



*The Ben Graham Centre's  
2015 Value Investing Conference*

How to keep your wits when your suspicion is the world has  
lost theirs: A look inside Graham's tool box

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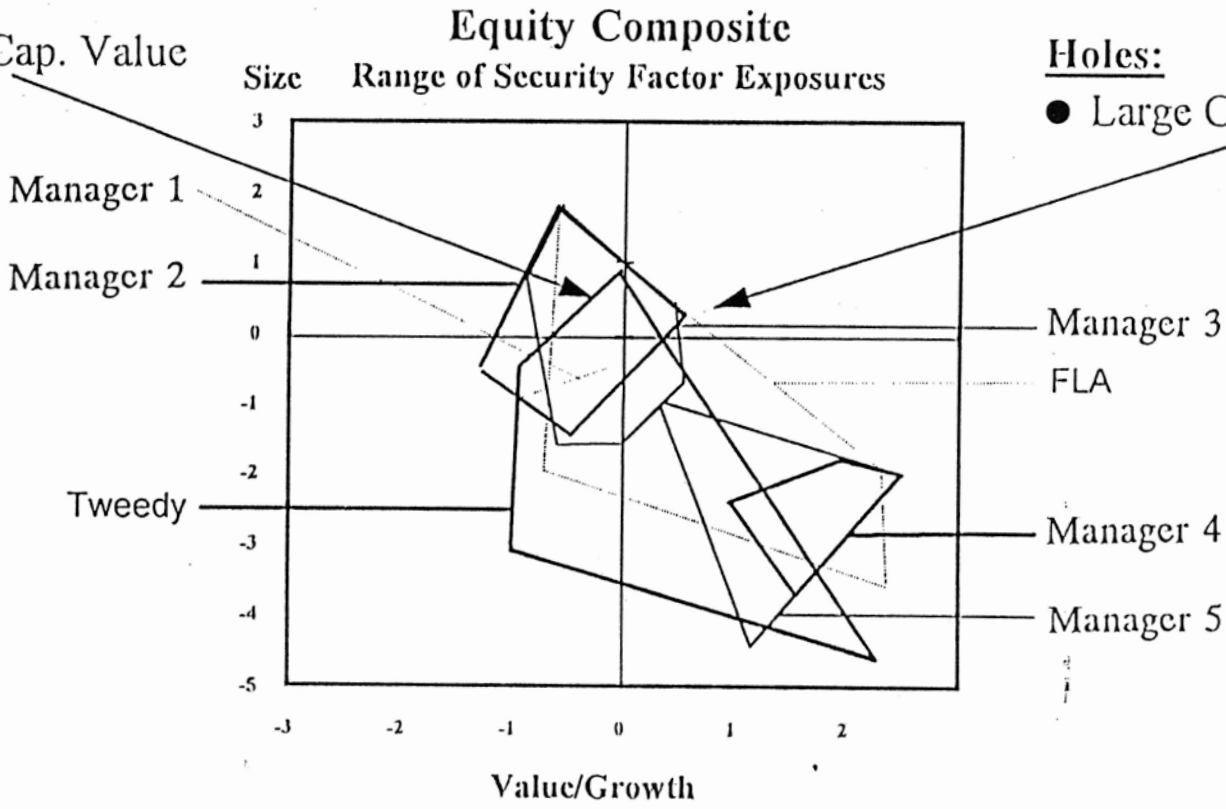
# Identify the Portfolio's Risks.

**Cluster:**

- Large Cap. Value

**Holes:**

- Large Cap. Growth



Note: Analysis based on BARRA "Size" and "Growth" factors relative to the S&P 500.



Then, the excess return is the difference between the portfolio return and the common (or market) return:

$$\begin{aligned} R_{excess} &= R_{equal\_wt\_port\_of\_n\_stocks} - R_{common} \\ &= R_{common} + \frac{1}{n} \sum_{i=1}^n R_i - R_{common} \\ &= \frac{1}{n} \sum_{i=1}^n R_i \end{aligned}$$

The volatility of the excess return is

$$\begin{aligned} \sigma_{excess}^2 &= vol\left(\frac{1}{n} \sum_{i=1}^n R_i\right) \\ &= \left(\frac{1}{n}\right)^2 \sum_{i=1}^n vol(R_i) \\ &= \left(\frac{1}{n}\right)^2 \sum_{i=1}^n \sigma_{stock\_specific}^2 \\ &= \left(\frac{1}{n}\right)^2 n \sigma_{stock\_specific}^2 \\ &= \frac{\sigma_{stock\_specific}^2}{n} \end{aligned}$$

Then, the tracking error (TE) is the square-root of this volatility of the excess return:

$$\begin{aligned} TE &= \sqrt{\sigma_{excess}^2} \\ &= \sqrt{\frac{\sigma_{stock\_specific}^2}{n}} \\ &= \frac{\sigma_{stock\_specific}}{\sqrt{n}} \end{aligned}$$



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