



National Association *of* Insurance Commissioners

**2009 RBC charges for RMBS – Progress Update**  
Chris Evangel, Managing Director, Securities Valuation Office

December 7, 2009  
NAIC 2009 Winter National Meeting  
San Francisco, California



# Significant resources have been dedicated at each point in the processes



## Market Survey and Assessment

- Task Force
  - Matti Peltonen
- Securities Valuation Office
  - Bob Carcano
  - Joe Prakash
  - Hancock Lee

## RFP development

- Task Force
  - Matti Peltonen
- Securities Valuation Office
  - Bob Carcano
- NAIC Central Office
  - Jim Woody
  - Gail Sciacchetano
  - Dan Daveline

## Vendor selection

- Securities Valuation Office
  - Chris Evangel
  - Bob Carcano
  - Eric Kolchinsky
- NAIC Central Office
  - Jim Woody
  - Gail Sciacchetano
  - Todd Sells
  - Dan Daveline
- Oliver Wyman
  - Sid Sankaran
  - Shaleen Khurana
  - Scott Campion
  - John Li

## Assumption review

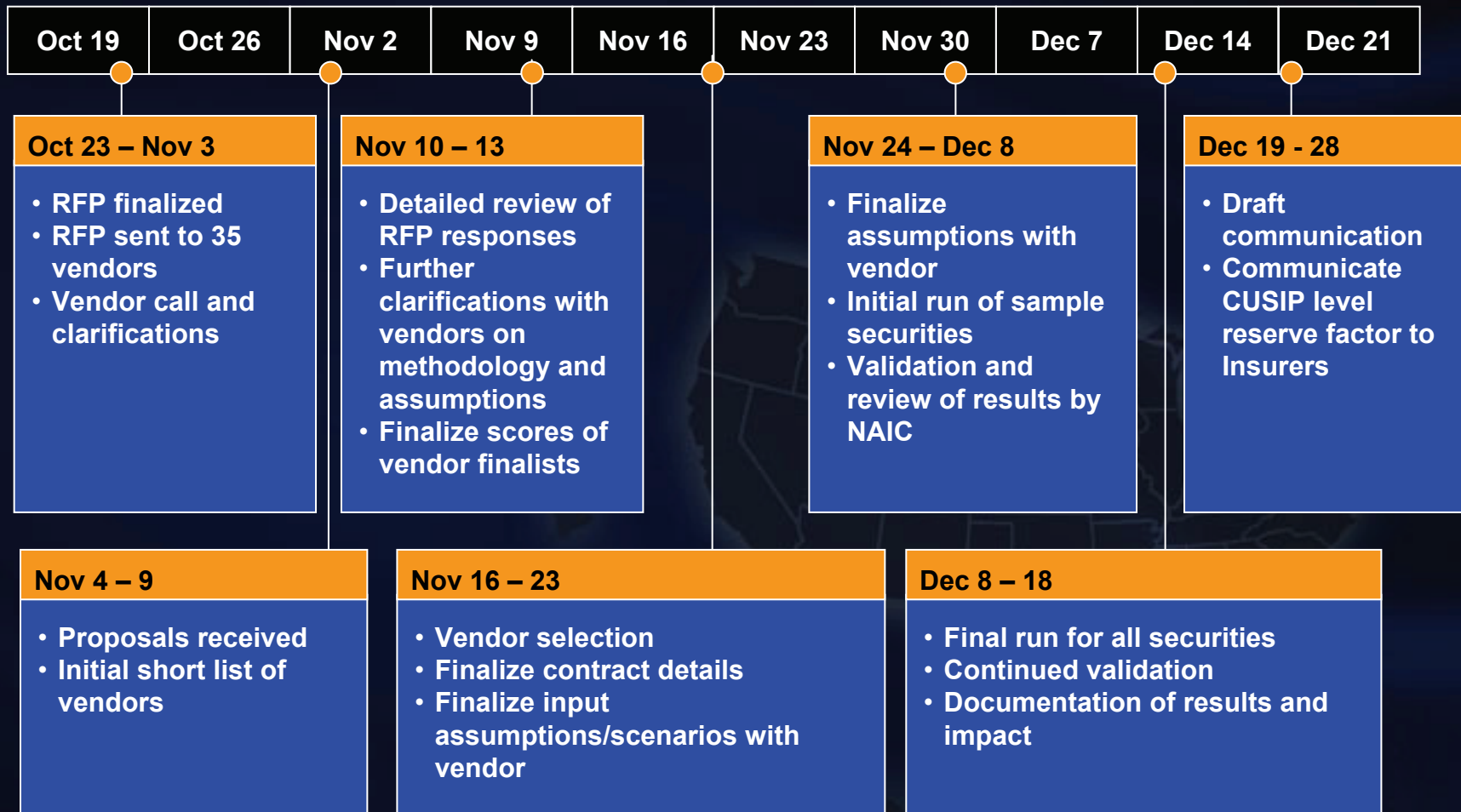
- Securities Valuation Office
  - Chris Evangel
  - Bob Carcano
  - Eric Kolchinsky
- Oliver Wyman
  - Sid Sankaran
  - Shaleen Khurana
  - Scott Campion

## Summary of the RMBS process



- **An RFP was drafted by the Task Force Chair, SVO staff and the NAIC staff and issued to prospective vendors on October 23rd, 2009**
- **PIMCO Advisory was selected as the result of a robust and fair vendor selection process by NAIC staff supported by consultants**
  - **Vendors were subjected to a deep-dive review against objective criteria**
  - **PIMCO Advisory demonstrated proven capabilities, robust methodology and a strong drive to meet the NAIC requirements**
- **The SVO team has conducted a thorough review of PIMCO Advisory's model and assumptions, and determined them to be valid and reasonable**
  - **PIMCO Advisory uses industry-leading methodology to project losses**
  - **The assumptions to be used are reasonable and fall within the range of industry and market-observer forecasts**
- **As the analysis is completed, the SVO is rigorously validating results for accuracy and completeness**

# The RMBS project is being conducted under a very tight timeline



# A thorough and robust vendor selection process led to the selection of PIMCO Advisory



## Evaluation criteria

Core  
criteria

- 1 Qualification and name recognition
- 2 Viability of methodology
- 3 Comprehensiveness of outputs
- 4 Ease of implementation
- 5 Post transaction support
- 6 Product and service expand-ability to other asset classes
- 7 Contractual requirements and fees

- Measured based on vendor's prior experience in RMBS valuation and references cited
- Each shortlisted vendor's methodology was analyzed in detail for conformity with market standard methodologies
- Additional criteria included data sources used, coverage of deals
- Sensitivity analysis and stress testing approaches were also considered
- "Industrial strength" ability to deliver in our short timeframe demonstrated through prior experiences of similar assignments
- Pro-activity and demonstration of willingness to support NAIC in required communications
- Measured based on vendor's prior experience in other securities valuation and references cited
- \$ fees and other requirements (licenses, data access, etc.)

PIMCO Advisory met or exceeded requirements on all criteria

# Following vendor selection, we focused on vetting and approval of assumptions to be used



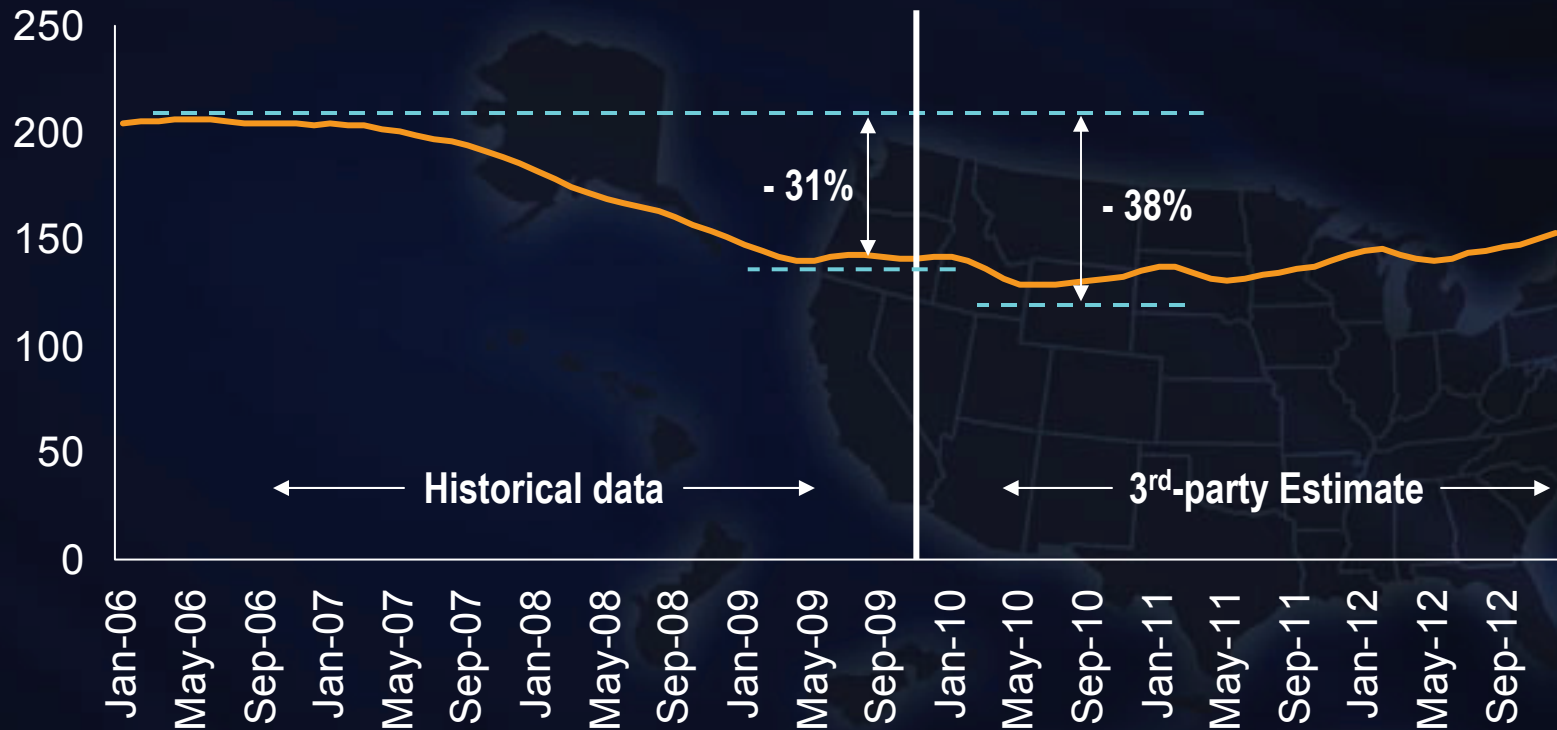
- **NAIC SVO and consultant team reviewed the macroeconomic assumptions that drive the valuation model for “reasonableness”**
  - Home Price Appreciation (HPA) is the primary macroeconomic assumption that drives the valuation- baseline HPA projection is calibrated to a 3<sup>rd</sup> party market standard HPA projection
  - Other standard underlying macroeconomic assumptions are not explicitly used but drive the HPA forecast and were also checked for reasonableness
    - GDP growth rate
    - Unemployment rate
    - CPI
- **Vetted assumptions were discussed with the task force and industry**
  - 11/24 – Initial assumptions discussed with task force in a regulator call
  - 11/25 – Assumptions released to industry for comments
  - 11/30 – Industry comments gathered in an open call
  - 12/2 – Final macro assumptions approved by task force; response to industry questions communicated in open call and released as a Q&A document

# Assumptions: The baseline HPA estimate projects a 38% Peak to Trough decline in Home Prices



## Historical and estimated HPA

Case Shiller 20 City index, 2006 – 2009; Model Estimates, 2009 - 2012



Source: Historical data from S&P, estimates from PIMCO Advisory model output

# Assumptions: Macroeconomic factors implicit in the HPA forecast have also been checked for reasonableness



- HPA is the primary driver of valuation model and is used as a proxy for the broader economic conditions
- Use of HPA as the primary independent variable by PIMCO Advisory does not mean that the assumption is that HPA causes or is the primary driver of mortgage defaults
- Rather, both HPA and defaults are closely related to other macroeconomic conditions; factors implicit in the HPA forecast include
  - Unemployment rate
  - GDP growth rate
  - CPI
  - Household Income
  - Treasury Interest Rates
  - Effective Mortgage Rate
  - Personal and Property Tax Rates
  - Inflation

Static variables included in the median-case economic projection

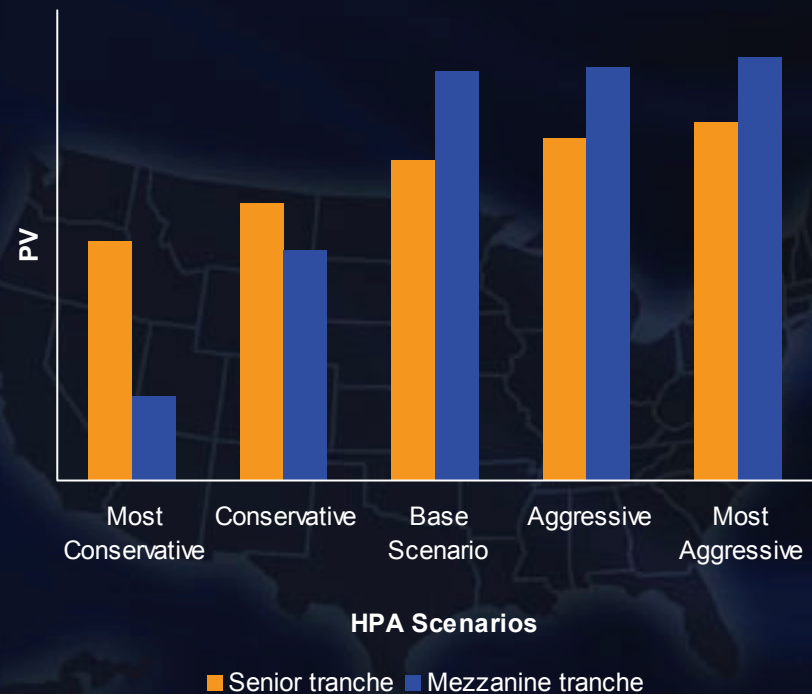
Factor	Forecast		
	2010	2011	2012
Unemployment	10.6%	9.6%	7.4%
GDP growth	2.2%	5.0%	4.9%
CPI growth	1.4%	2.0%	2.0%

# Assumptions: RMBS possess “cuspiness” and we have opted to use multiple scenarios approach to capture this risk



- Many securities may have a high present value under a single scenario, but may suffer large losses under a slightly more stressful scenario (referred to as “cuspiness”)
- We are valuing these securities under multiple scenarios to capture this “cuspiness”
- Losses under each scenario for a security will be weighted based on its probability

## PV vs. HPA Scenarios (Illustrative purposes only)



# Assumptions: We will be using 5 probability weighted scenarios ranging from 33% to 61% peak-to-trough home price decline



## Scenario parameters

Scenario	Probability	Timing of Trough	Peak to Trough HPA
Most Aggressive	2.5%	Q2 2010	-33%
Aggressive	22.5%	Q2 2010	-35%
Base Case	50.0%	Q2 2010	-38%
Conservative	22.5%	Q2 2011	-41%
Most Conservative	2.5%	Q2 2020	-61%



95% probability weight to Peak to Trough HPA between 35% and 41%

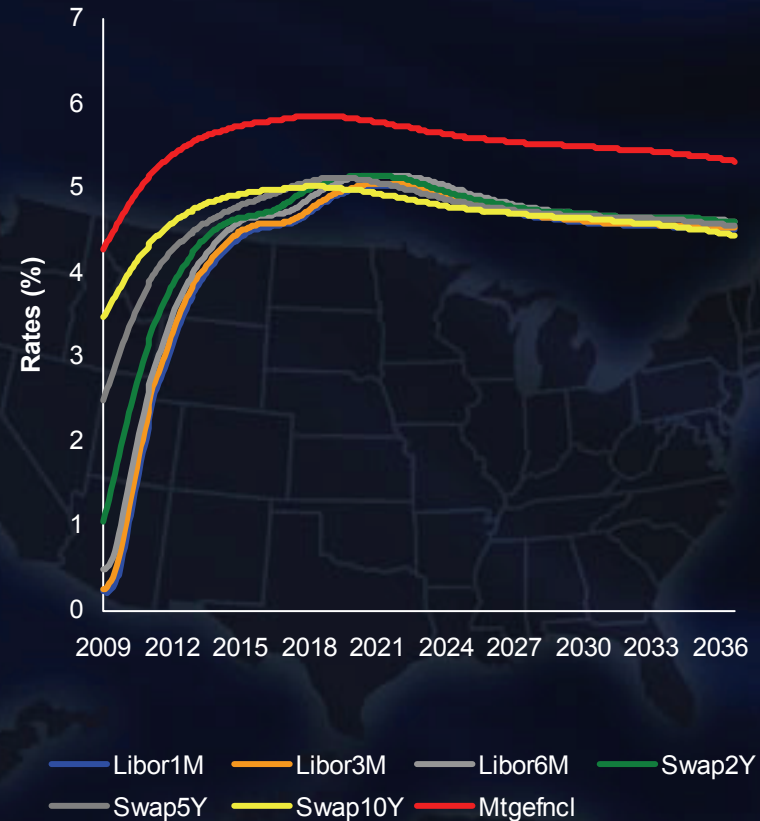
- HPA scenarios were generated using a Monte Carlo simulation to generate different HPA paths around the base case using historical volatility
- Base case represents a median scenario with a high probability while the most extreme scenarios have a very low probability
- Most conservative scenario selected represents a very severe scenario to capture the downside with 'tail risk'

# Assumptions: Forward-looking interest rates are also a primary dynamic variable in the model



- Future interest rate paths are based on implied forward money market and mortgage interest rates
- The projected mortgage rate is a function of 5- and 10-year swap rates and credit spreads
- Interest rates impact the collateral cashflows
- In particular the projected interest rates impact the ability to refinance the loans as well as any borrower payment shock

Projected Rates



# As results are becoming available, the SVO is conducting thorough quality assurance and testing



## Sector level validation

- Assumptions from market observers (investment banks, sell side research, rating agencies, etc.) are available at the aggregate-level, e.g. 2007 Subprime
- PIMCO's sector-level are being checked to confirm they fall within range of market forecasts

## Statistical analysis and Outlier testing

- We are performing analysis by cohorts to confirm expectations of model performance and highlight and isolate outliers
- We are also sanity checking results at an aggregate level through the use of multiple metrics (e.g. lifetime remaining loss rates, implied roll rates, etc.)

## Deep-dive review of selected securities

- Sample includes outliers from cohort analysis and randomly selected test securities
- Analysis includes end-to-end calculation verification and a complete review of all data inputs and assumptions

## The industry will receive five prices for each CUSIP with which they will map the CUSIP to NAIC designation



- The final output will be five “break point” carrying prices for each CUSIP
  - The prices represent the maximum carrying prices at which a security can be held at NAIC designations 1 through 5
  - Separate sets of prices will be calculated for P&C/Health and Life
- Insurers will follow a three-step process to determine NAIC designation
  - Use Amortized Cost to determine Initial Designation
  - Use Initial Designation to determine carrying value method (i.e. Amortized Cost or Fair Value)
  - Determine Final Designation using Amortized Cost or Fair Value
- A detailed instruction document will be released to explain the output format

# Example mapping to NAIC designations



## Illustrative example – P&C insurers

NAIC designation	RBC charge	Break Point
1	0.30%	76.50
2	1.00%	77.16
3	2.00%	78.55
4	4.50%	81.94
5	10.00%	95.00
6	30.00%	

	Example 1	Example 2	Example 3
Amortized cost	77.00	85.00	105.00
Initial designation	NAIC 2	NAIC 5	NAIC 6
Carrying value method	Amort. Cost	Fair Value	Fair Value
Fair value	N/A	78.00	75.00
Final designation	NAIC 2	NAIC 3	NAIC 1
RBC charge	1.00%	2.00%	0.30%

## Illustrative example – Life insurers

NAIC designation	RBC charge	Break Point
1	0.40%	76.65
2	1.30%	78.31
3	4.60%	81.98
4	10.00%	91.02
5	23.00%	103.40
6	30.00%	

	Example 1	Example 2	Example 3
Amortized cost	77.00	85.00	105.00
Initial designation	NAIC 2	NAIC 4	NAIC 6
Carrying value method	Amort. Cost	Amort. Cost	Fair Value
Fair value	N/A	N/A	75.00
Final designation	NAIC 2	NAIC 4	NAIC 1
RBC charge	1.30%	10.00%	0.40%

# Next steps: We continue to operate under very tight timelines to meet the end of year deadline



November 30

December 7

December 14

December 21

December 28

**December 2:  
Assumptions approved**

**December 18:  
Final valuations due**

**December 28:  
Target date for industry  
communication**

- 12 business days (16 calendar days) between assumptions approval and final valuation
- 20,000 + CUSIPs will need to be evaluated in this period
- Focus during this time will be on QA and validation of results
- Format of output will be communicated to the industry
- Critical that PIMCO Advisory focus on analytics (and not be distracted by other considerations) to ensure delivery of a quality result

- Communication of results and validation to task force
- Preparing and formatting final output
- Quality control and error checking
- Communication of final results to industry