

COMMERCIAL REAL ESTATE MORTGAGE CREDIT RISK
2006 MBA ACCOUNTING, TAX AND FINANCIAL ANALYSIS CONFERENCE

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™

PPR

Introduction to PPR — Who are the Clients?

PPR works with institutional investors to understand cycles, domestic and global, and to **apply** these insights to investment decisions.

Clients include:

Banks

Wall Street firms

Insurance companies

Pension funds

Private capital

Developers

Investment advisors

Rating agencies

Public agencies

REITs

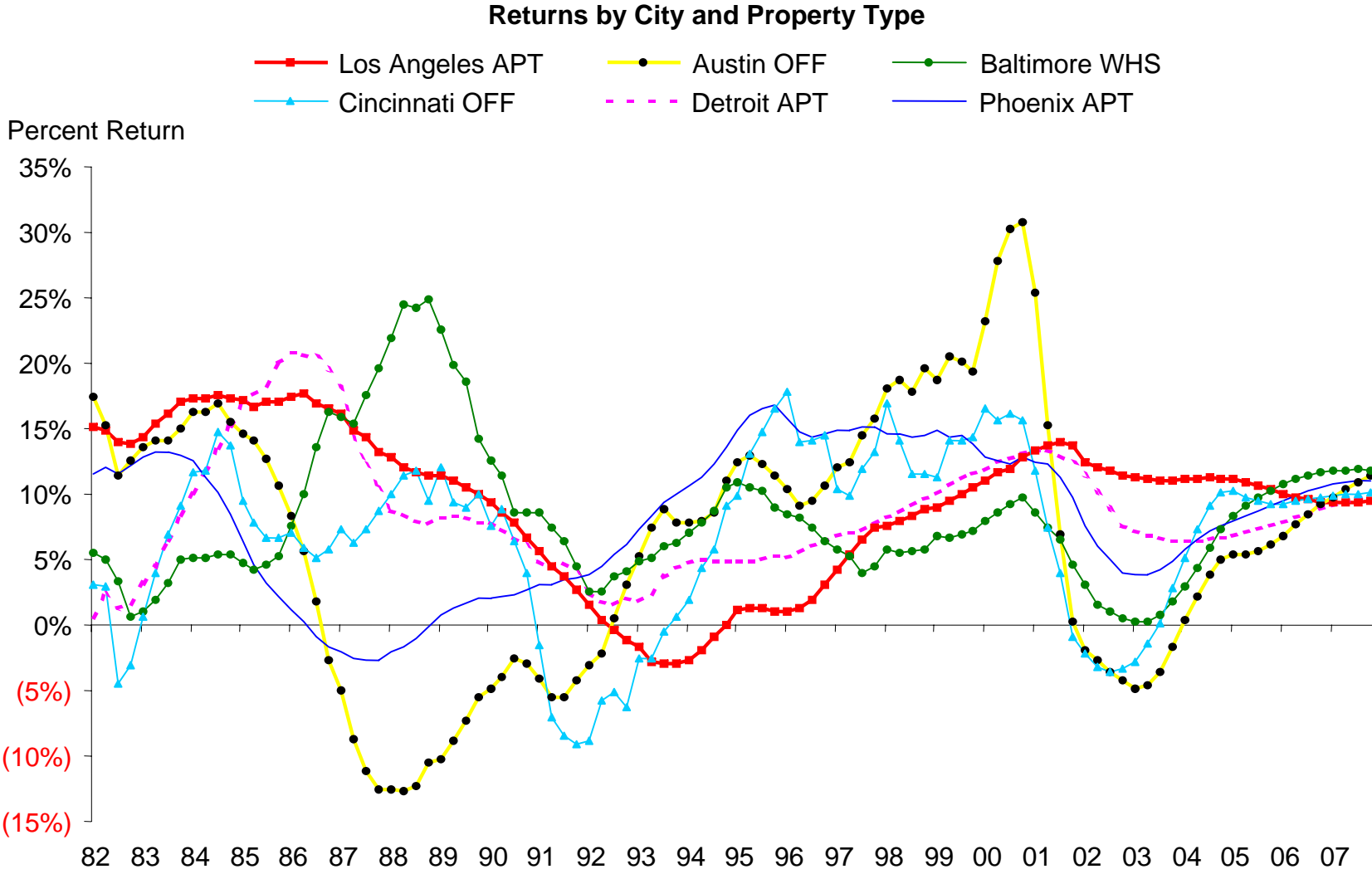
Our Clients Operate on the Buy and Sell Sides,
and in the Debt, Equity, Public and Private Markets

- Compute *Probability of Default, Loss Given Default, Expected Loss, and Unexpected Loss* for a loan, portfolio, or securitized pool
- Methodology takes into account interaction of NOI and value volatility, market growth, seasoning and loan structure protection
- Provides direct comparison of systematic risk across time, market, property type, loan structure, and *other asset classes*

Used by:

- ✓ **Risk Managers** to determine Reserve Requirements and Economic Capital
 - ✓ **Lenders** to target markets and set pricing strategy
 - ✓ **Investors** to objectively compare and price loans and pools
 - ✓ **Issuers** to design more marketable securities with better subordination levels
 - ✓ **Management** to communicate strength of approach to investors, regulators, rating agencies, and more effectively allocate capital
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- Puts Real Estate in the Same Analytical Framework as Other Asset Classes

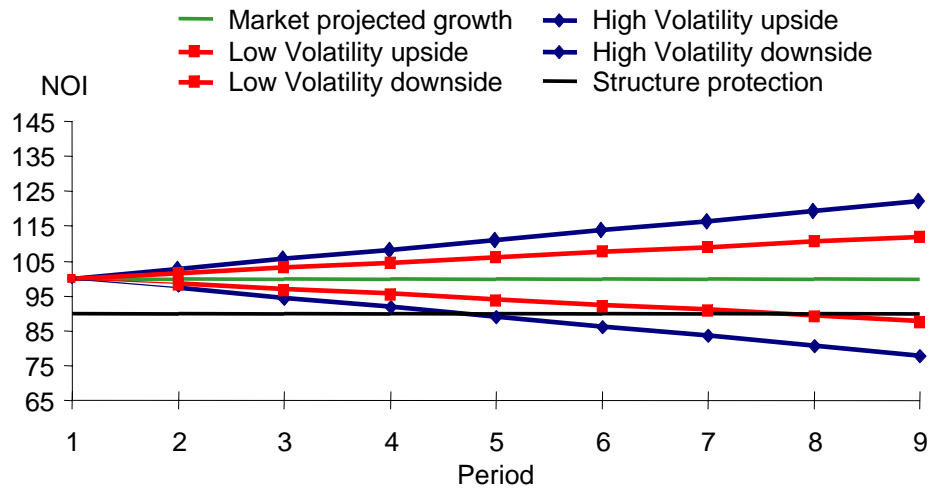
The Derived Market Return



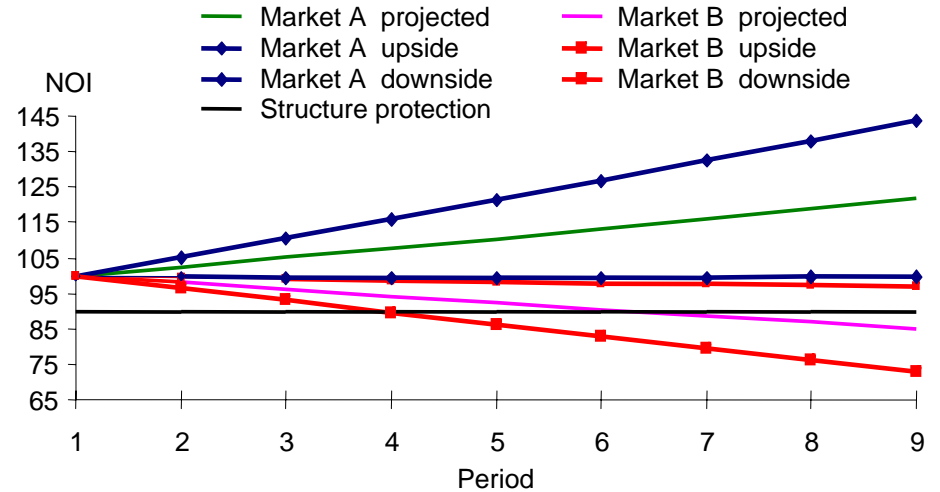
The Process : Model “Top Down,” Validate/Challenge “Bottom Up.”

Three Key Issues that Impact Risk

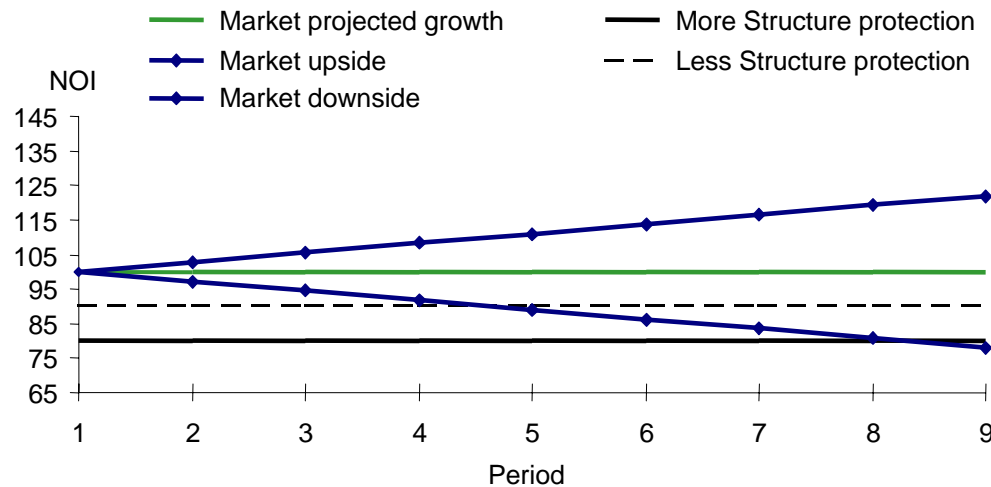
Volatility



Expected Growth



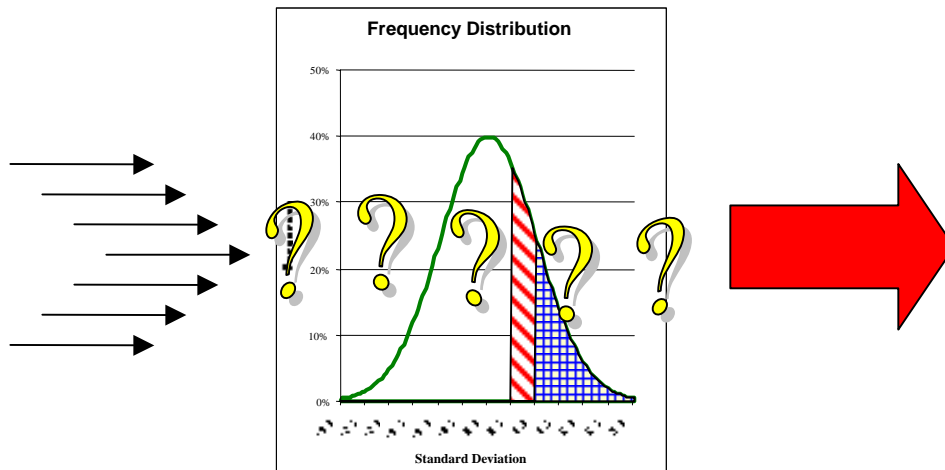
Structure Protection



Mapping to Expected Loss

- Fit default metrics to match known default outcome on a known pool
 - ✓ Modeled pool used in Snyderman/Esaki studies
 - Used ACLI underwriting terms by property type and origination cohort
 - More than 16,000 loans
 - ✓ Determine appropriate distribution to match Snyderman outcome
- Benchmarks to best available data on **actual** default history under a stressed real estate environment

Portfolio A	
Loan #	Z- Distance
Loan 1	Z_1
Loan 2	Z_2
Loan 3	Z_3
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.	.
.	.
.	.
.	.
.	.
Loan n	Z_n

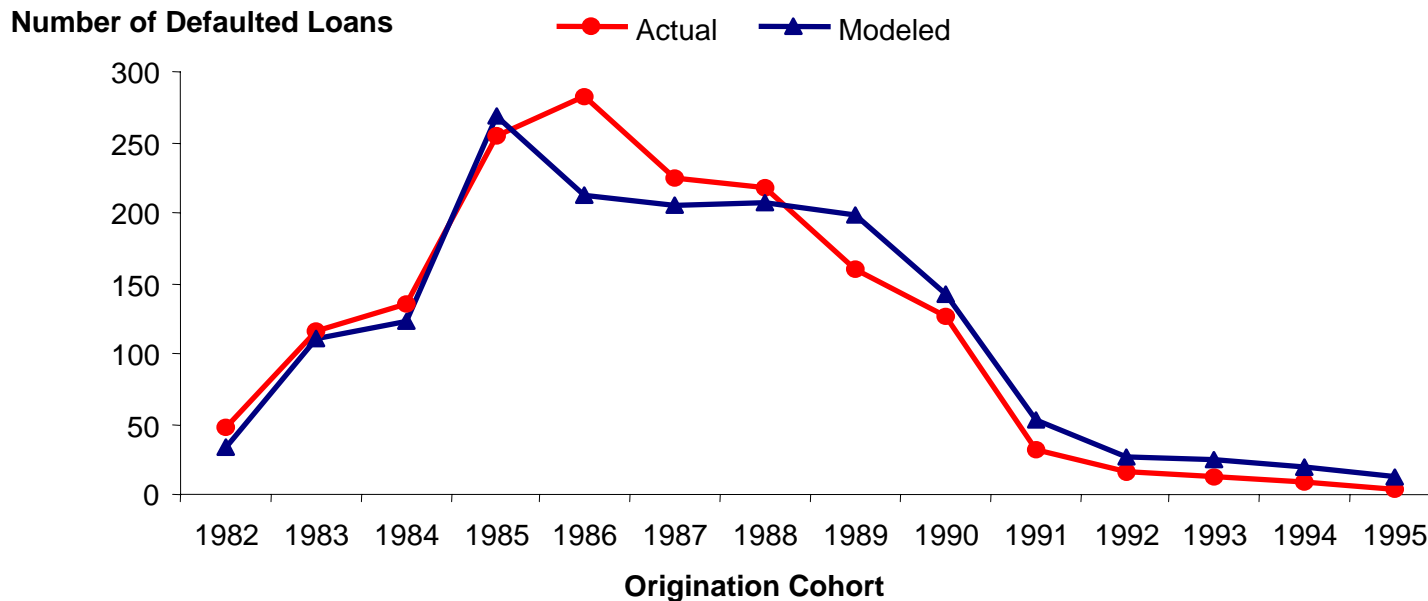


Frequency of Default
= 18.1%

Average Severity of Loss
= 37.7%

PPR Model Benchmarking: Probability of Default and Loss Given Default

Portfolio Averages	Snyderman	PPR
Frequency of Default	17.20%	17.20%
Severity of Loss	34.00%	33.00%
Overall Loss	5.86%	5.69%

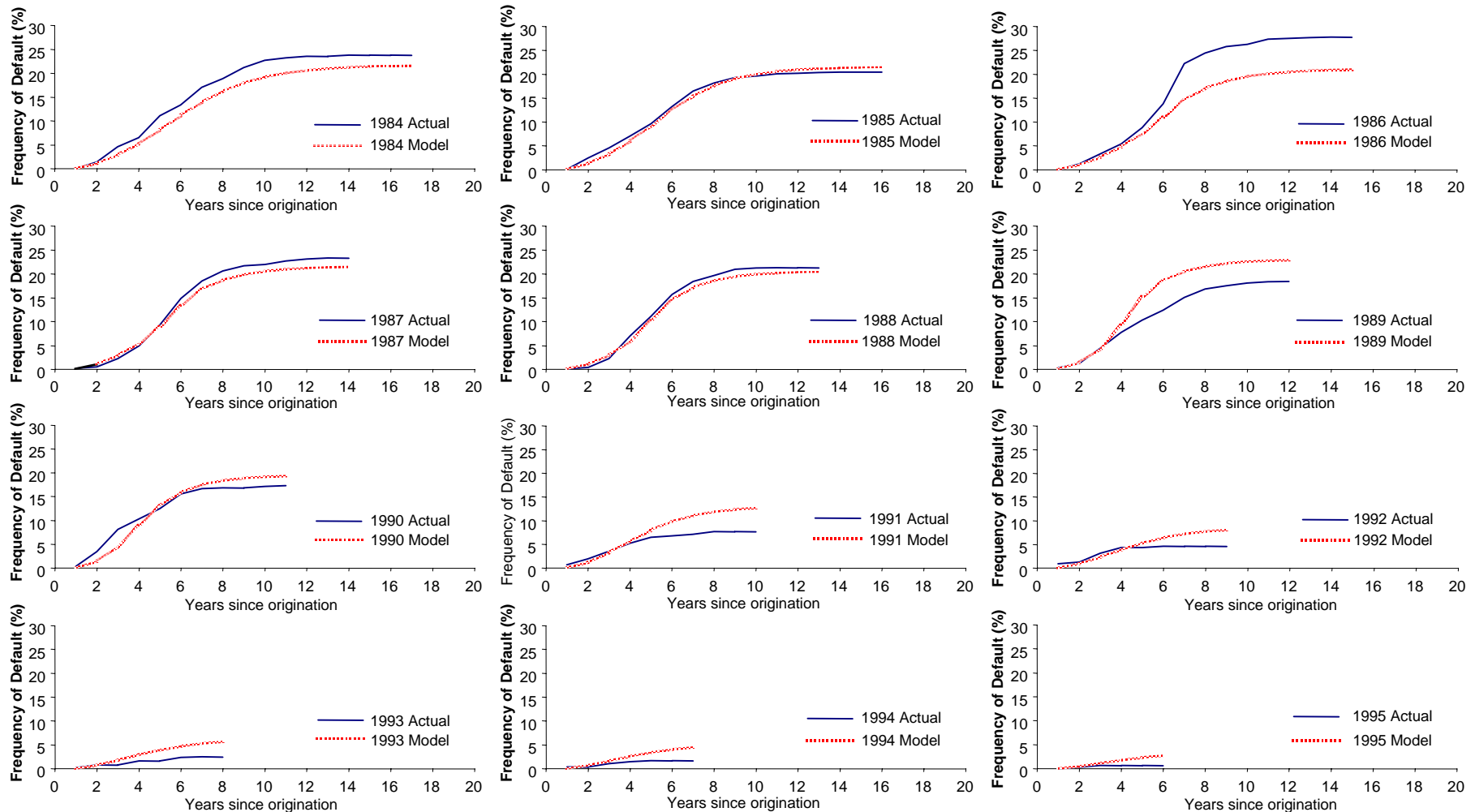


- Origination cohorts **97%** correlated

Comparative Accuracy: Cumulative Probability of Default

Results extremely encouraging

- very tight across most origination cohorts,
- especially strong correspondence during loan's initial years



Factors effects from: 1) loan seasoning, 2) survival rate, and 3) economic conditions

COMPASS^{CRE} — Out-of-sample Tests

- Background

- ✓ The original Compass^{CRE} model was calibrated to historical credit experience of life insurance company loans reported by Snyderman/Esaki studies
- ✓ A rigorous true out-of-sample test was performed by applying Compass^{CRE} to multi-family loans securitized prior to 2005Q1
- ✓ Modeled PD/EL results from 1998 through 2006Q1 were compared to the actual defaults and losses to determine the out-of-sample accuracy of Compass^{CRE}

- Summary data description

- ✓ PPR obtained from Trepp, LLC the initial loan-level characteristics recorded post-securitization for the entire multi-family CMBS universe through 2005Q1
- ✓ PPR has been able to run through Compass^{CRE} a total of 19,731 multi-family loans with aggregate loan amount of \$87.9 billions. The average loan amount in the sample is around \$4.5 millions
- ✓ The actual aggregate time-series defaults and losses data for the same loan pool was reported by a published study by Lancaster and Butler (2006)

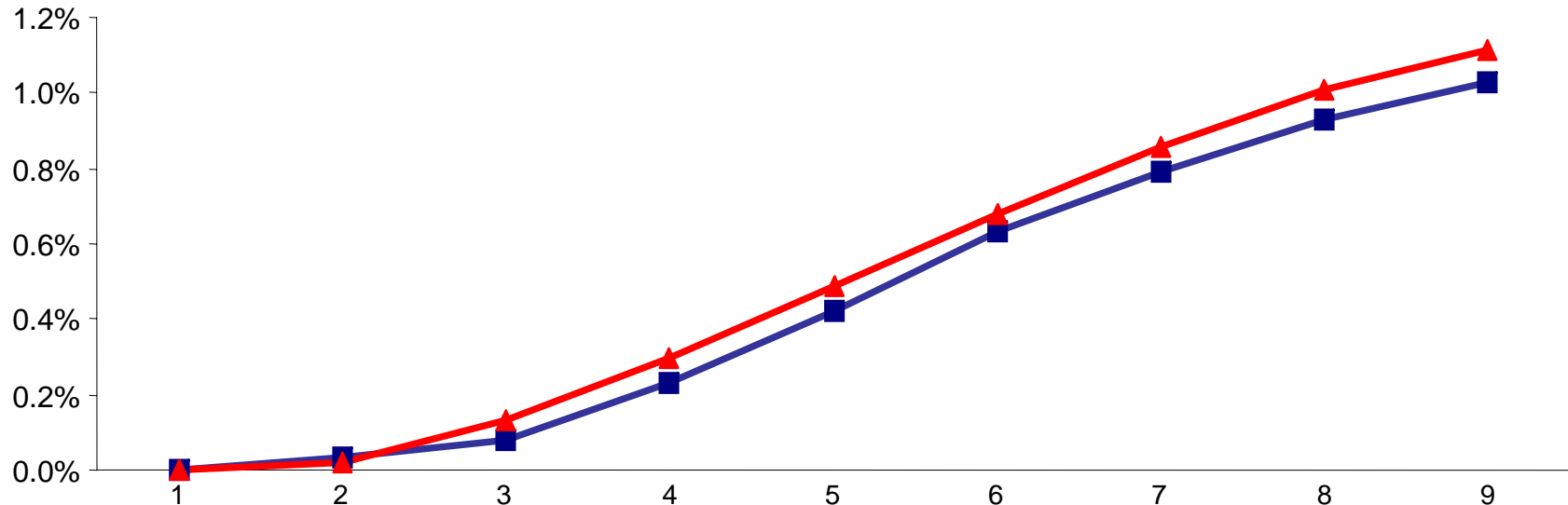
COMPASS^{CRE} — Out-of-sample Tests

Actual vs. Modeled Loss Curve

Cumulative Loss Curve

Cumulative loss as a % of original balance

■ Actual Losses ▲ Modeled EL



Actual Losses	0.00%	0.03%	0.08%	0.23%	0.42%	0.63%	0.79%	0.93%	1.03%
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Modeled EL	0.00%	0.02%	0.13%	0.30%	0.49%	0.68%	0.86%	1.01%	1.12%
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Years (Seasoning)

- Compass^{CRE} exhibits extremely tight fit to out of sample data

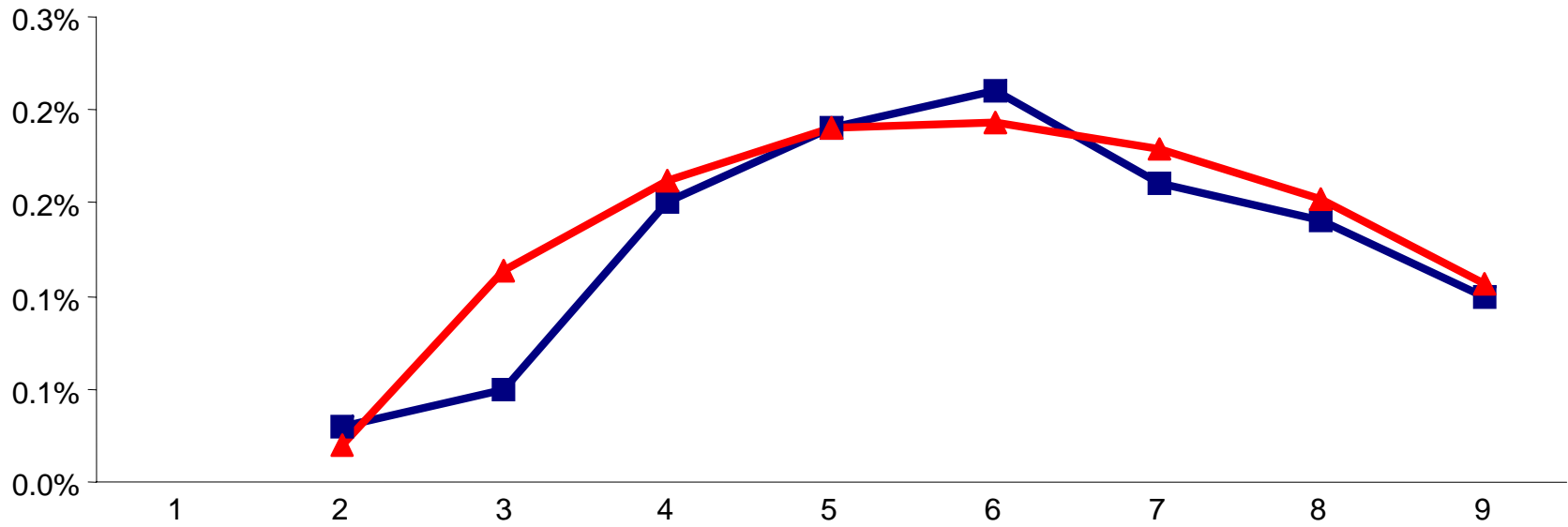
COMPASS^{CRE} — Out-of-sample Tests

Actual vs. Modeled Loss Curve

Conditional Loss Curve

Periodic loss as a % of original balance

■ Actual Losses ▲ Modeled EL



Actual Losses	0.03%	0.05%	0.15%	0.19%	0.21%	0.16%	0.14%	0.10%
Modeled EL	0.02%	0.11%	0.16%	0.19%	0.19%	0.18%	0.15%	0.11%

Years (Seasoning)

- Even given differences in underlying collateral between calibrated and out-of-sample data, Compass^{CRE} produces results well within statistical guidelines

COMPASS^{CRE} — Out-of-sample Tests

- Conclusion

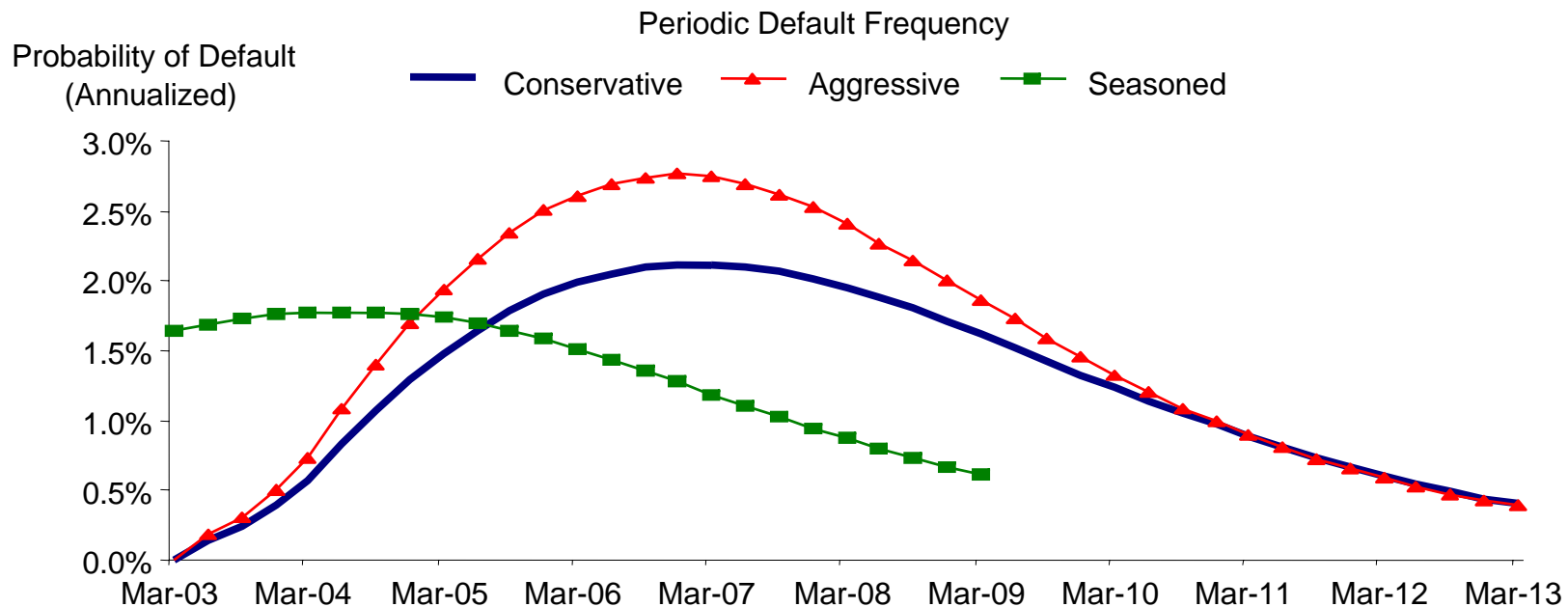
- ✓ There is a very tight fit between the modeled PD/ELs and the actual experience. The fit is shown in both lifetime cumulative numbers and year-to-year seasoning curves.
- ✓ The out-of-sample test using the multi-family CMBS universe has proved the accuracy of Compass^{CRE} and the relevance of its use in today's general lending business beyond that of life insurance companies.
- ✓ The test has confirmed not only the predictiveness of Compass^{CRE} in forecasting PD/ELs but also the accuracy of PPR's historical real estate market data series.
- ✓ While the commercial real estate lending industry has evolved drastically throughout 1990s and 2000s, it appears that the default behavior of the borrowers has not changed noticeably under the same financial conditions.

COMPASS^{CRE} Differentiates Across Numerous Dimensions

A fixed-rate, 10-year bullet with:

- a **Conservative** Structure — 75% LTV, 1.3 DSCR, originated 1Q03
- an **Aggressive** Structure — 85% LTV, 1.2 DSCR, originated 1Q03
- a Conservative Structure — 75% LTV, 1.3 DSCR, originated 4 years prior (**seasoned**)

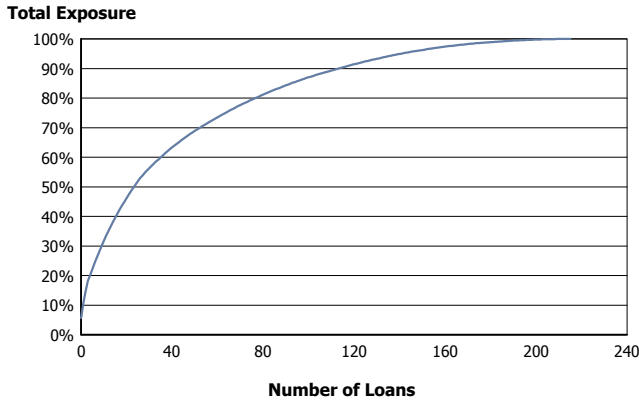
Will all exhibit large differences in level and timing of risk exposure



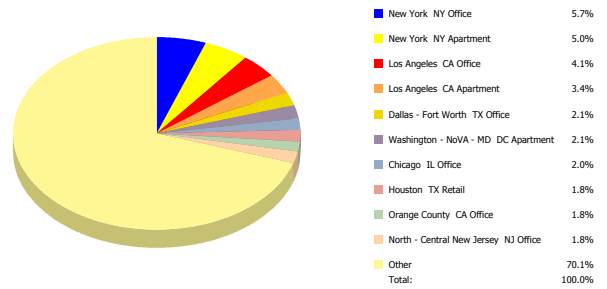
BUT, each result also differs by sub-market and property type

All Loans	Base Case					Recession Case				
	Property Type	WA PD	WA LGD	WA EL	EL(\$)	% EL(\$)	WA PD	WA LGD	WA EL	EL(\$)
Apartment	6.2%	20.0%	128	\$9,181,720	22.6%	10.1%	22.8%	238	\$17,057,839	21.9%
Office	8.5%	21.8%	194	\$19,071,911	47.0%	11.3%	24.0%	280	\$27,546,631	35.4%
Retail	5.1%	19.9%	106	\$9,658,129	23.8%	11.0%	25.0%	291	\$26,546,357	34.1%
Warehouse	5.2%	18.9%	103	\$2,707,220	6.7%	11.3%	21.8%	253	\$6,635,975	8.5%
Total	6.5%	20.5%	141	\$40,618,980		10.9%	23.8%	271	\$77,786,801	

Exposure Concentration

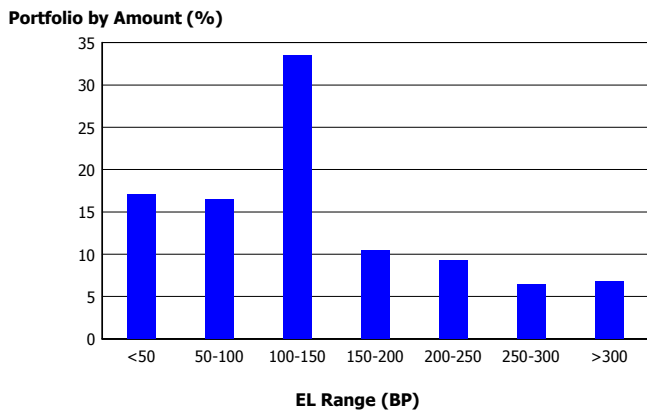


Top 10 Market Exposure Expected Loss

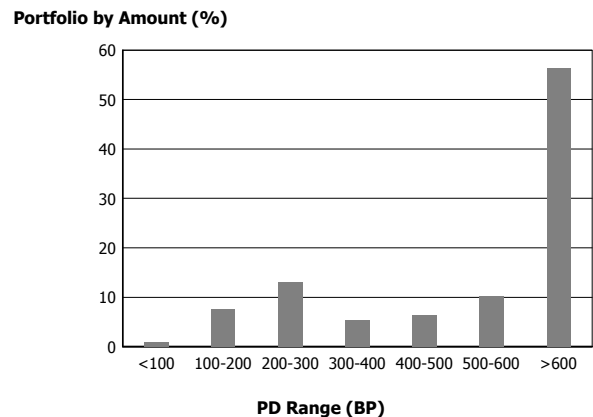


Top 10 PPR Markets	Base Case					Recession Case				
	Property Type	WA PD	WA LGD	WA EL	EL(\$)	% EL(\$)	WA PD	WA LGD	WA EL	EL(\$)
New York - NY Office	6.7	21.6	144	\$2,308,975	5.7%	8.7	23.5	205	\$3,283,114	4.2%
New York - NY Apartment	7.1	21.1	150	\$2,025,154	5.0%	11.1	24.0	266	\$3,606,012	4.6%
Washington - NoVA - MD - DC Office	2.0	18.8	38	\$511,033	1.3%	3.6	21.4	77	\$1,041,479	1.3%
Los Angeles - CA Apartment	6.9	20.7	142	\$1,399,207	3.4%	11.2	23.6	264	\$2,603,987	3.3%
Los Angeles - CA Office	9.7	22.9	221	\$1,653,489	4.1%	12.8	24.6	314	\$2,348,391	3.0%
New York - NY Retail	2.7	19.7	53	\$365,387	0.9%	5.7	22.9	130	\$905,119	1.2%
Los Angeles - CA Retail	5.1	21.0	108	\$690,999	1.7%	9.9	24.7	244	\$1,563,465	2.0%
Chicago - IL Office	7.6	21.6	164	\$812,691	2.0%	9.5	22.8	215	\$1,064,214	1.4%
Chicago - IL Retail	1.2	17.9	21	\$99,421	0.2%	6.6	23.9	156	\$749,726	1.0%
Boston - MA Retail	2.5	19.8	50	\$234,013	0.6%	13.3	29.7	396	\$1,836,248	2.4%
Other	7.0	20.4	153	\$30,518,612	75.1%	11.8	23.8	295	\$58,785,047	75.6%

EL Breakdown

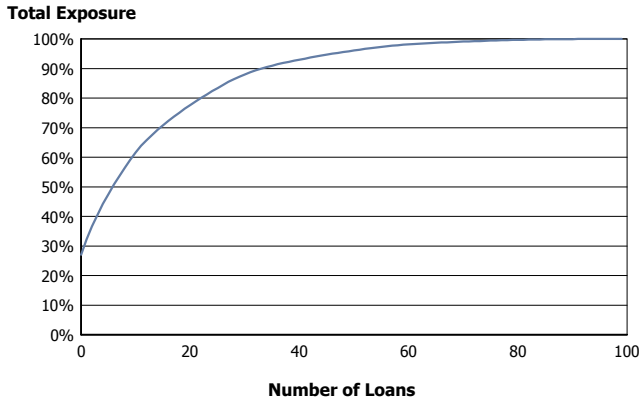


PD Breakdown

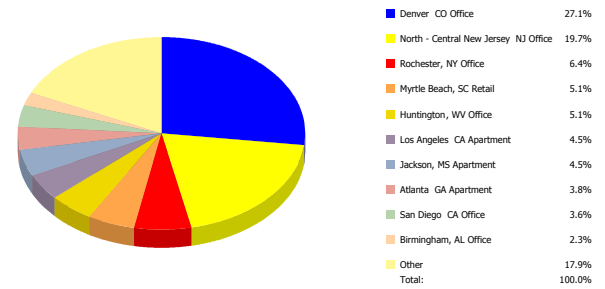


All Loans	Base Case					Recession Case				
	Property Type	WA PD	WA LGD	WA EL	EL(\$)	% EL(\$)	WA PD	WA LGD	WA EL	EL(\$)
Apartment	4.5%	20.5%	95	\$1,142,767	20.8%	5.9%	21.6%	131	\$1,587,802	23.3%
Office	6.9%	23.0%	168	\$3,956,294	72.1%	7.6%	23.9%	195	\$4,588,307	67.5%
Retail	3.6%	17.6%	67	\$328,801	6.0%	5.1%	19.4%	107	\$523,556	7.7%
Warehouse	2.8%	19.3%	55	\$61,767	1.1%	4.4%	20.6%	90	\$101,686	1.5%
Total	5.7%	21.5%	132	\$5,489,629		6.7%	22.6%	163	\$6,801,351	

Exposure Concentration

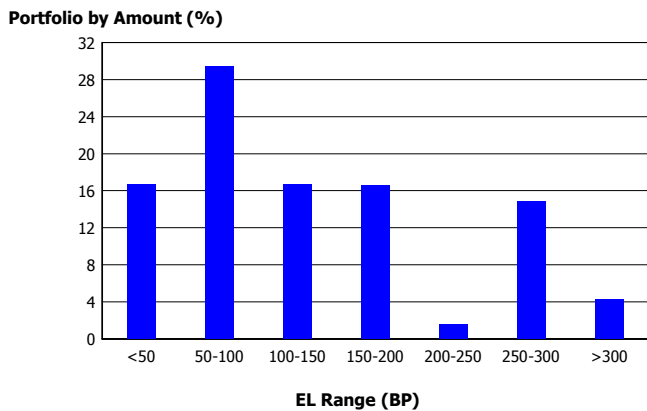


Top 10 Market Exposure Expected Loss

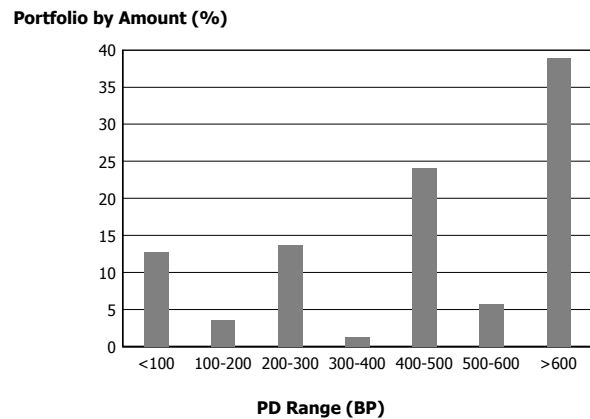


Top 10 PPR Markets	Base Case					Recession Case				
	Property Type	WA PD	WA LGD	WA EL	EL(\$)	% EL(\$)	WA PD	WA LGD	WA EL	EL(\$)
Denver CO Office	10.4	26.1	272	\$1,485,196	27.1%	11.1	26.9	298	\$1,629,623	24.0%
North - Central New Jersey NJ Office	8.1	24.3	198	\$1,079,349	19.7%	8.9	25.4	227	\$1,239,616	18.2%
East Bay CA Office	0.9	17.8	16	\$62,824	1.1%	1.0	18.1	18	\$69,138	1.0%
Los Angeles CA Apartment	3.7	20.5	75	\$248,769	4.5%	4.5	21.3	97	\$324,317	4.8%
Myrtle Beach, SC Retail	4.8	18.8	90	\$282,181	5.1%	6.7	20.7	138	\$431,378	6.3%
Jackson, MS Apartment	4.7	23.1	108	\$246,532	4.5%	5.7	24.0	136	\$310,911	4.6%
Huntington, WV Office	6.0	24.7	148	\$279,761	5.1%	6.4	25.3	163	\$306,435	4.5%
Panama City, FL Apartment	2.4	19.7	49	\$80,908	1.5%	3.4	21.2	73	\$120,924	1.8%
Birmingham, AL Office	4.9	20.5	101	\$128,975	2.3%	6.4	22.1	143	\$183,949	2.7%
Pittsfield, MA Office	3.0	19.1	58	\$70,713	1.3%	3.4	19.5	67	\$82,109	1.2%
Other	5.7	20.3	127	\$1,524,422	27.8%	7.4	21.7	175	\$2,102,952	30.9%

EL Breakdown



PD Breakdown



Policy Implications — Proactive Portfolio Risk Management

- Risk analysis conducted across numerous dimensions:
 - ✓ Loan Structure, Market, Property Type, Time, Economic Scenario
- Key Benefits
 - ✓ Enhances competitive position by setting more appropriate **reserve requirements and economic capital** levels
 - ✓ More efficient loan pricing
 - ✓ Enhances surveillance through improved **“watch lists”**
 - ✓ **Validates** and strengthens risk grades
 - ✓ Improves communication of risk strategy to regulators, investors, and senior management
 - ✓ **Stress tests** portfolios
 - ✓ **Facilitates Basel II** compliance