C1 RBC Representative Portfolio

American Academy of Actuaries Report to
NAIC Investment Risk-Based Capital Working Group

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Presentation Outline

- **The Purpose of a Representative Portfolio**

- **The Construction of the Representative Portfolio**
  - Source of data

- **Initial Observations on Data**
  - Differences by portfolio size
  - Differences by quality
  - Possible adjustments to the base C1 factor

- **Open Issues & Next Steps**

Purpose of a Representative Portfolio

- Major assumption in the development of the basic C1 factors; input to bond model
  - Generic portrayal of portfolio structure that captures key features which differentiate C1 risk
  - Impractical to model every company's portfolio
- Underlying data provides basis for adjustments to the basic C1 factors
  - Data is not cusip specific
  - Given a quality rating and instrument type, default and recovery are assumed to be constant, i.e., not issue or issuer specific

Portfolio Construction: Data

- NAIC provided information on every bond position for every life insurance company as of December 31. 2011; data provided did not identify company or asset cusips

- Data represented approximately 287,000 positions; 782 companies

- Data was adjusted
  - Excluded bonds guaranteed by the full faith and credit (FFC) of the US Government
  - Excluded zero value bonds

- Variables with large C1 impact are being analyzed
  - Portfolio size
  - Quality mix
  - Instrument type mix

Portfolio Size Category Ranges

The data is grouped into size categories for construction of model points that more closely correspond to the characteristics of portfolios

Size	$Billion		$Billion
1	0.0	-	0.5
2	0.5	-	1.0
3	1.0	-	2.5
4	2.5	-	5.0
5	5.0	-	10.0
6	10.0	-	25.0
7	25.0	-	80.0

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Portfolio Construction: Model

- Sort each company's bond portfolio by issuer amounts and group by bins to identify size and quality distribution

- Bin sizes set as a percentage of total portfolio assets

- Result is the representative portfolio for each company

- Average of all portfolios is baseline representative portfolio for each respective size category

Observations on Portfolio Structure

- Issuer count and average issuer size is related to portfolio size

- Average portfolio issuer size distribution is related to portfolio size

- Most portfolio issuer size distributions across different size categories are in a similar range

- Portfolio issuer size distribution is evaluated with a variation index as a comparable measure across all portfolios

Observed Portfolio Variation
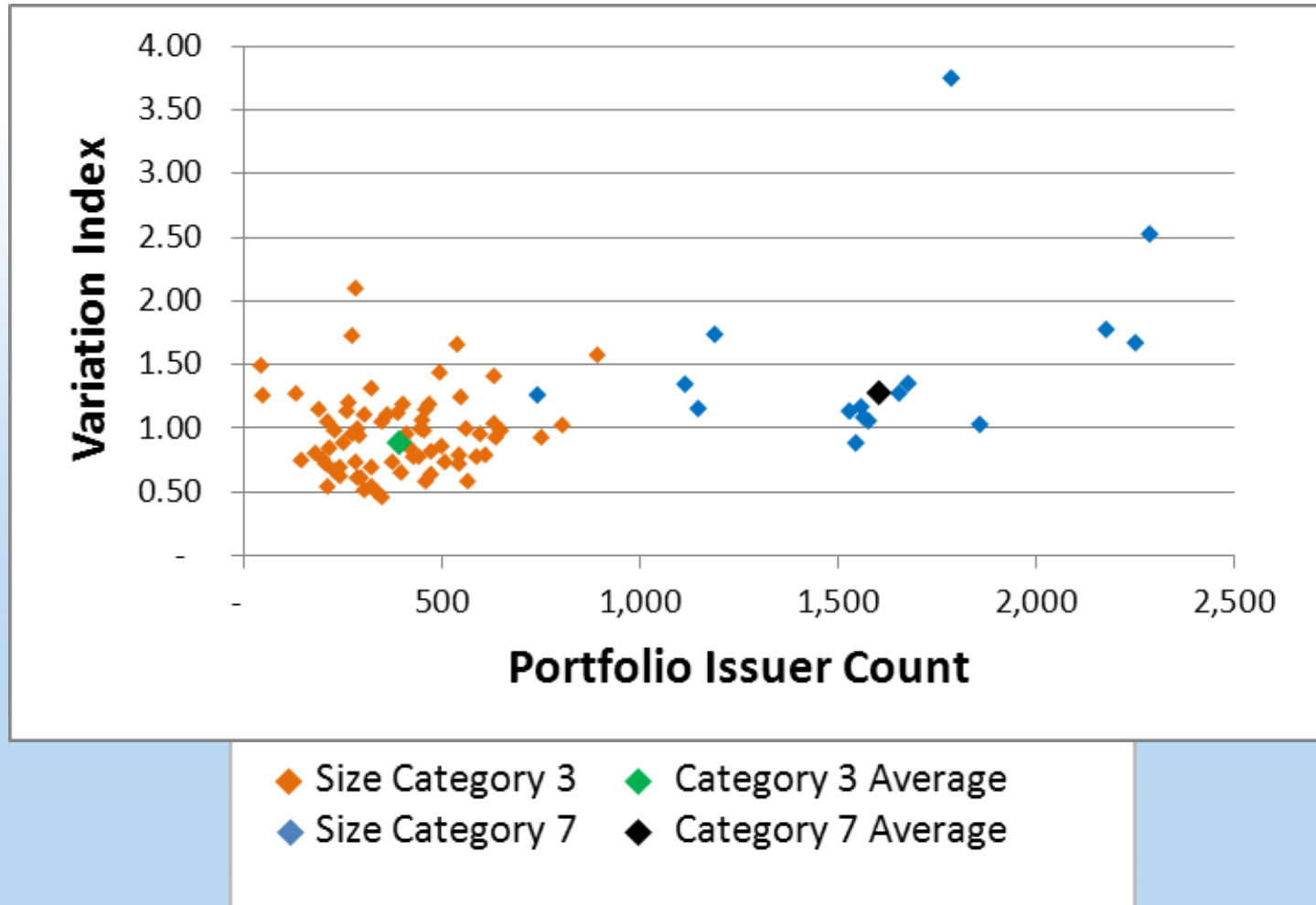
Portfolio Structure Effect on RBC

- Utilized the 1991 model in the table below to illustrate how a C1 charge would vary, if based on different portfolios

- Results show significant variation of C1 charge

Issuer Count	92nd Percentile RBC C1 Factors				
400	*0.17%*	*0.35%*	*0.31%*	*0.45%*	*0.55%*
800	*0.09%*	*0.19%*	*0.16%*	*0.26%*	*0.31%*
1200	*0.04%*	*0.13%*	*0.11%*	*0.17%*	*0.21%*
2400	*0.01%*	*0.05%*	*0.03%*	*0.08%*	*0.11%*
Variation Index	0.00	0.98	0.82	1.27	1.53

Possible Adjustments to Base C1 Factor

- RBC formula contains adjustments to base C1 factors to reflect key differences in risk characteristics of an insurer's asset portfolio

- Current approach
  - Number of issuers – aggregate C1 adjustment up/down relative to a portfolio with 1200 issuers
  - Issuer concentration – double the C1 of the ten biggest issuer positions
  - Current approach may not be the best way to reflect portfolio differences
    - Insurers can arbitrarily change the ten biggest positions to reduce C1

- Other alternatives
  - Issuer concentration
    - Adjust relative to variation index
    - Adjust for the x% biggest issuer positions
  - Combined measure – adjustments relative to issuers per unit of the variation index

Open Issues and Next Steps

- Expand analysis to all size groups

- Consider analysis of portfolios with more granular letter modifier rating groupings

- Expand representative portfolio information

- Analyze portfolio variations to define adjustments to base C1 factors