analysis

	2013	2014	2015	T12 Ended September 2016	Underwritten	Fitch Cash Flow Analysis	Per Room
Occupancy (%)	89.9	90.7	94.4	94.6	94.6	90.0	
ADR (\$)	232	238	241	250	249	241	
RevPAR (\$)	209	216	227	237	236	217	
Room Revenue (\$)	218,202,120	225,776,905	237,172,233	247,711,744	247,034,700	226,661,874	79,252.40
Food and Beverage Revenue (\$)	56,844,007	62,740,100	70,771,369	69,023,623	68,996,667	69,023,623	24,134.13
Telephone Revenue (\$)	1,738,761	1,952,380	540,774	326,632	325,740	326,632	114.21
Parking Revenue (\$)	0	0	0	0	0	0	0.00
Other Revenue (\$)	48,190,000	55,620,243	58,306,846	59,925,439	58,080,636	58,760,250	20,545.54
Total Revenue (\$)	324,974,888	346,089,627	366,791,222	376,987,438	374,437,742	354,772,380	124,046.29
Departmental Expenses (\$)	108,450,526	115,746,148	126,658,376	127,698,731	126,780,054	122,212,892	42,731.78
Undistributed Expenses (\$)	79,780,449	83,266,040	82,561,911	86,765,936	83,156,131	84,271,367	29,465.51
Gross Operating Profit (\$)	136,743,914	147,077,440	157,570,935	162,522,771	164,501,557	148,288,122	51,848.99
Fixed Expenses (\$)	12,780,083	13,373,036	14,161,563	15,550,153	16,937,073	17,069,815	5,968.47
FF&E Reserves (\$)	12,998,996	13,843,585	14,671,649	15,079,498	14,977,510	16,506,539	5,771.52
Net Cash Flow (\$)	110,964,835	119,860,819	128,737,723	131,893,120	132,586,975	114,711,768	40,109.01

Source: Fitch Ratings, Presale Report

Questions?

Major topics

- Market overview
- Benefits of pooling
- Credit enhancements
- Bond and CMBS risks

Review

- CMBS market is large and well established
- Benefits of securitized debt include liquidity and risk selection
- Highly-rated tranches receive principal and interest before subordinated classes
- Lowest-rated tranches absorb shortfalls and losses first

Class 1: Introduction to CMBS

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