INTRODUCTION TO THE STRUCTURED SECURITIES

Eric Kolchinsky
Director, Structured Securities Group
NAIC
STRUCTURED SECURITIES
GROUP
ABOUT US

• Structured Securities Group (SSG) was formed in 2013 and is based in NAIC’s New York Office.

• SSG’s primary function is to oversee an annual valuation of insurance company held Residential Mortgage Backed Securities (RMBS) and Residential Mortgage Backed Securities (CMBS).

• In 2015, SSG analyzed approximately 27,716 CUSIPs consisting of 22,406 RMBS and 5,310 CMBS.
NAIC's Financial Modeling

In 2009, NAIC responded to the impact of rating downgrades by the Credit Rating Providers (CRPs) on insurers' risk-based capital (RBC) charges amid the burst of the real estate bubble. NAIC, in-house Structured Securities Group (SSG) was formed to institutionalize the relevant regulatory functions.

Subsequently, the scope of financial modeling was expanded to commercial mortgage-backed securities (CMBS) for year-end 2010. The change in risk measurement for RMBS in the regulatory framework first became effective for the statutory reporting in year-end 2009.

2009

In 2009, NAIC responded to the impact of rating downgrades by the Credit Rating Providers (CRPs) on insurers' risk-based capital (RBC) charges amid the burst of the real estate bubble.
## Insurance Industry Holdings YE ‘15

<table>
<thead>
<tr>
<th>Collateral Type</th>
<th>2015 YE BACV ($Bil)</th>
<th>2014 YE BACV ($Bil)</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMBS</td>
<td>107.82</td>
<td>115.02</td>
<td>-6.3%</td>
</tr>
<tr>
<td>CMBS</td>
<td>167.12</td>
<td>173.93</td>
<td>-3.9%</td>
</tr>
<tr>
<td>Loan/CLO</td>
<td>52.36</td>
<td>51.79</td>
<td>1.1%</td>
</tr>
<tr>
<td>Auto</td>
<td>20.60</td>
<td>23.05</td>
<td>-10.6%</td>
</tr>
<tr>
<td>CTL</td>
<td>16.87</td>
<td>15.88</td>
<td>6.2%</td>
</tr>
<tr>
<td>Credit Card</td>
<td>13.79</td>
<td>15.82</td>
<td>-12.8%</td>
</tr>
<tr>
<td>Equipment Lease</td>
<td>13.44</td>
<td>13.63</td>
<td>-1.4%</td>
</tr>
<tr>
<td>Student Loan</td>
<td>8.46</td>
<td>7.73</td>
<td>9.5%</td>
</tr>
<tr>
<td>Aircraft Lease</td>
<td>10.27</td>
<td>7.01</td>
<td>46.5%</td>
</tr>
<tr>
<td>Trade Rec</td>
<td>3.45</td>
<td>3.34</td>
<td>3.3%</td>
</tr>
<tr>
<td>Other</td>
<td>110.55</td>
<td>96.98</td>
<td>14.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>524.74</strong></td>
<td><strong>524.17</strong></td>
<td><strong>0.1%</strong></td>
</tr>
</tbody>
</table>

*Source: NAIC; Schedule D1s 2014 and 2015. RMBS and CMBS included non-modeled securities.*
“OUTSOURCE AND OVERSIGHT”

- There are a number of approaches to regulatory credit analysis ranging from complete in-house solutions to complete outsourcing.
- The NAIC relies on three approaches:

<table>
<thead>
<tr>
<th>Example</th>
<th>In-house</th>
<th>Hybrid</th>
<th>Outsourced</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVO sourced designations</td>
<td>SSG</td>
<td>Filing Exempt</td>
<td></td>
</tr>
<tr>
<td>Employees</td>
<td>Third Party (contracted vendor)</td>
<td>Third Party (NRSRO)</td>
<td></td>
</tr>
</tbody>
</table>

| Regulatory Quality Assurance | Yes via NAIC’s governing structure | Yes via SSG / contract with Third Party | None |

There are a number of approaches to regulatory credit analysis ranging from complete in-house solutions to complete outsourcing. The NAIC relies on three approaches: SVO sourced designations for in-house, SSG for hybrid, and filing exempt for outsourced. Employees perform analysis in-house, third party (contracted vendor) performs in the hybrid approach, and third party (NRSRO) is used for outsourced. Regulatory quality assurance is ensured via NAIC’s governing structure for in-house, via SSG/contract with third party for hybrid, and none for outsourced.
OVERVIEW

• SSG’s operates under an “outsource and oversight” model. A vendor, currently Blackrock Solutions, is contracted to provide analysis for RMBS and CMBS.

• NAIC staff oversee all aspects of the process, including:
  – Creating macroeconomic scenarios for approval by VOS (E) TF
  – Oversight of modeling Credit Modeling including an extensive Quality Assurance process at the loan and pool level, as necessary.
  – Delivery of results to Insurers through the AVS+ platform.

• The following slides detail NAIC modeling philosophy and process.
BUILDING BLOCKS OF MODELING

Valuation or analysis of structured securities typically take the form of four distinct steps.

1. **Macroeconomic Model**
   - Projects macroeconomic variables which drive the Mortgage Loan Credit Model

2. **Credit Model**
   - Projects the performance of each loan based on macroeconomic scenario and loan characteristics

3. **Waterfall Model**
   - Uses the results of the Credit Model to allocate cashflows/losses to each tranche in the deal

4. **Valuation Model**
   - Uses tranche cashflows to calculate some aspect of risk (e.g. rating, price)
MACROECONOMIC MODEL

“What’s going to happen in the world?”

Four scenarios of the NAIC:
• Optimistic
• Baseline
• Conservative
• Most Conservative

Projects macroeconomic variables which drive the Mortgage Loan Credit Model
CREDIT MODEL

"In a given macroeconomic environment, what’s going to happen to my loans?"

Credit Model

Projects the performance of each loan based on macroeconomic scenario and loan characteristics

Outputs of Credit Model:
A time series of aggregate performance statistics including Principal, Interest, and Loss projections that are required to determine Cashflow distribution and Loss allocation

Mortgage pool
**WATERFALL MODEL**

"If the loans perform in a certain way, how does my investment (tranche) perform?"

**Outputs of Waterfall Model:**
A time-series of cashflows for the tranche including principal and interest paid and losses taken.

**Waterfall Model**
Uses the results of the Credit Model to allocate cashflows/losses to each tranche in the deal.
**VALUATION MODEL**

If the investment performs in a certain way, what does that mean?

The valuation block takes the raw cashflows and transforms them into a form of risk/value measurement.

The NAIC currently uses Intrinsic Price defined as ‘Weighted Average of $(1 – Discounted Principal Loss)$’.