



## PIMCO Advisory's Approach to RMBS Valuation

December 8, 2010

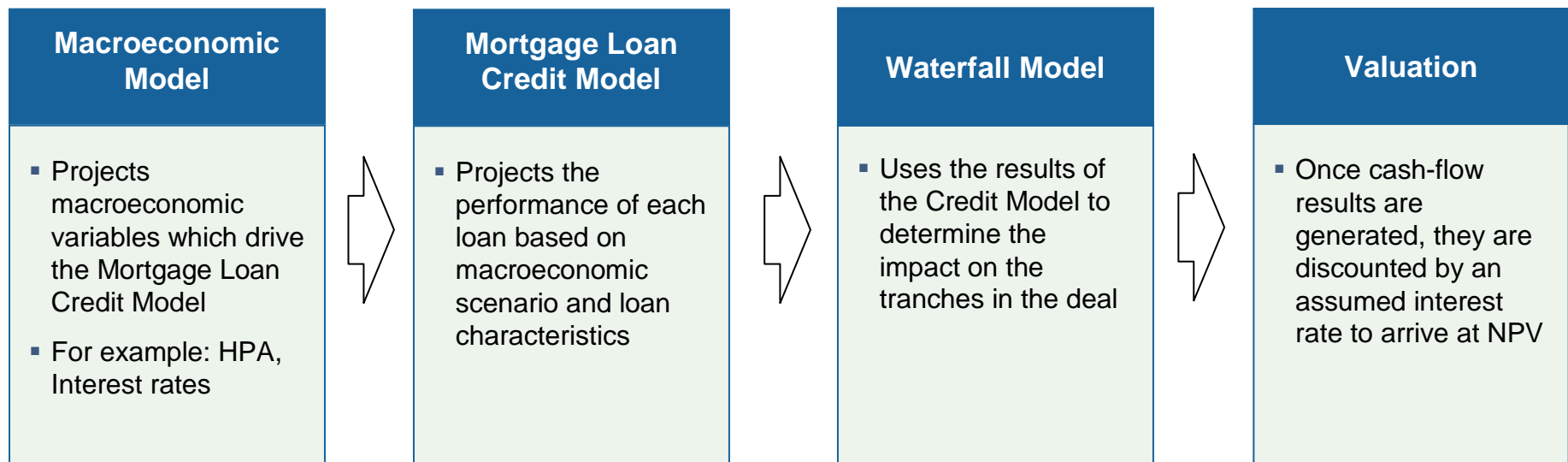
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## The Building Blocks of Valuation

- Credit sensitive mortgages are very complex assets and there is no simple way to determine their expected losses with certainty
- Mortgage models are effectively making a forecast about the future, e.g., what path will home prices take over the next 30 years
  - Models aren't perfect and are rough approximate of expected future behavior
  - Valuation of RMBS requires a combination of quantitative modeling and fundamental understanding of mortgage markets
  - Effective use of models requires substantial judgment on the part of the modeler and end-user.
- PIMCO Advisory's mortgage modeling process is the result of decades of experience & a deep fundamental understanding of the underlying assets



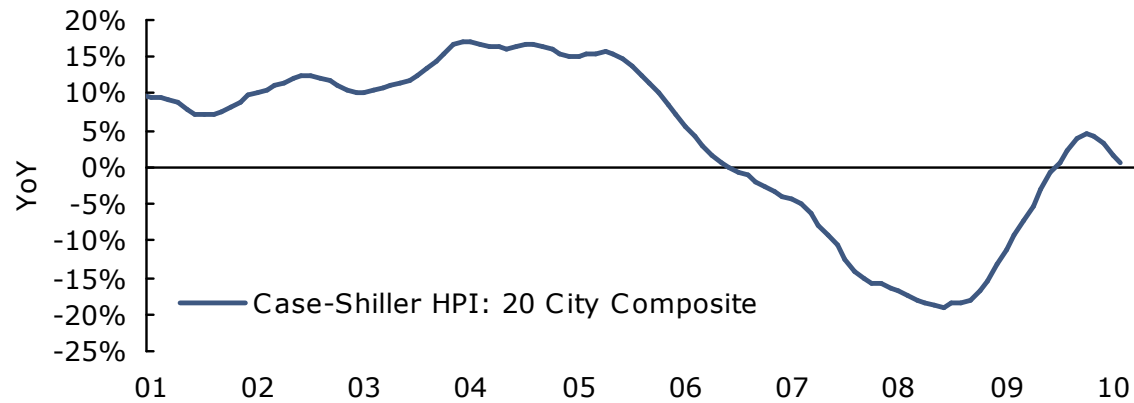
# National House Price Situation

As Of September 30, 2010

Case-Shiller HPI 20-City Composite

YoY		MoM		Peak Month	Peak to Current	Peak to Trough
Current	Previous	Current	Previous			
0.5%	1.6%	-0.8%	-0.5%	Apr-06	-29.6%	-31.8%

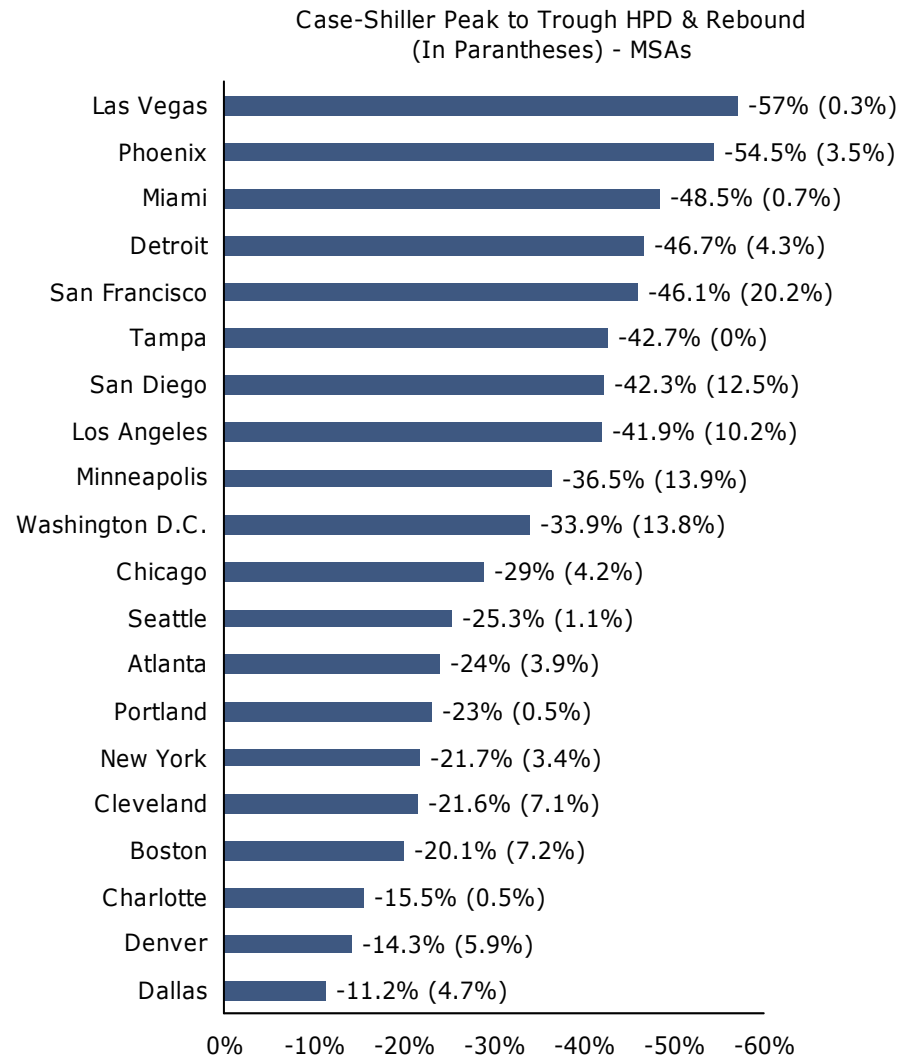
House Price Appreciation



SOURCE: S&P, Haver Analytics

# Significant Variation Exists Across Local Housing Markets

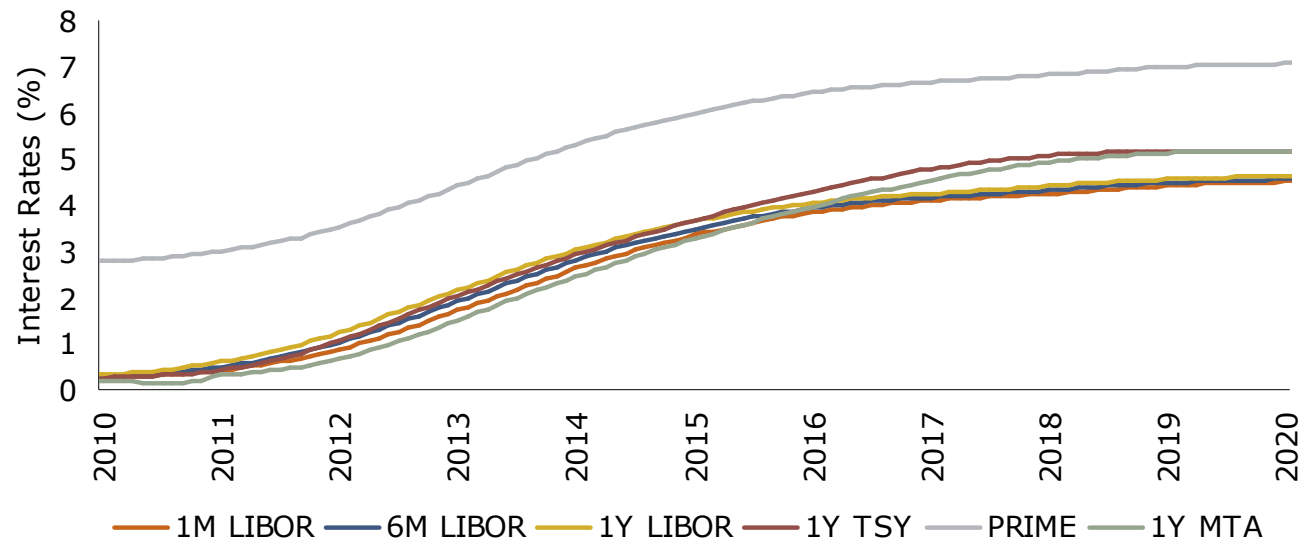
As Of September 30, 2010



SOURCE: S&P, Haver Analytics

## Interest Rate Paths

- Future interest rate paths are usually based on implied forward money market and mortgage interest rates
- Interest rates impact the collateral cashflows. In particular the projected interest rates impact refinaneability of the loans as well as any borrower payment shock



SOURCE: PIMCO  
The dates projected are a forecast along forwards made by PIMCO.

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## Mortgage Loan Credit Model

- The role of a mortgage loan credit model is to project mortgage default, prepay and loss severity on a loan basis – and by extension – on a mortgage-backed security
- PIMCO Advisory's loss expectations are determined by employing proprietary loan level quantitative models
- The proprietary loan-level default model has the following three major components:
  - Incorporates borrower and property characteristics based on attributes known at the time of origination
  - Includes dynamic performance data from origination including borrower payment, interest rates, and home price histories
  - Incorporates future economic information on regional home-price appreciation and mortgage/interest rates
- We employ different sub-models by credit (subprime, Alt-A etc.) and product type (fixed vs. adjustable)
- The output of the model is a set of CPR, CDR and severity vectors

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## Loan-Level Default Analysis

- PIMCO Advisory's loan level process models each individual loan in each securitization
  
- Historical loan performance is a critical factor in projecting future performance
  - In our model, loans are classified into two groups: performing and non-performing
  - The model incorporates not only the current status but also considers the previous history of the loan; if a loan was previously delinquent, the probability of future default increases
  - Based on the loan level characteristics and macro economic variables, transition probabilities are calculated, a random drawing against these calculated probabilities decides which performance group or exit group (prepayment or default) the loan goes during the next month
  - Since the parameters of the model are path-dependent, Monte-Carlo simulation is used
  - After updating all the information, a new set of probabilities is calculated, a new drawing is performed for the next month. This procedure repeats until the loan prepays or defaults. The loan level prediction is then aggregated into CPR/CDR vectors



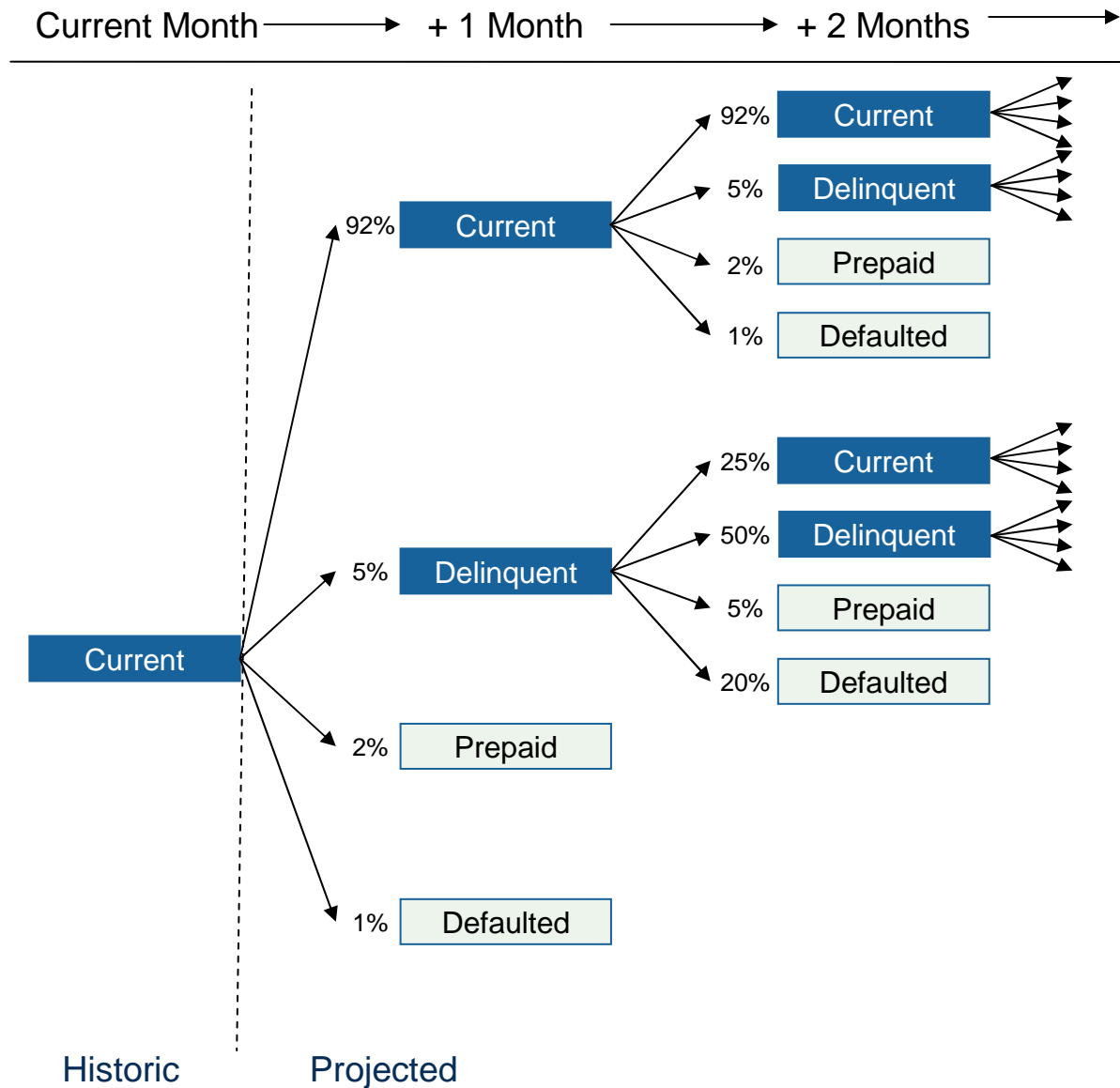
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## Important Explanatory Factors of Credit Model

- Static Factors
  - Original borrower FICO
  - Documentation level
  - Property type (single unit, condo, two-four unit etc.)
  - Occupancy (owner, investor/second homes)
- Dynamic Factors
  - Current marked-to-market loan-to-value ratio; Current LTV is adjusted using regional home price indices.
  - Interest rates: impacts prepayment speeds and payment shock behavior
  - Home price appreciation / depreciation (HPA / HPD)
  - Seasoning / Loan age
  - Regional foreclosure timelines
- Historical Payment Information
  - Duration of delinquency
  - Fraction of time in delinquency
- Finally our expert analysts manually calibrate the model for a variety of reasons, including but not limited to:
  - Inherent model biases
  - Loan modifications
  - Servicer-level adjustments

# Illustrative Path-Dependent Simulation

- Each loan is modeled individually over time
- Historic data tells us whether loan is current or delinquent as of today
- Loans may transition between current and delinquent states, and can terminate through prepayment or default
- Transition probabilities are a function of static, dynamic or path-dependent variables



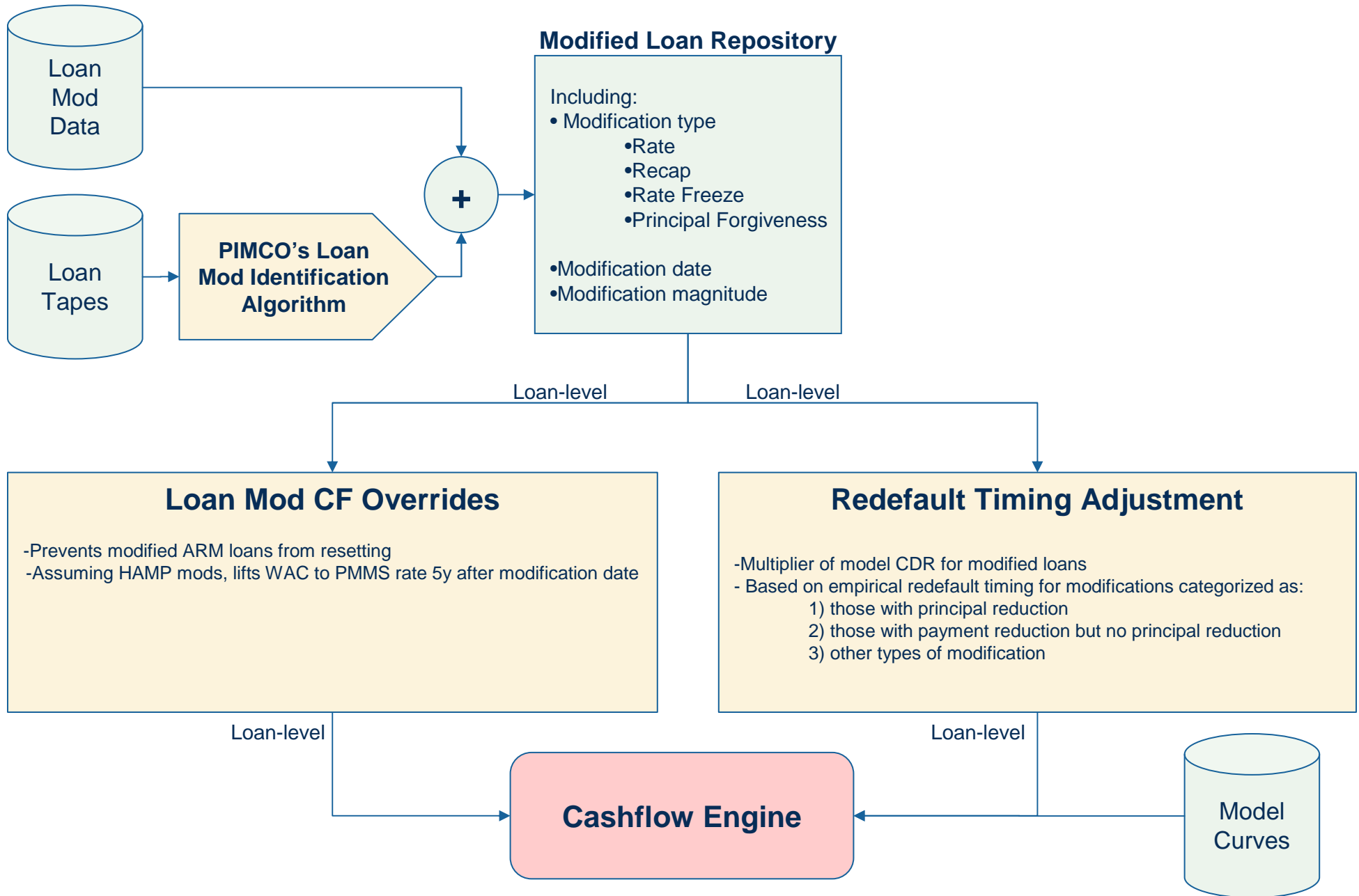
Sample for illustrative purposes only.

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## Loss Severity Analysis

- For the purposes of loss severity, the same default probabilities are applied to maintain consistency. Additional components that contribute to the ultimate loss severity analysis include:
  - Collateral deficiency (unpaid balance less REO sales price)
  - Lost interest (accrued as servicer advances)
  - Expenses (legal, property taxes, brokerage fees)
  - Mortgage insurance considerations
- The explanatory variables incorporated in the default probability have a linear relationship with loss severity. Historical trends can help predict loss severity sensitivities to inputs such as:
  - Static Factors (at origination)
    - FICO
    - Property type
    - Occupancy (owner, investor/second)
    - Lien-Position
    - Mortgage Insurance
    - Judicial vs. non-judicial state
  - Dynamic Factors
    - Interest-rate
    - Loan Balance
    - HPA/HPD
    - Current marked-to-market LTV
    - Regional Foreclosure Timelines
    - Time/Loan Age

# Sample Adjustment: Accounting For Loan Modifications



## Model Curves are Input into the Cash-flow Engine and Allocated According to Each Deal's Waterfall Structure

Principal Allocation	
Group 1	Group 2
A1A	A2D <sup>K</sup>
A1B	A2A
A1C	A2B
	A2C
	A2D <sup>K</sup>
	M1
	M2
	M3
	M4
	M5
	M6
	<b>B1</b>
	B2
	B3
	B4
	B5

- Bonds get paid principal and interest and losses at a particular point in time
- The deal's legal documents determine the waterfall rules

Sample Subprime
Tranche AF2

Loss Allocation				
Group 1	Group 2			
AV1 (37.25%) i	AF1 (0.00%) i	<b>AF2</b> (37.25%) i	AF3 (37.25%) i	AF4 (37.25%) ik
		M1 (25.67%)		
		M2 (14.76%)		
		M3 (8.12%)		
		M4 (1.99%)		
		M5 (0.00%)		
		M6 (0.00%)		
		B1 (0.00%)		
		B2 (0.00%)		
		B3 (0.00%)		
		B4 (0.00%)		
		B5 (0.00%)		

SOURCE: PIMCO  
Sample for illustrative purposes only