Equity Calibration Comparsion

Two Alternative Calibrations

Modified GEMS Calibration

    a) Based on standard GEMS calibration approach

    b) Adjusted for NAIC's mean and standard deviation targets

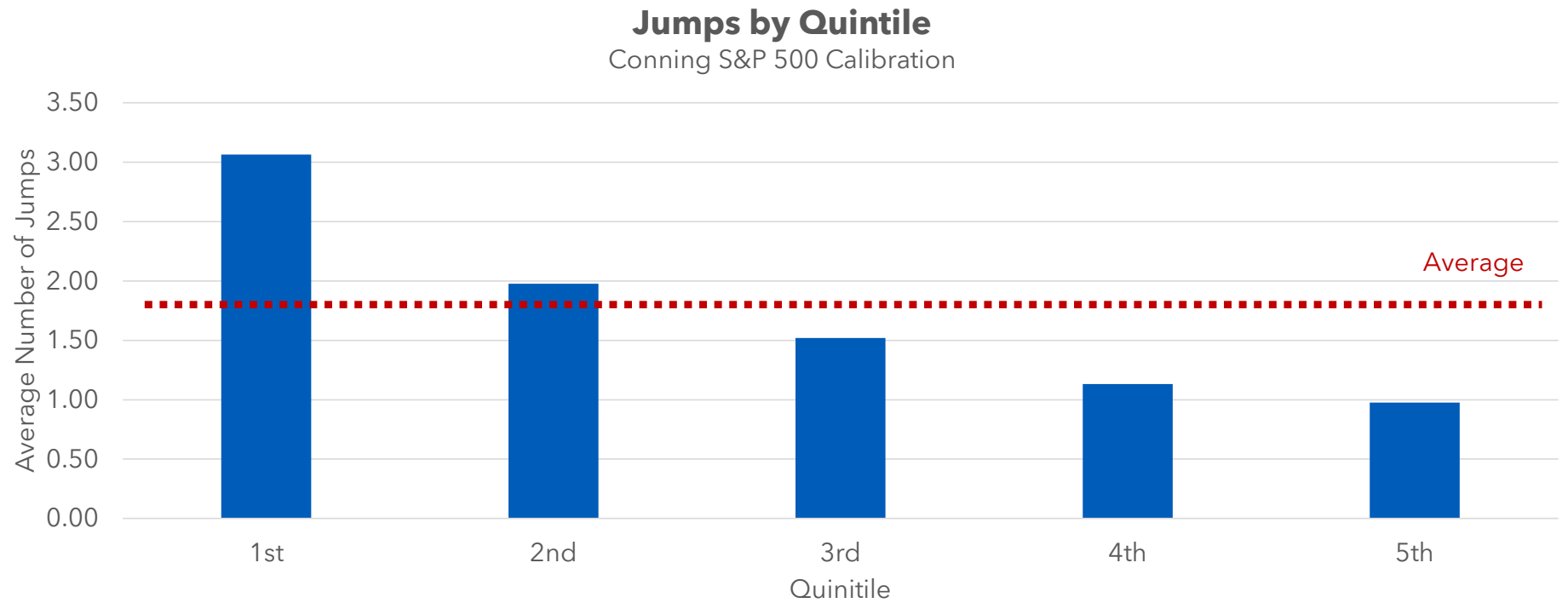   c) Basis for Field Test #2 runs

ACLI's Proposed Calibration

    a) Based on Run #6 from Field Test #1

    b) Adjusted to address some of Conning's previous concerns

Previous Concern: Tail Correlation

Correlation by Quintile
S&P 500 vs Russell 2000
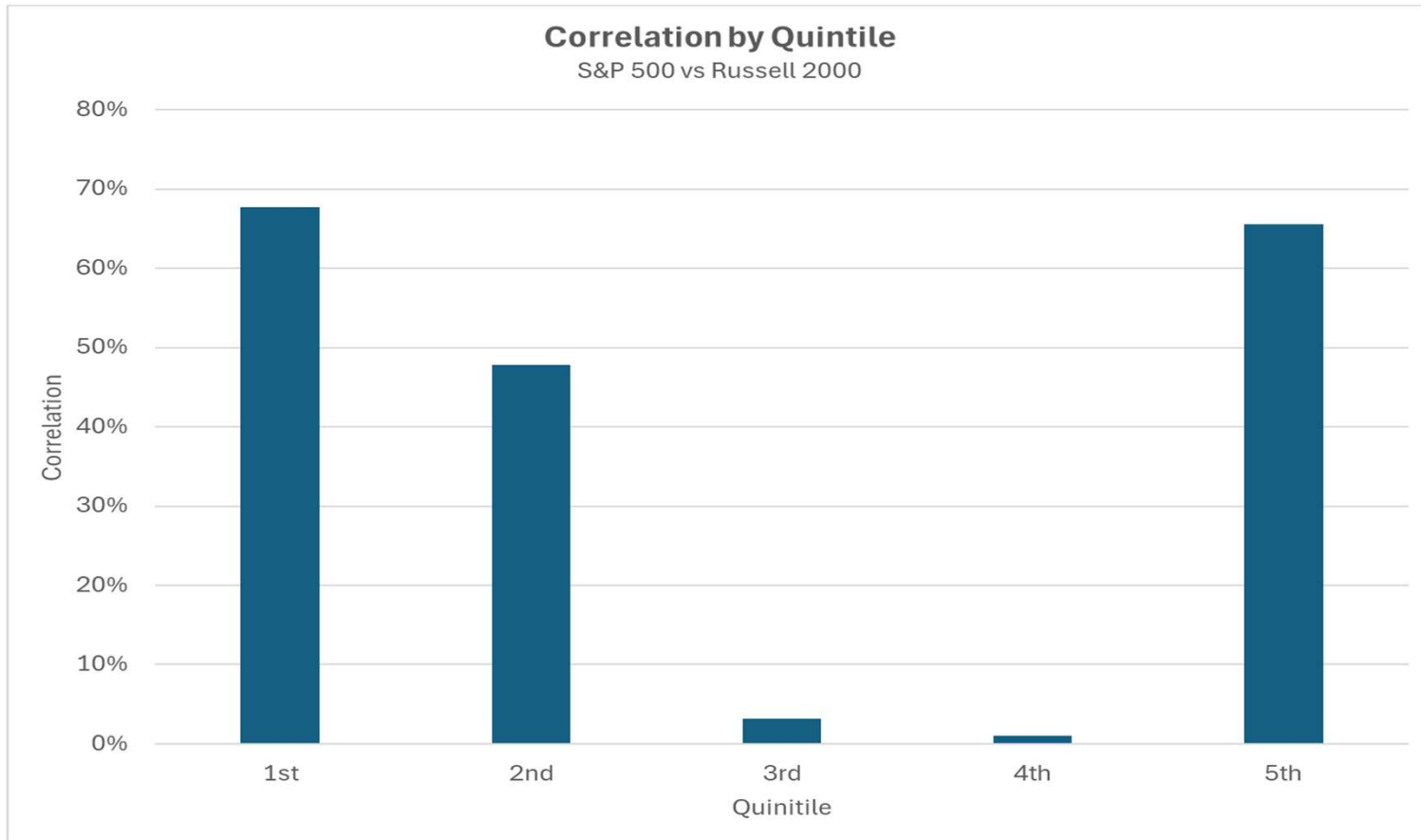
Previous Concern: Tail Correlation

Focus on Impact of Jumps

Jumps by Quintile
Conning S&P 500 Calibration

Previous Concern: Tail Correlation

Way to achieve this in GEMS

   a)   Correlation between Variances

Calibration	Mid Cap	Small Cap	US Aggressive Equity
Conning	0.8920	0.8530	0.9360
ACLI	0.8172	0.7667	0.7889

# Previous Concern: Tail Correlation

Way to achieve this in GEMS

a) Correlation between Variances

b) Correlations between Jump Losses

c) Similar Jump Frequencies

- Frequency is linked to Variance: Expected Frequency = Jump Intensity * Current Variance
- Variance reverts to α / β
- So, want Long-Term Frequency (= Jump Intensity * α / β) to be similar

Calibration	Large Cap	Mid Cap	Small Cap	US Aggressive Equity
Conning	1.7419	1.8656	1.8288	3.3580
ACLI	0.1019	0.1270	0.1273	0.1449

Alternative Calibrations: Large Cap Parameter Comparison

Parameters	Conning	ACLI
Fixed Return	0.0825	0.0723
Risk Premium Coefficient	0.0926	0.5744
Alpha	0.0058	0.0196
Beta	0.4627	0.9519
Sigma	0.0747	0.1254
Jump Intensity	139.5882	4.9442
Jump Mean	-0.0525	-0.1500
Jump Sigma	0.0575	0.0584

Alternative Calibrations: First Month Returns
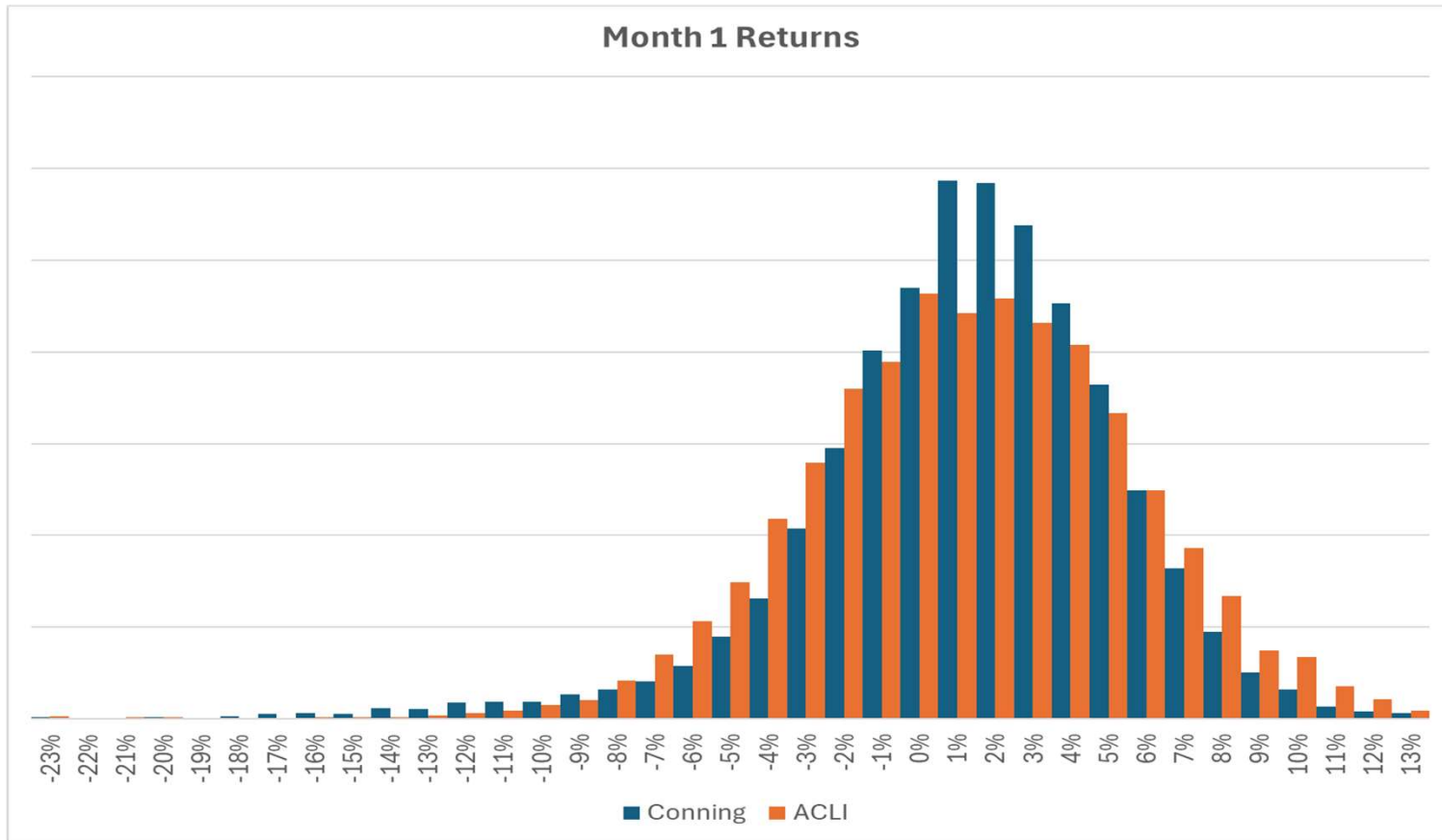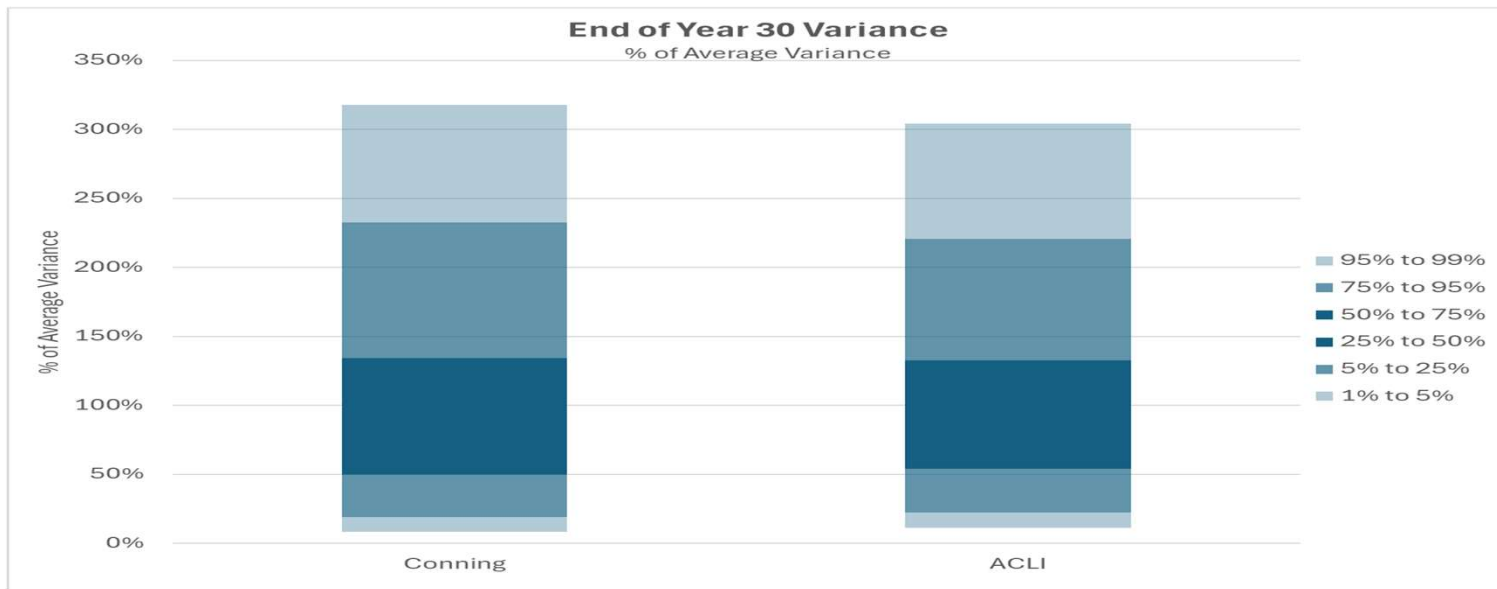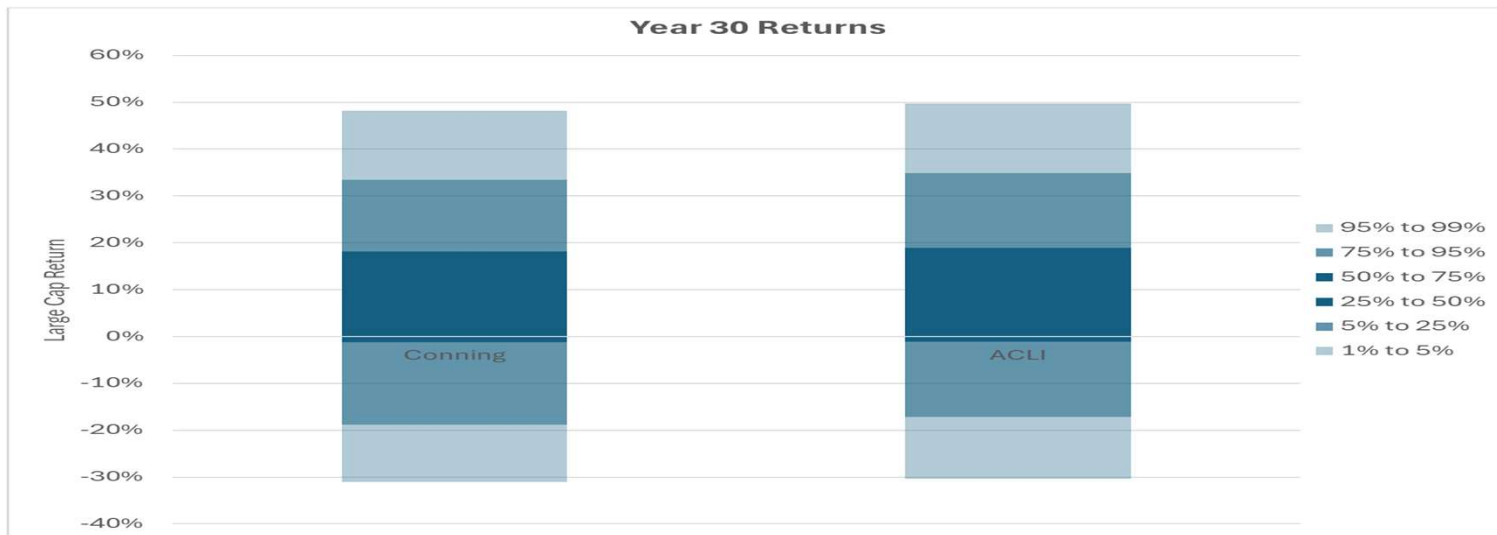
Alternative Calibrations: First Year Returns

Alternative Calibrations: Changes over Time

Evolution only Impacted by Variance
- Core volatility is completely independent

Impact of Variance
- Is it variable?

Alternative Calibrations: Changes over Time

Evolution only Impacted by Variance
- Core volatility is completely independent

Impact of Variance
- Is it variable?
- Does that variability impact return?

Alternative Calibrations: Changes over Time

Evolution only Impacted by Variance
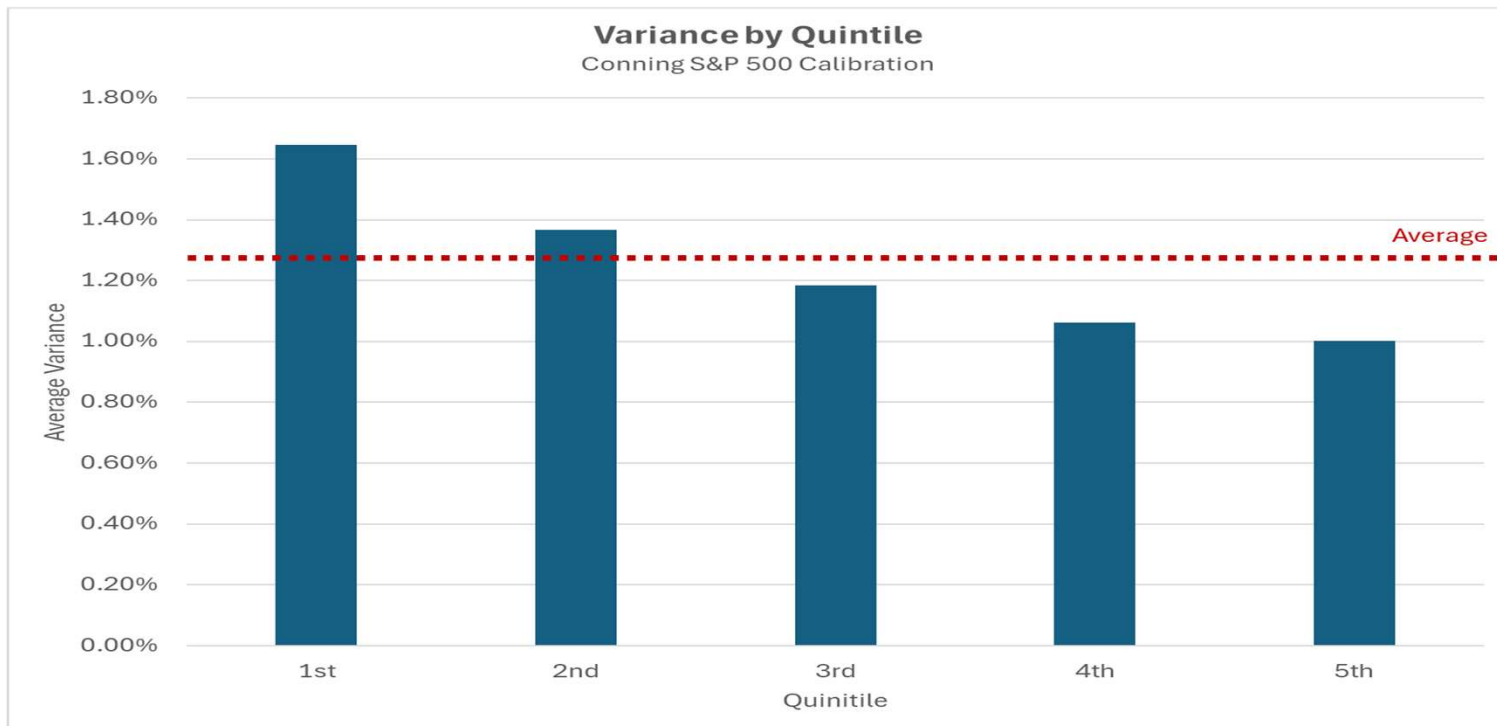- Core volatility is completely independent

Impact of Variance
- Is it variable?
- Does that variability impact return?
- How does it impact serial correlation?

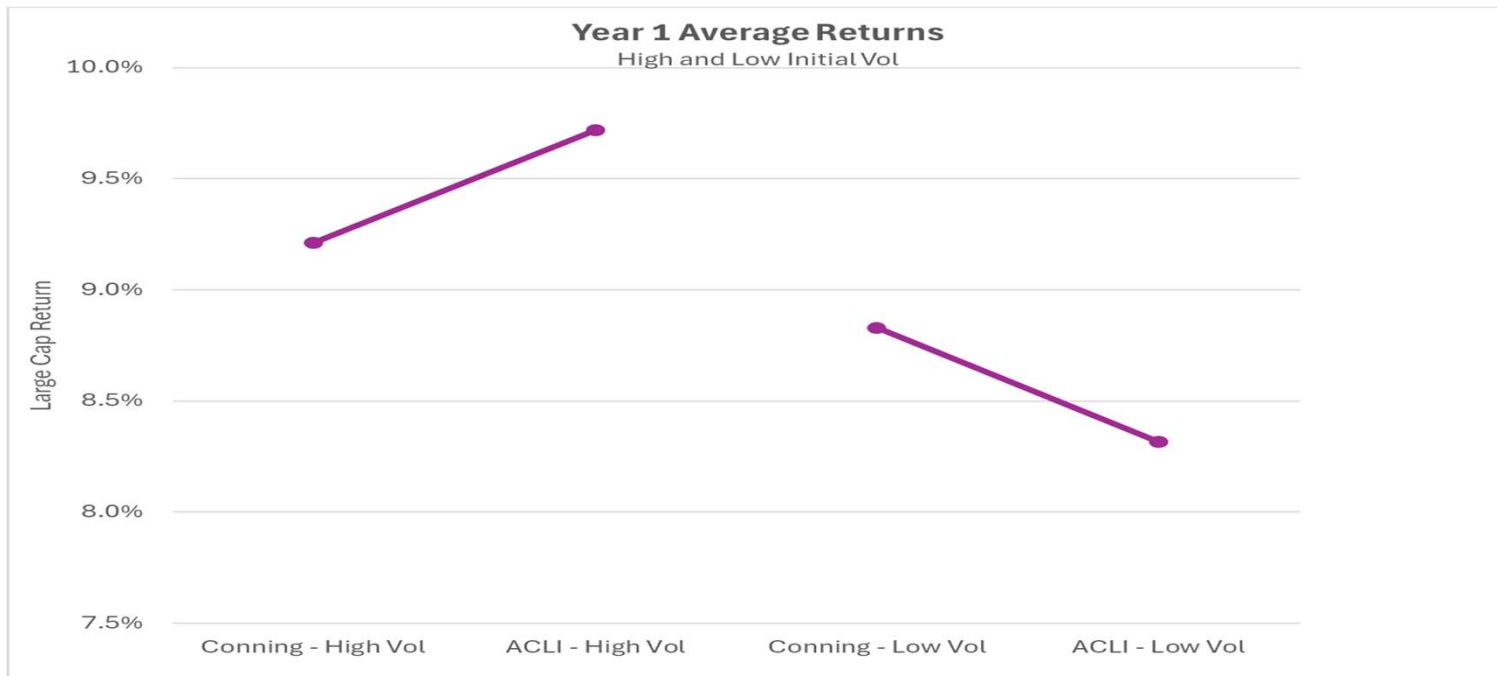# Alternative Calibrations: Impact on Serial Correlation

Impact is Complicated

- Like Jumps, Variance increases with bad returns

Alternative Calibrations: Impact on Serial Correlation

Impact is Complicated
- Like Jumps, Variance increases with bad returns
- Large Risk Premium Coefficient makes Average Return very susceptible to changes in Variance

Alternative Calibrations: Impact on Serial Correlation

Impact is Complicated

- Like Jumps, Variance increases with bad returns
- Large Risk Premium Coefficient makes Average Return very susceptible to changes in Variance
- Changes the sign of Serial Correlation
  - Conning's Year 1 vs Year 2 is +2%
  - ACLI's is -3%

Rolling 10-Year Serial Correlation