

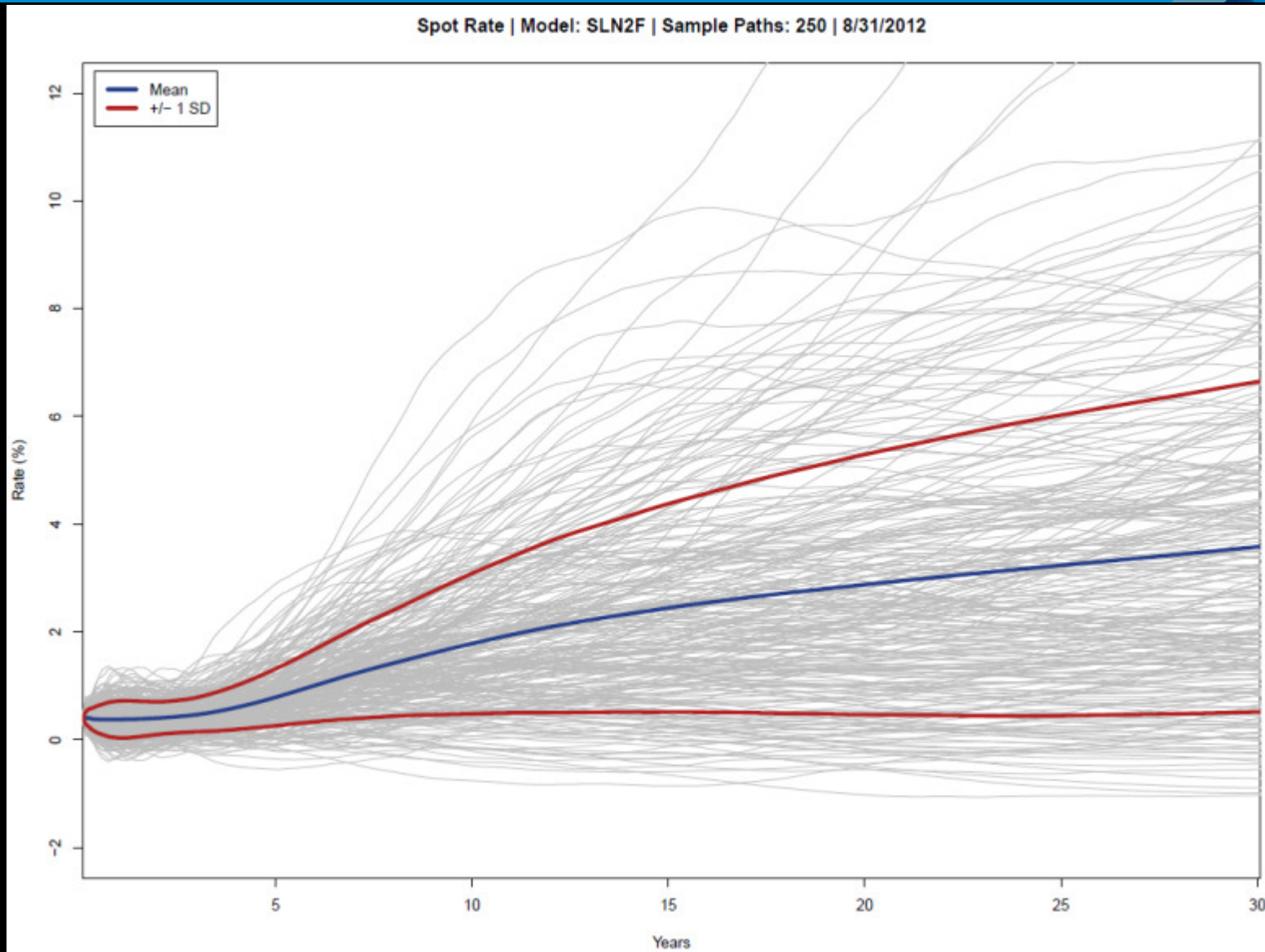


The Impact of BSM on Mortgage-Backed Securities

**Bennett W. Golub, PhD
Chief Risk Officer
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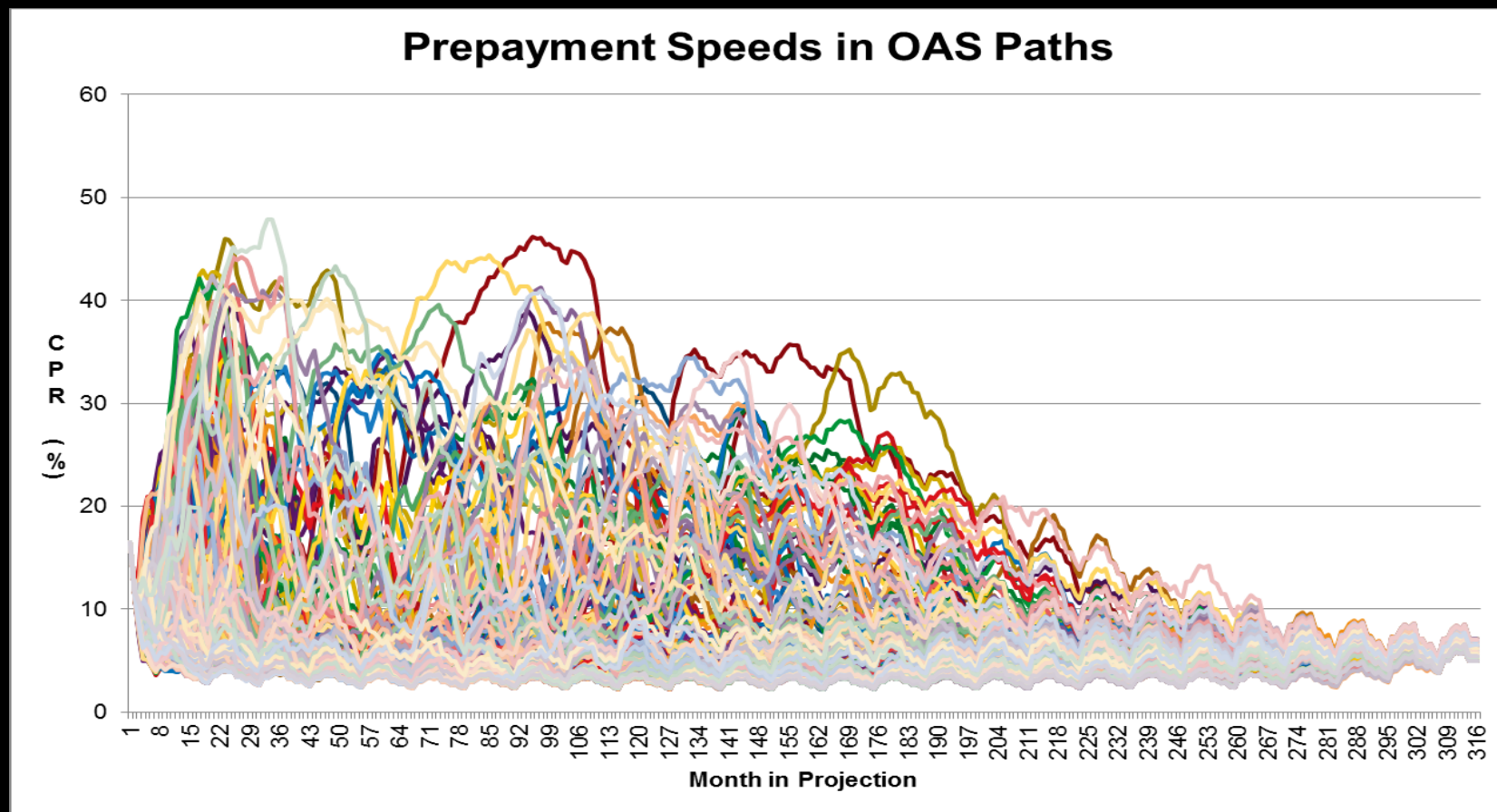
BMS 40 Conference
MIT
October 2, 2013

Shifted Log Normal Interest Rate Paths



Prepayment Speeds Vary Across Different Interest Rate Paths

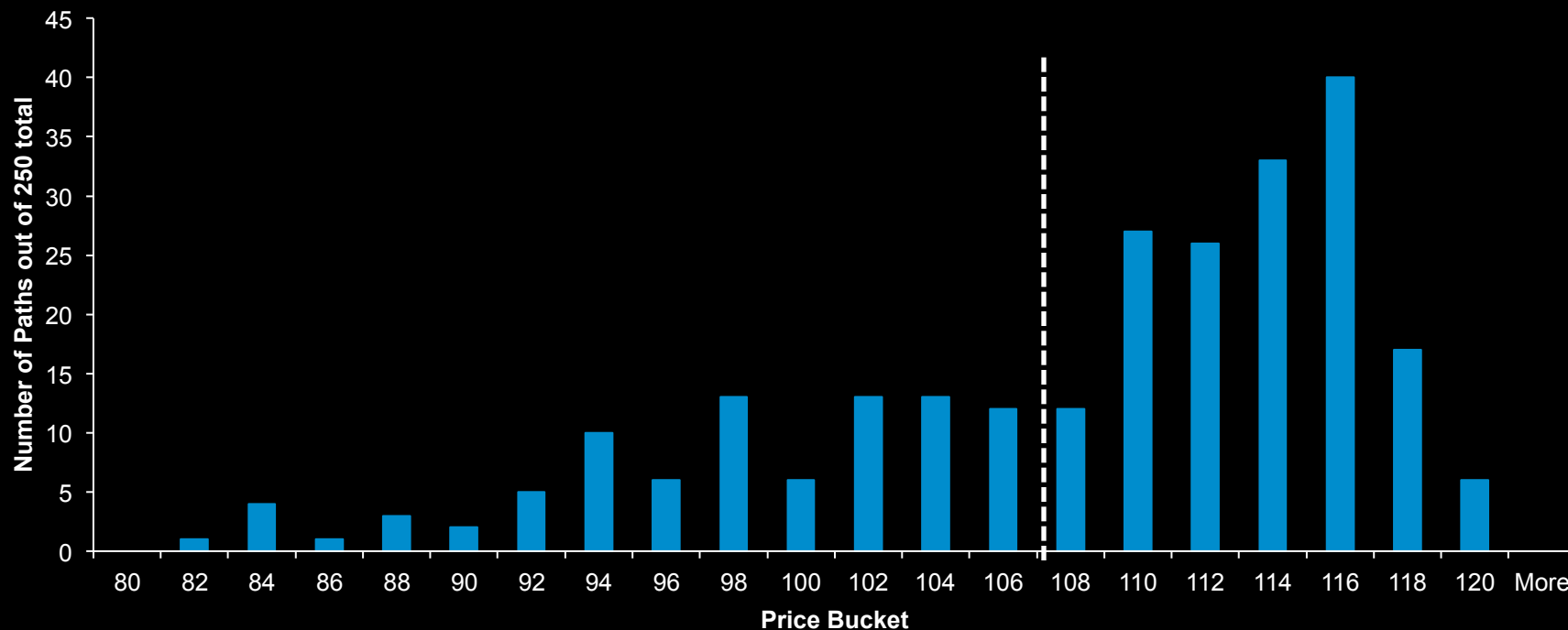
- Given the path-dependent nature of mortgage prepayment behavior the prepayment speeds need to be simulated across various rate paths
- Many paths experience very fast speeds, under which the valuation will suffer severely. The distribution is asymmetric.



Distribution of Path-wise Mortgage Simulation Values

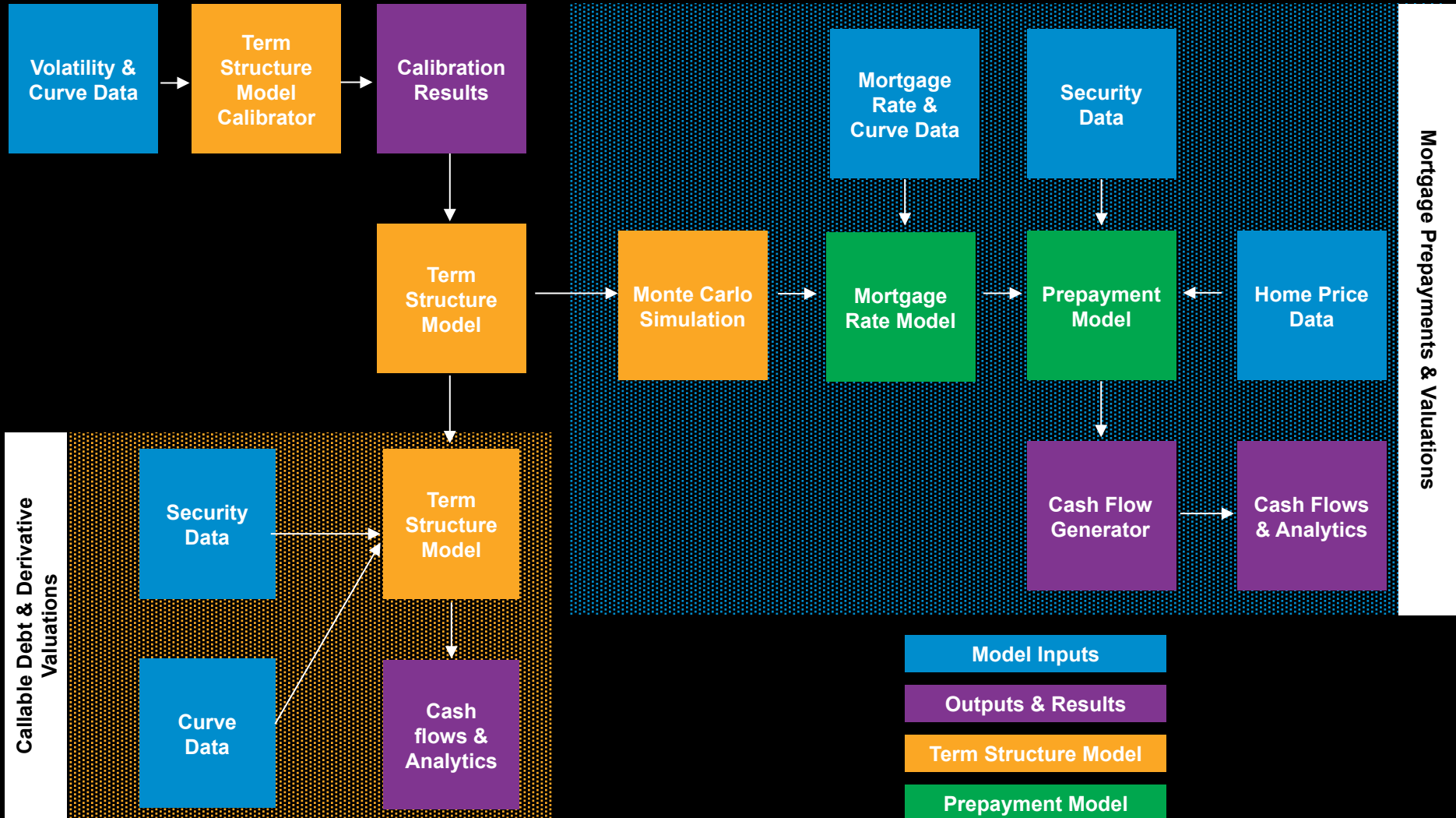
FNMA 30 Year TBA 4.50 Coupon MBS Path Value Distribution

Price: 107-10; Median: 109.9;
StDev: 8.6; Skewness: -0.97



Callable Debt & Derivatives/Mortgage Model Infrastructure

A “high-level” diagram illustrating how the optionality of mortgage-backed securities are implemented within Aladdin



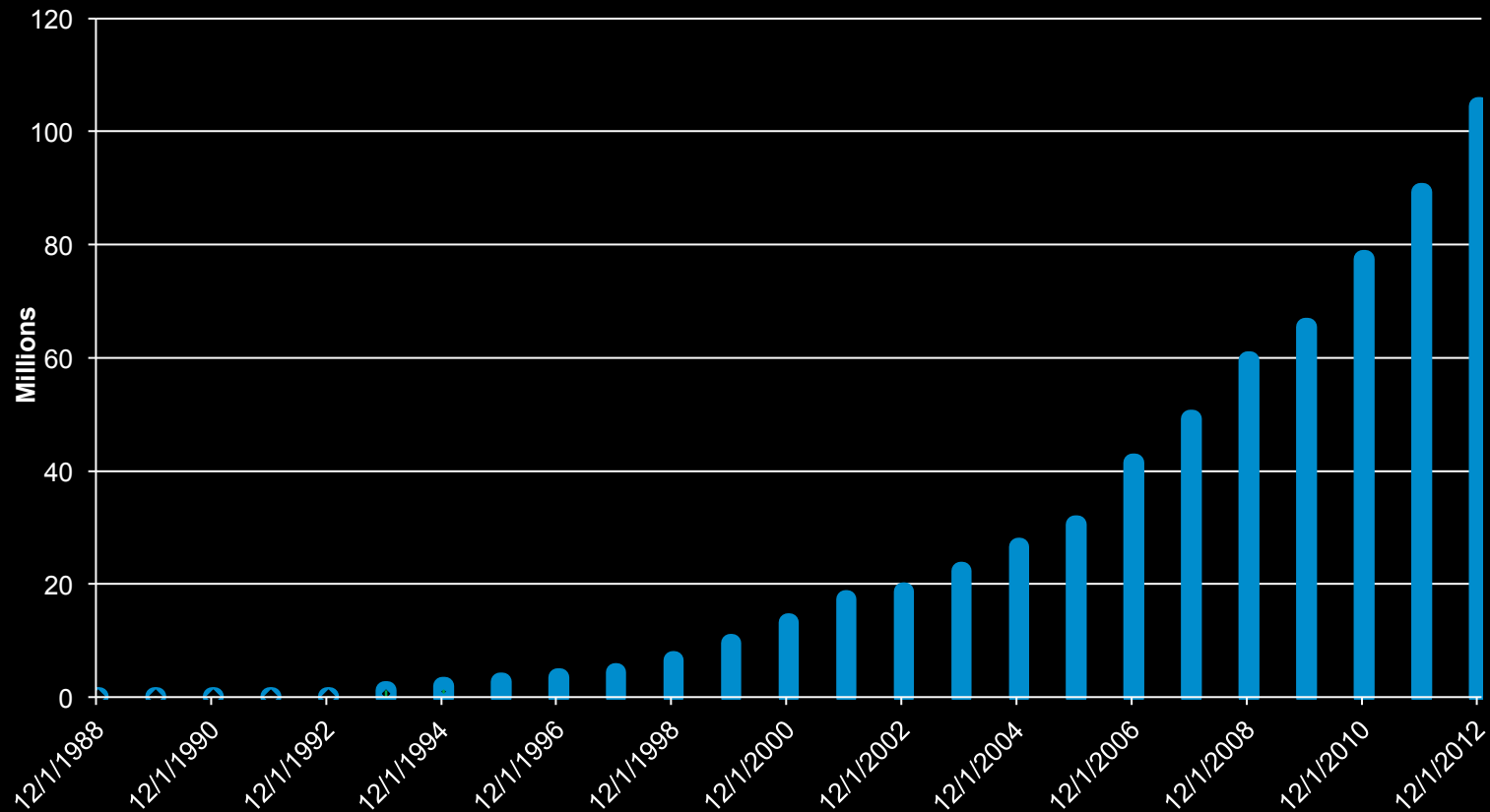
Numerically Calculated Mortgage “Greeks”

- **Interest Rate Sensitivities**

- Option-Adjusted Duration and Convexity
- Key Rate Durations and Convexity
 - 3 month
 - 6 month
 - 1 year
 - 3 year
 - 5 year
 - 10 year
 - 15 year
 - 20 year
 - 25 year
 - 30 year
- Spread Duration
- Volatility Duration
- Prepayment Duration
- HPI Duration
- Expected Rate of Return

Growth of OAV Calculations

Nightly OAV Calculations



As of the 2nd quarter of 2013, average of total nightly calculations were 110,267,333 million

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