$$S_C = \sqrt{\frac{\sum[R_i - MEAN(R)]^2}{n}},$$

where R_i is the return on the ith portfolio that has been in the composite for the full annual period, n is the number of portfolios in the composite for the full annual period (the use of either n or $n - 1$ in the denominator of the standard deviation calculation is acceptable), and $MEAN(R)$ is the equal-weighted mean return of the portfolios in the composite for the full annual period, where

$$MEAN(R) = \frac{R_{PORT1} + R_{PORT2} + ... + R_{PORTn}}{n},$$

where R_{PORT1} is the time-weighted return for the first portfolio in the composite for the full annual period and n is the number of portfolios in the composite for the full annual period. Because only portfolios that have been managed for the full annual period are included in the internal dispersion calculation, n may be different from the number of portfolios shown in the compliant presentation.

High–Low and Range The high–low and the range are the simplest and most easily understood measures of internal dispersion. Their key advantages are simplicity, ease of calculation, and ease of interpretation. One disadvantage of these measures is that one extreme value or outlier can skew the internal dispersion measure. In addition, by themselves, the high–low and the range of returns are not particularly rigorous measures of internal dispersion.

3-5

Q&A

1. *Firm A has a composite that consists of 15 portfolios. Ten of the portfolios have been in the composite for the entire year. How could Firm A calculate a measure of internal dispersion?*

	Beginning Value	Annual Return
Portfolio 1	100,000	5.2%
Portfolio 2	300,000	4.9%
Portfolio 3	200,000	5.5%
Portfolio 4	500,000	5.6%
Portfolio 5	100,000	5.1%
Portfolio 6	250,000	4.7%
Portfolio 7	450,000	5.2%
Portfolio 8	200,000	4.8%
Portfolio 9	300,000	5.3%
Portfolio 10	200,000	5.0%
Composite Value	2,600,000	
Equal-Weighted Return		5.1%

Firm A could disclose the high and low or range of portfolio returns (i.e., High–Low = 5.6%–4.7%; range = 0.9%) or could disclose the internal standard deviation. The equal-weighted internal standard deviation is calculated as follows:

$$S_R = \sqrt{\frac{(0.052 - 0.051)^2 + (0.049 - 0.051)^2 + ... + (0.050 - 0.051)^2}{10}} = 0.0028, \text{ or } 0.28\%.$$